

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

Vol 105, No 14

CHICAGO, ILLINOIS

OCTOBER 5, 1935

CYANOSIS OF THE NEW-BORN

E. A. MORGAN, M.B.
AND
ALAN BROWN, M.D.
TORONTO, ONT

The frequency with which cyanosis of the new-born is encountered constitutes a problem which, in the past has received too little attention from the obstetrician, general practitioner and pediatrician. It is difficult to think of any other condition in the realm of pediatrics which can be charged with so many slipshod methods of prevention, inaccuracies of diagnosis and uncertainties of prognosis. Of recent years much progress has been made in methods of treatment, but it is probable that the reputation achieved by these methods has been largely due to the fortunate fact that a large proportion of cyanosed new-born babies recover spontaneously. A correct diagnosis is arrived at with difficulty, owing to a combination of factors: the multiplicity of conditions that may produce cyanosis, the as yet meager knowledge of the physiology of respiration and circulation of the new-born baby, and the present day lack of unanimity in the interpretation of various clinical laboratory procedures used to facilitate the diagnosis.

The more commonly accepted causes of cyanosis of the new-born may be divided into those due to accidents of labor and those due to pathologic conditions of the infant.

CAUSES DUE TO ACCIDENTS OF LABOR

- 1 Aspiration of mucus
- 2 Atelectasis
- 3 Prolapsed cord or cord around the neck.
- 4 Early separation of the placenta and low implantations of the placenta
- 5 Prolonged difficult labor
- 6 Breech presentation with difficulty in delivering of after-coming head
- 7 Severe circulatory or toxic conditions of the mother, or drugs, particularly morphine, administered to the mother during labor
- 8 Cerebral edema.
- 9 Intracranial hemorrhage (traumatic)

CAUSES DUE TO PATHOLOGIC CONDITIONS OF THE INFANT

- 1 Prematurity
- 2 Persistent thymus
- 3 Diaphragmatic hernia
- 4 Tracheo-esophageal fistula
- 5 Congenital cardiac malformation
- 6 Tongue swallowing
- 7 Pneumonia of the new-born

- 8 Tetany of the new born
- 9 Sepsis of the new-born
- 10 Intracranial hemorrhage (spontaneous)

COMMENT

A detailed discussion of the majority of the causes is unnecessary, since their relation to cyanosis is obvious, a few have received undue emphasis in the past, and others, in spite of their etiologic importance, have not received the consideration they deserve. It is hoped that a critical analysis, from a clinical point of view, of some of these causes will stimulate a free discussion and help to establish a greater uniformity in our conception of the etiology of cyanosis and in the diagnostic methods employed.

Some familiarity with the accepted theories relative to the physiology of the new-born baby is of the utmost value to the clinician.

During fetal life the necessary supply of oxygen for the developing fetus and the disposal of carbon dioxide are effected by simple diffusion across the placenta. The carbon dioxide tension of fetal blood is higher than maternal venous blood and the oxygen tension is less.¹ The stimulus responsible for the first respiration is not definitely known but is at present credited to an increase of carbon dioxide tension stimulating the respiratory center. If this is true, it is difficult to explain intra-uterine apnea unless one assumes that the fetal respiratory center is much less sensitive than that of the new-born baby and responds only to much higher concentrations of carbon dioxide. During labor the normal interchange of gases across the placenta is impeded and in some instances, such as premature separation or low implantation of the placenta or umbilical cord pressure, may be completely suspended. This is reflected in a much increased carbon dioxide tension in the fetal blood and a diminished oxygen concentration. That this blood picture is practically invariable in the new-born has been proved by the careful studies of Eastman. In addition, he has shown that the p_H of the serum of these infants and particularly of those with asphyxia is very much reduced. In prolonged labor the increase in carbon dioxide tension and even the anoxemia itself may stimulate the respiratory center prematurely. Proof is abundant that premature respiratory efforts do occur, as evidenced by the number of instances in which amniotic fluid has been found in the alveoli of still-born infants.² Even if premature respiratory efforts do not occur it is logical to assume that frequent stimulation of the respiratory center may materially depress its functional capacity. The reduction of oxygen in the fetal blood has further-

more been proved by Schmidt³ to damage the cells of the respiratory center so that they are incapable of responding to the normal stimuli.

If, then, one accepts the fact that most new-born babies enter the world in the condition of anoxemia, with the functional activities of their respiratory centers more or less impaired, and that in addition they have normally a polycythemia (which facilitates the occurrence of cyanosis), one cannot consider as remarkable the frequency of this symptom in the new-born. Added to these factors, which may be considered more or less normal, there are numerous accidents of labor and pathologic conditions in the infant, which may be the means of producing cyanosis.

ASPIRATION OF MUCUS AND ATELECTASIS

Although aspiration of mucus and atelectasis as causes of cyanosis have been listed under different headings, they are coupled for discussion since they represent a definite cause and effect. It is conceivable that paralysis of the respiratory center may, per se, produce atelectasis, but in the great majority of instances the more simple explanation is the correct one, namely, the plugging of sections of the bronchial tree with aspirated mucus. It is one of the most common causes of cyanosis and one that lends itself readily to preventive measures, which are all too frequently ignored.

When one considers that the expansion of the alveoli in the new-born baby's lung is accomplished only after the exercise of considerable force (that represented by 14 cm of water) and that dilatation is not complete for two or three days after birth, it is readily seen that any additional impeding factor such as mucus in the bronchial tree may oppose the relief of atelectasis. The actual cause of the cyanosis is not the shunting of blood through the collapsed area nor is it the throwing out of commission of one section of the lung by the collapse of the alveoli, it is simply the interference with the proper entrance of air into the lungs by the occlusion of bronchi or of the trachea itself, having the same effect as if one deliberately choked the infant by compression of the trachea with the fingers. The coating of the alveolar epithelium with mucus, preventing the normal interchange of gases between the capillary circulation and the alveolar air, is probably another factor.

The diagnosis of atelectasis by physical examination is a difficult one, but it has been greatly simplified by the use of the x-rays, as shown by Dunham.⁴ The change in the angle of the ribs described by Wasson⁵ is of great help in the proper interpretation of the x-ray film.

The prevention of cyanosis due to aspiration of mucus should not be a difficult problem. The mistakes made in the past have been

Delay in attempting to remove the mucus until after the first inspiratory effort of the infant. It should be possible to perform this function as soon as the head is delivered.

The use of coarse gauze to wipe out the secretions. Such a procedure is apt to traumatize the child's buccal mucous membrane and also fails to remove mucus below the faucial region.

The too vigorous use of a hard rubber catheter with consequent traumatism of the pharynx by the sharp edges of the

openings in the end of the rubber. It is also customary for the operator to suck up mucus into the catheter, blow it out into a basin and reinsert the tube, thereby introducing pyogenic organisms into the infant's upper air passages.

A metal suction-tip with smooth surfaces, bent to conform to the curve of the infant's mouth and pharynx, serves the purpose admirably. The suction should be continuous and of moderate force to obviate injury to soft structures such as the uvula.

CEREBRAL EDEMA

From a clinical point of view there is every reason to believe that edema of the brain is a not uncommon cause of cyanosis and one that is frequently overlooked. Unfortunately, substantiating pathologic evidence is difficult to obtain. The symptom complex of the condition can best be illustrated by a hypothetical case history.

An infant is delivered after a prolonged difficult labor, possibly with the aid of forceps. Some difficulty may be experienced in resuscitation, but thereafter the infant behaves in a normal manner for a period varying from eighteen to twenty-four hours, at which time an attack of cyanosis occurs followed by a succession of disturbing symptoms such as vomiting, refusal to nurse, twitching of extremities, and even convulsions. The fontanel is full and tense. Lumbar puncture reveals clear spinal fluid with possibly a few red blood cells discovered microscopically. These signs continue for two or three days and then diminish in intensity, until on the fourth or fifth day the infant has returned to normal.

The clinical picture strongly suggests intracranial hemorrhage, but the delay in appearance of the signs, the negative results of spinal fluid examinations and the rapid subsidence of the symptoms render this diagnosis untenable.

There is plenty of evidence to support the view that the brain receives, during even a moderately difficult labor, sufficient traumatism to produce a reactionary edema. Pressure exerted on the skull during labor results in increased intracranial tension and congestion, which is reflected in the frequency with which petechial hemorrhages are found at autopsy in the brain and meninges.⁶ Excessive molding of the cranial bones and pressure by application of instruments are common causes of intracranial damage. It is a logical assumption that this damage must frequently result in cerebral concussion and edema.

INTRACRANIAL HEMORRHAGE (TRAUMATIC)

The most serious obstacle to the proper recognition of intracranial hemorrhage is the lack of a clear-cut definition. The great variability in the situation and size of the hemorrhage as found at autopsy is no doubt responsible for the confusion and looseness in the nomenclature. The diagnosis is not an easy one and it is rendered even more difficult by the confusion that exists in the interpretation of the various signs and symptoms. Some of the principal factors that help to confound the clinician are

The variety of pathologic conditions which present similar clinical pictures.

The absolute undependability of such physical signs as the tendon reflexes, muscle tone and ocular manifestations as aids in diagnosis.

³ Schmidt C. F. *Am J Physiol* 84: 202 (Feb.) 1928.
⁴ Dunham, Ethel C. *Atelectasis in the New Born*. *Am J Dis Child* 43: 594 (March) 1932.
⁵ Wasson W. W. *A Roentgenographic Study of the Infant Chest as Seen at Birth*. *J A M A* 83: 1240 (Oct. 18) 1924.

⁶ Schwartz P. *Ztschr f d ges Neurol u Psychiat* 40: 263 1924.

The unreliability of xanthochromic spinal fluid as a sign of previous hemorrhage

The demonstration of microscopic blood in the spinal and cistern fluid of most normal new-born babies⁷

The difficulty in evaluating the presence of gross blood in the lumbar puncture fluid. This blood may be the result of faulty technique or it may be due to spinal cord hemorrhage

The realization, which is dawning on most clinicians, that, even if gross blood is found in the spinal or cistern fluid and can be proved satisfactorily to be due to intracranial hemorrhage, this pathologic state is not incompatible with perfect and complete recovery. Recent reports in the literature attest the fact that such recovery is not only possible but relatively common. Ford⁸ in his monograph on cerebral birth injuries cites three such recoveries and quotes numerous instances described by other observers

There is a great disparity in the incidence of birth injury reported in the literature—from 0.6 to 9 per cent⁹. This disparity is not surprising when one considers the different methods by which the diagnosis of birth injury was achieved. In some instances, cases of suspected brain injury have been followed up in later life and the presence or absence of physical and mental defects recorded. Positive indications were considered as proof that birth injury had occurred. These conclusions were obviously based on a false premise and must be discounted

The following signs and symptoms should be regarded as strongly suggestive but by no means conclusive evidence of intracranial hemorrhage

Asphyxia pallida.

Difficulty in deglutition

Stertorous breathing

Full and boggy fontanel

Convulsions

The occurrence of these symptoms after a difficult or instrumental delivery or in a premature infant

The demonstration of gross blood in the cisternal fluid and to a lesser extent in the spinal fluid

An accurate prognosis cannot be given for the first few days. If the hemorrhage is subtentorial, the infant usually succumbs in the first week. If it survives this period, the chance of complete recovery is not as hopeless as has been heretofore believed

PERSISTENT THYMUS

Some years ago we published an article¹⁰ in which attention was directed to such signs as cyanosis, choking attacks, noisy nasal breathing and attacks of syncope as evidences of thymic dysfunction. The article was prompted by the fact that during the previous two or three years there had occurred in Toronto a succession of sudden deaths in apparently normal infants. The fatalities could not be attributed to any cause other than a persistent thymus, and this pathologic condition was verified, in several instances, at autopsy. Never at any time was it felt that pressure on the trachea was the cause of the symptoms, nor was there any proof

that an internal secretion of the gland was responsible. An explanation, which at that time seemed adequate, was that the hypertrophied gland produced pressure on, or traction on, certain vital mediastinal structures such as the vagus nerve

Given an alarming symptom or a combination of symptoms suggesting thymic enlargement, a hypertrophied gland, as shown by the x-rays, no other discernible cause for the symptoms and then a rapid return to normal following roentgen therapy, it seemed a logical conclusion that the symptoms were the result of thymic enlargement. But such a conclusion, though logical, was not scientific. During the last decade the more skilful application of the x-rays has uncovered cases of atelectasis previously unrecognized, and blood chemistry determinations have paved the way for the discovery of tetany of the new-born. These two conditions account for some of the clinical pictures formerly attributed to the thymus. There are, however, many cases in which symptoms cannot be satisfactorily explained. Further investigations along physiologic and biochemical lines will, it is hoped, reduce the number of such cases. Until then, the diagnosis of thymic dysfunction as a cause of cyanosis of the new-born infant should be made with the realization that such a diagnosis has never yet been substantiated by factual proof

The question as to whether or not irradiation of the gland is justified is one that must be decided in the individual case by the clinician himself

TETANY OF THE NEW-BORN

Tetany is a condition which, in the last few years, has received much attention as a cause of cyanosis in the new-born infant. The clinical picture is not unlike that of intracranial injury and cerebral edema except that the symptoms may appear at any time in the first few weeks of life. The diagnosis is suggested by the following signs and symptoms: cyanosis, usually intermittent, convulsions and twitchings, hyperesthesia, hypertonicity of skeletal muscles, and Chvostek's sign. It is verified by the demonstration of low blood calcium in the infant's blood. The rapidity with which the symptoms disappear following calcium therapy supplies additional proof of the importance of the condition from an etiologic standpoint. Various explanations for the occurrence of the tetany have been advanced. It may be due to faulty diet of the mother during pregnancy. Hypoparathyroidism in the infant due possibly to trauma has been suggested. Shannon¹¹ attributes it to an alkalosis in the new-born. In his publications he has presented the most logical and convincing explanation that is at present available

CONCLUSIONS

1 In the list of causes of cyanosis of the new-born, aspiration of mucus with resultant impaired ventilation should be given first place. The careful removal of pharyngeal secretions before the child's first inspiratory effort will materially reduce the incidence of cyanosis

2 Cerebral edema is a distinct clinical entity and an important cause of cyanosis

3 There is great need for a more clear-cut definition of the diagnosis of intracranial hemorrhage and for more uniformity in the interpretation of the various diagnostic procedures

11 Shannon W R Arch Pediat. 51 23 (Jan) 1934

7 Glaser Jerome. The Cerebrospinal Fluid of Premature Infants. Am J Dis. Child 36 195 (Aug) 1928. Roberts M H. The Spinal Fluid in the New Born. J A M A 85:500 (Aug 15) 1925. Levinson A. Greengard J and Lifvendahl R. Cerebrospinal Fluid in the New Born. Am J Dis Child 32:208 (Aug) 1926.
8 Ford F R. in Medicine Monographs. Baltimore. Williams & Wilkins 1927 vol 11.
9 Dunham, Ethel C. Transactions of the American Pediatric Society 1933. Sharpe William and MacLair A. S. Intracranial Hemorrhage in the New Born. J A M A 86 332 (Jan 30) 1926.
10 Morgan E A. Rolph A. H. and Brown Alan. Clinical Manifestations of an Enlarged Thymus. J A M A 88 703 (March 5) 1927

4 The thymus gland is a possible cause of disturbances of the new-born baby, but establishment of such a relationship still awaits factual proof

5 Tetany of the new-born is not an infrequent cause of cyanosis and one that should never be overlooked, since it responds readily to specific therapy

170 St George Street

ABSTRACT OF DISCUSSION

DR ETHEL C DUNHAM, Washington, D C The threshold for the appearance of cyanosis is, according to Lundsgaard and Van Slyke, an oxygen unsaturation of the capillary blood above about 65 volumes per cent. A number of conditions are responsible for this common symptom in the new born. I believe that atelectasis should be considered the abnormal persistence, after birth of a condition which is normal in fetal life and that it should be sharply differentiated from atelectasis which is the result of collapse of previously expanded lung tissue. Atelectasis of varying degrees may persist for some days or even as long as two weeks after birth without giving symptoms. This may be explained by the fact that the demands of the new born infant for oxygen are probably not great while it is quiet or asleep. When the infant cries, however the demand is increased and cyanosis under these circumstances may appear rather readily. At such times clinical evidences of atelectasis may be found. If the condition is one of simple atelectasis stimulating the infant to cry at regular intervals should be efficacious, particularly if the infant is feeble and premature. The types of atelectasis least amenable to treatment are the type which is secondary to accidents of labor or delivery and that which is the result of incomplete development of lung tissue. The pathologic diagnosis of atelectasis is obscured by the fact that the normal anatomy of the lungs of fetuses and young infants is not wholly understood. In 1932 Hunt made a study of 118 infants less than 1 month of age who had cyanosis. He reports that, although atelectasis of some degree was present in thirty-nine it was of a severe degree in only four cases. On this basis he considers atelectasis unimportant among the causes of cyanosis. He apparently assumes that it is possible to determine from the area of lung involved how important atelectasis is in the production of cyanosis. Hunt does not point out, however the incidence of atelectasis in the 482 additional infants studied who gave no history of cyanosis. Another cause of cyanosis is that of narcotization by morphine administered to the mother during labor. Murphy has stated that narcotization was the commonest cause of respiratory difficulty in sixty-six infants studied. That the fetus becomes tolerant to the continued use of morphine is shown by the fact that addicts give birth to infants apparently unaffected. However, recent reports make its menace to the fetus unquestionable. These narcotized infants, of course suffer from atelectasis. Carbon dioxide and oxygen, the Drinker respirator and injections of alpha lobeline into the umbilical vein have been advocated. It would seem rational to use a modification of the methods used at older age periods application of heat and the giving of respiratory stimulants, as well as the administration of carbon dioxide and oxygen combined with gentle artificial respiration.

DR JOHN D DONNELLY, Bala-Cynwyd Pa In attempting to differentiate the causes of cyanosis in accurate interpartum delivery and immediate postpartum history is of prime importance in helping to correlate and interpret symptoms and signs elicited from inspection and physical examination. Familiarity with the so-called normal new-born infant aids in the recognition of deviations from normal. As infants are born in a state of traumatic shock—and if also cyanosed—vigorous methods of treatment designed for the purpose of establishing respiration seem to be contraindicated. For the removal of mucus from the throat, a small, smooth woven catheter with smooth and rounded edges through which gentle suction is applied mechanically, should serve. When the pharynx is cleared, the tube may be slipped past the epiglottis for further drainage if so desired, after which oxygen or a mixture of oxygen and carbon dioxide may be passed through the catheter and either followed or accompanied by placing the

infant in a respirator. Any technique, such as that suggested by the authors, which may prevent the aspiration of mucus with its attendant danger of pneumonia and atelectasis is well worth a thorough trial. At the necropsy table, one is impressed with the overwhelming silent evidence of brain injury, as attested by cerebral edema and hemorrhage. In this type of case the severity of symptoms and signs in life is unreliable as an aid in immediate and remote prognosis, as some of my worst cases have survived with little or no evidence of neurologic or mental defect through the preschool age, while some with mild symptoms and signs have succumbed early or survived only to be horribly crippled mentally or physically, or both. When congenital cardiac defects have been excluded, it has been my experience that cerebral trauma and pneumonia have been the more common causes of prolonged intermittent or constant cyanosis and that pneumonia has proved to be more usually fatal.

DR CLIFFORD SWEET, Oakland, Calif I have discovered great value in postural drainage of the trachea for children immediately after birth. The large vigorous children will do well, no matter what one does with them, provided one does not injure them. Suction is provided in the delivery room, as is a mixture of oxygen and carbon dioxide in the hospital in which I see these infants. Also, all new-born infants are placed in the head-low ventral position. The child is put into its basket immediately after it is taken from the delivery table lying face down, with the foot of the basket well elevated and is kept in that position while the mother is given the necessary immediate attention and until it is returned to the nursery and at times for some little time after it is returned to the nursery. One who follows this procedure will be gratified and surprised at the amount of mucus which drains out of many of these babies in that period of time, and the number of children reported as being cyanotic will be decreased for a time after their return to the nursery. There is nothing, I think to support the traditional idea that all babies should be turned on the right side immediately after delivery. The child's circulation will take care of itself, nor is there any ground for the objection that in lowering the child's head one increases the amount of hemorrhage if any damage has been done within the intracranial cavity. Any prolongation of cyanosis after the birth of the child is the most potent factor in increasing hemorrhage if damage is done to the brain.

DR EDWARD A MORGAN, Toronto I think that Drs Dunham Brown and I are still in agreement as to how atelectasis should be classified. It is persistence of the fetal type of lung. My only point is that the mechanical condition which prevents the lung from expanding is the mucus in the bronchial tree and that, I feel, is an accident of labor. Dr Sweet's remark about postural drainage in the prevention of mucus getting into the respiratory passages sounds feasible. I am going to advise our obstetricians to practice it. I think that enough emphasis is not laid on the time at which the attempt should be made to remove mucus from the throat. In the last two obstetric deliveries at which I was present, one of cesarean section and the other a forceps delivery, the child after delivery was merely put aside. Everybody was so busy that there was no time to attend to the child. As I stood there (I was not supposed to be implicated in the operation at all) the child took a long sobbing, deep first inspiration and that was many seconds after delivery. I think that if mucus is aspirated before this respiratory effort, a lot of grief will be saved as far as cyanosis is concerned.

Vitamin C Is Easily Destroyed—In general it is the most easily destroyed of all the known vitamins, also it is easily soluble in water so that rejection of cooking water or the "water" of such canned vegetables as asparagus, peas or string beans may result in the loss of a large part of the vitamin C which had escaped destruction, and, furthermore, fruits are often preserved, prepared and eaten with such large amounts of added sugar that the vitamin value (and mineral content) is materially diluted and at the same time the consumption of actual fruit diminished because of the extent to which the sugar satiates the appetite.—Sherman, H C Food and Health, New York, Macmillan Company, 1934

ACTIVE IMMUNIZATION AGAINST POLIOMYELITIS

MAURICE BRODIE, MD

AND

WILLIAM H PARK, MD

NEW YORK

Controlled clinical and experimental studies have shown that convalescent serum is efficacious in the treatment of paralytic poliomyelitis.¹ The reason for this can be seen from the pathogenesis of the disease, which indicates that poliomyelitis is an infection of the central nervous system exclusively. Evidence has been brought forth to show that the virus of poliomyelitis travels by way of the nerve tracts² and becomes fixed to the anterior horn cells of the spinal cord.³ With this fact in mind, and knowing that the central nervous system is a well insulated and closed system, we believe it unlikely that serum could reach the affected cells, and, if it did, it is even more unlikely that it could dislodge the virus.⁴ With the consideration that convalescent serum is of little or no value and that isolation to prevent contact infection is impracticable because of the probable high carrier rate, the best means of combating the disease appears to be in the form of a vaccine.

Since individuals who have recovered from one attack of poliomyelitis rarely if ever are subject to a second one, there appears to be some basis for the belief that active immunization can be effective in this disease. Moreover, both convalescent human beings and monkeys usually have demonstrable antibody.

We have found the antibody content higher following a severe attack as compared with that produced by a mild attack in the experimental animal, and likewise animals recovered from a severe attack show a much greater resistance to reinfection. Since there is some correlation between concentration of antibody and immunity, the former can be used as an index of immunity in immunization experiments.

Epidemiologic evidence indicates that immunity against poliomyelitis develops with aging and is probably due to exposure to the virus. Added evidence of this is brought out by a study of antibody in the serums of human beings and monkeys at different age levels. In monkeys, owing to a lack of exposure to the virus (table 1), there is no antibody at any age, but in human beings (table 2 and fig. 1) there is increased antibody with aging. Since in natural immunization some children contract the disease, a safe and effective method of artificial immunization would be preferable. For this purpose, only that vaccine which is antigenic, safe and innocuous would be of any use. This report deals with the immunization of human beings and monkeys with such a vaccine and with the tests performed to determine the degree of this immunity.

Toward this end, several methods were first developed in monkeys. The first involved the injection of

subinfective doses of active virus. This was discarded because of the danger of infection. The second method, which was concerned with the use of virus serum mixtures,⁵ was not practical because of the fact that in order to get an appreciable immunity the mixtures had to be just neutralized, which meant the use of many monkeys. The third and selected preparation was that of virus inactivated by germicides.⁶

Infectious monkey cord was treated with various germicides, of which solution of formaldehyde proved to be the most efficacious. Various dilutions of this germicide were mixed with the virus and the mixture was kept either in the incubator or in the icebox for different intervals, to inactivate the virus. In each case equal parts of double the required concentration of solution of formaldehyde and 20 per cent virus suspension were combined. During the course of this work it was found that the virus suspension should be just inactivated, for overtreatment or prolonged treatment with solution of formaldehyde reduced the antigenicity of the vaccine.⁷ Therefore, in most of the work

TABLE 1—Results of Inoculations in Monkeys

| Serum from Monkey | Age | Equivalent Age in Human Scale | Weight in Kilo grams | Result |
|-------------------|-------------|-------------------------------|----------------------|-------------------|
| Very young | 15-18 mos | 6-8 years | 3.0 | Paralysis 8 days |
| Very young | 15-18 mos | 6-8 years | 3.5 | Paralysis 11 days |
| Very young | 2 years | 9-10 years | 3.8 | Paralysis 9 days |
| Very young | 2 years | 9-10 years | 3.5 | Paralysis 9 days |
| Very young | 2 years | 9-10 years | 3.5 | Paralysis 12 days |
| Prepubescent | 2½ years | 11-13 years | 3.8 | Paralysis 9 days |
| Prepubescent | 2½ years | 11-13 years | 5.0 | Paralysis 4 days |
| Puberty | 3 years | 14-16 years | 5.0 | Paralysis 8 days |
| Puberty | 3 years | 14-16 years | 5.0 | Paralysis 5 days |
| Puberty | 3-4 years | 15-17 years | 5.0 | Paralysis 8 days |
| Puberty | 4-5 years | 16-18 years | 6.0 | Paralysis 9 days |
| Adult | 5-7 years | 21+ | 8.0 | Paralysis 6 days |
| Adult | 10-15 years | Adult | 10+ | Paralysis 9 days |
| Adult | 15-20 years | Adult | 10+ | Paralysis 17 days |

TABLE 2—Antibody Levels in Age Groups*

| Age Group | Number Tested | No Neutralizing Antibody | Neutralized 10-50 Infective Doses | Neutralized 60-200 Infective Doses | Neutralized Over 200 Infective Doses |
|------------|---------------|--------------------------|-----------------------------------|------------------------------------|--------------------------------------|
| 6-8 months | 5 | 2 | 2 | 1 | |
| 1-5 years | 45 | 21 | 18 | 11 | |
| 6-10 years | 10 | 1 | 5 | 4 | |
| Adults | 34 | | | | 27 |

* Children 75 per cent under 5 years show little or no antibody adults majority have considerable antibody

reported, virus inactivated by 0.1 per cent solution of formaldehyde for from eight to twelve hours at 37 C was usually employed.

In immunizing the experimental animal, the vaccine was administered in either one or two doses of 2.5, 5 or 10 cc amounts. It was found that a 5 cc dose was sufficiently antigenic so as to produce an immunity better than that developed after a mild attack of the disease and sometimes comparable with that produced by either immunization with active virus or a severe attack of poliomyelitis.

Experiments in monkeys indicated that immunity could be developed by the injection of virus treated with solution of formaldehyde and that the vaccine was noninfective (table 3). Inoculation of this material into several human volunteers having shown that it was probably safe for human administration, it was used in children.

5 Brodie Maurice and Goldbloom A J Exper Med 53:885 (June) 1931
6 Brodie Maurice Maurice ibid 56:493 (Oct) 1932
7 Brodie Maurice J Immunol 28:1 (Jan.) 1935
Am. J. Pub Health 25:54 (Jan) 1935

This research was aided by grants from the Rockefeller and New York Foundations and from Mr. Jeremiah Milbank.
From the Department of Bacteriology New York University Medical College and Bureau of Laboratories of the Department of Health.
Read before the Section on Pediatrics at the Eighty-Sixth Annual Session of the American Medical Association Atlantic City N J June 14 1935.

1 Park W H Tr A Am Physicians 47:123 1932
S D Aycock W L Solomon C I and Thenebe C L New England J Med 208:432 (March 3) 1932
Fischer A E Human Convalescent Serum in the Treatment of Paralytic Poliomyelitis Am J Dis Child 48:481 (Sept) 1934

2 Brodie Maurice and Elvidge A R Science 79:235 (March 9) 1934

3 Brodie Maurice J Immunol 25:71 (July) 1933

4 Brodie Maurice J Immunol 28:353 (May) 1935

The vaccine was given in either one or two doses, each 5 cc in amount, of which from 1 to 2 cc was injected intracutaneously and the remainder subcutaneously. In more than 2,300 vaccinations there have been only three general reactions and twenty-three appreciable local reactions, such as superficial necrosis or

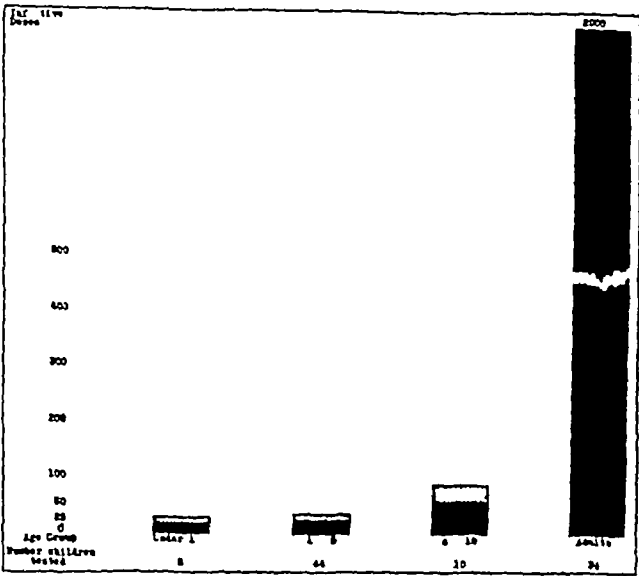


Fig. 1—Antibody content in various age groups

marked induration. About one third of those vaccinated showed a moderate induration, which lasted for a week or two.

About seventy-five children have been tested for antibody both before and after immunization. The results are herewith recorded so far as they have been completed. To test for antibody, the serums both before and for four weeks after the administration of the vac-

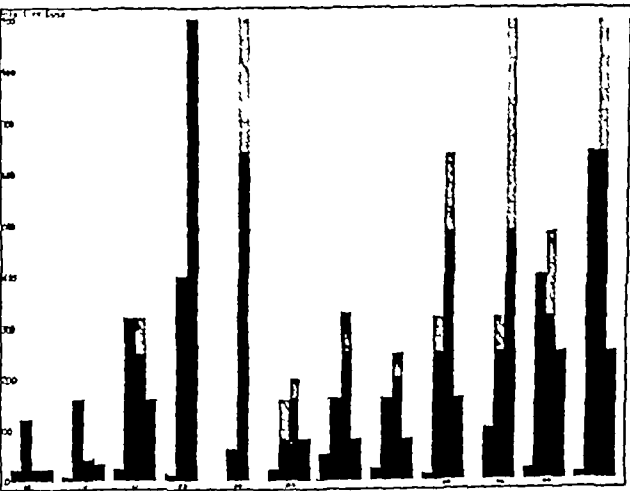


Fig. 2—Series 1. Antibody content before immunization and one month, five months and eight months after immunization reading from left to right. Amount is represented by vertical columns in terms of ability to neutralize different amounts of virus. The antibody level lies between the dark and the light areas.

cine were mixed with varying amounts of virus, the mixtures were incubated at 37 C for two hours and, after standing on ice over night, were injected into monkeys, intracerebrally. If neutralization occurred, the monkey remained well. The test can be carried out quantitatively, and so, in those children in whom a slight amount of antibody was present, it was possible

to determine whether or not an increase occurred after immunization.

The first twelve children, of whom five received a single 5 cc dose and seven, two such doses, eleven days apart, were vaccinated in July 1934. They were tested before and at one month, five months and eight months after immunization. When tested from three to four weeks later, all showed an appreciable antibody response. At five months, nine of eleven retained a considerable amount of antibody, while at eight months, seven of nine still showed antibody. These results are summarized in figure 2.

A second series of seventeen children was then vaccinated, of which seven received 5 cc amounts, four a single dose, and three two such doses, while ten were given 2.5 cc amounts, five a single dose and five two doses. The methods of immunization and the tests carried out before and at one and five months after immunization are given in table 4, in which it can be seen that the immunity resulting from the injection of 5 cc amounts is decidedly better than with 2.5 cc amounts.

The results up to the present show that, with a single 5 cc dose antibody was produced in twenty-two of

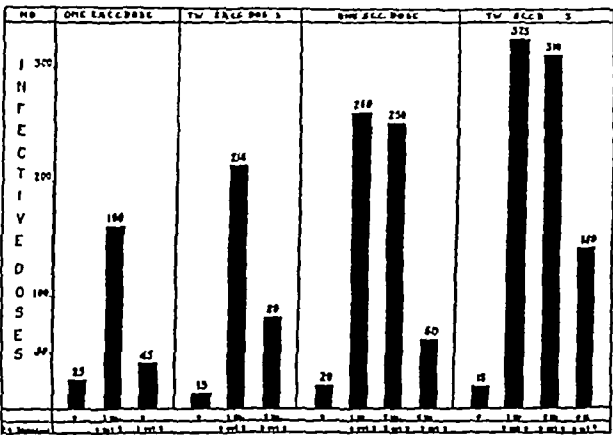


Fig. 3—Immunization in children. Little or no antibody. Zero indicates antibody before vaccination.

TABLE 3—Experiments in Monkeys

| Concentration of Cord per Cent | V O P * Doses Injected Intracerebrally | Time Contact Between Virus and Germicide, Hours | Results |
|--------------------------------|--|---|---|
| 10 | 6,400 + 32,000 Intraperitoneally repeated for 3 consecutive days | 0 | Paralysis in 10 days prostrate 2 days later |
| 10 | 6,400 + 32,000 Intraperitoneally repeated for 3 consecutive days | 12 | No evidence of poliomyelitis |
| 10 | 6,400 + 32,000 Intraperitoneally repeated for 3 consecutive days | 12 | No evidence of poliomyelitis |
| 10 | 6,400 + 32,000 Intraperitoneally repeated for 3 consecutive days | 24 | No evidence of poliomyelitis |
| 10 | 3,400 + 16,000 Intraperitoneally 10 days later 3,000 | 24 | No evidence of poliomyelitis |
| 10 | 3,200 + 16,000 Intraperitoneally 10 days later 3,000 | 24 | No evidence of poliomyelitis |
| 10 | 3,000 + 4,800 Intraperitoneally | 24 | No evidence of poliomyelitis |

* Minimal completely paralyzing dose: the smallest amount of virus containing tissue that gives a complete and rapid paralysis within thirteen days after intracerebral inoculation.

twenty-six children and that with two such doses ten out of ten responded. With one dose of 2.5 cc, four out of five developed antibody and with two such doses five out of five showed an antibody response. That two doses each of 5 cc are decidedly better than a single

dose or than 2.5 cc amounts is indicated in figure 3, in which it is shown that the antibody is better maintained with two doses than with one or with the smaller amount of vaccine. One child, who before immunization had no antibody and who after a single dose, showed no response was then given a second dose, after which there was demonstrable antibody in his serum. Two children, who had received a single dose, lost their antibody at five and eight months respectively and were given a second dose. After the reinjection of the vaccine a rapid and high antibody response followed. It would seem therefore, that two doses rather than one should be given.

The serums of the majority of the children immunized had little or no antibody before immunization while a few had considerable neutralizing power. For the purpose of study they have been divided into three groups: those without any antibody, those with a slight amount, and those with appreciable antibody. The first of these groups also includes serums neutralizing less than ten infective doses, the second from ten to fifty and the third more than fifty infective doses. The results obtained from thirty-three children given 5 cc

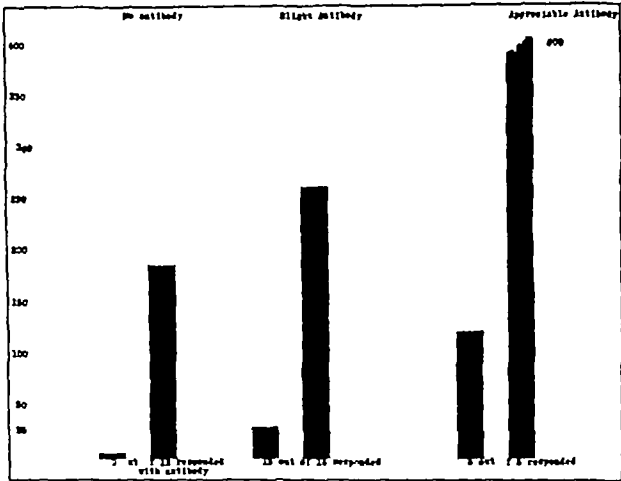


Fig. 4—Results after various preimmunization levels. Left hand column represents preimmunization level, right hand column represents after immunization level.

amounts of vaccine are represented in figure 4, in which it is shown that although the proportion of those immunized and the height of antibody level is greater when antibody is present before vaccination, yet in the absence of any previous antibody in the small series, nine out of twelve developed antibody. All but two of these were given a single dose and since a second dose may produce antibody, it is quite likely that, judging from the small series in which one dose gave immunity to 75 per cent, two doses would produce antibody in a greater proportion. Thus the vaccine appears to elicit an antibody response in those who seem to be the most susceptible in that they have no normal antibody.

For use in epidemics it is important that the administration should be followed by the rapid production of immunity. Three children who had small amounts of antibody before vaccination were tested at weekly intervals after receiving the vaccine. Demonstrable antibody was present in a week and reached its height in from three to four weeks. In two children, who had no antiviral substance in the control period, antibody could be demonstrated in eight days in one and in the other at sixteen days following vaccination. Figure 5 shows the composite antibody production of three chil-

dren tested at weekly intervals for four weeks and then at six and eight weeks after injection of the vaccine. In the same graph is indicated the amount of antibody present at various intervals following the stage of acute paralysis in three convalescent cases. The results show that the degree of immunity developed by vaccination

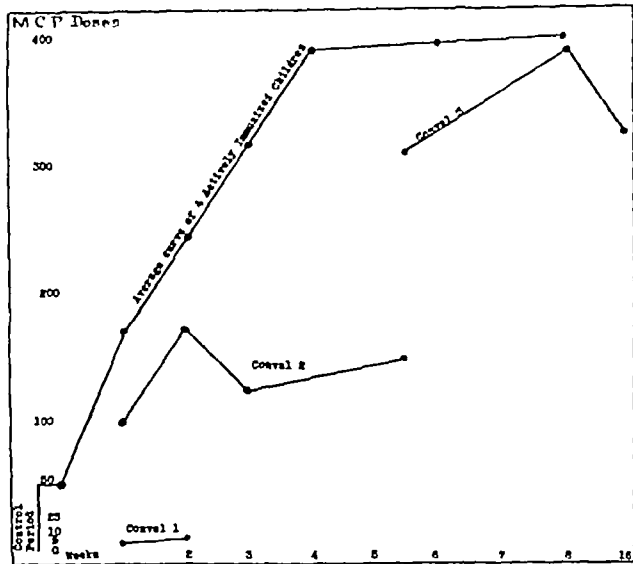


Fig. 5—Comparison between convalescent and active immunity.

compares favorably with that present in the three children who recovered.

Were a simple test for antibody available to enable the selection of those requiring the vaccine and also to determine the results of immunization, it would be possible to limit the number of vaccinations. The only test available at the present time is the monkey neutralization test, which involves the use of several monkeys and also an interval of from two to four weeks. We were able to render mice susceptible to the virus of poliomyelitis by subjecting them to repeated x-ray exposures

| Poliomyelitis | | | | Vaccinated Control |
|------------------------|--|-----------------------|--------------|--------------------|
| Hospital: | | Chart No.: | Mother Born: | Grav. born: |
| Name: | | Date of Polio Immun.: | | Grav. born: |
| Address: | | Father Born: | | Grav. born: |
| Birth: | | Sex: | Religion: | Grav. born: |
| Diagnosis: | | | | Siblings: |
| P. a. last immun.: | | | | Birth: |
| Date of Polio Immun.: | | | | Name: |
| Wt. at Vaccination: | | | | |
| P. a. Y. M. W. H. I.: | | | | |
| P. a. Y. M. W. H. I.: | | | | |
| Dose of Polio Vaccine: | | | | |
| Let. Num.: | | | | |
| P. a. Y. M. W. H. I.: | | | | |
| Antibody Content: | | | | |
| C. no. at I. W. H. I.: | | | | |
| Do. for sig.: | | | | |

Fig. 6—Forms used in keeping records of the vaccinated control in poliomyelitis in New York and in Newark, N. J.

and to transfer the infectious agent serially to normal mice. The fact that we were transferring the virus of poliomyelitis was borne out by specific neutralization of the mouse passage virus by serums containing poliomyelitis antibody, by the production of typical poliomyelitis in monkeys who were injected with infectious mouse brains, and by the immunization of monkeys with the mouse virus. However, after a number of passages the virus is lost in mice and has to be reestablished.

Although in children the vaccine produces an antibody response which compared well with that of several convalescent children, the test of its value must rest of the disease was too low and the number vaccinated too few, as indicated in table 5, to give any definite information Large groups of children are being

TABLE 4—Series 2 Immunization and Titration of Antibody Before and After

| Name | Age Years | Weight Lb | Date | First Immunization with Vaccine | | Date | Second Immunization with Vaccine | | Neutralizing Power of Serum Before Im- munization M C P Doses | Neutralizing Power of Serum After Im- munization M C P | Neutralizing Power 5 Months After Im- munization |
|------------|--------------|--------------|----------|---|-------------------|----------|---|-------------------|---|---|--|
| | | | | Amounts and Route of Inoculation, Cc | | | Amounts and Route of Inoculation, Cc | | | | |
| | | | | Intracu- taneous | Subcu- taneous | | Intracu- taneous | Subcu- taneous | | | |
| Hector | 1½ | 18 | 10/17/34 | 1.0 | 4.0 | 10/31/34 | | 3.0 | 10-20 | 160-240 | 160-240 |
| Deyaux | 5 | 40 | 10/17/34 | 1.5 | 7.5 | 10/31/34 | 2.0 | | 40 | 800+ | 160-300 |
| Viola I | 7 | 73 | 10/17/34 | 1.0 | 4.0 | 10/31/34 | | 5.0 | 10-20 | 160-240 | 100-320 |
| Calvin G | 2 | 24 | 10/17/34 | 1.5 | 3.5 | | | 5.0 | None | None | |
| Ramus | 4½ | 70 | 10/31/34 | 2.0 | 3.0 | | | | 240-400 | 640 | 640 |
| Louise S | 5 | 40 | 10/17/34 | 1.5 | 3.5 | | | | 50-50 | 640-800 | |
| Sealcon | 7 | 31 | 10/17/34 | 2.5 | 2.5 | | | | 100 | 640 | 640-800 |
| White | 2 | 20 | 10/21/34 | 0.5 | 2.0 | 11/ 7/34 | 0.5 | 2.0 | 3-10 | 100-160 | 40-80 |
| Dora M | 3 | 28 | 10/24/34 | 1.0 | 1.5 | 11/ 7/34 | 1.0 | 1.5 | 10-20 | 240-320 | 160-240 |
| Lawrence A | 5 | 41 | 10/24/34 | 0.5 | 2.0 | 11/ 7/34 | 0.5 | 2.0 | 5-20 | 100-160 | 20-60 |
| Frankie C | 5 | 30 | 10/24/34 | 1.0 | 1.5 | 11/ 7/34 | 1.0 | 1.5 | None | 40-60 | None |
| Ann Jew R | 7 | 58 | 10/24/34 | 0.5 | 2.0 | 11/ 7/34 | 0.5 | 2.0 | 20-40 | 450+ | |
| Lucas | 1½ | 21 | 10/24/34 | 0.5 | 2.0 | | | | None | 4-20 | |
| Millard M | 4 | 37 | 10/24/34 | 1.0 | 1.5 | | | | 10 | 100-160 | Less than 80 |
| Pellaga | 6 | 44 | 10/31/34 | 1.25 | 1.25 | | | | 20-40 | 320-450 | |
| Allice P | 6 | 44 | 10/31/34 | | 2.5 | | | | None | 50 | |
| Tangford B | 5 | 44 | 10/31/34 | 1.25 | 1.25 | | | | 80 | 320 | 60-80 |

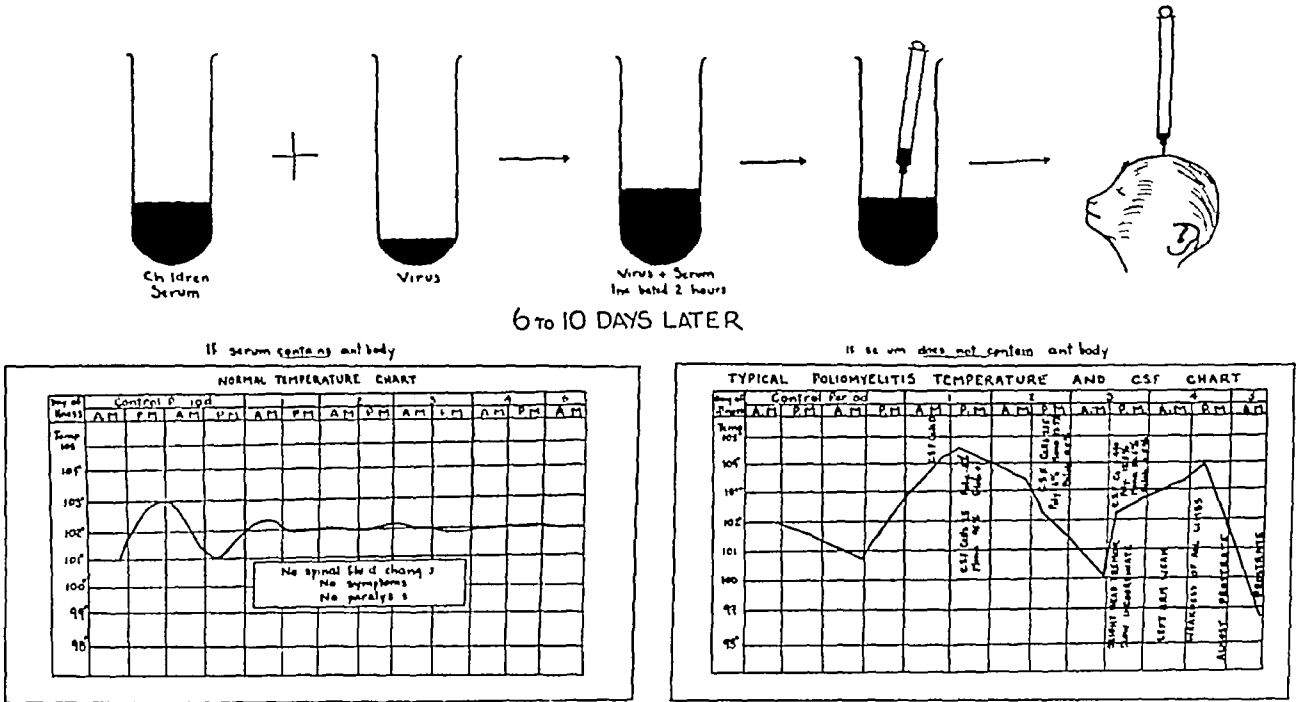


Fig 7—Testing children's serum for antibody response Poliomylitis neutralization test in the monkey

TABLE 5—Immunizations in Kern County, California

| | |
|---|-------------------|
| Health Officer | Dr. Joe Smith |
| Chief Asst. Health Officer | Dr. M. A. Gifford |
| 1 654 Individuals Vaccinated Nov 1934 to May 1935 | |
| Number who had 1 dose | 110 |
| Number who had 2 doses | 1,573 |
| Number in epidemic and endemic focus | 1 184 |
| Known exposure | 128 |
| Reactions | |
| Systemic | 3 |
| Local | |
| Neurosis | 3 |
| Induration | 152 |
| Very slight | 400 |
| Number of cases November to May | 80 |
| 12% had more than 1 case per family | |
| Population of epidemic focus | 51 477 |
| None of these vaccinated developed poliomyelitis | |

with epidemic studies and with a follow up of the incidence of the disease in a large number of grouped, vaccinated children Although the vaccine was used in a small outbreak in Kern County, Calif, the incidence

immunized in several centers in New York and in Newark, N J, and are being followed (fig 6) with controls We hope to immunize a sufficient number to make a comparative study between the immunized and the nonimmunized A poliomyelitis vaccine treated with formaldehyde gives antibody production, which is apparent in about one week and reaches its full development in from three to four weeks It has been demonstrated eight months after vaccination and by greater amounts in those receiving two doses As far as the tests have been carried out, a single dose produces antiviral substance in more than 75 per cent and two doses in practically all

The material appears to be perfectly safe, as demonstrated by its noninfectivity for monkeys and from more than 2 300 human immunizations
Foot of East Fifteenth Street

ABSTRACT OF DISCUSSION

DR JOHN A. KOLMER, Philadelphia Three years ago my associates and I failed to immunize monkeys with vaccines of poliomyelitis virus apparently 'killed' with heat, phenol, chloroform and other chemical agents and turned our attention to immunization with living virus attenuated with sodium ricinoleate, which proved completely safe and apparently highly effective. It may be that our failure with "dead" virus was due to the administration of too small doses, but I am convinced that the living attenuated virus in small doses is a safe and effective immunizing agent. None of a large group of monkeys receiving as many as ten consecutive subcutaneous injections of the ricinoleated vaccine in doses varying from 0.05 to 1 cc per kilogram of weight showed the slightest evidences of infection during the period of immunization and all were found to have acquired a high degree of immunity as determined by the intracerebral injection of virus. Sodium ricinoleate vaccine has now been given to more than 400 children in Philadelphia during the past year with absolutely no ill effects, and enough for the immunization of more than 2000 individuals has been distributed. No effects other than mild local reactions at the sites of injection have occurred. The safety of the vaccine is largely due to the fact that it is prepared from remote monkey passage virus that has apparently lost infectivity for human beings, just as the smallpox virus is changed by passage through the lower animals. Additional factors of safety are the subcutaneous route of administration, the use of three small doses at weekly intervals and the rapidity of antibody production. Antibody has been found in the blood of children as early as ninety-six hours after the first dose, and during the past year we have found that monkeys can be effectively protected when the vaccine is given even during the incubation period of the disease following intracerebral injections of virus. For this reason I believe that the vaccine can be given safely during epidemics and during the incubation period. Attenuation of the virus with sodium ricinoleate may be an additional factor of safety, but the degree of attenuation is slight and of minor importance. Antibody production occurs in at least 80 to 90 per cent of vaccinated children with the doses now employed comparable in amount to that found in the blood of individuals recovering from an attack of the disease. I too believe that this antibody will protect against the disease and we have found that it was capable of neutralizing the virus of the California epidemic.

DR ALTON GOLDBLOOM, Montreal It is gratifying to see the extent to which Drs Brodie and Park have succeeded in producing a harmless inoculation capable of producing immunity against poliomyelitis on a large scale. One or two practical points have to be considered in the application of this immunization. It must be realized that it can never be either necessary or possible to immunize the entire child population of so large a country as this against poliomyelitis. It would be desirable to have some easy, rapid method of determining those children who are susceptible to poliomyelitis and to use the methods available for them. A rapid test, therefore, is essential as one of the prerequisites of this method. In some bacterial diseases susceptibility can be determined by skin tests. Those methods are scarcely available in the case of virus diseases but perhaps some new approach to the entire subject of immunity to virus diseases may eventually develop a new index of susceptibility or immunity, and with that may come an easy, rapid method of separating susceptible from nonsusceptible subjects. In addition, it is essential to develop an easier and cheaper means of producing virus for the purpose of formalizing. At present virus is produced only through the destruction of infected monkeys. The authors have indicated the possibility of developing virus from some cheap, easily handled and easily available animal, such as the mouse. They have shown that the exposure of mice to x-rays renders them susceptible to the infection and it may be that some such method will be developed by which virus will be available on a large scale, or some method of culture of the virus itself, either by tissue methods or some other new medium, will be developed which will make the culture of viruses as simple a thing as the culture of bacteria is today. Again, this may come about, as Dr Kolmer indicated, by the recognition of one of the many

paralyzing diseases of animals as being so allied to poliomyelitis that it may in itself be antigenic against poliomyelitis in human beings, without being pathogenic.

DR MAURICE BRODIE, New York I agree with Dr Kolmer when he states that decidedly larger amounts of an inactivated virus or vaccine are necessary. Of course, that has been pointed out in other diseases, in which it has been shown that inactivated virus will immunize as long as large amounts are used. With active virus one can use smaller amounts. However, we found that with the use of very small amounts of virus, such as would be safe from danger of infection, we had to give repeated doses to immunize. To get immunization with one or two doses it was necessary to give a fairly large dose, about half to one fourth as much as of formalized vaccine. That dose was dangerous for monkeys and occasionally some came down with mild or even severe attacks of the disease. In order to get immunization with the very small and safe doses, we had to give many doses, which is not practical, and so it seemed more practical to use two larger doses of formalized vaccine. Although I think the small doses of the active virus may be perfectly safe, it has to have a very widespread use to determine that. I do not feel we can say the virus has been changed as Dr Kolmer has stated. In rabies for example, the rabbit virus is still under discussion as to whether the paralytic accidents of rabies immunization are due to rabies virus or not. And so since in rabies, immunization has been going on many years and still the question is not answered, in poliomyelitis, whether or not active virus will infect human beings can be answered only when thousands have been immunized and another susceptible animal is found. If it were possible now to infect mice the virus could be passed through hundreds of generations and it would be seen whether or not it still infected monkeys. Dr Goldbloom has pointed out the impracticability of the immunization except in an epidemic.

SYMPTOMS THAT PERSIST AFTER
CHOLECYSTECTOMY

THEIR NATURE AND PROBABLE SIGNIFICANCE

JAMES F. WEIR, M.D.

AND

ALBERT M. SNELL, M.D.

ROCHESTER, MINN.

It is generally agreed that cholecystectomy, when performed on proper indications is an extraordinarily successful procedure as the follow-up studies of Mueller,¹ Whipple,² Maynard,³ Stanton,⁴ Dwyer and Dowling,⁵ Judd,⁶ Graham and Mackey⁷ and others have clearly shown. Permanent good results are obtained in from 80 to 95 per cent of cases in which stones are present, and in noncalculous disease of the gallbladder comparable results are obtained when the pathologic process is advanced. As all authorities agree, patients who have lesser degrees of cholelithic disease give distinctly less favorable results. If persons have suffered from definite biliary colic, the surgical results are usually good, regardless of the pathologic condition of the gallbladder. In those cases in which symptoms are less

From the Division of Medicine, the Mayo Clinic.
Read before the Section on Gastro-Enterology and Proctology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.
1 Mueller, G. P. The Noncalculous Gallbladder. *J. A. M. A.* 89: 786-789 (Sept. 3) 1927.
2 Whipple, A. O. Surgical Criteria for Cholecystectomy. *Am. J. Surg.* 40: 129-131 (June) 1926.
3 Maynard, C. W. Cholecystectomy as Seen by the Surgical Pathologist. Report of 223 Cases. *Am. J. Clin. Path.* 3: 339-345 (Sept.) 1933.
4 Stanton, E. M. The Stoneless Gallbladder. A Study of Operative Cases. *Am. J. Surg.* 18: 246-250 (Nov.) 1932.
5 Dwyer, M. F. and Dowling, G. A. Results in Cholecystectomy, with Especial Reference to the Symptomatology and Diagnosis of Cholecystitis. *J. A. M. A.* 98: 722-726 (Feb. 27) 1932.
6 Judd, E. S. Clinical versus Pathologic Cholecystitis. Collected Papers of the Mayo Clinic. 17: 152-156, 1925.
7 Graham, E. A. and Mackey, W. A. A Consideration of the Stoneless Gallbladder. *J. A. M. A.* 103: 1497-1499 (Nov. 17) 1934.

striking, and particularly in those in which the patients complain only of vague indigestion, the least satisfactory results are obtained, more or less independently of the degree of disease of the gallbladder. These facts may explain the unfavorable opinion concerning operation on the gallbladder held by certain laymen; they also lend support to the idea, recently expressed by Graham and Mackey, that the general principle of attacking disease in its early stages in order to obtain the most satisfactory therapeutic results does not necessarily hold for disease of the biliary tract.

The patient who is not cured by cholecystectomy often presents a most difficult diagnostic and therapeutic problem. What is the disease that remains to cause trouble? How can a physician select the cases in which cholecystectomy is likely to produce a good result and how can surgical intervention be avoided if patients are not likely to be benefited? These are some of the questions that perplex all physicians who have under their care patients afflicted with cholecytic disease. In general, the persistence of preoperative symptoms and the development of new symptoms may be traced to (1) erroneous diagnosis or poor selection of cases, (2) the residues of cholecytic disease, such as cholangitis, hepatitis and pancreatitis, (3) the formation of strictures of the extrahepatic bile passages, and (4) post-cholecystectomy colic, which may be attributable to a variety of organic causes and also to visceromotor disturbances, of which the so-called biliary dyskinesia is the most representative.

SELECTION OF CASES FOR CHOLECYSTECTOMY

It has just been stated that erroneous diagnosis and poor selection of cases are the most common reasons why patients are not relieved by cholecystectomy. It is necessary to consider not only the question of whether cholecytic disease is present but also whether it is responsible for all the patient's symptoms and, if it is so responsible, whether these are of sufficient severity to warrant cholecystectomy. We believe that a conservative attitude should be adopted in these matters.

The criteria for diagnosis of cholecytic disease requiring operation include (1) a satisfactory account of one or more attacks of biliary colic or its equivalent, with or without fever, chills and jaundice, (2) residual tenderness in the region of the gallbladder following such painful episodes, (3) indigestion, which is usually characterized by flatulence, bloating and discomfort, (4) a positive cholecystogram giving evidence of a nonfunctioning gallbladder or of the presence of stones, and (5) reasonably exact exclusion of conditions that simulate cholecystitis. When such symptoms are presented by a stable, sensible individual who is not given to habitual complaining, good results almost certainly can be assured. Such conclusive evidence will not be present in every case, and not infrequently cholecystectomy will be required on less definite indications. However, the more closely these criteria are followed, the higher will be the diagnostic accuracy and the more satisfactory the therapeutic results attained.

SOURCES OF DIAGNOSTIC ERROR

The best approach to postcholecystectomy complaints is a thorough review of the preoperative history and of the indications that led to operation. Neuroses with visceral symptoms, peptic ulcer, appendicitis, pylorospasm, irritable bowel, small intestinal or renal lesions, and tabes dorsalis are prominent among the causes of indigestion closely resembling that produced by a dis-

eased gallbladder. Such types of dyspepsia, attributable to associated lesions and erroneously diagnosed as being caused by cholecystitis, obviously will persist after cholecystectomy. Every physician of experience has known of cases in which errors have arisen from the symptomatic similarity that has just been mentioned, and there are few who have not been misled on occasions.

Colic may likewise be misinterpreted. A perforating peptic ulcer, renal calculi, hydronephrosis, and root pains of vertebral or spinal lesions may produce colic-like pain presenting difficulties in differentiation from that originating in the biliary tract. We have seen all these conditions mistaken for disease of the gallbladder or associated with it, and obviously in such cases the symptoms referable to the associated disease persist after cholecystectomy.

Not a few gallbladders are removed simply because of a history of jaundice or because of its presence at the time of examination. The reasons for this practice are obvious. From a statistical standpoint jaundice, especially if intermittent and painful, is usually attributable to inflammation or stones in the gallbladder or bile ducts. Many individuals, however, give an erroneous or misleading history of icterus, and unless observation is possible in the course of such an episode it is easy to be confused by intrahepatic or hemolytic types of jaundice. The former are characterized by absence of pain, by lack of evidence indicating obstruction of the biliary tract, and, in their active stage, by positive galactose tests. A history of persistent, mild icterus should particularly put one on guard against the presence of the hemolytic variety of jaundice. In this type of jaundice the bilirubinemia is slight and more or less persistent, and an indirect van den Bergh reaction is the rule. Since cholelithiasis occurs in from 50 to 60 per cent of cases of familial hemolytic icterus, both hemolytic and obstructive types of jaundice may occur in the same case. Familial or congenital hyperbilirubinemia and pernicious anemia are other constitutional diseases, associated with icterus, which may lead to error in diagnosis. Carotenemia, which is not so uncommon as is generally believed, must also be considered in all cases of mild, persistent, ictteroid pigmentation. In other words, the presence of jaundice does not necessarily signify that its source is in the extrahepatic biliary tract or that it is amenable to surgical treatment. Errors in selection of cases for the causes mentioned in the foregoing are uncommon in our experience, the principal difficulties arising from another source.

A certain number of individuals present themselves because of indefinite dyspepsia, malaise and attacks of abdominal distress, often poorly localized and not of great severity. If such patients, by cholecystography, show evidence of disease of the gallbladder, the question at once arises as to the proper course to pursue. Because the history is inconclusive, one is often tempted to place confidence in roentgenologic evidence only. There are certain groups of patients in dealing with whom this problem arises almost as a routine, and the patient's background, habits, temperament and complaints have to be weighed carefully against the evidence afforded by cholecystography. In our experience the patients who have given the most difficulty under these conditions are (1) those presenting signs of constitutional inadequacy, with or without the mild grades of affective disorders, (2) migrainous individuals, with

or without abdominal equivalents, (3) patients with the more severe degrees of the syndromes of so called irritable colon, and (4) those with lowered basal metabolic rates. Various grades of nervous exhaustion are frequently presented by patients of all the foregoing groups, further confusing the issue.

The most careful and astute diagnostician, using every resource at his command, is often sorely tried to arrive at a proper evaluation of the disability of individuals who make these and related complaints. Cholecystography undoubtedly has aided greatly in the diagnosis of disease of the gallbladder, and visual demonstration of calculi is confirmatory evidence in localization of the cause of the symptoms. On the other hand, roentgenologic disclosure of a poorly functioning or nonfunctioning gallbladder, if a patient presents indefinite or functional digestive symptoms, may not always be an indication for surgical measures. If the symptoms are adequate, exploration may be required, but the accidental finding of a nonfunctioning or calculous gallbladder, on routine gastro-intestinal roentgenologic examination, is little reason for undertaking operation in the absence of definite symptoms. It is important to recall that a neurotic or unstable patient who has only indefinite dyspepsia will seldom be greatly benefited by cholecystectomy, no matter what pathologic lesion is present, and that removal of a calculous gallbladder from the patient afflicted with psychoneurosis, especially if colic is not present, seldom relieves symptoms to any significant degree. If a better selection of cases could be made, particularly when patients of the sorts just considered are encountered, the percentage of favorable results after cholecystectomy would be greatly increased.

THE RESIDUES OF CHOLECYSTIC DISEASE

The residues of cholecyctic disease constitute the second most common cause of persisting symptoms after cholecystectomy. Pathologic changes in the bile ducts, liver and pancreas are well recognized accompaniments of cholecystitis and cholelithiasis. The more advanced the cholecyctic disease, especially if associated with stones in the common bile duct, the more prominent may be the hepatitis or pancreatitis that is encountered. The hepatic involvement, which occurs from spread of infection through the lymphatic channels or from ascending cholangitis, may be manifested as a local lesion confined to the region of the gallbladder or, in its later stages, as an extensive lesion resembling biliary cirrhosis. In some of the latter cases there is reason to suspect that the cholecystitis may be secondary to the hepatitis. Judd has stated his belief that cholecystitis seldom exists without hepatitis and also has noted that, of a series of 1,290 patients who had disease of the gallbladder or bile ducts, 16.8 per cent had associated pancreatitis. In Judd and Mentzer's⁸ series of 1,000 cases of cholesterosis, hepatic lesions were found in 27 per cent of those in which calculi were not present and in 14 per cent of those in which calculi were present. Pancreatitis was diagnosed grossly in 11 per cent of the former group of cases and in 16 per cent of the latter. In general, it can be said that a fifth of the patients who have cholecystitis have associated lesions of the liver or pancreas, or both, some of which may be sufficient to cause symptoms. It is not uncommon to find slight degrees of hyperbilirubinemia,

a persistent direct van den Bergh reaction, and mild to moderate degrees of retention of bromsulphalein for weeks or months after cholecystectomy, and many patients who present these signs of hepatic involvement have definitely persistent abdominal pain and dyspepsia. What happens to these hepatic lesions after cholecystectomy? Undoubtedly many regress or become inactive, but, if the lesions are of the more severe grades, complete resolution can hardly be expected. To what extent these residues of disease in the liver and pancreas produce symptoms is difficult to determine, but they are certainly common sources of postoperative difficulty. Patients who have the most extensive hepatic lesions may have few or no symptoms after cholecystectomy, whereas others who have a minimal degree of hepatic or pancreatic involvement demonstrable at operation may have considerable symptoms after operation, including dyspepsia, at times colic, and occasionally icterus. The relation of these lesions to post-cholecystectomy colic will be considered in a later paragraph.

STRICTURE OF THE COMMON BILE DUCT

Stricture of the common bile duct as a cause of complaints after cholecystectomy, which may also be classed with the residues of cholecyctic disease, is fortunately rare. The mechanism by which these strictures form is imperfectly understood. They are usually regarded as traumatic or infective but may occasionally be the result of injury of the common bile duct from impacted stones. The essential pathologic change is that of obliterative cholangitis. As Judd has pointed out, three syndromes may occur in the presence of stricture: (1) jaundice appearing shortly after operation, usually painless, with subsequent attacks of colic and further deepening of the jaundice, (2) persisting biliary fistula which, after several attempts, may finally close only to be followed by jaundice and colic, and (3) a normal course for some months after operation, interrupted by attacks of jaundice, which at times are associated by colic, chills and fever. In this last type of syndrome, the jaundice eventually becomes permanent and the biliary obstruction more or less complete. It is important to recognize that in such cases dyspepsia and colic may be present for considerable periods before actual evidence of biliary obstruction is apparent. In the presence of all the syndromes named there is a tendency to the development of ascending cholangitis and progressive biliary cirrhosis with hepatic and splenic enlargement, in the terminal stages, hepatic insufficiency supervenes. For this reason, reconstructive operations should be undertaken before permanent hepatic damage has occurred.

POSTCHOLECYSTECTOMY COLIC

The fourth group of patients to be considered, those who present postcholecystectomy colic, represent a major problem, because of the variety of lesions that may produce the difficulty and of the uncertainty that surrounds the question of the mechanisms involved. These attacks of colic include (1) the immediate postoperative or "convalescent" colic, (2) colic referable to incomplete cholecystectomy, (3) colic attributable to stone in the common duct, hepatitis or cholangitis, (4) colic caused by stricture, and (5) unexplained paroxysmal pain resembling colic, not referable to any gross disease of the liver or bile ducts.

In considering the mechanism of colic, it must be recalled that certain anatomic and physiologic changes

⁸ Judd E. S. and Mentzer S. H. Cholesterosis of the Gallbladder. I. A Clinical Study. *California & West Med.* 27: 337-339 (Sept.) 1927. II. The Surgical Aspects. *ibid.* 27: 487-489 (Oct.) 1927.

occur following cholecystectomy. The chief anatomic change is dilatation of the extrahepatic bile ducts. This is probably attributable to removal of the "tension bulb" function of the gallbladder and to the fact that the resistance of the sphincter is greater than the secretory pressure of the liver. For a short time after cholecystectomy the sphincter is incompetent, but it then regains its function. There is evidence that in some cases it may actually undergo hypertrophy. The concentrating and storage function of the gallbladder is eliminated with its removal. One would suppose that subsequently there would be a continuous flow of bile into the duodenum, as very little, if any, concentrating function has been demonstrated for the common bile duct. However, there is some evidence to show that the flow of bile may at times be intermittent rather than continuous. This may be attributable to a rhythmic function of the sphincter, which at times may exhibit prolonged spasm, or the intermittence of flow, presuming it takes place, may be attributable to rhythmic secretion of bile by the liver.

Much has been written recently with regard to the nerve supply of the biliary tract and its possible relationship to symptoms referable to this region. In experimental animals stimulation of the splanchnic nerves causes relaxation of the gallbladder and of the antral portion of the sphincter, while the papillary sphincter contracts. The effects of vagal stimulation are contraction of the gallbladder, with peristaltic activity of the antral sphincter, and relaxation of the papillary sphincter, the degree of reaction depending on the degree of stimulation. With strong stimulation, spasm of the antral sphincter is produced, in addition to active contraction of the gallbladder.

Ivy and Sandblom⁹ have shown that, in some normal individuals, pain referable to the biliary tract may be produced by inducing spasm of the sphincter with pilocarpine or by stimulating the gallbladder to contract by injection of a secretin-cholecystokinin preparation when the sphincter is in a normal state of contraction. In such cases the sphincter is probably hyperkinetic. After removal of the gallbladder, hyperkinesia of the sphincter may persist, and at times it may become spastic leading to overdistention of the bile ducts and production of pain.

The significance of these physiologic considerations in production of biliary colic is not as yet completely understood. The type of postcholecystectomy colic most easily explained on a purely physiologic basis, the simple postoperative or "convalescent" colic, occurs frequently enough so that the patient should be warned about it and told of its essentially harmless nature. As a rule, the attacks are less severe than the colic that has occurred preoperatively, then they become progressively less painful and finally clear up. Possibly such attacks are attributable to residual infection or to the passage of inspissated mucus and debris through inflamed extrahepatic bile passages, but the best explanation is referable to the motor changes occurring in the biliary tract and in the sphincteric mechanism as it is adjusting itself to the changed physiology induced by cholecystectomy.

Colic attributable to partial cholecystectomy is rare and need only be mentioned. The source of pain in these cases is exactly the same as it is in the preoperative state.

The third and most common cause of colic after cholecystectomy is the presence of stone in the common duct, incidentally, choledocholithiasis is also the most frequent cause of secondary operations on the biliary tract. Stones in the common duct may be overlooked at the original operation, they may form in the intrahepatic bile passages and eventually reach the common duct, possibly they also form in the latter structure. It has been stated repeatedly that a history of jaundice prior to cholecystectomy, and the finding of a dilated or inflamed common duct at the time of operation indicate the need for careful exploration of the whole biliary tract. Lahey and Jordan¹⁰ have emphasized particularly the marked reduction of the frequency of secondary operations when this plan has been followed.

The presence of stone in the common duct is especially suggested if there is prolonged drainage of bile after cholecystectomy or if further attacks of colic, fever, chills or jaundice occur immediately or later. There is one useful point in the diagnosis of stone in the common duct after an attack of colic: examination of the serum, qualitatively and quantitatively, by the van den Bergh test, may establish the presence of latent jaundice and give a clue to the cause of the pain. It is frequently very difficult to be certain of the presence of residual stones and only prolonged observation can establish a diagnosis, a certain number of patients may require exploration even in the absence of abnormal drainage of bile postoperatively, or in the absence of chills, fever or jaundice.

As is generally known, the symptoms of choledocholithiasis may not appear until long after cholecystectomy. Occasionally a case is encountered in which stones again form in the common or hepatic ducts, even after choledocholithotomy and drainage of the duct.

After the common causes of biliary colic have been eliminated, there remains a certain number of cases in which a stone cannot be demonstrated. In some of these the symptoms are apparently attributable to residual pancreatitis, cholangitis, hepatitis or biliary cirrhosis. In the two first mentioned conditions, colic can be explained on the basis of intermittent obstruction of the common duct, with increasing pressure and distention above the point of obstruction.

Parenchymal hepatic diseases, for reasons as yet unknown, occasionally give rise to attacks resembling colic, but in the majority of these cases the hepatic disease is usually well advanced and gives little difficulty in diagnosis. Pancreatitis also may cause attacks resembling colic, but, as a rule, they are more gradual in onset and longer in duration. Cholangitis of varying degrees is a frequent accompaniment of inflammatory cholecystic disease, and at secondary operations a certain amount of thickening, injection or edema of the common duct may be the only finding. At times this seems to be an obliterating process, again, the duct may contain a certain amount of purulent bile, indicating the presence of a suppurative process. More often, however, the changes found in the common duct are rather meager, and the diagnosis of cholangitis is doubtful. However, cholangitis is still considered the probable cause of the majority of attacks of postcholecystectomy colic, when stone in the common duct and pancreatitis are absent.

What can be said of the patient who has persistent biliary colic and indigestion, in examination and further

⁹ Ivy A. C. and Sandblom P. Biliary Dyskinesia. *Ann Int Med* 8: 115-122 (Aug.) 1934.

¹⁰ Lahey F. H. and Jordan Sara M. Management of Biliary Tract Disease. *Tr. Am Gastro-Enterol. A.* 1930 pp. 54-58.

consideration of whom none of the aforementioned crises can be demonstrated? Here one must revert to a physiologic explanation and assume that some disturbance of innervation of the duct, with spasm of the sphincter and transient "physiologic" obstruction, occurs. These crises constitute a formidable and, as yet unsolved problem in diagnosis and treatment. In some cases, these attacks of colic appear to be associated with gastro-intestinal crises of indeterminate origin. The theory of biliary dyskinesia as advanced by Westphal¹¹ and by Ivy and his collaborators, appears to explain the matter in part. These investigators have emphasized the unity of the biliary tract and duodenum, and Westphal has noted that stasis in the upper part of the intestinal tract may be associated with spasm of the mechanism of the sphincter. The innervation of the duct system has been outlined in an earlier paragraph. On this basis it seems that some abnormality of the sympathetic or parasympathetic innervation may produce spasm of the sphincter of Oddi of sufficient degree to produce overdistention of the common duct and to give rise to pain. That such overdistention can cause digestive symptoms, particularly nausea and vomiting, is shown by the experiments of Zollinger.¹² Pribram¹³ has shown that prolonged spasm of the sphincter may occur in certain cases, he has expressed the belief that this spasm may be increased after removal of the gallbladder. Walters and Thiessen¹⁴ have also demonstrated recently, by roentgenographic studies after injection of an innocuous opaque medium into the bile ducts, that some physiologic obstruction may occur at the sphincter and that reflux into the pancreatic duct may occur. They wrote also of possible "sphincteritis."

The clinical aspects of these cases in which symptoms of unknown cause persist deserve brief mention. The sufferers are almost exclusively women, frequently of neurotic tendencies, who have recurring attacks of pain of varying severity and duration in the epigastrium or in the right upper quadrant. These are identical with or they closely resemble, biliary colic attributable to stone, the pain may begin and cease suddenly or gradually, and right subscapular extension of the pain may occur, but chills, fever, jaundice or leukocytosis are usually absent. As a rule, opiates are necessary, although in an occasional case the pain may be milder than usual and of relatively short duration. Nausea and vomiting, presumably secondary to reflex mechanisms involving the stomach and upper part of the intestinal tract, may be pronounced features and may be very exhausting. Residual tenderness is not, as a rule, present after an attack, but in certain cases it may be pronounced and associated with marked cutaneous hyperesthesia.

In certain of these cases which we have observed, features of functional disease and affective disorders were very prominent, making diagnosis and evaluation of therapy uncertain.

In reviewing the earlier histories of some of these individuals who have persistent, unexplained trouble,

it is apparent that the original indications for operation were not particularly definite, and it seems that, in some of the cases at least, a "biliary dyskinesia" was originally present, which was only aggravated by removal of the gallbladder. Many competent observers believe that these motor disturbances are important in the production of symptoms and that these symptoms are in part amenable to medical measures. Newman's¹⁵ recent report stated the problem clearly, this report deserves careful consideration.

The treatment of such cases is a most difficult problem and one that must be individualized. The severity of symptoms usually calls for surgical intervention.

Three patients recently observed were women who had undergone cholecystectomy because of indeterminate attacks of abdominal pain, the gallbladder of one contained stones, that of another was the site of extensive cholesterosis, and that of the third gave little evidence of abnormality. Acute pain and severe nausea and vomiting were characteristic features of the post-cholecystectomy syndrome. In all cases, results of physical and laboratory examinations did not vary from normal, except that in one case a direct van den Bergh reaction was obtained on various occasions. Paravertebral nerve block with procaine apparently relieved the pain temporarily in two cases, and splanchnic nerve block gave prompt temporary relief in another. This seems to give a clue to the possible nervous mechanism involved, but to date section of splanchnic nerves has not been employed in a sufficient number of cases to warrant any conclusions as to its value. In one case, not of the three just mentioned, the results of section of splanchnic nerves were satisfactory, in another, the procedure has produced little benefit to date. The best results have, as Judd¹⁶ has noted, been obtained by prolonged drainage of the common duct by a T-tube, which, of course, provides for permanent "decompression" while the tube is in situ. Transplantation of the common duct elsewhere into the bowel, in order to remove the influence of the sphincter, has been suggested. A few patients get along fairly satisfactorily with dietary regulation and medical measures. Courses of transduodenal biliary drainage, or administration of antispasmodic drugs, sedatives, alkalis, chologogues such as bile salts, or a small dose of sodium phosphate, in the morning, may be helpful. The analgesic effect of roentgen therapy over the lower thoracic region has been tried, but in our hands the results have not been encouraging.

SUMMARY

The results of cholecystectomy for well defined cholelithic disease are, as a rule, highly satisfactory. The physician cannot expect 100 per cent curative results from cholecystectomy alone when other visceral disease, systemic disorders and neuroses are present. Erroneous diagnoses and imperfect selection of cases are responsible for a majority of the cases in which post-operative symptoms appear. At operation an exacting technic and thorough examination of the common duct, liver and pancreas are essential. Recurring postoperative colic offers the greatest difficulty in diagnosis and treatment. This is most frequently attributable to stone in the common duct and to residual infection in ducts,

11 Westphal, Karl. Muskelfunktion, Nervensystem und Pathologie der Gallenwege. I. Untersuchungen über den Schmerz anfall der Gallenwege und seine ausstrahlenden Reflexe. II. Experimentelle Untersuchungen über die nervöse Beeinflussung der Bewegungsvorgänge der Gallenwege. III. Die Motilitätsneurose der Gallenwege und ihre Beziehungen zu deren Pathologie zur Stauung, Entzündung, Steinbildung usw. *Ztschr. f. klin. Med.* 96: 22-150, 1923.

12 Zollinger, Robert. Observations following distention of the gall bladder and common duct in man. *Proc. Soc. Exper. Biol. & Med.* 30: 1260-1261 (June) 1932-1933.

13 Pribram, B. O. New Methods in Gallstone Surgery. *Surg. Gynec. & Obst.* 60: 55-64 (Jan.) 1935.

14 Walters, Walzman, and Thiessen, N. W. Visual Methods of Studying the Physiology of the Common Bile Duct. I. The Problem of Pancreatitis and Sphincteritis. *Proc. Staff Meet. Mayo Clin.* 9: 772-775 (Dec. 19) 1934.

15 Newman, Charles. Physiology of the Gallbladder and Its Functional Abnormalities. I. *Physiology*. *Lancet* 1: 785-791 (April 15) 1933. II. Disorders of Motility, *ibid.* 1: 841-848 (April 22) 1933. III. Abnormalities of Concentration and Secretion in the Gallbladder. *ibid.* 1: 896-901 (April 29) 1933.

16 Judd, E. S. Condition of the Common Duct after Cholecystectomy. *J. A. M. A.* 81: 704-709 (Sept. 1) 1923.

liver and pancreas. In a few cases postoperative colic is not satisfactorily explained except on a neurogenic basis, and some type of biliary dyskinesia may be responsible for the difficulty.

ABSTRACT OF DISCUSSION

DR COLIN G SUTHERLAND, Montreal. In the Royal Victoria Hospital in Montreal, for several years, we have been dissatisfied with the results of the operation in certain cases. Dr A. L. Wilkie, working on the production of gallstones, found that increasing the concentration of taurocholate and glycocholate salts in bile would increase the saturation of cholesterol. This seemed like a promising lead for investigation and probable therapy. We have used cholesterol-free sodium taurocholate in large doses with a low cholesterol diet in three different types of cases: (1) functioning gallbladder with stones, not operated on, (2) functioning gallbladder not operated on, stones removed and gallbladder closed without drainage, and (3) gallbladder removed, with common duct colic. The results have been most encouraging. The following protocols are illustrative: 1. A woman, aged 19, had intermittent attacks of colic requiring morphine for ten months. The gallbladder was visualized and contained many cholesterol stones. She was given 60 grains (4 Gm) of taurocholate daily with an appropriate diet and she has been perfectly well. She has taken the capsules steadily during three years without toxic symptoms. 2. A woman, aged 40, insisted that her gallbladder be not removed. Roentgen examination showed numerous cholesterol stones with some evidence of function. The stones were removed and the gallbladder closed without drainage. She has been perfectly well ever since. 3. A woman, aged 54, had a cholecystectomy five years ago and the functioning gallbladder was removed with one stone. The attacks continued from three to four each month. On diet and 30 grains (2 Gm) of sodium taurocholate daily she had three mild attacks in one month and none have occurred since. Follow-up roentgenograms in these cases have failed to show any recurrences of stones in the patients operated on. Clinically they are ostensibly in perfect health. Whether the capsules alone without operation will suffice is difficult to say.

DR HENRY A. RAFSKY, New York. The subject of neurogenic instability, before and after cholecystectomy, has been stressed. The diagnostic and therapeutic difficulty arises here from the similar symptom complex encountered in nervous persons and in patients with an atypical history of disease of the biliary tract; furthermore, it is not uncommon for patients with a psychogenic background to have an associated ailment of the gall tract. In treating these patients, I have been guided by the microscopic examination of the preoperative specimens of bile. The presence of numerous cholesterol and carbonate crystals and an abundance of calcium bilirubinate pigment, separately or collectively, in the bile indicate active cholelithic disease, and this disorder should be treated primarily. On the other hand if in these patients repeated examinations of the bile do not reveal many crystalline elements, it may be concluded that the disease of the biliary tract is coincidental and that surgical intervention is inadvisable, notwithstanding the cholecystographic observations. Pancreatitis and hepatitis are so frequently associated with pathologic changes of the gall tract that it is difficult to appraise these disorders in the light of sequels after cholecystectomy. In 50 per cent of twenty-two patients before operation, pathoglycemic curves and glycosuria were observed. After cholecystectomy the blood sugar returned to within normal limits and the urine was sugar free in all but two patients. In one of the cholecystectomized patients who had a recurrence of abdominal pain, the tolerance test again showed a hyperglycemic curve and glycosuria. The relation of the sugar tolerance to cholecystectomy is still under investigation. Cholelithiasis as a causative factor of post-cholecystectomy colic is well known. In trying to detect the presence of latent jaundice in these cases and its time relationship to the onset of pain I have found the icteric index (Bernhard-Maue method) of great value. Additional aids employed to diagnose cholelithiasis are bile and stomach

lavage microscopy. Reference has been made to splanchnic nerve block to relieve colic after cholecystectomy. Crile advocates the use of splanchnic nerve block and avoidance of the sympathetic system at the time of the original operation to prevent subsequent pain and indigestion following cholecystectomy. Pathologic processes found at reoperation, after cholecystectomy, are often out of all proportion to the clinical history, a fact which was emphasized in a recent editorial in THE JOURNAL.

FUNCTIONAL STUDIES IN PATIENTS WITH THE NEURODERMATOSES

JOHN M. VAN DE ERVE, M.D.
CHARLESTON, S. C.

AND
S. WILLIAM BECKER, M.D.
CHICAGO

Increased interest is being evinced in so-called functional medicine by workers in all branches, and the functional approach as contrasted to and supplemental to but not as a substitute for the mechanistic approach is being taught more and more to undergraduate and postgraduate students of medicine. One of us,¹ on the basis of intensive study of the patients themselves, has suggested the classification of certain dermatoses as neurodermatoses, since they are always found in patients with neurocirculatory instability. Stokes² prefers the term "diathetic makeup," and adds "One might call it 'neurodermiobronchonasomucosal lability' without having named all the elements involved. This state of inborn tissue lability and hyperirritability is hereditary in character." As we shall state later we believe that the term "protoplasmic instability" expresses our conception of the condition.

Careful study of patients has convinced us that an underlying instability is present and plays an important role in the development of the neurodermatoses as well as other functional diseases, including those that can be proved to be allergic. This functional approach is usually graciously received by undergraduate and postgraduate students, sometimes with reservations. The intangibility of the situation makes it difficult to produce convincing proof of some of our ideas. The present study was undertaken for the purpose of utilizing certain fundamental studies which seemed to give promise of aiding in a better understanding of this group of patients. The methods used in the valuable studies of Draper,³ Petersen and Levinson⁴ and others have been utilized. Their very multiplicity tends to preclude proof in either direction but should furnish data from which tentative conclusions may be drawn or further work may be suggested.

The dermatologist is peculiarly fortunate in that the organ which he is studying in its normal or pathologic state is on the outside of the body and readily observable. Evaluation of changes for better or worse does not depend on the patient's own interpretation, which may be highly subjective. It is therefore not illogical to assume that the dermatologist may be able to acquire

From the Section of Dermatology of the Department of Medicine, University of Chicago.

Read before the Section on Dermatology and Syphilology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.

1. Becker, S. W. *Dermatoses Associated with Neurocirculatory Instability*. Arch. Dermat. & Syph. 25: 655 (April) 1932.

2. Stokes, J. H. *The Complex of Eczema*. J. A. M. A. 98: 1127 (April 2) 1932.

3. Draper, G. (a) *Human Constitution*, Philadelphia: W. B. Saunders Company, 1924. (b) *Disease and the Man*. New York: Macmillan Company, 1930.

4. Petersen, W. F., and Levinson, S. A. *The Skin Reactions, Blood Chemistry and Physical Status of Normal Men and of Clinical Patients*. Arch. Path. 9: 147 (Jan.) 1930.

more information with less effort than a worker in another field of medicine

A group of eighty patients presenting typical clinical examples of the neurodermatoses represented in this series was selected at random from those in the University Clinics, with diagnoses as follows: neurodermatitis (dry type), nineteen, pruritus ani or vulvae, five, neurodermatitis (exudative type), twenty-eight, dyshidrosis, four, urticaria, fifteen, lichen planus, two, dermatitis herpetiformis, one, neurotic excoriations, one. The following were also included: aphthae, two, vitiligo, one, summer prurigo, one.

METHOD OF EXAMINATION

The following is a detailed description of the methods employed. Testing of the skin by the patch and scratch method was not carried out as a routine but was performed in some cases. The patch tests were uniformly negative, and, since information obtained by scratch tests has little or no practical relation to the dermatoses on the basis of interpretation dependent on present-day knowledge, results will not be mentioned here but will be included in a more complete report on studies relative to the value of skin testing in dermatology.

All these studies were done as far as possible on the same day in order to have the status of physiologic function as nearly constant for all tests as possible. Calculations, follow-ups and further studies not influenced appreciably by this factor were done subsequently.

Care was also exercised to see that all studies on women were done as nearly as possible in the middle of the intermenstrual period, so as to avoid most of the functional changes incident to the menstrual cycle.

Personal History—Careful questioning was made as to the present complaint, onset, causal factors, environmental circumstances, sensitizations, past history and menstrual, marital and occupational history, also the elicitation of any history of infantile eczema, asthma, chronic bronchitis, functional colitis, hay fever, migraine, vasomotor rhinitis and urticaria.

Family History—The history of each member of the immediate family, relatives, and all forebears was

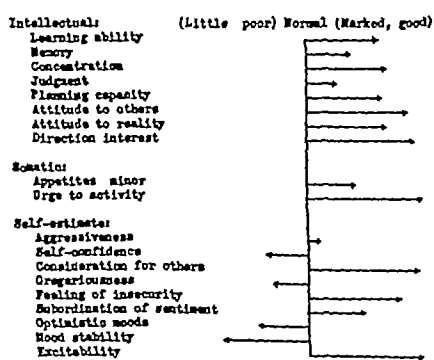


Chart 1—Psychomotor panel (Chart made up of composite analysis of patient by patient, his family and study by examining physician) Form followed is that of Dr. Smiley Blanton

recorded, as to health, cause of death, physical structure and activity, mental activity, disease tendencies, occupation, outlook on life, adjustment to environments, and the incidence, past or present, of asthma, hay fever, chronic bronchitis, eczema (infantile), migraine, functional colitis, vasomotor rhinitis, urticaria, eczema and neurodermatitis.

Psychomotor Panel^{3b}—The chart form devised by Blanton of the Child Guidance Clinic was used. This takes into consideration the intellectual activities of the

patient, the somatic demands, the self estimate, the mood, the reactions to pain and pleasure, the adaptation imperative, and special traits in reference to the graphic and rhythmic arts. We shall consider the application and interpretation of this psychologic study in detail in the treatment of experimental data. The patient was asked to fill out a questionnaire dealing with each phase in specific questions, and on the return of the filled out sheets one of us (v d E) reviewed them with the

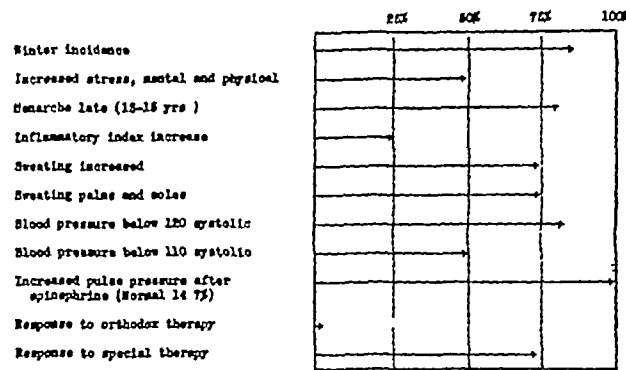


Chart 2—Manifestations common to all neurodermatoses

patient and revised the answers as objectively as possible. Thus, this study is a composite picture of the patient's self analysis and that of his immediate family, interpreted and objectively arranged by the investigator. Fallacies were guarded against as far as possible.

Physical Examination—A careful and detailed physical examination was made on each patient, with special reference to color, moisture and texture of skin, characteristics of the hair, and details of any cutaneous lesions.

Anthropometric Measurements—Following the form devised by Draper,^{3a} a complete anthropologic study was made on each patient when feasible. Two patients were so obese as to preclude any accuracy, and a number were so young as to cause doubt concerning the value of the results. These patients were omitted. Hair distribution, color, circulatory changes in the skin in various regions, and all the usual indexes were calculated. Only the most important indexes and measurements were utilized in the data presented.

Urinalysis was performed and the Kolmer and Kahn reactions of the blood serum were determined on each patient.

Special Tests—The majority of the tests were identical with those used by Petersen and Levinson⁴ in their study of 100 normal men, in order to have some basis for control and comparison. A brief description of the tests follows.

A small square of cantharides plaster was firmly pressed on previously cleaned skin on the inner surface of the thigh covered with a dressing, and allowed to remain for four hours. From that time it was observed constantly until a blister formed, the time necessary for production of which was recorded.

Fluid from the cantharides blister and blood serum obtained simultaneously were placed in a refractometer and the index of refraction obtained. After allowing for nonprotein factors, the percentage of protein in each was calculated and the following formula was used: $\frac{\text{per cent of protein in blister fluid}}{\text{per cent of protein in serum}} = \text{permeability ratio}$.

The inflammatory index was calculated from these data, the formula $\frac{\text{permeability ratio}}{\text{blister time in hours}} = \text{inflammatory index}$ being used.

Sedimentation time was determined on each patient following the usual technic, Cutler's tubes being used with sodium citrate as an anticoagulant.

Erythema time was determined by exposing a small area either on the antecubital surface of the arm or on the inner surface of the thigh to the water-cooled quartz lamp. Contact exposure was for thirty seconds, and the time of the appearance of erythema was observed. Erythema time was also observed following one minute's application of ice to the chest wall and following exposure to dry heat from an electrically heated coil. In a few instances in which the factor of heat

data were obtained by one of us (J. M. v. d. E.), since another worker might place a slightly different interpretation on some of the results, therefore they are uniform throughout and reflect the differences in the various groups of patients.

Certain data did not vary throughout the entire group, so that they can be presented in composite tables. These include the psychomotor panel, seasonal incidence, mental and physical stress, menarche, inflammatory index, degree of sweating, increase in pulse pressure after epinephrine, response to orthodoxy therapy and response to special therapy designed to reduce the patient's underlying instability and exhaustion. These results are presented in charts 1 and 2.

In studying the determinations with apparent differences in the various groups it was seen that results on patients with the dry type of neurodermatitis and those with pruritus ani and vulvae corresponded closely. These conditions are not infrequently associated in the same patient. It was also seen that patients with dyshidrosis and exudative neurodermatitis, conditions which are often associated and apparently closely related, gave similar results. Consequently, these patients were grouped together in the first two groups. The third group comprises patients with urticaria. The other groups were too small

for tabulation, so that charts 3 and 4 represent only the three groups.

While each question in the psychomotor panel may not be conclusive in itself, yet from the whole group one may draw conclusions that in the main, will be true to fact.

In the intellectual phase a definite trend to an alertness and quickness of comprehension and mental activity is found. In learning ability, planning capacity, attitude to rights of others and attitude to reality are

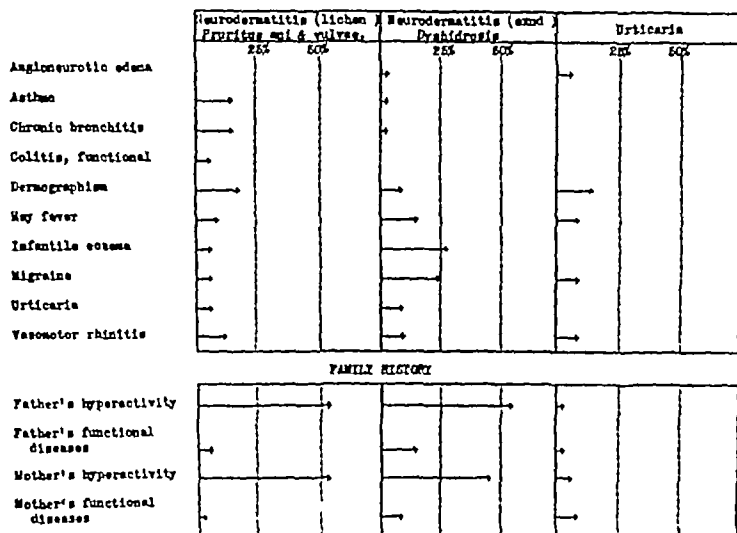


Chart 3—Associated functional diseases. History

or pressure was considered a possible cause, hot and cold water was allowed to trickle over the skin, and pressure was made by various weights.

Studies on reaction of the skin to friction were made with an instrument having a rounded stylus on one end and a shelf for the holding of various weights, which increased the pressure on the stylus. The stylus was then drawn over the skin of the middle of the back and the appearance time and extent of both the flares and the wheals were noted.

The reaction of the skin as regards flares and wheals following the application of drugs was studied as follows: Drops of saline solution (control), epinephrine hydrochloride 1:1,000, histamine hydrochloride 1:1,000 and thyroxine 1:10,000 were placed at wide intervals on the skin of the volar surface of the forearm and, with a separate needle for each drug, punctures of the superficial epidermis were made through each drop. The solutions were then gently removed with gauze and the time and extent of appearance of both flares and wheals recorded. Caffeine monobromide (1:100) and caffeine sulphate (1:1,000,000) were also used at first, but since no reactions were observed their use was discontinued.

The patient was placed on an examining table in a horizontal position and the blood pressure was taken at once. Readings were repeated at five minute intervals until the readings became fairly constant at resting level. The variations in blood pressure during this interval were noted and the data used as an index of stability.

At resting level, 0.5 cc of 1:1,000 epinephrine hydrochloride was injected subcutaneously and readings were taken at five minute intervals until the blood pressure readings returned to resting levels.

RESULTS

These data are presented with a distinct appreciation of their limitations. The various series are small, and control consisted of comparison with results that have been given as normal for the methods employed. Cornbleet has called attention to the fact that repeated tests must be made, because of the instability of these patients. This was not feasible in our study. All the

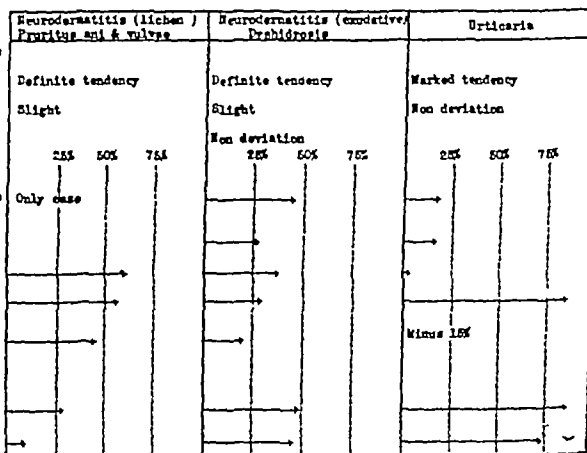


Chart 4—Associated functional diseases. Physical examination

found talents and activity in excess of normal. On the whole the patients are exteroceptive in type. The mentally lazy and inert are absent from our group.

In the somatic phase also definite trends are found. There is a pronounced variation in the direction of greatly increased neuromuscular activity and excitability. We can also say, from personal observation, that the majority of these patients are quick, intent, make a great many useless movements and evidence a restlessness that is not normal. A few of the patients

present the picture given by Stokes "tense mobility with almost a rigid restraint of all actions while the eyes peer out quick and birdlike, at one as 'holes burnt in a blanket'."

In the self estimate, in which we had to rely mainly on the patients' own evaluation and those impressions of them given by close relatives, are found interesting facts. On the whole, the patients tend to be a little timid, very suggestible, touchy, changeable and quick. They are overgenerous and altruistic. Emotional instability in these patients expresses itself in worry and brooding rather than in transient emotional storms.

The menarche tended to be late (from 13 to 15 years) and functional disturbances of menstruation seem to be slightly more common than normal.

The inflammatory index was only moderately increased.

Sweating usually was markedly increased, usually palmar, plantar and axillary, a finding that has been emphasized by Stokes.

The blood pressure average was low, the systolic pressure usually being between 100 and 110 mm of mercury. Many of the patients had unstable pressure levels, even while resting, and these were markedly accentuated during ordinary physical activity. After injection of epinephrine, marked lability was evident, with great increase in pulse pressure and cardiac output.

The incidence of functional disturbances such as asthma, hay fever, vasomotor rhinitis, chronic bronchitis, functional colitis and urticaria is higher than normal in our second group, less so in the first group and still less in the urticarial group.

The family history shows slightly greater tendency to functional diseases than normal in the first two groups but not so pronounced in patients with urticaria.

The physical examination revealed the patients to be in excellent general health, rather better than the average.

Anthropometric measurements did not reveal any striking abnormalities. There was a tendency toward an intermediate and female type of pubic hair in male patients, a tendency to long and narrow fingers in all three groups, a high neck index in the first two groups and a slight tendency to a high cephalic index in the first group.

The index of capillary permeability showed a definite increase, especially in urticaria and dry neurodermatitis, and the blister time was markedly increased in dry neurodermatitis, less so in the exudative type, and practically normal in urticaria.

Dermographism, as regards both flare and wheal, was progressively increased in the three groups, especially in urticaria.

The flares and wheals from drugs placed on the skin followed by acupuncture were either normal or subnormal. The sedimentation time was always normal.

The erythema time following application of water-cooled ultraviolet radiation showed a moderate increase in the first group, a slight increase in the second group, and decreased erythema time in patients with urticaria. Erythema times following heat and cold were normal. Results from pressure were negative.

COMMENT

The group of manifestations common to all patients with neurodermatoses may be interpreted as representing general features, mainly endocrine, nervous and vascular. As has recently been expressed by one of

us,⁷ we believe that there is an underlying protoplasmic instability shared by every cell of the body. Since the most prominent manifestations refer to the vascular and especially the nervous system, the term "neurocirculatory instability" was coined to represent the condition, although "protoplasmic instability" might be preferred. In a somewhat similar study, Cornbleet⁶ wrote "The great instability of the factors studied was the most outstanding observation. This denoted an inability to adjust rapidly to stimuli or an overcompensation for them." He added "Such measurable instabilities are probably a few of the bases for such vague, inclusive terms as Czerny's diathetic state. The capacity for allergy can be built from such a background." One of us⁵ has stated "I believe that all sensitizations in human beings, allergic or not, are made possible only by the underlying protoplasmic instability with which the patients have been born, and which has been increased by bodily exhaustion produced by a high powered nervous system."

The psychomotor panel presents the average characteristics of patients with neurocirculatory instability and furnishes a basis for psychotherapy, which is a minor part of our therapeutic armamentarium. Therapeutic methods designed to correct the underlying instability and exhaustion adjust some of these factors automatically by decreasing nervous irritability, but this adjustment can be facilitated by a brief psychotherapeutic session. More extensive psychotherapeutic procedures as advised by Stokes⁷ are occasionally necessary.

The seasonal variations bear out the results of other investigators in that winter and spring are the worst seasons of the year, with fall next, and comparative relief from symptoms during the warmer months.

On the whole, patients with neurodermatoses tend to drift into occupations requiring more activity and responsibility than usual, and they are overconscientious in performance of their duties, which accounts for the increased mental and physical stress. Success is good, as a rule, unless the dermatosis is so severe as to interfere with their work, or their instability is so great that they will not tolerate routine work.

The late menarche is interesting in that many female patients in the group were hyposexual. An early menarche occurs in tropical countries, where hypersexuality is more frequent.

The low blood pressures are in accord with those in a previous study.¹

The therapeutic response to added treatment, as previously outlined,¹ of rest, relaxation, sunshine therapy, sedation, and reeducation as protection from useless worry and strain and as protection against the unavoidable but nevertheless very real shocks and stresses of ordinary life in an unsettled economic world, has yielded gratifying results. Bearing in mind that rest per se is the greatest standby of every physician in treating most of the ailments of humankind and that any pathologic condition will respond somewhat to rest, we feel that in this group of patients it holds a fundamental place in therapy.

The incidence of functional diseases in family histories is rather less than we expected. The small num-

5 Becker S W. Commoner Diseases of the Skin in Fishbein, Morris. National Medical Monographs. New York: National Medical Book Company, 1935.

6 Cornbleet, Theodore. Some Nonspecific Dermatoses. Arch. Dermat. & Syph. 27: 956 (June) 1933.

7 Stokes, J H. An Office Technique of Treating Functional Neuroses as Complications of Organic Disease with Special Reference to the Dermatoneuroses. J. A. M. A. 103: 1007 (Sept. 28) 1935.

ber in the urticaria group is partially in accord with the observations of Stokes, Kulchar and Pillsbury,⁸ who stated that urticaria is not an associate of other neurodermatoses. They did, however, find an "allergic-neurogenous" background in 60 per cent of patients with urticaria as compared with 25 per cent in psoriasis, acne vulgaris and impetigo. In our group, the highest incidence of association with other functional diseases, including the neurodermatoses, was found in patients with exudative neurodermatitis.

The excellent general health of patients in our groups is in accord with the observations made¹ in a previous study. The low blood pressure seems to protect them from the serious diseases of middle life.

Anthropometric measurements yielded disappointing results, possibly because of the variety of races and mixtures. The tendency toward long and narrow fingers and intermediate and female distribution of pubic hair in males is interesting in that it might be interpreted as a tendency toward female characteristics, since the neurodermatoses are more frequent in females than in males.

If the sedimentation time is an index to allergy, as Schulhof⁹ stated, we are evidently not dealing with allergic conditions, since all results were within normal limits.

The increased blister time may be of significance, since it was found previously¹ that patients with neurodermatoses have low basal metabolic rates, and decreased blister times are usually found in patients with hyperthyroidism having increased basal metabolic rates.

The marked difference in the ultraviolet erythema time reflects the differences in the skins of patients with urticaria and those with neurodermatitis. While our results following heat were normal, even when the history suggested its etiologic connection, we have previously observed one case reported by Tannenholz¹⁰ in which heat was definitely causative. Pressure evoked no response, even in a patient in whom angio-neurotic edema developed on the shoulder from pressure of a fire hose during a fire. There may have been an element of deep friction, which we could not duplicate.

Perusal of the charts showing differences in results in the three groups suggests that certain systems are predominantly involved in these various diseases. The differences are especially marked in patients with urticaria. Identification of these weakest links, so to speak, may lead to therapeutic attempts which may offer better results than the general procedures that are being used at present. For instance, it is well established that epinephrine and ephedrine are efficacious in a palliative way in urticaria and hence are valuable as emergency initial measures. We do not believe that it is safe to venture far from an assumption of general instability, and since therapeutic results based on a knowledge of the presence of this instability are much more satisfactory than those depending on hypothetical endocrine imbalance, hypersensitiveness, allergic or otherwise, and other more or less tangible factors, general measures offer the best outlook. A great deal

of work remains to be done in following up these clues and placing therapy on a rational basis. Large series of all the neurodermatoses may produce interesting and valuable data.

SUMMARY AND CONCLUSIONS

Functional study of eighty patients with various neurodermatoses (neurodermatitis [dry type], neurodermatitis [exudative type], dyshidrosis, urticaria, lichen planus, pruritus ani or vulvae, dermatitis herpetiformis, neurotic excoriations, aphthae, vitiligo, summer prurigo) was made by the following procedures: history, family history, psychomotor panel, physical examination, anthropometric measurements, urinalysis, Kolmer and Kahn reactions of the blood serum, blister time, permeability ratio, inflammatory index, sedimentation time, erythema time, friction, introduction of drugs by acupuncture and blood pressure studies.

Some results were uniform in all types of neurodermatoses and probably reflected the general instability of these patients. Many manifestations in patients with urticaria showed marked differences from those in patients with neurodermatitis, suggesting a different mechanism. Study of all patients, along with family histories, makes us believe that they have been born with generalized protoplasmic unrest, manifested chiefly as "neurocirculatory instability," which results in nervous exhaustion and increased instability. Therapeutic measures directed toward relief of this general instability and exhaustion seem to offer the best therapeutic promise. Further study of larger series of patients will be necessary before more specific therapy can be considered.

77 Rutledge Avenue, Charleston—950 East Fifty-Ninth Street.

ABSTRACT OF DISCUSSION

DR. PAUL A. O'LEARY, Rochester, Minn. I believe that Drs. van de Erve and Becker have discussed the incidence of certain dermatoses in what is known commonly as the neurotic personality or colloquially as the high-strung individual. The authors admit in their presentation that there is an intangible element in neurodermatoses or dermatoses of neurogenic origin, a premise with which most dermatologists are in accord. I confess a certain degree of coolness for the concept of neurogenic dermatosis as expressed by them. I can sum up my impression by repeating the sage comment that, when we believe, we stop thinking. If a larger series of control cases of dermatoses, other than those which the authors call neurogenic, were included in this appraisal, the same or a similar incidence of high-strung personalities might be encountered. It is rather hazardous to discuss pruritus ani as solely a neurogenic disease, because of the established examples of the bacterial and mycotic origin of the condition as well as the various colonic diseases so common in the production of pruritus ani. The same idea is applicable in the case of lichen planus, dermatitis herpetiformis, vitiligo and aphthous lesions in the mouth. I question that these should be admitted to the group of neurogenic diseases. The term "neurogenic dermatosis" has a definite application, for example, in the group reported by Dr. Becker several years ago. There have been several cases of this type presented recently before the Chicago Dermatological Society, the individuals having developed a definite dermatitis following the resection of a gasserian ganglion. I cannot agree with the idea of classifying a dermatitis in the neurogenic group when a definite etiologic factor other than nervous exhaustion has been described. I feel that when a neurogenic dermatosis is discussed it must be discussed in a negative manner. Such a diagnosis, presumptive at best, should be made only after a most thorough search has been made for concrete etiologic agents and a prolonged observation has failed to offer an explanation other than nervous exhaustion.

⁸ Stokes J. H., Kulchar G. V. and Pillsbury Donald. Effect on the Skin of Emotional and Nervous States, Arch. Dermat. & Syph. 31: 470 (April) 1935.

⁹ Schulhof Kamil. Increased Suspension Stability of Erythrocytes. Its Frequency in Allergic Individuals and Their Relatives, J. A. M. A. 100: 318 (Feb. 4) 1933.

¹⁰ Tannenholz, Harold. Erythema Caloricum Associated with a Remote Reaction to Heat (Neurodermatitis and Dyhidrosis). Arch. Dermat. & Syph. 28: 168 (Aug.) 1933.

DR. SAMUEL M. PECK, New York Allergy cannot be disregarded as a very important factor in the study of neurodermatitis in children. Children with neurodermatitis have a much higher incidence of personal and familial allergy than those of the same age group with a vesicular eczema. A child with a strong atopic history and a vesicular eczema in the first year is almost destined to develop a typical neurodermatitis if the skin eruption extends beyond the first year. That is why I have referred to the neurodermatitis as an eczema. Too little stress has been placed on those instability and neurogenic factors which play such an important part in the development and continuance of this condition. My conception, however, is perhaps a little different. I conceive the difference between ordinary vesicular eczemas and atopic (neurodermatitis) eczema to be one of threshold. I mean by that that children with an atopic eczema are born with a lowered threshold for sensitization, that is, they have a greater tendency to become sensitized to allergenic substances. I believe that time may show that the neurogenic factor plays an important part in the raising or lowering of this threshold for the elicitation of sensitivity reactions.

DR. JOHN H. STOKES, Philadelphia Until those of us who are working in this field succeed in bringing our results down to the point at which we can tell in figures exactly what is going on as the expression of the influence of the central and peripheral nervous systems on cellular mechanism, we are going to seem to sincere observers to be moving in the clouds and believing rather than thinking. Dr. Becker's instability concept shares with the laborious and extended observations of Brill and the current theorizing of the allergist the need to get down to brass tacks on mensuration and a consequent precise definition of the general constitutional and the local or individual cellular characteristics as expressed in elementary physiologic terms. Referring specifically to the observations of the authors, I hope that in time these studies of habitus, the shape of the face and width of the shoulders will lead us to the heart of the matter of the neurogenic background. Thus, as I see it, is the atrocious energy output over a special series of channels in the central nervous system, originating particularly, it would seem, from the floor of the fourth ventricle, which characterizes the possessor of a neurogenic background or a neurocirculatory instability. Why is it that he seems to be bombarding his periphery with this enormous and over-balanced energy, which requires all the reining in that he can do to get him through seventy years of life without obvious disaster? Almost certainly it will be the physiology of the vascular system and its nervous mechanism that will have to be made the principal point of attack. The importance of a selection of method is well illustrated by the status of capillary microscopy, for example, which, because it is too far out toward the extreme end and is concerned less with the function of the entire vascular bed than with the shape of individual minute blood vessels has made relatively small contribution thus far to our understanding of the neurovascular physiology of the skin. Much more significant, however, is the entire vascular bed and its function, as displayed in the blood volume and the arteriovenous proportions passing through the skin at a given time. This it may be possible to recognize by colorimetric methods. We are in accord with other investigators, such as Sheard, worrying over clinical photometry in the effort to find what the cutaneous vascular bed is doing under the conditions which van de Erve and Becker have been studying. I agree with Dr. Peck in that sooner or later we shall find in our study of the allergic-neurogenic individual that the allergic state stands back to back, Janus faced, with the function of the nervous system. It has been wisely said by Dr. Peck and other students of this relationship that the raising and lowering of the threshold and the broadening and narrowing of the base of what is today called allergy is one of the functions of some portions of the nervous system.

DR. THEODORE CORNBLEET, Chicago The people having these disorders have one common characteristic: they respond too readily and out of all proportion to any stimulant. Their reactions may be likened to pendulums that swing too far and bang against the framework that houses them to damage it. We all know that cells have the power to regain their

states of equilibrium, provided they have not deviated too far from it. If the change, however, exceeds a certain critical degree, it becomes permanent. This is known in biology as the law of reversible and irreversible change. The investigator doing this sort of work unconsciously hopes to find original causes. In this I feel that he is doomed to failure. He may measure functional capacities or reactive states, but I think that he will be unable to discover the prime movers with this approach. This type of investigation is not directed toward seeing the performers, but it pieces together the scenery in back of the real actors. It is nevertheless of immense importance, because through these means we shall more likely discover original causes and understand them better.

DR. EUGENE TRAUGOTT BERNSTEIN, New York Blushing, pallor and sweating are expressions of an emotional state. The vascular apparatus is of basic value in expressing all those states and all those skin disorders, and the psychotherapist can do much by applying his methods, he must not be rigid, however, but must understand every case individually. I think that even in acne rosacea and urticaria the raising and lowering of the blood pressure plays an important part, but the nervous system also is involved in allergy. When a patient who is allergic to lobsters comes into the room and sees a picture in which is reproduced a lobster and gets some allergic condition of the skin, it must be admitted that allergy and psychogenicity have something in common. I think that neurodermatitis or neurodermitis has probably very little to do really with a neurotic basis but is only a term selected because there is no better one to apply.

DR. S. WILLIAM BECKER, Chicago A transition in medicine is being passed through which is not limited entirely to dermatology. The internists, the endocrinologists and the gastroenterologists are all gradually focusing their attention on so-called functional disease, and we believe that the conditions that we have studied fall into this large group. We have no particular choice of terms, we have used the terms that seem most appropriate and have been used for a long time by various workers. If some one can identify the processes and substitute better terms, we shall be very glad to adopt them. We feel that these conditions must have exhaustion as an underlying factor. Dr. Minot at the opening of the new Eli Lilly Laboratories in Indianapolis stated that one does not need to enter the laboratory to do research, he said that one can do research by studying one's patients, and this is the type of research that we have been trying to carry on. If infections, infestations and neoplasms are eliminated from dermatology, the dermatoses are practically confined to human beings, who differ from animals in the high development of their nervous system, so that more and more conditions are going to be understood as having some relation to the nervous system. When we did our work, instead of choosing supposedly normal patients for controls we simply took the results of Drs. Peterson and Levinson on 100 supposedly normal individuals, and the differences between our cases and theirs were shown. In reply to Dr. O'Leary's contention relative to pruritus ani, we had eliminated all organic causes of pruritus ani and pruritus vulvae before we studied these particular individuals, so that these patients fall into the so-called functional group. It is perfectly true, as Drs. Stokes and Peck have said, that true allergy also occurs in these patients, and the combination of allergy and nervous exhaustion makes this study extremely difficult. It is only a beginning of what we hope will some day bear fruit.

Science and World Progress—Looking back on this three-year development of heavy hydrogen, my claim is that no one could have had the wisdom to direct research along these different lines in such a way as to produce better results. Each of these different contributors to scientific research was impelled only by his interest and enthusiasm in creative work, and any regimentation would have been fatal. We must not interfere with our scientists. We must not starve them nor frighten them, for the progress of the world depends upon them. Research in science has been one of the few outstanding successes in the human race, and we need not less, but more of it.—Daniels, Farrington. Photons in Chemistry and Biology, *Science* 81: 523 (May 31) 1935.

TOTAL THYROIDECTOMY FOR INTRACTABLE HEART DISEASE

SUMMARY OF TWO AND ONE-HALF YEARS'
SURGICAL EXPERIENCEDAVID D. BERLIN, MD
BOSTON

It is now approximately two and a half years since total ablation of the normal thyroid gland was first successfully performed for the relief of chronic intractable heart disease at the Beth Israel Hospital in Boston.¹ The results obtained in ninety patients who have been submitted to this operative procedure indicate that this surgical therapeutic measure has a definite place in the treatment of chronic intractable heart disease.² A brief review of our experience will be outlined in this communication.

RATIONALE

The original researches on the velocity of blood flow by Blumgart and his co-workers³ demonstrated that an intimate relationship existed between tissue demands as expressed by the basal metabolic rate and the speed of blood flow. As the demands of tissue metabolism mounted, the rate of blood flow was proportionately increased. With the metabolism depressed, as in myxedema, the velocity of blood flow was correspondingly reduced. In patients with circulatory failure the rate of blood flow was definitely slower than in compensated or normal individuals with a similar metabolic rate. In terms of the law of supply and demand the reduced speed of blood flow or supply of blood in a patient with congestive failure might be insufficient for the demands of the normal metabolism but might, nevertheless, be adequate for the lessened requirements of a reduced metabolic rate. This significant physiologic relationship between the demands of metabolism and the supply of blood by the heart led to the belief that the production of artificial myxedema in a patient suffering from

chronic heart disease and having a normal metabolic rate might result in definite clinical improvement.

Striking clinical improvement in thyrocardiac patients following subtotal thyroidectomy is a well recognized fact and is in accord with the preceding considerations as far as it exemplifies the value of diminishing the load of an overburdened heart by the reduction in the metabolic level.

Maximal subtotal thyroidectomy, bordering on complete ablation of the gland, performed on two patients in October and November of 1932, resulted in a conspicuous but temporary clinical improvement, which paralleled the fall in the metabolic rate. Both patients, however, relapsed to their preoperative clinical state as the metabolism returned to normal. Roentgen irradiation failed to inactivate the remaining thyroid remnants and a secondary surgical attempt to remove them proved unavailing, as the fragments of glandular tissue were found inextricably enmeshed in a matrix of dense scar tissue. A study of the results obtained in these two cases suggested to Blumgart the advisability of complete excision of the thyroid gland in order to establish a persistent lowering of the metabolic rate.

A careful study of the special surgical problems involved was made before proceeding with the first complete thyroidectomy. On the basis that the latter procedure necessarily implies the removal of every vestige of thyroid tissue, we performed the first recorded total ablation of the normal thyroid gland for the relief of chronic intractable heart disease on Dec. 15, 1932. During the two and a half years that has elapsed, more than ninety total thyroidectomies have been performed by us, with the induction of artificial myxedema in every instance.

SELECTION OF PATIENTS

While the criteria for the selection of patients for operation have been carefully described in previous publications,⁴ a brief consideration at this time of this highly important phase of the investigation is in order, even at the risk of repetition. The selection of patients properly suited for this operative procedure is the problem of the cardiologist. Thus the responsibility of achieving favorable results devolves on the internist as well as the surgeon. Close cooperation with a competent internist will undoubtedly serve to reduce the incidence of failures to a minimum. Operations ill advised will unjustifiably throw into disrepute an otherwise valuable therapeutic measure.

From the very outset we have recommended that this operation be applied only to those patients who, despite all available medical measures, continue to remain chronic invalids. In general, it may be stated that those patients with a slowly progressive heart lesion who continue to suffer recurrent attacks of failure on exertion over a prolonged period of time will probably show a favorable response to operation. On the other hand, patients with congestive failure, regardless of cause or type of lesion, showing a short and rapidly progressive course are excluded as unfavorable risks. In the presence of severe impairment of renal function and acute pulmonary or active rheumatic infection, the operation should not be undertaken.

4. Blumgart, H. L., Berlin, D. D., Davis, David, Riseman, J. E. F., and Weinstein, A. A. Treatment of Angina Pectoris and Congestive Heart Failure by Total Ablation of the Thyroid in Patients Without Thyrotoxicosis. A. With Particular Reference to the Pre- and Post-operative Medical Management. *Ann. Int. Med.* 7:1469 (June) 1934. Total Ablation of Thyroid in Angina Pectoris and Congestive Failure. XI. Summary of Results in Treating Seventy Five Patients During the Last Eighteen Months. *J. A. M. A.* 104:17 (Jan. 5) 1935.

From the Surgical Service of the Beth Israel Hospital.
Read before the Section on Surgery, General and Abdominal at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.

1. Blumgart, H. L., Levine, S. A., and Berlin, D. D. Congestive Heart Failure and Angina Pectoris. The Therapeutic Effect of Thyroidectomy on Patients Without Clinical or Pathological Evidence of Thyroid Toxicity. *Arch. Int. Med.* 51:866 (June) 1933.

2. Berlin, D. D. Therapeutic Effect of Complete Thyroidectomy on Congestive Heart Failure and Angina Pectoris in Patients with no Clinical or Pathological Evidence of Thyroid Toxicity. II. Operative Technique. *Am. J. Surg.* 21:173 (Aug.) 1933.

3. These include:

Blumgart, H. L., and Voss, O. C. Studies on the Velocity of Blood Flow. I. The Method Utilized. *J. Clin. Investigation* 4:1 (April) 1927.

Blumgart, H. L., and Weiss, Soma. Studies on the Velocity of Blood Flow. II. The Velocity of Blood Flow in Normal Resting Individuals, and a Critique on the Method Used. *ibid.* 4:15 (April) 1927.

IX. The Pulmonary Circulation Time, the Velocity of Venous Blood Flow to the Heart, and Related Aspects of the Circulation in Patients With Cardiovascular Disease. *ibid.* 5:343 (Feb.) 1928.

X. The Relation Between the Velocity of Blood Flow, the Venous Pressure and the Vital Capacity of the Lungs in Fifty Patients with Cardiovascular Disease Compared with Similar Measurements in Fifty Normal Persons. *ibid.* 6:379 (Feb.) 1928.

Weiss, Soma, and Blumgart, H. L. The Effect of the Digitalis Bodies on the Velocity of Blood Flow Through the Lungs and on Other Aspects of the Circulation. A Study of Normal Subjects and Patients with Cardiovascular Disease. *ibid.* 7:11 (April) 1929.

Blumgart, H. L., Gargill, S. L., and Gilligan, Dorothy R. Studies on the Velocity of Blood Flow. XIII. The Circulatory Response to Thyrotoxicosis. *ibid.* 9:69 (Aug.) 1930.

XIV. The Circulation in Myxedema with a Comparison of the Velocity of Blood Flow in Myxedema and Thyrotoxicosis. *ibid.* 9:91 (Aug.) 1930.

XV. The Velocity of Blood Flow and Other Aspects of the Circulation in Patients with 'Primary' and Secondary Anemia and in Two Patients with Polycythemia Vera. *ibid.* 9:679 (Feb.) 1931.

Blumgart, H. L. The Velocity of Blood Flow in Health and Disease. The Velocity of Blood Flow in Man and Its Relation to Other Measurements of the Circulation. *Medicine* 10:1 (Feb.) 1931.

While the diagnosis of angina pectoris must be accurately established, the task of choosing from among these crippled cardiac patients subjects suitable for operation is not as great as in the group afflicted with congestive failure. If the patient's history shows a rapid progression in the number of attacks of coronary pain with frequent seizures at bed rest, thyroidectomy will probably not give lasting results. A recent coronary attack within three months, likewise contraindicates operation. Heretofore coronary thrombosis, however, is not a contraindication. In several of the cases there has been a history of more than one attack of coronary thrombosis, but in no instance did the last attack occur less than four months prior to operation.

When the metabolism is below minus 15 per cent in patients of either group, operation is not recommended.

PREOPERATIVE MANAGEMENT

In patients with congestive failure, operation is deferred until they are rendered edema free by sufficient bed rest and the administration of diuretics and cardiac stimulants such as strychnin and digitalis. Our earlier experience taught us that patients who persisted in showing signs of congestive failure up to the time of operation were likely to develop serious postoperative pulmonary complications or die too soon after their operative recovery to justify the procedure.⁵ Intensive preoperative and postoperative sedation is avoided in order to guard against the accumulation of tracheo-bronchial secretions and the consequent danger of postoperative bronchopneumonia. One of the barbituric derivatives, usually 3 grains (0.2 Gm.) of sodium amytal, is given the night before and supplemented by one-fourth grain (0.016 Gm.) of morphine the morning of the operation. The patient's reaction to whatever drug is used should be tested preoperatively to determine the presence of idiosyncrasy. Sedation need not be so cautiously restricted in angina pectoris.

OPERATIVE CONSIDERATIONS

Anesthesia—We believe that complete thyroidectomy in these patients with advanced heart disease performed under local anesthesia will reduce the mortality rate to a minimum.⁶ Gas-oxygen anesthesia, occasionally supplemented with small amounts of ether, was employed in the first twenty-eight cases with six operative deaths while the subsequent sixty-two patients were operated on under local anesthesia without mortality and with no postoperative complications. The elimination of operative mortality as well as postoperative morbidity can be attributed not only to increased skill in the medical management and to improvement in surgical technique but to the use of local anesthesia as well.

Deep infiltration of the lateral lobes of the thyroid, especially at the upper poles, and infiltration deep in the danger zone along the tracheo-esophageal sulcus must be carefully avoided, for it carries the risk of directly anesthetizing the concealed recurrent nerve with a resulting temporary paralysis of the homolateral vocal cord. This technical accident occurred in one patient and necessitated the termination of operation

after hemithyroidectomy. The remaining lobe was successfully excised at a secondary operation.

Recurrent Laryngeal Nerve—It has been previously stated,⁷ and is again emphasized that the recurrent nerve is regarded as the greatest technical hazard of this operation. It therefore behooves the surgeon to acquaint himself with the anatomic variations in the course of the recurrent laryngeal nerve in its relation to the thyroid gland.

The variations in the course of 140 nerves as observed in anatomic dissections and comparative observations in the operating room in seventy cases in which total thyroidectomy was performed have been detailed elsewhere.⁷ It was noted that about 65 per cent of the nerves coursed in the sulcus between the trachea and the esophagus and were reasonably well protected against operative injury. Approximately 25 per cent of the recurrent nerves passed through the adherent zone in close apposition to the gland and the remaining 10 per cent partially penetrated the gland substance. Obviously therefore, it is when the nerves appear in either of the latter positions that they are in imminent danger of being seriously injured.

Injury to both recurrent laryngeal nerves is a tragedy. Danger of this calamitous complication is considerably greater in total ablation than in the usual goiter surgery. As a precaution against its development, direct laryngoscopic examination is carried out after one lobe has been extirpated, in order to ascertain the integrity of the corresponding vocal cord.⁸ This applies to patients operated on under local as well as under generalized anesthesia, for we have not infrequently observed that there may be no apparent change in the quality of the spoken voice in the presence of unilateral nerve paralysis. If laryngoscopy discloses a paralyzed vocal cord on the side of the removed lobe operation is ended to prevent the possibility of bilateral abductor paralysis. While ligation or severance will permanently paralyze the recurrent laryngeal nerve, it should be remembered that inadvertent pinching during operation will result in transient paralysis. In 100 total thyroidectomies, including all types of patients, there have been three permanent and nine temporary unilateral nerve injuries, with complete subsequent recovery in the latter nine palsies occurring from two days to approximately four months following injury. One recent unilateral nerve paralysis, probably the result of accidental pinching with a snap, was the only recurrent nerve accident in the last forty consecutive cases. We have never encountered bilateral laryngeal nerve injury.

Adherent Zone—The recurrent nerves may be injured at any point in their course in the neck but are most subject to operative damage in the region of the adherent zone. The latter region represents the area of fixation of the lateral lobe of the thyroid to the trachea at about the level of the upper two tracheal rings and comes into clear view after one has mobilized both the upper and the lower poles and then exerts traction on the lobe toward the median plane. The juxtaposition of nerve to gland in this vulnerable region is found with sufficient frequency to demand deliberate meticulous dissection on the part of the surgeon in his

5 Blumgart H. L., Riseman J. E. F., Davis David and Berlin D. D. Therapeutic Effect of Total Ablation of Normal Thyroid on Congestive Heart Failure and Angina Pectoris. III. Early Results in Various Types of Cardiovascular Disease and Coincident Pathologic States Without Clinical or Pathologic Evidence of Thyroid Toxicity. *Arch. Int. Med.* 52: 165 (Aug.) 1933.

6 Mixter C. G., Blumgart H. L. and Berlin D. D. Total Ablation of the Thyroid for Angina Pectoris and Congestive Heart Failure. Results of Eighteen Months Experience. *Ann. Surg.* 100: 570 (Oct.) 1934.

7 Berlin D. D. The Recurrent Laryngeal Nerves in Total Ablation of the Normal Thyroid Gland. An Anatomical and Surgical Study. *Surg., Gynec. & Obst.* 60: 19 (Jan.) 1935.

8 Freedman L. M. Treatment of Angina Pectoris and Congestive Heart Failure by Total Ablation of the Thyroid. V. Importance of Laryngoscopic Examination as a Means of Preventing Bilateral Paralysis of the Vocal Cords. *Arch. Otolaryng.* 10: 383 (March) 1934.

TOTAL THYROIDECTOMY FOR INTRACTABLE HEART DISEASE

SUMMARY OF TWO AND ONE-HALF YEARS'
SURGICAL EXPERIENCEDAVID D. BERLIN, M.D.
BOSTON

It is now approximately two and a half years since total ablation of the normal thyroid gland was first successfully performed for the relief of chronic intractable heart disease at the Beth Israel Hospital in Boston.¹ The results obtained in ninety patients who have been submitted to this operative procedure indicate that this surgical therapeutic measure has a definite place in the treatment of chronic intractable heart disease.² A brief review of our experience will be outlined in this communication.

RATIONALE

The original researches on the velocity of blood flow by Blumgart and his co-workers³ demonstrated that an intimate relationship existed between tissue demands as expressed by the basal metabolic rate and the speed of blood flow. As the demands of tissue metabolism mounted, the rate of blood flow was proportionately increased. With the metabolism depressed, as in myxedema, the velocity of blood flow was correspondingly reduced. In patients with circulatory failure the rate of blood flow was definitely slower than in compensated or normal individuals with a similar metabolic rate. In terms of the law of supply and demand the reduced speed of blood flow or supply of blood in a patient with congestive failure might be insufficient for the demands of the normal metabolism but might, nevertheless, be adequate for the lessened requirements of a reduced metabolic rate. This significant physiologic relationship between the demands of metabolism and the supply of blood by the heart led to the belief that the production of artificial myxedema in a patient suffering from

chronic heart disease and having a normal metabolic rate might result in definite clinical improvement.

Striking clinical improvement in thyrocardiac patients following subtotal thyroidectomy is a well recognized fact and is in accord with the preceding considerations as far as it exemplifies the value of diminishing the load of an overburdened heart by the reduction in the metabolic level.

Maximal subtotal thyroidectomy, bordering on complete ablation of the gland, performed on two patients in October and November of 1932, resulted in a conspicuous but temporary clinical improvement, which paralleled the fall in the metabolic rate. Both patients, however, relapsed to their preoperative clinical state as the metabolism returned to normal. Roentgen irradiation failed to inactivate the remaining thyroid remnants and a secondary surgical attempt to remove them proved unavailing, as the fragments of glandular tissue were found inextricably enmeshed in a matrix of dense scar tissue. A study of the results obtained in these two cases suggested to Blumgart the advisability of complete excision of the thyroid gland in order to establish a persistent lowering of the metabolic rate.

A careful study of the special surgical problems involved was made before proceeding with the first complete thyroidectomy. On the basis that the latter procedure necessarily implies the removal of every vestige of thyroid tissue, we performed the first recorded total ablation of the normal thyroid gland for the relief of chronic intractable heart disease on Dec. 15, 1932. During the two and a half years that has elapsed, more than ninety total thyroidectomies have been performed by us, with the induction of artificial myxedema in every instance.

SELECTION OF PATIENTS

While the criteria for the selection of patients for operation have been carefully described in previous publications,⁴ a brief consideration at this time of this highly important phase of the investigation is in order, even at the risk of repetition. The selection of patients properly suited for this operative procedure is the problem of the cardiologist. Thus the responsibility of achieving favorable results devolves on the internist as well as the surgeon. Close cooperation with a competent internist will undoubtedly serve to reduce the incidence of failures to a minimum. Operations ill advised will unjustifiably throw into disrepute an otherwise valuable therapeutic measure.

From the very outset we have recommended that this operation be applied only to those patients who despite all available medical measures, continue to remain chronic invalids. In general, it may be stated that those patients with a slowly progressive heart lesion who continue to suffer recurrent attacks of failure on exertion over a prolonged period of time will probably show a favorable response to operation. On the other hand, patients with congestive failure, regardless of cause or type of lesion, showing a short and rapidly progressive course are excluded as unfavorable risks. In the presence of severe impairment of renal function and acute pulmonary or active rheumatic infection, the operation should not be undertaken.

4. Blumgart, H. L., Berlin, D. D., Davis, David, Riseman, J. E. F. and Weinstein, A. A. Treatment of Angina Pectoris and Congestive Heart Failure by Total Ablation of the Thyroid in Patients Without Thyrotoxicosis. With Particular Reference to the Pre- and Post-operative Medical Management. *Ann. Int. Med.* 7:1469 (June) 1934. Total Ablation of Thyroid in Angina Pectoris and Congestive Heart Failure. Summary of Results in Treating Seventy Five Patients During the Last Eighteen Months. *J. A. M. A.* 104:17 (Jan. 5) 1935.

From the Surgical Service of the Beth Israel Hospital.
Read before the Section on Surgery (General and Abdominal) at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.

1. Blumgart, H. L., Levine, S. A. and Berlin, D. D. Congestive Heart Failure and Angina Pectoris. The Therapeutic Effect of Thyroidectomy on Patients Without Clinical or Pathologic Evidence of Thyroid Toxicity. *Arch. Int. Med.* 51:866 (June) 1933.

2. Berlin, D. D. Therapeutic Effect of Complete Thyroidectomy on Congestive Heart Failure and Angina Pectoris in Patients with No Clinical or Pathologic Evidence of Thyroid Toxicity. II. Operative Technique. *Am. J. Surg.* 21:173 (Aug.) 1933.

3. These include

Blumgart, H. L. and Yens, O. C. Studies on the Velocity of Blood Flow. I. The Method Utilized. *J. Clin. Investigation* 1:1 (April) 1927.

Blumgart, H. L. and Weiss, Soma. Studies on the Velocity of Blood Flow. II. The Velocity of Blood Flow in Normal Resting Individuals and a Critique on the Method Used. *ibid.* 1:15 (April) 1927.

IX. The Pulmonary Circulation Time, the Velocity of Venous Blood Flow to the Heart, and Related Aspects of the Circulation in Patients With Cardiovascular Disease. *ibid.* 5:343 (Feb.) 1928.

X. The Relation Between the Velocity of Blood Flow, the Venous Pressure and the Vital Capacity of the Lungs in Fifty Patients with Cardiovascular Disease Compared with Similar Measurements in Fifty Normal Persons. *ibid.* 5:379 (Feb.) 1928.

Weiss, Soma and Blumgart, H. L. The Effect of the Digitalis Bodies on the Velocity of Blood Flow Through the Lungs and on Other Aspects of the Circulation. A Study of Normal Subjects and Patients with Cardiovascular Disease. *ibid.* 7:11 (April) 1929.

Blumgart, H. L., Gargill, S. L., and Gilligan, Dorothy R. Studies on the Velocity of Blood Flow. XIII. The Circulatory Response to Thyrotoxicosis. *ibid.* 9:69 (Aug.) 1930.

XIV. The Circulation in Myxedema with a Comparison of the Velocity of Blood Flow in Myxedema and Thyrotoxicosis. *ibid.* 9:91 (Aug.) 1930.

XV. The Velocity of Blood Flow and Other Aspects of the Circulation in Patients with "Primary" and Secondary Anemia and in Two Patients with Polycythemia Vera. *ibid.* 9:679 (Feb.) 1931.

Blumgart, H. L. The Velocity of Blood Flow in Health and Disease. The Velocity of Blood Flow in Man and Its Relation to Other Measurements of the Circulation. *Medicine* 10:1 (Feb.) 1931.

While the diagnosis of angina pectoris must be accurately established, the task of choosing from among these crippled cardiac patients subjects suitable for operation is not as great as in the group afflicted with congestive failure. If the patient's history shows a rapid progression in the number of attacks of coronary pain with frequent seizures at bed rest, thyroidectomy will probably not give lasting results. A recent coronary attack within three months, likewise contraindicates operation. Healed coronary thrombosis, however, is not a contraindication. In several of the cases there has been a history of more than one attack of coronary thrombosis, but in no instance did the last attack occur less than four months prior to operation.

When the metabolism is below minus 15 per cent in patients of either group, operation is not recommended.

PREOPERATIVE MANAGEMENT

In patients with congestive failure operation is deferred until they are rendered edema free by sufficient bed rest and the administration of diuretics and cardiac stimulants such as salyrgan and digitalis. Our earlier experience taught us that patients who persisted in showing signs of congestive failure up to the time of operation were likely to develop serious postoperative pulmonary complications or die too soon after their operative recovery to justify the procedure.⁵ Intensive preoperative and postoperative sedation is avoided in order to guard against the accumulation of tracheo-bronchial secretions and the consequent danger of postoperative bronchopneumonia. One of the barbituric derivatives, usually 3 grains (0.2 Gm.) of sodium amytal, is given the night before and supplemented by one-fourth grain (0.016 Gm.) of morphine the morning of the operation. The patient's reaction to whatever drug is used should be tested preoperatively to determine the presence of idiosyncrasy. Sedation need not be so cautiously restricted in angina pectoris.

OPERATIVE CONSIDERATIONS

Anesthesia—We believe that complete thyroidectomy in these patients with advanced heart disease performed under local anesthesia will reduce the mortality rate to a minimum.⁶ Gas-oxygen anesthesia, occasionally supplemented with small amounts of ether, was employed in the first twenty-eight cases with six operative deaths while the subsequent sixty-two patients were operated on under local anesthesia without mortality and with no postoperative complications. The elimination of operative mortality as well as postoperative morbidity can be attributed not only to increased skill in the medical management and to improvement in surgical technique but to the use of local anesthesia as well.

Deep infiltration of the lateral lobes of the thyroid, especially at the upper poles, and infiltration deep in the danger zone along the tracheo-esophageal sulcus must be carefully avoided, for it carries the risk of directly anesthetizing the concealed recurrent nerve with a resulting temporary paralysis of the homolateral vocal cord. This technical accident occurred in one patient and necessitated the termination of operation

after hemithyroidectomy. The remaining lobe was successfully excised at a secondary operation.

Recurrent Laryngeal Nerve—It has been previously stated,⁷ and is again emphasized that the recurrent nerve is regarded as the greatest technical hazard of this operation. It therefore behooves the surgeon to acquaint himself with the anatomic variations in the course of the recurrent laryngeal nerve in its relation to the thyroid gland.

The variations in the course of 140 nerves as observed in anatomic dissections and comparative observations in the operating room in seventy cases in which total thyroidectomy was performed have been detailed elsewhere.⁷ It was noted that about 65 per cent of the nerves coursed in the sulcus between the trachea and the esophagus and were reasonably well protected against operative injury. Approximately 25 per cent of the recurrent nerves passed through the adherent zone in close apposition to the gland and the remaining 10 per cent partially penetrated the gland substance. Obviously, therefore, it is when the nerves appear in either of the latter positions that they are in imminent danger of being seriously injured.

Injury to both recurrent laryngeal nerves is a tragedy. Danger of this calamitous complication is considerably greater in total ablation than in the usual goiter surgery. As a precaution against its development, direct laryngoscopic examination is carried out after one lobe has been extirpated in order to ascertain the integrity of the corresponding vocal cord.⁸ This applies to patients operated on under local as well as under generalized anesthesia, for we have not infrequently observed that there may be no apparent change in the quality of the spoken voice in the presence of unilateral nerve paralysis. If laryngoscopy discloses a paralyzed vocal cord on the side of the removed lobe, operation is ended to prevent the possibility of bilateral abductor paralysis. While ligation or severance will permanently paralyze the recurrent laryngeal nerve, it should be remembered that inadvertent pinching during operation will result in transient paralysis. In 100 total thyroidectomies, including all types of patients, there have been three permanent and nine temporary unilateral nerve injuries, with complete subsequent recovery in the latter nine palsies occurring from two days to approximately four months following injury. One recent unilateral nerve paralysis, probably the result of accidental pinching with a snap, was the only recurrent nerve accident in the last forty consecutive cases. We have never encountered bilateral laryngeal nerve injury.

Adherent Zone—The recurrent nerves may be injured at any point in their course in the neck but are most subject to operative damage in the region of the adherent zone. The latter region represents the area of fixation of the lateral lobe of the thyroid to the trachea at about the level of the upper two tracheal rings and comes into clear view after one has mobilized both the upper and the lower poles and then exerts traction on the lobe toward the median plane. The juxtaposition of nerve to gland in this vulnerable region is found with sufficient frequency to demand deliberate meticulous dissection on the part of the surgeon in his

5 Blumgart H. L., Riseman J. E. F., Davis David and Berlin D. D. Therapeutic Effect of Total Ablation of Normal Thyroid on Congestive Heart Failure and Angina Pectoris. III. Early Results in Various Types of Cardiovascular Disease and Coincident Pathologic States Without Clinical or Pathologic Evidence of Thyroid Toxicity. Arch. Int. Med. 62: 165 (Aug.) 1933.

6 Mixer C. G., Blumgart H. L. and Berlin D. D. Total Ablation of the Thyroid for Angina Pectoris and Congestive Heart Failure. Results of Eighteen Months Experience. Ann. Surg. 100: 570 (Oct.) 1934.

7 Berlin D. D. The Recurrent Laryngeal Nerves in Total Ablation of the Normal Thyroid Gland. An Anatomical and Surgical Study. Surg. Gynec. & Obst. 60: 19 (Jan.) 1935.

8 Freedman L. M. Treatment of Angina Pectoris and Congestive Heart Failure by Total Ablation of the Thyroid. V. Importance of Laryngoscopic Examination as a Means of Preventing Bilateral Paralysis of the Vocal Cords. Arch. Otolaryng. 10: 383 (March) 1934.

attempt to excise every visible trace of thyroid tissue and at the same time preserve the nerve intact. At this same area the thyroid is sometimes found to be very deeply molded in the tracheo-esophageal sulcus with a definite retrotracheal extension of glandular tissue. This, of course, increases the hazard of nerve injury. In approximately 5 per cent of our operative series, such a retrotracheal prolongation of thyroid tissue was encountered.

Pyramidal Lobe—In operating for exophthalmic goiter an enlarged hyperplastic pyramidal lobe usually can be identified with ease, and failure to remove it may sometimes account for the recurrence or persistence of symptoms of thyrotoxicosis. In surgery of the normal thyroid gland, however, this structure, sometimes referred to as the third lobe of the thyroid, is thin, much less vascularized than the hyperplastic pyramidal lobe and often effectively concealed beneath the thin stratum of deep cervical fascia. A deliberate search for its presence should therefore be made and, when found, it should be traced to its uppermost level and removed. Failure to remove an elongated pyramidal lobe may preclude the development of a persistent lowering of the basal metabolism. Without such a permanent depression in the metabolic level a successful therapeutic end result is not to be anticipated. In a previous report⁹ it was noted that a pyramidal lobe was found in 35 per cent of the first sixty patients operated on.

Parathyroids—When this problem was first undertaken we were much concerned about the development of serious postoperative tetany. McCullagh¹⁰ in 1932 reported an incidence of tetany of 13 per cent following subtotal removal of the abnormal thyroid gland in a series of 11,500 operations performed at the Cleveland Clinic. Means and Richardson¹¹ observed that the occurrence of postoperative parathyroid tetany was roughly related to the amount of thyroid tissue removed at operation. Tetany rarely followed hemithyroidectomy and was more common following subtotal thyroidectomy of the hyperplastic gland than after the excision of an adenomatous goiter. It was feared, therefore, that total extirpation of the gland might yield a high incidence of severe tetany.

The patients and those in attendance were instructed to report the onset of numbness and tingling of the hands and feet immediately, and tests were frequently made to elicit the presence of Chvostek's and Trousseau's signs. Repeated measurements of the concentration of serum calcium were also carried out.¹²

To date not a single instance of severe tetany, such as spontaneous carpopedal spasm or convulsions, has been manifested. There were altogether fourteen patients who developed signs or symptoms of mild parathyroid insufficiency in whom at least one parathyroid gland was identified and preserved at operation.

9 Berlin D D and Blumgart H L. The Treatment of Chronic Intractable Heart Disease by Total Thyroidectomy, presented at the annual meeting of the New York State Medical Society, Utica May 15 1934.

10 McCullagh E P. The Diagnosis and Treatment of Parathyroid Tetany in Crile G W and associates. Diagnosis and Treatment of Diseases of the Thyroid Gland Philadelphia W B Saunders Company, 1932.

11 Means J H and Richardson, E P. The Diagnosis and Treatment of Diseases of the Thyroid in Christian, H A. Oxford Monographs on Diagnosis and Treatment New York Oxford University Press, 1929, vol. 4.

12 Gilligan Dorothy R. Berlin D D Volk Marie C Stern B and Blumgart H L. Therapeutic Effect of Total Ablation of Normal Thyroid on Congestive Heart Failure and Angina Pectoris. IX. Postoperative Parathyroid Function. Clinical Observations and Serum Calcium and Phosphorus Studies. J Clin Investigation 13 789 (Sept) 1934.

We advise against a too diligent search for these glands away from the surface of the thyroid gland, for we attribute the symptoms of temporary impairment of parathyroid function to injury rather than to removal of these glands during operation. A parathyroid accidentally removed is reimplanted in the sternomastoid muscle.

POSTOPERATIVE MANAGEMENT

The immediate postoperative reaction is usually mild. Patients have regularly been able to take fluids by mouth immediately following operation and we have not had to resort to hypodermoclysis. For the first three postoperative days fluids are given to the amount of 1,500 cc or less daily and subsequently reduced to the preoperative intake. The administration of oxygen to the occasional patient who develops dyspnea and slight cyanosis is followed by quick and striking relief.

Since the underlying cardiac lesion still exists following operation, these patients continue to demand the same careful medical supervision postoperatively that any patient with heart disease requires. Furthermore, the depressed metabolism incident to the myxedematous state must be carefully regulated. Without thyroid medication, practically all patients will eventually develop untoward symptoms and signs of myxedema. With rare exceptions the metabolism can be maintained at a level of minus 25 to minus 30 per cent by the administration of small doses of thyroid daily. At this

Results from One to Two and One Half Years
Following Operation

| | Angina Pectoris | Congestive Failure |
|----------------------|--------------------|-----------------------|
| Marked improvement | 66% | 38% |
| Moderate improvement | 17% | 31% |
| Slight improvement | 14% | 29% |
| No improvement | 10% | 9% |
| Number of cases | 36 | 72 |

Twenty two patients have been operated on within the last twelve months; these results are not evaluated.

optimum level the untoward clinical manifestations of hypothyroidism are usually controlled with the heart still released from its previous burden. In the majority of instances the administration of thyroid one-fourth grain, or 0.016 Gm (Armour's), daily is sufficient to keep the patient in comfort. In others, one-half gram (0.032 Gm) daily is required to maintain the desired metabolic level. The details of the medical management have been fully described elsewhere.⁴

RESULTS

An evaluation of the clinical results obtained in those patients who were operated on from one to two and a half years ago reveals that of thirty-six patients with angina pectoris 50 per cent have been markedly improved, as shown in the accompanying table. In this category are included patients who were previously incapacitated and were sufficiently relieved by operation so that they no longer required medication and were able to return to work. In an additional 17 per cent the attacks of coronary pain were diminished in frequency and severity. The improvement in this group is classified as moderate.

The results in patients with congestive failure are equally satisfactory. Approximately 70 per cent derived a degree of improvement which was greater than that

obtained by adequate medical therapy prior to thyroidectomy. Thirty-eight per cent of these totally incapacitated cardiac patients were markedly benefited by operation to the extent that they were able to undertake, without circulatory embarrassment, activity such as had been previously denied them. An additional 31 per cent showed a moderate increase in their capacity for work without recurrence of failure.

Approximately 30 per cent of the patients suffering from either angina pectoris or congestive heart failure showed little or no improvement following operation. The lack of improvement in this group can be attributed in most instances either to a rapid progression of the underlying disease or to an unduly low preoperative basal metabolic rate. The results of this group emphasize the need of utmost care and caution in the selection of patients for operation.

SUMMARY

1 Approximately 70 per cent of the patients with either angina pectoris or congestive failure who were operated on from one to two and a half years ago have shown marked or moderate improvement following total ablation of the thyroid gland.

2 Close cooperation between internist and surgeon is most essential. Extreme care must be exercised in the selection of patients for operation.

3 Attention is called to the danger of bilateral recurrent laryngeal nerve injury. Direct laryngoscopic examination after the ablation of one lobe of the thyroid gland is advisable as a precaution against the development of bilateral abductor paralysis.

4 The pyramidal lobe and the retrotracheal extension of glandular tissue in the region of the adherent zone must be carefully dissected and excised to effect a total extirpation of the gland.

5 The absence of operative mortality in the last sixty-two patients submitted for operation is attributed to increased experience in medical management, improvement in surgical technic, and the use of local anesthesia.

330 Brookline Avenue.

ABSTRACT OF DISCUSSION

DR. JOHN HEPBURN, Toronto. Our results at the Toronto General Hospital agree with those of the author in that in careful hands tetany need not be feared. These patients will not stand the enormous deluge of fluids which too many surgeons appear to think all postoperative cases require. In a small series of cases treated more than a year ago, two groups of patients were selected. 1 Patients totally incapacitated because of anginal attacks. They are all alive and improved in varying degrees. The most severely ill patient had been in bed for nine months, receiving morphine up to $1\frac{1}{2}$ grains (0.1 Gm.) daily before the operation. He is now able to walk six or eight blocks several times a day and takes no sedative. 2 Patients with marked congestive failure, which persisted in spite of prolonged bed rest, diuretics and restricted fluids. One patient died as the result of the operation or anesthetic, one or two others improved greatly for a time, others did not improve, and all are now dead. We have had no experience with cases of recurrent failure which clears up readily on rest. Several interesting points have emerged from this work. First, only a tiny dose of thyroid extract is needed to raise the basal metabolic rate from 10 to 15 per cent and to clear up the disagreeable symptoms of myxedema, secondly, no one has adequately explained why angina decubitus as a rule disappears on the day of operation, thirdly, two of our anginal patients, whose preoperative basal metabolic rate was minus 15 per cent, improved definitely following the operation without any further

lowering of the metabolic rate. Every patient should be carefully selected by a competent cardiologist and advised to have this operation if totally incapacitated by angina or, judging by Dr. Berlin's results, if failure recurs on assuming light duties, in spite of adequate medical attention, but not to be operated on if failure resists medical treatment.

DR. DAVID D. BERLIN, Boston. The important problem of the selection of patients for operation and the various surgical pitfalls have all been outlined in detail in previous communications. I have never submitted any patient to this operative procedure without first knowing that all available medical measures have already been applied and proved unsuccessful. I believe that the disappearance of angina decubitus on the day of operation can be explained on the basis of sensory nerve interruption during operation. I have noted this phenomenon immediately following operation on the corresponding side of the removed lobe of the thyroid. Dr. Hepburn referred to patients who were improved with no lowering of the basal metabolic rate. The early relief that comes following resection of the sensory nerves in the course of total thyroidectomy may last anywhere from six weeks to about three months. Beyond this period, the degree of improvement following operation has in my experience uniformly paralleled the fall in the basal metabolism. Conservatism has been the keynote throughout this investigation. Many more patients have been rejected than have been selected for this operative procedure. Dr. Herrman L. Blumgart, under whose direction this investigation has been conducted, will frequently call a halt to the procedure for careful reflection and critical appraisal of the results.

SUBJECTIVE MENTAL AND PHYSICAL REACTIONS TO A FREE FALL IN SPACE

HARRY G. ARMSTRONG, M.D.

Captain, Medical Corps U. S. Army. Director of the Physiological Research Laboratory, Materiel Division, Air Corps.

DAYTON, OHIO

Until recent years a free fall in space of any considerable distance was always the result of either an accident or an attempt at self destruction. Since these falls invariably ended in instant death, it was impossible to get any information as to the subjective sensations experienced. It was assumed that a fall of more than 100 feet produced unconsciousness, and it was even thought by some that death occurred before the ground was reached.

The development of the parachute and its use by aviators exploded these theories and it was soon established, by accident at first, that a free fall in space produces neither unconsciousness nor death. This fact was capitalized by individuals who made delayed parachute jumps as an exhibition before public gatherings. Other delayed parachute jumps have been made unintentionally in which the jumper had difficulty locating his ripcord or other similar troubles. Unfortunately, the subjective mental or physical reactions that occurred in any of these jumps was never recorded.

That an exact knowledge of these reactions is of considerable practical importance is evidenced by the following considerations.

Fear of falling is one of the strongest inherited and acquired self-preservative instincts of man. It is one of the two external factors that produce evidences of fear in new-born infants. Thus fear is the source of many fatal aircraft accidents, for the following reasons. Many airmen choose to stay with a disabled ship and crash rather than take to their parachutes and face the unknown. Others who take to their parachutes cannot

resist the fear of a short free fall, pull their ripcord too soon, become entangled with the airplane, and are dragged to destruction. A second situation that calls for a delayed parachute opening is in those cases in which a jump is made from a disabled ship which travels in a circle and collides with the jumper. At other times it is possible to avoid colliding with other jumpers by a suitable delay. Many avoidable accidents have been caused in the past by both these occurrences. The third situation that requires a delayed parachute opening is a jump from extremely high altitudes. It is necessary on altitude flights to use oxygen, since anoxemia begins to develop at about 10,000 feet producing dyspnea at 15,000, unconsciousness at about 22,000 and death at about 27,000. If it should be necessary to make a parachute jump from 30,000 feet or above, one would not only abandon the airplane

set up in either the fabric or the harness and the opening shock to the jumper is not normally sufficient to produce injury. However, when a man jumps from a modern airplane traveling 250 miles per hour, or one in a dive going 360 miles per hour, he is for a few seconds traveling in the same direction and at the same speed as the ship. If he should open his parachute at that moment, it can be easily seen that at 360 miles per hour the stresses on the parachute and on the jumper are tripled. This unusual force has, in at least one instance, broken both leg straps and the breast strap of a service type parachute harness and only the arm loops prevented the pilot from falling to his death. Since the terminal maximum velocity of a human free fall in space is only 175 feet per second or about 119 miles per hour, it is evident that with a sufficient delay one would actually decelerate from say 360 miles to 120 miles per hour, at which time a safe parachute opening could be made.

OBJECT

The object of this experiment was to (1) determine the subjective mental reactions to a free fall in space, (2) determine the subjective physical sensations to a free fall in space, (3) observe any unusual phenomena incident to a free fall in space and (4) test the practicability of utilizing delayed parachute jumps as a safety measure.

EQUIPMENT

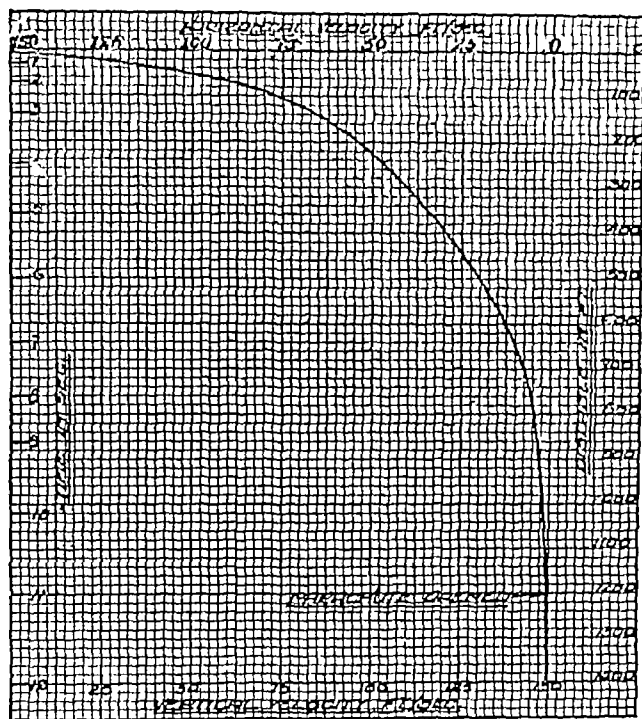
The jump was made from the rear cockpit of a two-seated biplane. Two standard U. S. Army Air Corps parachutes were worn, one a 28-foot seat-pack training type, the other a 22-foot emergency type worn on the abdomen. A summer flying helmet covered the head, but goggles were not used.

PROCEDURE

The airplane was flown on a straight and level course at 2,200 feet and at an air speed of 119 miles per hour over a given point on the terrain. At a prearranged signal from the pilot, as this point was crossed, I made the jump in the following manner. Standing on the seat of the rear cockpit facing the right side of the airplane, I placed the left foot on the edge of the cockpit, grasped the ripcord of the training parachute with the right hand and grasped the back of the pilot's seat with the left hand for balancing. The upper part of the trunk was thrown forward and downward, and as the body reached a horizontal position a strong thrust was given with the left leg. This resulted in a slow tumbling fall, the body making one complete revolution every two seconds. During the second and third revolutions of the body, the eyes were voluntarily closed and at the end of that time again opened. Careful note was made of all mental and physical reactions and sensations until the 1,000-foot limit was reached, at which point the ripcord of the training parachute was pulled and the remaining distance traversed with the parachute open. Two attendants on the ground timed the free fall and from this and a series of photographs calculated the distance of fall.

THEORETICAL CONSIDERATIONS

From a series of interesting experiments¹ with dummies conducted by the Materiel Division, Air Corps, it has been found that "a man equipped with a para-



Calculated path and rate of fall

but also one's oxygen supply. Were the parachute opened at once, unconsciousness or even death might occur before the relatively slow descent carried the jumper to the lower altitudes where the oxygen pressure is sufficient to maintain life. On the other hand a free fall from 30,000 feet to 15,000 feet would require only about one and one-half minutes, which is less time than is necessary to develop extreme oxygen want.

The next situation to be considered applies only to military aviation. Here a ship, disabled in combat, may require its occupants to take to their parachutes. These individuals then become easy prey to enemy airmen and are helpless to resist as they float to earth. Their only defense is a strategic quick retreat downward, using the speed and the time element of a free fall to escape.

The last situation to be discussed is of quite recent origin and has developed as a result of modern aircraft performance. Our present parachutes presume a velocity of about 175 feet per second, or 119 miles per hour, at the time of opening. At that speed the parachute functions smoothly, no undue stresses are

¹ Determination of the Rates of Descent of a Falling Man and of a Parachute Test Weight. Air Corps Information Circular vol VII No 628 Nov 24 1928

chute pack but allowing it to remain closed, will fall at a maximum rate of between 160 feet per second (109 m p h) and 175 feet per second (119 m p h) and that he will gain this velocity in about 12 seconds time, having fallen 1,400 to 1,500 feet." The differences in the terminal velocities were determined to be due to the fact that a tumbling body falls slower than one that falls straight. It was also noted that "the velocity which the airplane imparts to a body diminishes as the velocity, due to gravity, increases, so that the resultant acceleration is not very great. If a man would jump from an airplane which is traveling at 120 m p h he would maintain very closely that same speed until he reached the ground or opened his parachute. If he left the airplane while traveling at a speed greater than 120 m p h, his speed would rapidly diminish to that amount."

Applying these data to the case under consideration it may be calculated that the initial velocity was 175 feet per second (119 miles per hour) in a horizontal direction with a terminal velocity of about 149 feet per second (102 miles per hour) in a vertical direction. The time of fall being eleven seconds, the distance (vertical) was approximately 1,200 feet. The probable path and rate of fall is shown in the accompanying chart.

RESULTS

To evaluate properly the reactions experienced in this experiment, it is necessary to consider first the physical and mental state during the few seconds preceding the jump. The predominant mental factors at that moment were fear and excitement. The fear was from an irrepressible self-preservative instinct, partly due to the instinctive fear of falling and partly to an acquired fear of fouling the airplane having a defective parachute or being injured in a faulty landing. The excitement was the result of participating in an undertaking of some danger without previous experience and with unknown consequences.

The other mental attributes were essentially normal. Consciousness was unclouded, perception was clear and ideation was rapid, although perceptibly influenced by the excitement.

The physical sensations were normal under the circumstances, the roar of the motor, the sight of the ground below, the roar of the wind past the head and the irritation of the eyes from the slipstream were all true to previous experience. There was no vertigo or nausea, nor loss of spatial or postural sense. The breathing was regular but difficult, owing to the wind blast from the propeller. The heart beat and other bodily processes were not consciously perceptible.

The normal or at least initial state having been established, the reactions of the free fall may now be described.

1 Mental Reactions—Throughout the free fall all conscious mental processes seemed normal. As soon as the airplane was cleared, fear and excitement disappeared.

Consciousness was unclouded and ideation was rapid, precise, penetrating and clear.

Perception of an auditory nature may or may not have been impaired. While twelve airplanes were in close proximity to the point at which the jump was made and one of these circled close to the line of fall, no airplane noise can be recalled. Also it was expected that the rush of air past the ears would produce considerable sound, yet none was noted. Whether this

loss of auditory perception was functional, due to lack of attention or because of atmospheric conditions, is not definitely known. I believe, however, that the latter is the most likely explanation and will discuss it more fully later.

Visual perception was normal. The earth, objects and individuals below and the sky above were normally visible.

There were no consciously perceptible heart beats or other bodily processes.

Probably one of the most interesting observations was in regard to the perception of position and motion in space. It will be recalled that at the moment of jumping the earth was in full view. For the first second of fall there was a horizontal velocity of about 175 feet per second and a vertical acceleration had been reached of about 16 feet per second. At the same time there was a tumbling motion of the body making a complete revolution in about two seconds. Of all these motions, acceleration and deceleration, the only one recognized was rotation of the body.

During the second second of fall, the horizontal velocity had decreased to about 120 feet per second and the vertical acceleration had increased to about 24 feet per second and still there was no conscious realization of any movement except the body rotation.

During the third and fourth seconds, the eyes were voluntarily closed and during that time all sense of motion was lost. Here, not only were the linear velocities and accelerations and decelerations, both horizontal and vertical, imperceptible but also the previously recognized body rotation. In short, the sensation was that of being suspended at rest in midair.

When the eyes were opened, which was at an altitude of about 1,900 feet, and the ground again sighted, it was then noted that there was for the first time a definite sensation of falling. This sense of fall increased rapidly and at the moment the parachute was opened, at an altitude of 1,000 feet, there was fully perceptible vertical velocity. A lengthy discussion of this phenomenon is not within the scope of this paper. I may say, however, that it lends strong support to the recent theory that the eye and not the ear is the predominant organ in determining spatial position and relationships.

The increased sense of motion (falling) as the ground was approached is readily explained by a normal lack of sufficient depth perception acuity at high altitude to recognize the shortening of the distance to the earth. As the fall continued, of course, the shortening of the distance became more readily recognizable and the sense of falling increased.

2 Physical Sensations—The period of free fall was remarkably free from abnormal physical sensations. There was no nausea or vertigo, although I am quite susceptible to both from any swinging, tumbling motion, or disorientation. In this case the lack of a distinct sense of motion may have been a factor.

There were no abnormalities noted in the cardiovascular system.

There was none of the empty or "gone" feeling in the abdomen so common in elevators and in airplanes.

The eyes, although unprotected from the high wind blast, were not irritated and vision was normal.

Breathing was even, regular and undisturbed. The latter is noteworthy and contrary to expectations, as it is a common experience to have the breath "taken away" by a stiff wind about a street corner. All

together the undisturbed breathing the unimpaired eyes and the apparent loss of hearing bring up an interesting speculation

What explains these three unusual phenomena, which are so contrary to expectations and previous experience? The opinions of airplane designers and wind tunnel experts differ. Some suggest a turbulent airflow about the body, producing small eddies and air currents instead of a strong blast. Others suggest that the body acts as a fairly good airfoil the downward portion of the body acting as a leading edge and the upward part as a trailing edge with a smooth, even flow of air over the surface. Still others suggest that there is a static air condition surrounding the body so that there is no flow of the air in contact with the body and that the pressure in the static area is a partial vacuum. Whatever the explanation it no doubt has to do with the airflow about the body and this fortunately is such that a perfect atmospheric environment is created.

The last phenomenon to be described is the only positive physical finding and is difficult of accurate description. It has to do with skin sensibility and was a result of the increased air pressure on the lower surface of the body. It consists of that force which restricts terminal velocity to 119 miles per hour instead of infinity and appears in consciousness as a very gentle evenly distributed generalized superficial pressure on the surface of the body toward the earth. The nearest possible similar earthly experience is that of being lowered slowly into a great bed of softest down.

CONCLUSIONS

From a study of the subjective reactions to a free fall of approximately 1200 feet in space made by means of a delayed parachute jump it may be concluded that:

1 In a free fall in space the mental reactions are normal except as influenced by fear excitement or other factors not attributable to the fall per se.

2 In a free fall in space there is produced only one abnormal physical sensation and this consists of a very gentle evenly distributed generalized superficial pressure on the downward surface of the body.

3 There is an apparent diminution of hearing acuity from an undetermined cause.

4 Position in space and motion through space are recognized solely by means of vision.

5 Depth perception acuity is such that a speed of approximately 100 feet per second at a distance of 1,900 feet from an object is required to recognize motion toward that object.

6 Delayed parachute jumps are an entirely practical means of avoiding certain highly hazardous aerial situations.

Wright Field

Quiet Walking—In the management of a case of gradual heart failure overexertion is to be particularly avoided and the patient should not do more than he can do without getting out of breath. For the myocardial cases particularly it may be said that he should never walk when he can ride never stand when he can sit and never sit when he can lie but quiet walking on the level if it can be done without breathlessness, may be helpful—Dr Robert Hutchison quoted by Fisher. *Alexander Aphorisms in Clinical Medicine Canad J Med & Surg* 77 166 (June) 1935.

Clinical Notes, Suggestions and New Instruments

PRIMARY SARCOMA OF PERICARDIUM

EDWARD G. STEUER, M.D. AND CHARLES S. HIGLEY, M.D.
CLEVELAND

Although the number of authenticated case reports of primary tumors of the heart and pericardium now approximates 200 the number of primary sarcomas of the pericardium described in the literature is still small. Yater,¹ writing in 1931, collected reports of ten cases of primary sarcoma of the pericardium. The present case adds one more to the literature.

Pericardial sarcomas may be divided into two general groups the one such as that described by Williams² being limited to the pericardium without invasion of the heart the other such



Fig 1—Section of heart showing pericardial tumor compressing myocardium. Note nodular character of tumor and areas of necrosis and hemorrhage.

as that described by Hill³ infiltrating the heart tissue. The case to be reported is of the former type. A review of our case with the changes found at necropsy is given here.

REPORT OF CASE

History—C. I., a white man aged 47 admitted to the Medical Service of City Hospital March 1, 1933 complained chiefly of shortness of breath. He was in good health up to four months before admission, when a cough and general malaise developed. A physician whom he consulted at that time told him he had influenza. In a few days he felt better and returned to work as a machinist. One month previous to admission he again noticed shortness of breath on exertion and a nonproductive cough developed which grew progressively worse. The patient also had attacks characterized by palpitation, dyspnea and a sensation of everything turning black before his eyes.

From the Medical Clinic of Western Reserve University at Cleveland City Hospital.

1 Yater, W. M. Tumors of the Heart and Pericardium. *Arch. Int. Med.* 48 627 (Oct.) 1931.

2 Williams, J. C. *New York M. J.* 71 537 1900.

3 Hill, Herbert. Primary Round Cell Sarcoma of Pericardium. *Arch. Path.* 5 625 (April) 1928.

which lasted from two to three minutes. There was no swelling of the ankles or abdomen. Thirty years previously the patient had a penile sore which was treated with several intra-urethral injections. There was no history of rheumatism. He used alcohol and tobacco moderately.

Examination—The patient was sitting up in bed and was apparently acutely ill. There was pallor and cyanosis of the skin and lips and he was markedly dyspneic. The pupils were equal and reacted to light. The retinas were normal. The thyroid gland was not enlarged. The veins of the neck were engorged and showed vigorous pulsations. There was dullness to percussion and diminished breath sounds at the left base, and a few moist rales were heard at the right base. Over the precordium was diffuse cardiac activity. The point of maximum impulse was feeble, located 13 cm from the midsternal line in the fifth interspace. The left border of cardiac dullness was in the anterior axillary line. The first heart sound at the apex was impure and suggested a split sound. No cardiac murmurs were heard. The blood pressure was 120 systolic, 90 diastolic. The rate was about 120 per minute and regular except for occasional runs of extrasystoles. The liver was tender and the edge was palpable four fingerbreadths below the costal margin. There was no ascites or edema of the ankles. No penile scar was found.

Laboratory examinations revealed the following:

The urine was normal.

A blood count showed red blood cells 3,400,000, hemoglobin, 60 per cent and white blood cells, 9,200. The Wassermann reaction of the blood was negative.

Nine hundred cubic centimeters of fluid was removed from the chest. It was a clear amber, with a specific gravity of 1.015 and contained many red blood cells, white blood cells and a few endothelial cells. Culture showed no growth.

The electrocardiogram (fig 2) showed a normal mechanism with auricular and nodal extrasystoles. There was an inverted T wave in leads 1 and 2.

X-ray films of the chest (fig 3) and fluoroscopic examination of the heart showed a tremendous bag-shaped enlargement of the heart. The left ventricular region extended almost to the lateral wall of the chest. The pulsations of the heart were very superficial. There was a slight amount of fluid and thickened pleura at the left base.

Clinical Course—The patient had a daily elevation of temperature to from 38.5 C to 39 C (101.3 F to 102.2 F). The heart rate remained at about 120 per minute except for runs

and measuring 25 by 19 by 13 cm. This mass was nodular, rubber-like in consistency and weighed 2,450 Gm in all. On section (fig 1) the heart was seen to be entirely surrounded by tumor tissue which extended from the myocardium outward, obliterating the pericardial sac and being intimately attached to the pericardium. The width of the tumor tissue measured from 1 to 5 cm. It was made up of multiple grayish nodules measuring from a few millimeters to 5 cm which were soft and spongy and showed many areas of necrosis and hemorrhage. The tumor compressed the myocardium from without but nowhere definitely invaded it. The tissue surrounded the pulmonary artery and ascending thoracic aorta.

On microscopic section the tumor tissue was seen to consist for the greater part of moderate-sized discrete cells with an oval chromatic nucleus having a scant rim of acidophilic cytoplasm. There was a stroma of short, thin acidophilic fibers, which tended to form a reticulated architecture. In places the tumor cells tended to form whorls or nests of cells and occasionally the cells were elongated and suggested an interlacing architecture. Areas of necrosis and hemorrhage were scattered throughout. Here and there were thin vessels, a few of which showed a perivascular arrangement of the tumor cells owing to surrounding necrosis. The epicardium was involved by the tumor tissue and the myocardium was compressed but not invaded. The microscopic diagnosis was sarcoma of the pericardium.

Other pathologic changes were thrombosis of the pulmonary vessels, infarct of the right lower lobe, left hemothorax, chronic passive congestion of internal organs, and cholelithiasis. There were no metastases from the primary tumor.

13224 Shaker Square



FIG. 3—Roentgen appearance of chest showing marked enlargement of heart shadow with irregularity of border caused by tumor nodules.

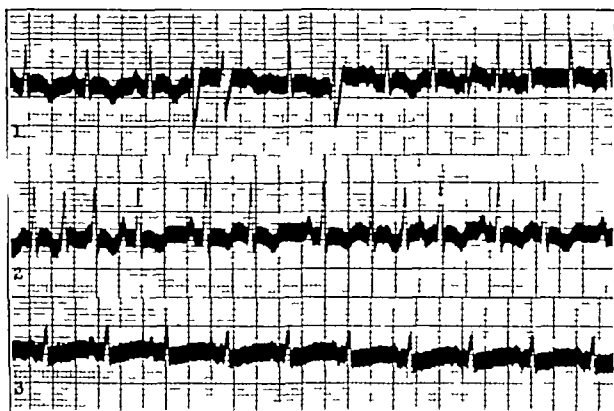


Fig 2—Electrocardiogram taken March 4, 1933 showing normal mechanism, auricular and nodal extrasystoles, and inverted T wave in leads 1 and 2.

of extrasystoles, when it went to as high as 150 per minute. The respiratory rate continued at about 30 per minute.

The patient grew progressively weaker and more dyspneic. On the sixth hospital day he complained of marked shortness of breath and a sudden sharp pain in the left arm. The arm became swollen. He died a few hours later on the seventh hospital day.

Anatomic Changes—The autopsy was performed a few hours after death. When the thorax was opened the pericardial sac presented a large mass having grossly the contour of the heart

COMPLETE LATERAL DISLOCATION OF THE KNEE JOINT

A. M. FICHMAN, M.D., FORT WAYNE, IND.

Complete lateral dislocation of the knee occurs rarely. The knee is the largest and strongest hinge joint of the body and is held in place by internal and external supporting structures. The former consist of the anterior and posterior cruciate and the coronary and the transverse ligaments. The latter include the fibrous expansion of the quadriceps extensor tendon, the ligamentum patellae, the posterior (oblique popliteal) ligaments, the capsular ligaments and the external lateral and internal lateral ligaments. The literature is almost devoid of case reports for complete lateral dislocation of the knee joint.

By complete dislocation of a joint is meant a disassociation of joint surfaces in which the opposing articular surfaces are no longer in apposition or in contact at any single point.

Huber and Yaffe¹ in their report of a case of anterior dislocation of the knee joint state that "lateral displacements are more infrequent." Longeway and Richardson² in their report of complete dislocation of the knee state that the "x-ray showed external condyle of femur resting on extreme edge of internal articular surface of tibia", thus this case does not conform to

Presented before the Fort Wayne Medical Society, March 4, 1935.

¹ Huber, H. H., Yaffe, Aaron, and Podlasky, H. B. Traumatic Dislocation of the Knee Joint. *Radiology* 7: 431-435 (Nov.) 1926.

² Longeway, A. F., and Richardson, R. B. Report of a Case of Complete Traumatic Dislocation of the Knee Joint Without Compounding. *Journal Lancet* 51: 120-122 (Feb. 1) 1931.

the definition of complete dislocation. Stellhorn³ reported a case of complete anterior dislocation of the right knee. Ritter⁴ failed to find a single case among 23,000 accident cases at the Reconstruction Hospital.

REPORT OF CASE

L. N., a white man, aged 75, 5 feet 11 inches (180 cm) tall, weighing about 190 pounds (86 Kg) and well preserved for his age, was brought to the hospital on the night of Jan. 11, 1935, immediately after being struck by an automobile. He was



Fig. 1—Anteroposterior view of complete lateral dislocation of the right knee.

struck on the right side of the body by the fender or head light and was thrown to the pavement, but the machine did not pass over his body.

On examination the patient was semiconscious with an extensive laceration on the scalp over the right temporal region and a friction abrasion of the right side of the face. The right knee was twice the width of the left knee. The distal end of the femur was on the medial side of the tibia. The condyles of the femur and the intercondylar notch could be made out on inspection and easily palpated under the overlying skin. The skin over the femoral condyles was stretched very tight and appeared about to break. The proximal end of the tibia was shoved up for about 2 inches along the lateral side of the femur, and the patella could be palpated along the lateral side of the femur and about 3 inches above the femoral condyles. The foot was warm and normal in color and there were no signs of injury to the popliteal vessels and nerves. The right lower extremity was 2 inches shorter than the left. The rest of the physical examination was negative. It was apparent that the patient was struck on the side of the right thigh just above the knee while the leg was in extension and bearing weight, otherwise the tibia would not have occupied the position that it did. The roentgen examination was in accordance with the physical examination, that of a complete lateral dislocation of the right knee (fig. 1).

Under ether anesthesia and with the patient lying on his back on the operating table, the dislocation was reduced in the following manner. With the affected leg under my right arm so that the dorsum of the foot was against the back of my shoulder, and the calf of the leg grasped in my right hand,

I used my body as traction and the right hand to grasp the calf of the leg for guidance. With the left hand placed over the knee and with counterclockwise motion and pressure so that the palm of the hand pressed downward on the tibial tuberosities and the fingers pushed upward on the femoral condyles, the dislocation was easily reduced. A posterior splint was applied and bandaged rather snugly. The scalp wound was cleaned and sutured, and the patient returned to bed. He made an uneventful recovery and did not require morphine at any time.

On the tenth day after the reduction, the posterior splint was removed, there was practically no swelling about the knee, and passive motion was started. By the fourteenth day he was allowed to be up, with the splint in place, and with the aid of crutches he was able to bear practically his whole weight on the affected leg. He was sent home, a distance of 120 miles from here, with a letter of instructions to his family physician to remove the splint three times a week for passive and active motion and gradually to increase the motion to the point of tolerance, and to prescribe the wearing of a mobile knee brace. A communication received from the family physician, March 2, seven weeks after the injury, stated that the patient was able to extend and flex the knee to a 90 degree angle, voluntarily without any difficulty, and that he was allowing the patient to walk about the house with the aid of crutches. It was planned that the patient wear a mobile brace about the knee until the joint was stable.

COMMENT

The question arises whether this patient should have been operated on and an attempt made to suture the cruciate ligaments, the external lateral and internal lateral, which undoubtedly were torn in this complete evulsion of the knee joint. No doubt there are some who strongly advocate this procedure, and perhaps they are right. Again there are others who strongly urge that complete immobilization be continued for

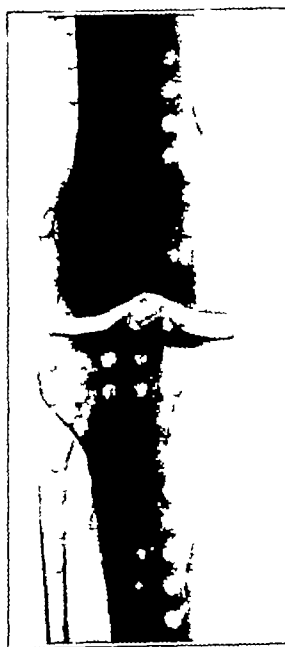


Fig. 2—Anteroposterior view after reduction.



Fig. 3—Lateral view after reduction.

a long period of time. With the results obtained in this case so far, would the foregoing two procedures be justifiable?

Sir Robert Jones⁵ emphasizes long immobilization. Platt⁶ followed a long immobilization treatment in two cases of anterior dislocation of the knee and obtained 20 degrees of flexion after eleven months and 90 degrees of flexion after four years.

⁵ Jones, Robert. Disabilities of Knee Joint. *Brit. M. J.* 2:169 (Aug. 5) 1916.
⁶ Platt, H. Traumatic Dislocation of the Knee Joint. *Brit. J. Surg.* 8:190-192 (Oct.) 1920.

³ Stellhorn, C. E. Complete Dislocation of the Knee Joint. *Am. J. Surg.* 26:332-333 (Nov.) 1934.
⁴ Ritter, H. H. *J. Bone & Joint Surg.* 14:391-394 (April) 1932.

Joseph I Mitchell⁷ in a case of posterior dislocation of the knee reduced by open operation excised the cruciate ligaments and the wound was closed in layers. The knee was immobilized for one month and was followed by the wearing of a brace with motion at the knee, for a comparatively short period, he obtained a stable good weight-bearing alignment, and the patient could walk without support. In three cases of anterior dislocation of the knee, reduced by the closed method he obtained good stable knees in all three with comparatively short periods of immobilization. In one the immobilization was for two weeks before active motion started and in three months a good stable joint was obtained. In the second the immobilization was for several weeks and the functional result was excellent. In the third the immobilization was for six weeks, and a stable joint was obtained.

404 Cal Wayne Building

ABSCESS OF THE PLACENTA CAUSING ABRUPTIO PLACENTAE

SAMUEL S. ROSENFELD, M.D., NEW YORK

Abscess of the placenta is a rare condition. Some of the well known textbooks on obstetrics do not even mention the condition, and those that do simply state that it may occur. Williams believes that practically all the cases designated as abscess of the placenta are in reality degenerated remains of



Fig 1—Cross appearance showing cross section of placenta through area of hemorrhage in the center of which an abscess cavity is seen. The neighboring placenta to the left appears normal.

deeply seated placental cysts, 'the grumous material' of the older writers.

This case is reported because there is unmistakable pathologic proof of the presence of an abscess of the placenta. The fact that this abscess was in immediate proximity to the site of hemorrhage makes me reasonably certain that it was responsible for the premature separation of the placenta.

REPORT OF CASE

Mrs. C. H., aged 24, white, a housewife, who was born in the United States, had diphtheria when she was a child. Her periods began at the age of 13, are regular and last four days, and the flow is scanty. There were no abortions or miscarriages. She was delivered six and one-half years before of a normal child by forceps in an uneventful pregnancy.

Her last regular period was on May 28, 1934. The urine and blood pressure were normal until the day of admission to the hospital. Her diet throughout was liberal and included cod liver oil, viosterol and calcium. There were two occurrences of possible etiologic significance during this pregnancy. While driving an automobile she skidded into a trolley pole. She apparently sustained no injury for she neither stained nor bled, nor did she find it necessary to notify me or go to bed. About a month before her admission to the hospital she began to complain of pain in the jaw at the site of a partly erupted wisdom tooth which may have been infected.

On the morning of Feb. 4, 1935, she experienced severe pain in the right side of the abdomen. She was admitted to the Royal Hospital and on reaching there I found her in terrific pain. She was bleeding profusely. The urine showed four plus albumin and the blood pressure was 140 systolic, 90 diastolic. The hemoglobin was 60 per cent (Dre), and the red blood cell count was 3,500,000. The pulse rate was 100. The uterus was tetanically contracted, ligneous and very tender. The fetal heart could not be heard.



Fig 2—Abscess under low power showing central cavity and wall consisting of fibrin and leukocytes and degenerated placental tissue.

She was given morphine, the membranes were ruptured and this was followed by a dose of solution of pituitary. The vagina was tightly packed with iodoform gauze. She delivered spontaneously in about two hours. The child was still-born. The placenta followed within a few moments.

The placenta was approximately normal in size. On the maternal surface there was a very large soft blood clot. On the fetal surface there were many small cysts. The entire placenta was riddled with infarcts. Directly beneath the blood clot an abscess was found measuring about 1 cm. in diameter. A thick pus exuded from this which on smear showed gram-positive cocci and numerous degenerated leukocytes. Dr. Joseph C. Ehrlich, the pathologist, reported the following microscopic changes: The placenta showed very marked congestion of villous capillaries with areas of hemorrhage. In the center of

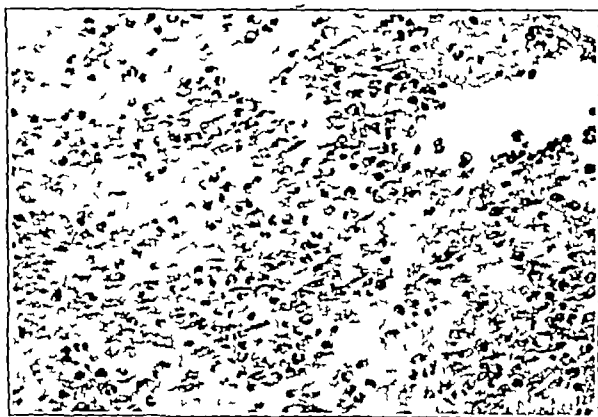


Fig 3—High power field near center of abscess showing fibrin, platelets and polymorphonuclear cells. Many of the polymorphonuclear leukocytes are degenerated.

the section there was a circumscribed accumulation of purulent material consisting chiefly of fibrin and polymorphonuclear cells. In the vicinity of the abscess extensive hemorrhage was present. An autopsy performed on the fetus failed to reveal anything pathologic.

Except for a furuncle of the right external auditory canal the patient made an uneventful recovery. On discharge from the hospital the blood pressure was 126 systolic, 80 diastolic, and the urine showed one plus albumin.

⁷ Mitchell, J. I. Dislocation of the Knee. *J. Bone & Joint Surg.* 12: 640-646 (July) 1930.

One can only speculate on the origin of the abscess. There might have occurred a slight separation with slight bleeding at the time of the automobile accident with subsequent infection of the hematoma either by extension upward through the cervix or from the oral cavity through the circulation. Then again, infection might have taken place without any relationship or connection with bleeding or separation.

1882 Grand Concourse

Special Article

ACUTE EMPYEMA IN CHILDREN CLINICAL LECTURE AT ATLANTIC CITY SESSION J. M. MASON, M.D. BIRMINGHAM, ALA.

In October 1934 I¹ reported at the meeting of the Southern Medical Association on a series of 103 patients with empyema from the Children's Hospital and from the pediatric service of the Hillman Hospital seen between Jan. 1, 1929 and Oct. 1, 1934. Ninety of these were treated surgically, with a mortality of 88 per cent. Since then (to June 1, 1935) thirteen additional patients have been treated with no fatalities, so that the mortality in the present series of 103 cases is 77.6 per cent.

In 1929 I² reported on a series of forty cases from the Children's Hospital with a mortality of 15 per cent. During the periods covered by these reports there have been no unusually severe epidemics of respiratory disease. Between 1929 and 1935 approximately the same number of patients (from seventeen to twenty) have been admitted each year. The admissions have climbed steadily from October to April and then have steadily declined, with no patients appearing in July and September and only four being admitted in the month of August for the entire period of six years.



Fig. 1 (case 1)—Condition on admission. The broad shadow is continuous with that of the heart. An encysted empyema cavity is located at the apex of the right lung.

The lowered mortality in the more recent series is attributed to a clearer understanding of the treatment of the disease rather than to the presence of a less virulent organism.

During the period covered by these reports I have also had the opportunity of treating and observing many adults with empyema. My observations in

these parallel cases convince me that undue stress has been placed on the treatment of empyema in children, thereby tending to create the impression that the same

surgical principles recognized as applicable to adults namely efficient drainage instituted at the proper time and maintained throughout convalescence, must in the case of children be waived in favor of measures less definitely curative.

While my paper deals with empyema in children it is presented with the somewhat paradoxical purpose of maintaining that the same rules should govern the treatment of the disease whether in children or in adults.

The high mortality among very young children may be attributed to the fact that they have not sufficient strength to resist any unusual demands that may be made on them and to the many and serious complications, aside from empyema, that develop during the course of acute respiratory infections. When these complications are under control or have been properly dealt with, the treatment of empyema in infant should follow the same rules that are applied to the adult. Hence I take issue with those who would withhold operative treatment from very young children, and I do not hesitate to perform open thoracotomy at the proper time without fear of an unfavorable outcome attributable to the operation.

Any comprehensive discussion of empyema divides itself into three phases: (1) a consideration of the practices that obtained previous to 1918 and during the early period of the invasion of the troops by empyema during the World War, (2) the practices which were developed during the prevalence of that epidemic and which have since been followed and (3) certain practices that have claimed attention in more recent years.

The great lessons from the first phase were that an early open operation in a case of acute empyema is contraindicated and that the course in cases of empyema caused by the pneumococcus differs greatly from that in cases resulting from infection by the streptococcus. Discussions during the second phase were devoted largely to the relative merits of open and closed methods of operation.

The third phase has been concerned with a consideration of the numerous schemes and devices that have been introduced for the purpose of improving the operative technique, and also with an evaluation of certain practices long fallen into disuse but lately revived, namely, the cure of empyema by aspiration, either alone or in combination with the replacement of air or chemical irrigations and instillations.

I have followed with keen interest the reintroduction of these latter measures and have studied with care the admirable and unbiased reports of McEnery and Brennemann³ on the treatment by repeated aspirations, and of Danna⁴ on treatment by aspiration and replacement without drainage.

³ McEnery, E. F. and Brennemann, Joseph. Aspiration in the Treatment of Empyema in Children, with a Critical Evaluation Based on Ninety Four Cases. *Am. J. Dis. Child.* 44: 742 (Oct.) 1932.
⁴ Danna, J. A. The Treatment of Empyema by Aspiration and Air Replacement Without Drainage. *J. A. M. A.* 96: 1453 (May 2) 1931.



Fig. 2 (case 1)—Tubes are shown in three separate empyema cavities.

Read before the General Scientific Meeting at the Eighty Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1935.
From the surgical services of Drs. W. Earle Drennen, S. L. J. Edbetter, Jr. and J. M. Mason, Children's Hospital, and of Drs. J. M. Mason, division A and D. S. Moore, division B, Hillman Hospital, Birmingham, Ala.
J. M. Mason, M.D., Emphyema in Children. *South. M. J.* 28: 219 (March) 1935.
J. M. Mason, M.D., Observations on a Series of Forty Cases of Emphyema in Children. *South. M. J.* 42: 348 (1929).

ment of air and have noted the results obtained principally by foreign investigators with aspiration followed by instillations of ethylhydrocuprene.

Without offering any criticism concerning the added value of replacement of air or chemical instillations following aspiration I would direct attention to a discussion of these points by McNery and Brennemann⁵ in which they questioned the benefits of these measures and claimed a lower mortality by aspiration alone than from the addition of either air or chemicals.

Any proposed method of treatment of empyema should meet three main requirements. It should promise a reduction in mortality, a shortening of the period of convalescence and a reasonable certainty of cure.

In meeting these demands methods of aspiration even in the hands of their most expert and enthusiastic supporters fall far short of operative treatment. Many reports show a lower operative mortality than that obtained by aspiration.

With aspiration and replacement of air, Dunn⁴ reported thirty-five cases among patients of all ages with a mortality of 57 per cent.

With aspiration followed by instillations of ethylhydrocuprene Woringer⁵ reported thirty-six cases with a mortality rate of 16.7 per cent.

With aspirations alone Ochsner and Gage⁶ reported twenty-six cases, all in persons over 11 years of age with a mortality of 10.5 per cent. Strong⁷ reported thirty-seven cases in children with a mortality of 8 per cent and McNery and Brennemann⁵ reported ninety-four cases in children with a mortality of 12.8 per cent.

Instead of shortening the period of convalescence aspiration greatly prolongs it. The following statistics are offered by way of comparison. McNery and Brennemann⁵ reported on ninety-four patients treated by aspiration with a period of convalescence of ninety days. Packard⁸ reported on fifty patients treated by closed drainage with obliteration of the empyema cavity in forty-six days. Graham and Berck⁹ reported on 116 patients treated by open drainage with obliteration of the cavity in thirty-seven days. Mason¹⁰ reported on sixty-two patients who were treated by open drainage with obliteration of the cavity in thirty-two days and twenty-seven patients who were treated by closed drainage with obliteration in thirty-five days.



Fig. 3 (case 1)—Final result. The tubes have been removed. All the cavities have been obliterated and recovery is complete.

CERTAINTY OF CURE

In general from 65 to 75 per cent of patients treated by aspiration are reported as cured after prolonged periods. It is necessary for the remaining 25 to 35 per cent to undergo operation after the failure of repeated aspirations. Operation is followed by a further period of convalescence, while the mortality, as already indicated, is no lower and is perhaps higher than that following operative methods.

No one can estimate the mortality in the hands of the less capable internists and pediatricians throughout the country who may persist in resorting to aspiration far beyond the limits of safety.

Drainage of an empyema cavity, whether by resection of a rib, intercostal incision or the trocar-cannula catheter method, is a minor procedure. With the use of preliminary sedatives the operation can be performed under local anesthesia without pain and, if undertaken at the proper time, is not attended with shock.

When one realizes these facts, there seems to be little justification in subjecting a patient to the prolonged treatment necessary to bring about cure by aspiration.

Concerning the type of effusion which should be classed as a true empyema Graham⁹ wrote as follows:

It is perhaps advisable to call attention to the fact that nearly every case of acute pneumonia will reveal some fluid in the pleural cavity if an aspiration is performed. This fluid is sero-fibrinous or sero-hemorrhagic. Even though leukocytes and bacteria may be found in it on microscopic examination, it does not indicate an empyema in the sense of a true abscess. In most cases this fluid will be absorbed as the pneumonia clears. Statistics therefore based on the recovery of such patients after aspiration or continuous closed drainage are often misleading.



Fig. 4 (case 2)—Condition found at time of third readmission. The empyema cavity is injected with iodized poppy seed oil.



Fig. 5 (case 2)—Three weeks after thoracoplasty and packing of the empyema and subphrenic cavities. Remnants of iodized poppy seed oil are seen in the abscess cavities. Healing is now complete.

CLOSED OPERATIONS

At the beginning of the empyema epidemic during the World War the practice of early open thoracotomy

⁵ Woringer, Pierre. Les resultats du traitement de la pleurésie purulente par l'optochine. Rev. franç. de pédiat. 5: 60 (Feb.) 1929.

⁶ Ochsner, Alton and Gage, I. M. The Treatment of Acute Empyema Thoracis with a Review of One Hundred Consecutive Cases. Proc. Inter State Post Grad. M. Assemb. North America 6: 261 1931.

⁷ Strong, R. A. cited by McNery and Brennemann⁵.

⁸ Packard, C. B. Jr. Empyema in Children. Surg. Gynec. & Obst. 53: 255 (Aug.) 1931.

⁹ Graham, E. A. and Berck, Maurice. Principles Versus Details in the Treatment of Acute Empyema. Ann. Surg. 98: 520 (Oct.) 1933.

was associated with a frightful fatality, hence the spectacular reduction in mortality that followed the closed trocar-cannula-catheter operation introduced by Diederich¹⁰ at Camp Pike attracted wide attention and found many ardent supporters. While the mortality was much reduced and many permanent cures were effected chronic empyema often followed necessitating many secondary operations and resulting in some fatalities.

At the present time early open thoracotomy is banned, and such operations are deferred until sufficient time has elapsed to insure stability of the mediastinum and fixation of the lung, as indicated by the presence of thick pus.

It has been difficult to convince those who have viewed closed drainage in the light of these earlier experiences that this type of operation possesses few if any of the advantages formerly claimed for it over the properly planned and executed method of open drainage is now employed.

It does not fulfil two of the demands already mentioned in that it does not lower the mortality or shorten convalescence, nor is the promise of cure without frequent secondary operations any too well assured.

It is generally recognized that closed operations remain closed for only a few days since air soon gains access to the pleural cavity by leakage around the tube or in some of the connections. This may take place accidentally soon after operation thereby converting a closed into an open thoracotomy at an inopportune time.

The Army Empyema Commission did not endorse this method, believing that it was potentially dangerous and possessed no advantage over repeated aspiration followed by open thoracotomy when the proper stage is reached.

McLeroy and Brennemann³ gave a more recent estimate of the comparative advantages of aspiration and closed operations as follows:

The so called closed operation is obviously a continuous closed method whereas aspiration is an interrupted closed method. Results in general have been much the same by both methods. There are, however, two serious handicaps in the closed method. From all reports it does not always remain

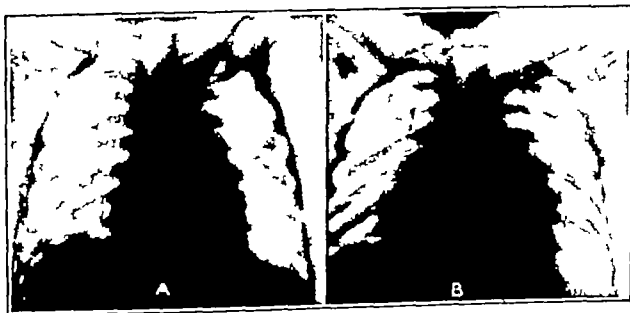


Fig 6 (case 3)—A May 18 the broad mediastinal shadow is continuous with that of the heart. The lungs are clear. B May 23 the heart and mediastinum are displaced to the right. The shadow has extended farther to the left. The periphery of the lungs remains clear.

closed. There is like unanimity of opinion that it requires a meticulous care which is rarely available or feasible and that it makes it less 'fool proof' than open operation or aspiration.

In studying reports from different sources it becomes apparent that closed operations are undertaken with two entirely different purposes in view. Some operators

among them Alexander,¹¹ operate early with the deliberate purpose of following this with secondary resection of a rib when the pus has become sufficiently thick. Others employ the operation after the stage of thick pus has been reached, seeking a cure by this method and resorting to secondary resection of a rib only when the closed operation fails.

So many technical devices have been developed in connection with operations for empyema that it is possible to mention only a few.

Singleton's¹² non-collapsible metal drainage tube and Hart's¹³ method of tidal irrigation are notable improvements in the method of closed drainage, the advantages of which will appeal to those who favor that type of operation.

Carlson and Bowers¹⁴ recently described a method that combines the principle of adequate drainage with closed operation something seldom obtainable. This is accomplished by means of a large tube inserted through a thoracotomy opening made by resection of a rib. The tube is passed through a rubber sponge that is strapped over the wound to make it air tight after which negative pressure is applied by suction.



Fig 7 (case 3)—Complete recovery following resection of the seventh rib posteriorly near its angle on the left side with drainage by tube of the encysted empyema.

OBLITERATION OF EMPYEMA CAVITIES

The belief that obliteration of empyema cavities is materially hastened by closed operations or methods of siphon suction designed to maintain negative pressure is not supported by experience with open thoracotomy, in which complete healing is observed to take place with equal rapidity.

The use of the Woulfe bottle in the postoperative treatment does not occupy as prominent a place as was formerly accorded it. It cannot be employed in the treatment of young children and has been discarded in some of the larger clinics, notably in the children's services of Bellevue, Willard Parker and Knickerbocker hospitals, New York, according to a report by Bohrer.¹⁵

The present concept of the process of healing was stated by Heuer¹⁶ as follows:

When the cavity becomes sterile the lung will approach the chest wall and the important and essential factor is the traction and pull of the granulation tissue upon the visceral pleura at its junction with the parietal pleura, this traction or contraction continuing until the visceral and parietal pleura come in contact with each other and fuse.

11 Alexander, John. Air Tight Intercostal Drainage of Acute Empyema. J A M A 92: 1818 (June) 1929.

12 Singleton, A. O. Simplified Treatment of Thoracic Empyema. Tr. South S. A. 42: 377 1929.

13 Hart, Deryl. Empyema. Treatment by Tidal Irrigation and Suction. Arch. Surg. 19: 1732 (Dec.) 1929.

14 Carlson, H. A. and Bowers, H. A. Acute Empyema. Mortality Healing and Methods of Treatment. Internat. S. Digest. 18: 131 (Sept.) 1934.

15 Bohrer, J. V. Acute Empyema in Children. Ann. Surg. 100: 113 (July) 1934.

16 Heuer, G. J. Acute Empyema. J. Thoracic Surg. 1: 461 (June) 1932.

10 Diederich, V. P. A Review of the Treatment of Purulent Pleuritis at Camp Pike Base Hospital. Surg. Gynec. & Obst. 28: 362 (April) 1919.

My own experience with open thoracotomy in children and adults commits me to an acceptance of this explanation of the obliterating process.

Wangensteen,¹⁷ who has so successfully applied suction siphonage in the treatment of abdominal distention and paralytic ileus, has presented an interesting discussion of this principle in securing expansion of the lung following drainage of an empyema cavity.

Koster and his associates¹⁸ reported eight cases of empyema in children in which rapid reexpansion was obtained by the production of artificial pneumothorax in the uninvolved side. Their explanation was that as a result of the pneumothorax the lung on the involved side undergoes compensatory expansion together with a shift of the mediastinum to the affected side, thus lessening the size of the cavity.

As set forth in my previous reports, I do not favor closed operations, and the following quotation from Graham's¹⁹ "Surgical Diseases of the Chest" exactly expresses my views concerning the treatment of acute empyema, and outlines the practice that I have followed for years.

Open drainage after the pleural infection has become a true abscess offers the advantages of free and adequate drainage without the necessity of complicated apparatus. Our preference in most cases of acute empyema is to carry on repeated aspirations until such time as the exudate has become frank creamy pus, and then to drain openly, usually by the resection of a portion of a rib at the most dependent part of the empyema cavity.

From investigations conducted in three series of cases my associates and I have ascertained that the stage when thick pus is present, that is, the safely operable stage, is reached approximately eighteen days after the onset of pneumonia.

If empyema developed while the patient was under observation and treatment in a hospital, thick pus was obtained in the three series as follows:

Children's Hospital 1929 report, 18.40 days

Children's Hospital 1934 report, 17.40 days

Hillman Hospital 1934 report, 19.33 days

During the same periods it was found that those patients who suffered from respiratory infections outside the hospital and who were admitted with a diagnosis of empyema had been ill for an average of thirty-five, thirty-three and thirty-two days, respectively.

From these observations it is deduced that the patient with postpneumonic empyema is safely operable at the end of three weeks from the onset of his illness, and that the patient who enters the hospital anemic, weak and toxic as a result of empyema has undergone unnecessary septic absorption for approximately two weeks. This is not to be construed as a plea for early operation but rather as a warning against undue delay.

The ordinary type of empyema which involves the general pleural cavity gives but little trouble with regard to diagnosis or treatment. Apical encysted empyemas or those situated mesially or in the fissures of the lung, which have been so well described by Berry and Childs,²⁰ are difficult of diagnosis, often missed on aspiration and sometimes located only after diligent search at operation. Stereoscopic x-ray films

are invaluable in such cases. While the practice may not be without danger, I have found it necessary in certain instances to make digital exploration and to break up adhesions before reaching these isolated abscesses. Obviously, trocar-cannula operations cannot be employed in such cases.

The investigation of Neuhoof and Berck²¹ tended to show that staphylococcal empyema or pyopneumothorax is a definite entity, and they expressed the belief that the staphylococcus is the cause of the great majority of suppurative pleural infections in infants. While in our series the pneumococcus was isolated in fifty-one instances and the staphylococcus in but six, their claims are interesting and the subject justifies further study.

The statistical information gained by adding the thirteen recent cases to my 1934 report is of no special interest except concerning the mortality. The revised figures are as follows: seventy-two patients were treated by open operation and resection of a rib with five deaths, a mortality rate of 6.94 per cent; thirty were treated by closed trocar-cannula operations with six secondary resections and three deaths, a mortality rate of 10 per cent. One patient recovered after two aspirations.

A high death rate among young children has always been noted in cases of empyema and, of the eight deaths in this series, seven were of children under 3 years of age. The rates for these early years were as follows: In the first year of life there were six cases with two deaths, a mortality of 33 1/3 per cent. In the second year there were eleven cases with two deaths, a mortality of 18.18 per cent. Under 3 years of age there were thirty-one cases with seven deaths, a mortality of 22.5 per cent.

For comments on these results and on the management of cases of empyema in general, I shall draw on my 1934 report.¹

I am inclined to attribute favorable results in this series to the fact that there were no early open operations and no early operations of any sort if aspiration is excluded, to the use of local anesthesia in eighty-nine of the 103 cases, and to the performance of open thoracotomy and drainage by tube at the proper time in more than two thirds of the cases.

I can hardly subscribe to the opinion expressed by Graham⁹ and held by some others, that "if care is taken to avoid open pneumothorax in the formative period of an empyema, it makes practically no difference, so far as mortality is concerned, whether the case is treated continuously by some form of closed drainage or by the institution of open drainage after a true empyema, that is, a true abscess, is present."

Steinke²² recently reported a series of 310 cases in children with a general operative mortality of 15.8 per cent. He stated that the lowest death rate of any of the methods employed was in the group treated by resection of a rib, which gave a mortality of 11.9 per cent.

In the present series the closed operation showed a higher mortality, a slightly longer period of convalescence and in certain instances inadequate drainage, necessitating secondary resection of a rib and open drainage in 20 per cent of cases. This record is in keeping with practically all reports on closed drainage.

17 Wangenstein O H. Observations on the Treatment of Empyema with Special Reference to Drainage and Expansion of the Lung. *J Thorac Surg* 4: 399 (April) 1935.

18 Koster Harry Rosenblum Jacob Kaaman L P and Lerner Henry. Empyema in Children. *J A M A* 104: 1484 (April 27) 1935.

19 Graham, E A, Singer, J J and Ballou H C. *Surgical Diseases of the Chest*. Philadelphia: Lea & Febiger 1935.

20 Berry, F B and Childs E P. The Fissures of the Lungs. *Ann Surg* 96: 961 (Dec.) 1932.

21 Neuhoof Harold and Berck, Maurice. Staphylococcal Empyema and Pyopneumothorax. *Arch Surg* 30: 543 (March) 1935.

22 Steinke C R. Acute Empyema in Children. *Ann Surg* 101: 617 (Jan.) 1935.

The general plan of treatment which I have formulated and some of the details that have been found important are as follows

1 After a physical examination roentgenograms are made in every suspicious case

2 Aspiration is performed and is repeated as often as indicated in order to decompress the lung, to ascertain the character of the effusion, to determine the infecting organism and to make certain that the patient is not subjected to operation until the proper stage has been reached. Also following aspiration the patient is observed frequently to see if any curative tendencies can be detected

3 Resection of a rib with drainage by tube is carried out under local anesthesia unless there is some special reason for the use of a general anesthetic

4 The tube should be of large caliber not stiff, not too long and placed at the most dependent part of the cavity. It should be so fixed to the edge of the wound that it will neither slip into nor out of the empyema cavity. I would here warn against the use of old or rotten tubing. I have known such tubing to tear off at its point of attachment to the wound by suture or pin and to escape into the cavity, with great annoyance to the surgeon and discomfort to the patient.

5 Following the operation the wound is covered with a large dressing of sterile gauze and this is changed as often as it becomes soiled. After the first forty-eight hours a change will rarely be necessitated oftener than once a day.

6 Irrigations are not employed in the postoperative treatment unless some special indication is noted.

7 The original tube may remain undisturbed for from seven to ten days, after that it should be changed daily, and its length and diameter diminished to conform to the needs of the lessening size of the abscess cavity. The progress of obliteration can be well observed by the frequent use of the x-rays. Our own practice is to make fluoroscopic examinations once a week, and to obtain stereoscopic films every two weeks when healing is slow. The same information may be obtained by measuring the capacity of the cavity from time to time.

8 Any sudden rise in temperature in a convalescent patient demands prompt investigation of the drainage tract. If no obstruction is found, diligent search should be made to ascertain the source of the trouble. In children this will often be found in the intestinal canal or in the middle ear.

Likewise, if a rise of temperature occurs after the removal of the drainage tube, it usually indicates that the tube has been removed too early and must be replaced unless some other definite cause for the rise can be discovered.

Furthermore, when a pleural abscess has been drained and the temperature does not show a definite tendency to subside, other areas of encysted empyema should be sought for, since recovery will be delayed until each pocket has been drained.

The foregoing plan of treatment was followed in the forty patients in this series who were under my personal charge, with only one death, a mortality of 2.5 per cent. The death was that of a boy aged 3 years who had been ill for three months before admission.

Among the very young patients successfully treated by resection of a rib and open drainage were five whose ages were 24, 22, 20, 5 and 3 months, respectively.

With one exception all the patients were kept in the hospital until the empyema cavity was completely obliterated, and that patient reported for examination at intervals until complete healing had taken place.

Several unusually interesting cases have been observed in this series, and three are deemed worthy of special report.

CASE 1—Multiple encysted empyema pockets. On account of multiple encysted pleural abscesses this patient was forced to undergo three operations before recovery finally took place. This case is reported in full in the *Southern Medical Journal*.

CASE 2—Acute appendicitis, spreading peritonitis, suspected subphrenic abscess, empyema. Six days after operation for gangrenous appendicitis with spreading peritonitis the patient was found to have acute empyema and was treated by resection of a rib and drainage by tube. The suspected underlying subphrenic abscess was not located. The patient recovered but was readmitted on three subsequent occasions because of recumulations of pus in the pleural cavity. These were relieved by inserting a tube in the drainage tract. On a fourth admission she was placed in my care. The pleural abscess was exposed by the resection of three overlying ribs. Exploration through this opening revealed also a small subphrenic abscess. The two cavities were converted into one by the excision of the intervening portion of the diaphragm. This cavity was packed with gauze, according to the method of Connors, and healing was rapid.

CASE 3—Encysted empyema, left upper and posterior aspect of the thorax. A white girl, aged 9 years, admitted to the Children's Hospital on May 14, 1935, had been ill for only about twenty-four hours. Examination revealed a high fever, abdominal distention, a high leukocyte count, normal urine and no pulmonary abnormalities. She complained greatly of pain mostly in the abdomen. It gradually became localized in the left upper portion of the abdomen and in the region of the left kidney. For the first few days there was no cough.

On May 18 a flat x-ray plate showed a broad mediastinal shadow but the lungs remained clear. Subsequently pericardial friction was observed, together with a slight cough and suppression of the breath sounds over the posterior and upper part of the left side of the chest.

On May 23 stereoscopic x-ray films of the chest showed a much broader mediastinal shadow, with the heart and mediastinum displaced to the right, but with the lungs clear except toward the midline on the left side. Study of the stereograms showed that the shadow extended well up to the posterior wall of the chest. By aspiration at the sixth interspace near the angle of the rib, thick pus was withdrawn that showed pneumococcus on smear and culture.

On May 27, under local anesthesia, the seventh rib on the left side was resected near its angle. Drainage by tube was followed by complete recovery.

POSTOPERATIVE CARE

The importance of the postoperative care of an empyema patient cannot be too strongly emphasized. He should be encouraged to get out of bed and into fresh air as early as possible. The diet should be generous. Transfusions, tonics and similar restorative measures should be employed as indicated.

When a tube has been placed in an empyema cavity through an intercostal incision, by resection of a rib or by means of a trocar and cannula or some other closed method of operating, it is incumbent on the attendant to maintain continuous unobstructed drainage until the cavity is entirely closed. No patient should leave the direct supervision of the surgeon until the tube has been out of the pleural cavity for several days without recurrence of symptoms, and until roentgen and physical examinations demonstrate that the cavity is completely obliterated.

1023 South Twentieth Street

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary

KRIM-KO CHOCOLATE FLAVORED DRINK

Bottlers and Distributors—

Banner Creamery, Abilene, Texas
Biltmore Dairy Farms, Inc., Asheville, N. C.
Booker Ice Cream Co., Inc., De Land, Fla.
Bowman Farm Dairy, Madison, Wis.
Central Ice Cream & Candy Company, Columbus, O.
City Dairy, Sturgis, Mich.
Deneen's Dairy, Sharpsville, Pa.
Dinsmore Dairy Company, Jacksonville, Fla.
Durham Dairy Products, Inc., Durham, N. C.
Early Dawn Dairy, Waynesboro, Va.
Elmore's Creamery, Elwood, Ind.
Escanaba Dairy, Escanaba, Mich.
Fort Dodge Creamery Company, Fort Dodge, Iowa.
Frazier's Dairy, Frankfort, Ind.
Grand Island Creamery Company, Grand Island, Neb.
Greenville Dairy Company, Greenville, Pa.
Guilford Dairy Cooperative Association, Greensboro, N. C.
Herold's Dairy, Butler, Pa.
Highlands Dairy, Hastings, Mich.
Hygeia Milk Products, Inc., Harlingen, Texas.
Ideal Dairy, Wooster, Ohio.
Iowa Farms, Davenport, Iowa.
Joppe's Dairy, Grand Rapids, Mich.
Kern Dairy, Constantine, Mich.
Lindale Dairy Corporation, High Point, N. C.

Licensor—Krim-Ko Company, Chicago, manufactures the Krim-Ko Chocolate Flavored Drink Base and licenses its use the name Krim-Ko and standard advertising under definite contract conditions.

Description—Pasteurized chocolate flavored sweetened skim milk, contains skim milk (from 0.5 to 1.5 per cent milk fat), sucrose, chocolate and cocoa, tapioca flour, salt and traces of tartaric acid and agar, flavored with vanilla, vanillin and coumarin. See Krim-Ko Chocolate Flavored Drink (THE JOURNAL, June 30, 1934, p. 2187).

MELVERN BUTTERED ALMOND ICE CREAM

Manufacturer—Melvern Dairies, Inc., Washington, D. C.

Description—Basic ice cream mix (THE JOURNAL, July 13, 1935, p. 121) flavored with "buttered almonds" prepared from blanched almonds, brown sugar, corn syrup, salt and butter.

Manufacture—The process of preparation and freezing is the same as described for Melvern Vanilla Ice Cream (THE JOURNAL, July 13, 1935, p. 121).

Analysis (submitted by manufacturer) —

Fat 14.5%

MACY'S STRAINED CEREAL

WITH ADDED WHOLE MILK, SOY BEAN FLOUR,
TRICALCIUM PHOSPHATE YEAST AND SALT

Distributor—R. H. Macy & Company, Inc.

Manufacturer—Stokely Brothers & Company, Inc., Indianapolis.

Description—Cooked sieved blend of farina, rolled oats, wheat germ, barley flour, whole milk, soy bean flour, yellow cornmeal, salt, tricalcium phosphate and brewers' yeast (same as THE JOURNAL, Feb. 16, 1935, p. 563).

JEFFERSON ISLAND EVAPORATED FREE RUNNING TABLE SALT

Distributor—Jefferson Island Salt Company, Inc., Louisville, Ky.

Manufacturer—Jefferson Island Salt Mining Company, Inc., Jefferson Island, La.

Description—Table salt containing 1 per cent added magnesium carbonate.

Manufacture—Mined rock salt is purified by converting into brine which is allowed to settle. The clear, supernatant brine is evaporated under vacuum to crystallize out the salt. The salt crystals are dried, screened, mixed with definite amounts of magnesium carbonate and packed.

Analysis (submitted by manufacturer) —

| | per cent |
|---------------------------------|---------------|
| Moisture | less than 0.1 |
| Calcium sulphate | 0.1 |
| Calcium carbonate | 0.01 |
| Magnesium carbonate | 0.9 |
| Sodium chloride (by difference) | 98.9 |
| Silica | 0.006 |

Claims of Manufacturer—For all table and cooking uses. The added magnesium carbonate tends to preserve "free running" qualities.

MCCORMICK'S BEE BRAND KETCHUP SPICE

Manufacturer—McCormick & Company, Inc., Baltimore.

Description—Ground mixture of allspice, paprika, saigon cinnamon, cloves, mustard, flour, celery seed, dehydrated onion, cayenne pepper and nutmeg.

Manufacture—Ingredients, prepared as described for McCormick's Bee Brand Allspice (THE JOURNAL, Oct. 28, 1933, p. 1393), are mixed in formula proportions and automatically packed.

Analysis (submitted by manufacturer) —

| | per cent |
|--|----------|
| Moisture | 8.0 |
| Total ash | 5.5 |
| Ash insoluble in hydrochloric acid | 0.3 |
| Volatile ether extract | 4.4 |
| Nonvolatile ether extract | 9.2 |
| Protein (N x 6.25) | 11.5 |
| Sucrose | 0.4 |
| Starch | 1.2 |
| Crude fiber | 18.5 |
| Carbohydrates other than crude fiber (by difference) | 42.9 |

MARGO

VEGETABLE LECITHIN AND ASSOCIATED PHOSPHATIDES
WITH VEGETABLE OIL

Distributor—American Lecithin Corporation, Atlanta, Ga., and New York.

Manufacturer—Hansa Muehle, Hamburg, Germany.

Description—Soy bean lecithin and associated phosphatides with about 30 per cent of soy bean oil.

Manufacture—Soy beans are cleaned of foreign material, washed, dried, crushed, rolled and extracted with a mixture of petroleum ether and benzene. The extracted soy bean meal retains about 1 per cent of oil. The solvents are removed from the oil and lecithin extract by steam distillation. The oil and lecithin residue is bleached with hydrogen dioxide under reduced pressure. Some of the oil is separated from the oil-lecithin residue by addition of water. The resulting product, containing about 30 per cent of soy oil and 70 per cent crude lecithin, is mildly heated in a vacuum to remove water and volatile matter. Low temperatures are used during the manufacturing process to prevent decomposition of the lecithin.

Analysis (submitted by manufacturer) —

| | per cent |
|-------------------------|----------|
| Moisture | 0.7 |
| Ash | 4.0 |
| Petroleum ether extract | 63.6 |
| Acetone extract | 35.7 |
| Total nitrogen (N) | 1.0 |
| Total phosphorus (P) | 2.3 |

Calories—8.6 per gram, 244 per ounce.

Claims of Manufacturer—An emulsifying agent for use in foods. Contains readily assimilable phosphorus in organic form.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - CHICAGO, ILL.

Cable Address

'Medic Chicago'

Subscription price

Seven dollars per annum in advance

Please send in promptly notice of change of address giving both old and new always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, OCTOBER 5, 1935

CHRONIC CONSTRICTIVE PERICARDITIS— PICK'S DISEASE

The development of our knowledge of chronic constrictive pericarditis, sometimes known as Pick's disease, has recently been traced comprehensively by White¹ in a lecture at the Royal Society of Medicine in London. The diagnosis of this condition has added significance now because of the possibility of cure by surgery, in the past the prognosis was hopeless, with a prospect of years of invalidism in most cases. Since there have been promising numbers of operative cures in Germany and in the United States, it is important that the disease be recognized by the medical profession. The majority of the patients are chronically ill at home or in institutions caring for chronic invalids, rarely do they enter hospitals for acute diseases. The cases are probably for the most part diagnosed as heart disease or cirrhosis of the liver.

Constrictive pericarditis has actually been recognized for centuries, but only by occasional observers. Even Galen,² the great Greek physician who practiced in Rome about 160 A. D., realized that pericardial disease, in particular effusion, might interfere with proper heart function, but it was the Englishman Lower³ who first clearly recognized the effect of cardiac constriction by pericarditis. Thus in 1669, a century before Morgagni, who is sometimes credited with the first accounts of pericarditis, he wrote that "a profuse effusion oppresses and inundates the heart. The walls of the heart are compressed by the fluid settling everywhere so that they cannot dilate sufficiently to receive blood, then the pulse becomes exceedingly small, until finally it becomes utterly suppressed by the great inundation of fluid, whence succeed syncope and death itself." Lower also recognized that interference to proper heart action arises when there are thick constricting adhesions and he reported the case of a

London housewife, aged 30, whose pericardium at necropsy "was not, as is proper, thin and transparent, but thick, opaque, and even callous." Lancisi⁴ in 1728 described the small pulse, engorgement of the jugular veins, and enlargement of the abdomen in a young man in whom necropsy revealed a small heart with thick completely adherent pericardium. In 1760 Morgagni⁵ described a somewhat similar case but tended to throw future observers off the scent by describing a number of cases of adhesive pericarditis without any disability whatever.

In 1842 an Englishman named Chevers⁶ clearly recognized and described chronic constrictive pericarditis, but even though he wrote in *Guy's Hospital Reports* in the great days of Bright and Addison his observations escaped notice and were resurrected for a brief moment in 1870-1871, when another Guy's Hospital man, Samuel Wilks,⁷ called attention to them, apparently in error. A brief quotation from Chevers will show how clearly he recognized the pathogenesis of the disease: "The principal cause of dangerous symptoms in cases of the above description appears to arise from the occurrence of gradual contraction in the layer of adhesive matter which has been deposited around the heart, compressing its muscular tissue, and embarrassing its systolic and diastolic movements, but more particularly the latter."

After the time of Wilks (1870) the German workers became the leaders in the recognition and treatment of chronic constrictive pericarditis, beginning with Kussmaul⁸ in 1873 and going on through Pick⁹ in 1896 to the pioneer surgeons Rehn,¹⁰ Sauerbruch¹¹ and Schmieden,¹² and to Volhard,¹³ who in 1923 wrote his classic paper on the diagnosis of the disease. Pick's name has unfortunately been attached to the disease, to be sure he did revive interest in it and emphasized one of the important characteristics, liver enlargement with ascites, but he was after all only one of a line of keen observers.

One French name stands out as a beacon along the way, that of Delorme,¹³ who for years urged pericardial resection to free the heart. Brauer¹⁴ advocated rib resection to remove external pericardial adhesions, but

4 Lancisi J. M. De motu cordis et aneurysmatibus. Rome 1728, pp 38 and 39.

5 Morgagni G. B. De sedibus et causis morborum 1760 book II letters XVIII and XXIV.

6 Chevers Norman. Observations on the Diseases of the Orifice and Valves of the Aorta. *Guy's Hosp Rep* 5: 387 1842.

7 Wilks Samuel. Adherent Pericardium as a Cause of Cardiac Disease. *Guy's Hosp Rep* 16: 196 1870 1871.

8 Kussmaul Adolf. Ueber schwierige Mediastino-Perikarditis und den paradoxen Puls. *Berl klin Wchnschr* 10: 433 445 and 461 1873.

9 Pick F. I. Ueber chronische Perikarditis unter dem Bilde der Lebercirrhose verlaufende Perikarditis (perikarditische Pseudolebercirrhose). *Ztschr f klin Med* 20: 385 1896.

10 Rehn Ludwig. Die perikardialen Verwachsungen im Kindesalter. *Arch f Kinderh* 68: 179 (Oct.) 1920.

11 Sauerbruch E. F. Die Chirurgie der Brustorgane. Berlin Julius Springer 2 1925.

12 Volhard Franz and Schmieden Victor. Ueber Erkennung und Behandlung der Umklammerung des Herzens durch schwierige Perikarditis. *Klin Wchnschr* 2: 5 (Jan 1) 1923.

13 Delorme. Sur un traitement chirurgical de la symphyse cardo-pericardique. *Bull et mém Soc. de chir de Paris* 24: 918 1898.

14 Brauer, L. Ueber chronische adhäsive Mediastino-Pericarditis und deren Behandlung. *München med Wchnschr* 49: 1072 1902.

1 White P. D. Chronic Constrictive Pericarditis (Pick's Disease) Treated by Pericardial Resection. The St. Cyres Lecture of the National Hospital for Diseases of the Heart. *Lancet* 2: 539 (Sept 7), 597 (Sept 14) 1935.

2 Galen Claudius. De affectionibus localis book 5.
3 Lower, Richard. Tractatus de corde. Amsterdam D. Elsevirium 1669 pp 104 107.

that operation is of no avail in cases of chronic constrictive pericarditis except as an approach to the operation of Delorme

White¹ presents the following definition and diagnostic criteria

Chronic constrictive pericarditis consists of a chronic fibrous or callous thickening of the wall of the pericardial sac which is so contracted that the normal diastolic filling of the heart is prevented. A condition called "inflow stasis" results. There may or may not be calcification of the pericardium, obliteration of the pericardial cavity, or important external pericardial adhesions. There may or may not be an associated accumulation of pericardial fluid in small amount, as in pockets. The parietal pericardium may be preponderantly affected or the epicardium may be also seriously involved or both pericardial membranes may be securely or even inseparably united. One section of the pericardium, as over the cardiac apex, may remain relatively free and but slightly thickened, while another part, as over the right auricle and great veins, is markedly contracted, or the entire heart and roots of the great vessels may be encased uniformly in a tightly fitting envelop. There may or may not be an acute or chronic polyserositis, which is, contrary to a common belief held even in the best medical circles, a different thing. There may or may not be frosted liver (perihepatitis) or spleen (perisplenitis). There may or may not be heart disease itself—the association of chronic constrictive pericarditis, of any important degree at least, with heart disease is very rare.

The signs of chronic constrictive pericarditis are similar in most respects to those of acute constrictive pericarditis or cardiac tamponade, due to pericardial effusion and indeed the signs of the former condition may follow the signs of the latter without any interruption at all or more often after an interval of months or years. The insidious evolution of the disability due to chronic constrictive pericarditis, frequently with no history of a preceding acute pericarditis, makes the diagnosis far more difficult than that of acute constrictive pericarditis that usually develops with striking signs and symptoms in the course of a few hours or days.

On a basis of fifteen certain cases of chronic constrictive pericarditis personally observed and studied at the Massachusetts General Hospital, six of which were cured by pericardial resection by E. D. Churchill and one other greatly relieved (out of ten patients operated on), White concluded that the leading diagnostic clues are "(1) the insidious onset of chronic dropsy in a young person, (2) preponderant liver enlargement and ascites, (3) increased prominence of the jugular veins, (4) normal or relatively normal heart in the presence of dropsy without nephritis, (5) low blood and pulse pressure and paradoxical pulse, (6) x-ray evidence (poor pulsation, calcification, or chronic pleuritis), (7) electrocardiography (low voltage or 'coronary' T waves in chronic disease in early youth), and (8) a previous history of acute pericarditis or polyserositis." At least several of these clues are to be found in every case, especially the first four and the seventh, the fifth, sixth and eighth are more inconstant.

The cause of the disease is in many cases obscure. It may begin with an acute pericarditis or polyserositis of unknown etiology, it may be tuberculous, it may follow a severe pneumonia or it may be of septic origin. Almost never is it rheumatic, in fact, the finding of valvular disease is strong though not conclusive evidence against the diagnosis of chronic constrictive pericarditis.

Although uncommon, the disease is not so rare as formerly supposed, as is indicated by the discovery during the last few years of these fifteen cases in Boston, of fourteen cases in Cleveland,¹⁵ and of cases in Nashville, Tenn.¹⁶

A NEW HEALTH SURVEY

Coincidental with the appearance of this editorial begins a survey, under the auspices of the United States Public Health Service cooperating with state and city health departments, of chronic illnesses and physical impairments in the general population. In presenting the survey it is pointed out that most of the gain in longevity has come from the control of the infectious diseases of childhood. It is now proposed to study the causes of chronic illnesses and disabilities that usually appear after middle life.

It is understood that the stimulus for this survey came from the Secretary of Labor and that it meets with administration approval. It is expected to throw light on the problem of medical care for the people, moreover, it will give employment to 30,000 workers to be selected from those on relief rolls. The survey is to be carried on in nineteen states divided into five areas, which will include large cities, smaller cities, towns and rural communities. Elsewhere in this issue appears a list of the states and cities which have been selected for these studies. Personal interviews will be held with 750,000 families. The survey will begin October 15 and presumably the field work will end in March 1936. Thereafter will come the question of tabulation, analysis and preparation of the final report.

The survey is in charge of L. R. Thompson, Assistant Surgeon General, United States Public Health Service. In each area a regional supervisor has been appointed. Under these supervisors will be state and city supervisors and field workers. In each state concerned, the approval of the state health officer had been secured before the state was included in the survey. Local health officers have also been approached in the cities. Later in the survey attempts will be made to verify the diagnoses of illnesses reported in the house-to-house canvass. For this purpose those in charge of the survey will seek the cooperation of local medical societies.

The blank to be used by the enumerators in their house-to-house canvass (pages 1127 and 1128) will call for information concerning the names and ages of those in the household, their employment status, including the occupation and the industry concerned, whether or not they hold membership in any sick-benefit organization and whether or not they have been immunized against smallpox and diphtheria. A record will be made also of all disabling illnesses, including those lasting seven days or longer, and whether or not the patient was in

15 Beck C. S. and Cushing E. H. Circulatory Stasis of Intra pericardial Origin. J. A. M. A. 102: 1543 (May 12) 1934.
16 Burwell C. S. and Flickinger D. D. Obstructing Pericarditis. Arch. Int. Med. 56: 250 (Aug.) 1935.

the hospital, with a record of the termination of the illness. The name of the physician and the hospital will be recorded, also the record of nursing attention and whether the patient has had previous attacks of the same disease. Records will be made of handicapping diseases and such conditions as asthma, neuralgia, cancer, diabetes and similar chronic disorders, also any record of tuberculosis, loss of legs, arms or fingers, crippling deformities, hernia, deafness and blindness. Notation will be kept as to whether or not any member of the family has been in attendance at a health clinic or health center, and finally statements will be made as to housing conditions and the income of the family. Eventually, as has been stated, it is proposed to check this information by calls on physicians who were reported as having been in attendance on the patients.

When this information is assembled it will be reported scientifically in the usual manner by the United States Public Health Service. Presumably these records will be made the subject of considerable editorial comment and debate on the question of the costs of medical care and the methods of its provision. Apparently there are not available anywhere in the world any useful statistics on the subject of chronic and disabling illnesses. Whether or not the survey here contemplated will yield material capable of scientific study remains to be determined. The project is obviously an exceedingly costly one, and the administration will be open to severe criticism if the study fails to yield data of scientific value.

THE CONNELL CANCER CURE

In Kingston, Ont., Dr. Hendry C. Connell, an assistant professor at Queen's University Faculty of Medicine, has announced a new treatment for cancer. It has been heralded by the press as a "cancer cure." Doctors will search in vain the archives of scientific medicine for any report by Dr. Connell of his contribution to medical advancement. He apparently made his announcement first in the newspapers. Those interested must turn to the *Detroit Saturday Night*, the *Utica Observer Dispatch* and the *Whig Review* of his own town to discover the nature of Dr. Connell's performance. According to the *Detroit Saturday Night*, 125 cancer patients have been in the Kingston General Hospital improving under the Connell treatment, and victims of cancer are moving into the city in increasing numbers. Kingston has turned over part of its municipal hall for the enlargement of his research work, and the Department of Health of the Ontario government is collecting cancer tissue from all parts of Canada so that Dr. Connell can use it in making up his preparation. He calls it "Ensol."

The background of this performance is said to be some experiments made by Dr. Connell four years ago in an attempt to control cataract. He grew nonpathogenic proteolytic micro-organisms on protein mediums

These organisms were themselves liquefied in the process, so that an enzyme was produced. It was found that this enzyme would liquefy proteins similar to its base. In other words, Dr. Connell claims to have developed a substance which would break down cataractous lens tissue without reacting on other proteins. By a similar process, he says, he developed an enzyme which would break down cancer tissue.

On July 13 Dr. Hendry C. Connell sent a letter to the editor of *THE JOURNAL* in which he enclosed a copy of a statement which he had given to the Canadian press. In that statement he announced that full and detailed reports of his work would be prepared for publication in medical journals as quickly as possible. His letter was acknowledged in the usual manner. This brought from him a letter stating that he had promised to submit a complete statement of his work to the *Canadian Medical Association Journal* and requesting the American Medical Association to send a representative to witness his results. He also submitted a statement alleged to be an account of the method of preparation of his product and an account of his results, which include merely some regression of cancer tissue. He concluded his letter with two remarkable paragraphs:

I am enclosing for your information only and not to be published the last statement I have prepared covering my views on cancer and the facts relating to this work. I have not decided how this will be used or when it will be released for publication. It is my "confession of faith" for the moment and states clearly that I think I have the solution of the problem.

I do this in all humility, with a great sense of responsibility and a profound wonder why I "one of the least of these, my brethren" should be granted the high honor and privilege of bringing this great gift to my fellow men.

This account of the methods pursued by Dr. Connell in promotion of his product reveals procedures more like those of the charlatan than of the scientific investigator. Moreover, his statement of the method of preparation of his product is so incomplete and confused as to make duplication of his work impossible.

The results he claims are similar to those which have been obtained with a half-dozen other methods. In a few cases there are apparently temporary remissions due to damage of the blood vessels in the tumor. The same effects have been produced by Coley's fluid, by various bacterial toxins, by injection of Witte's peptone and by a number of similar foreign proteins. Results probably as good occur with the methods used by many cancer quacks. There does not appear to be any real evidence that an antitumor enzyme is present in the mixture. Notwithstanding these considerations, newspapers have heralded widely Dr. Connell's claims. Great numbers of sufferers from cancer have been stimulated to false hopes. Public officials, university officials, and some Canadian physicians have been led into participation in the promotion of a project which will inevitably bring them grief. The true test of a cancer cure is recovery of the patient and disappearance

of the tumor. How many of Dr. Connell's patients with cancer will be alive in five years? Time is the true tester of cancer cures—yet newspapers continue to lead cancer sufferers to promoters of cancer cures that have been tested only a few weeks or months. If Dr. Connell really realized his responsibility he would have waited to inform the newspapers until he knew whether or not his "discovery" actually had merit. Faith may move mountains but it is yet to be shown that it will cure cancer, even when given in the form of something called "Ensol."

Current Comment

CHILDREN OF THE DEPRESSION POOR

That significant differences exist between the average body weights of children from different economic classes is well known.¹ The weight of children from financially comfortable families exceeds that of children of the poor. The present depression has afforded an opportunity for studying in a large number of cases the effect of a transition from the former group to the latter, since many families that were financially comfortable prior to the depression have become poor since then. A statistical analysis² of some 5,000 such families living in certain cities in the eastern half of the United States has yielded interesting information. Weight and height data were obtained on children of typical working-class families, either by direct interview or by transcription from school records. The families chosen fell into three groups—"control families" that had remained financially comfortable during the period from 1929 to 1933, control families that had remained consistently poor, and families that had been comfortable in 1929 but became progressively poorer, reaching the economic level of the continuously poor families by 1933. The average weight of the children from the financially comfortable group was from 5 to 6 per cent higher than that of the children of the consistently poor families. The average weight of children of the "depression poor," however, showed a progressive decrease from a value about the same as that of the children of the financially comfortable families to one nearly as low as that of the continuously poor. Similar statistical studies³ have shown that the incidence of illness is highest in families of the depression poor. These data furnish quantitative evidence that, as far as the wage-earning class in the large urban centers is concerned, the children from families whose income has fallen to a low level have been most affected by the depression. The foregoing studies emphasize in a convincing manner the deleterious effect of poverty on the state of nutrition and health.

1 Paton D. N., and Findlay L. Poverty Nutrition and Growth. Medical Research Council Special Report Series No. 101. London: His Majesty's Stationery Office.

2 Palmer C. E. Height and Weight of Children of the Depression. Poor. Pub. Health Rep. 50: 1106 (Aug.) 1935.

3 Perrott G. S. and Collins S. D. Relation of Sickness to Income and Income Change in Ten Surveyed Communities. Pub. Health Rep. 50: 595 (May 3) 1935.

Association News

NEW ACTION BY COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

A business meeting of the Council on Medical Education and Hospitals was held at the Brown Palace Hotel, Denver, September 15.

According to the minutes the survey of American medical schools so far completed has revealed certain significant weaknesses, namely:

There is a tendency for medical schools to enlarge their enrolment without a corresponding increase in personnel or instructional facilities.

With a growing appreciation of the necessity for an intimate correlation between clinical and laboratory knowledge, it is evident that this can be obtained only by increasingly close contact between preclinical and clinical departments continuously maintained from the time the student first enters the medical school until he graduates.

The advances of the medical sciences have been and should be independent of any sectarian point of view and medical education should not be handicapped or directed by a dogmatic attitude toward disease.

For these reasons the Council took the following action:

(a) *Resolved* That in each medical school the number of students should not exceed the number that can be adequately taught with the laboratory, library and clinical facilities available and for whom a sufficiently large and competent teaching staff is provided.

(b) *Resolved* That after July 1 1938, the Council on Medical Education and Hospitals will no longer publish a list of approved two-year medical schools.

(c) *Resolved*, That after July 1 1938 the Council on Medical Education and Hospitals will no longer carry on its approved list schools of sectarian medicine.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

DELAWARE

State Medical Meeting in Wilmington, October 7-9—The Medical Society of Delaware will hold its annual meeting in Wilmington, October 7-9, with headquarters at the Delaware Academy of Medicine. Dr. Jerome D. Niles, Townsend, will deliver the presidential address on "Medical Ethics Then and Now." The invocation will be given by the Rt. Rev. Philip Cook, bishop of Delaware, and the address of welcome by Gov. C. Douglass Buck. The following physicians will participate:

Brice S. Vallett, Wilmington, Urology and the Child.
Joseph C. Birdsall, Philadelphia, Infections of the Upper Urinary Tract.
Charles P. White, Wilmington, Acute Otitis Media.
Francis C. Grant, Philadelphia, Diagnosis and Treatment of Brain Tumors.
Henry L. Bockus, Philadelphia, Chronic Ulcerative Colitis—Impressions Gained from a Review of 100 Cases.
Gabriel Tucker, Philadelphia, Cancer of the Larynx: Its Diagnosis and Surgical Cure.
Norris W. Vaux, Philadelphia, Fetal Mortality in Relation to Methods of Delivery.
Damon B. Pfeiffer, Philadelphia, Postoperative Complications with Special Reference to Water and Chemical Balance.
Bartholomew M. Allen, Wilmington, Uncommon Bone Lesions.
Hubley R. Owen, Philadelphia, Closed versus Open Reduction of Fractures.
Charles C. Wolferth, Philadelphia, Diagnosis of Coronary Arteriosclerosis and Its Complications.
John A. Kolmer, Philadelphia, Immunity and Vaccines in Acute Poliomyelitis.

The women's auxiliary to the society will hold its meeting at the Hotel du Pont, October 9. Guest speakers will be Mrs. Prentiss Wilson, Washington, D. C., president of the woman's auxiliary to the Medical Society of the District of Columbia, and Dr. Paul R. Smith, Wilmington, chairman, auxiliary advisory committee, Medical Society of Delaware.

ILLINOIS

Society News—Dr Herbert N. Raftery, Robinson read a paper on "Management of Head Injuries" before the Crawford County Medical Association September 12.—At a meeting of the DuPage County Medical Society, September 18, in Lmhurst, Dr Edward D. Allen, Chicago, spoke on endometriosis.—The Madison County Medical Society held its meeting at the Alton State Hospital September 6. Dr Abraham A. Low, Chicago, gave a clinical demonstration of neuro-psychiatric patients. Dr Joseph Edgar Stewart, St. Louis addressed the society recently on "Intracapsular Fractures of the Femur".—A skin and cancer clinic was conducted before a joint meeting of the Macoupin and Montgomery county medical societies September 24, by Drs Louis H. Jorstad and Clinton W. Lane, St. Louis.—Dr Lawrence M. Hilt, Springfield, among others, addressed the Sangamon County Medical Society, September 5 on roentgen therapy.

Chicago

Dr Beck Honored—Dr Joseph C. Beck, associate professor of laryngology, rhinology and otology, emeritus, University of Illinois College of Medicine was guest of honor at a dinner marking his sixty-fifth birthday and the completion of thirty-five years in the practice of medicine, September 26, at the Lake Shore Athletic Club. About 200 persons attended the dinner which was given by friends and former students of Dr Beck. Dr Frank J. Novak Jr. presided; the speakers included Drs Harry W. Woodruff, Joliet, Ralph A. Lenton, Portland Ore., William P. Wherry, Omaha, Burt R. Shurly, Detroit, Samuel J. Kopetzky, New York, Samuel Iglauer, Cincinnati, Otto Jorichim, New Orleans, and Louis Ostrom, Rock Island. Dr Beck graduated from the University of Illinois College of Medicine in 1895. He is a past president of the American Academy of Ophthalmology and Otolaryngology and was chairman of the Section on Laryngology, Otology and Rhinology of the American Medical Association in 1919-1920.

KANSAS

"Eye Specialists" in Kansas—Two strangers called on a man in Kansas who had failing eyesight. One man claimed to be an "eye specialist." He put some drops of a "special liquid" in the eye and later withdrew it. The patient feeling that his sight had been improved paid the \$50 fee requested. The two men then departed in an automobile. Months later two men resembling the "doctor" and his companion called again. "Dr. Hamilton" explained that his friend the "eye specialist" before his death in an automobile accident asked him to call to see if a lasting cure had been effected. Dr. Hamilton examined the eye and after deciding that a complete cure had not been made, treated it in the manner described. He requested and received \$50 for his services but promised to refund the first \$50 the victim had paid. Two weeks later the companion of "Dr. Hamilton," who called himself "Dr. R. B. Martin" of Independence, returned and said he would give the victim the \$50 as promised by "Dr. Hamilton." He presented a cashier's check in the amount of \$125 purporting to be issued by the Exchange State Bank of Sapulpa, Okla., payable to "Dr. R. B. Martin" and signed L. J. Askew, cashier. As the check appeared genuine, the victim accepted it and gave "Dr. Martin" \$75 in cash. Later he was informed that there is no Exchange State Bank in Sapulpa.

MAINE

Society News—At a meeting of the Hancock County Medical Society in Bar Harbor, August 22, speakers were Drs. George R. Minot, Boston, on "The Anemias, Their Diagnosis and Treatment," and Robert M. Lewis, New Haven, "Sex Hormones."—Prof. Webster Chester of Colby College, Waterville, addressed the Kennebec County Medical Association, September 4, on "The Doctor and Natural Selection." Dr. John L. Johnson, Bangor, president, Maine Medical Association, also spoke.

Annual Clinical Meeting—The annual clinical session of the Maine Medical Association will be held, October 24-25, at St. Mary's General and Central Maine General Hospitals, Lewiston. Members of both hospital staffs will present the program, guest speakers will be Dr. Elliott C. Cutler, Moseley professor of surgery, Harvard Medical School, Boston, and Clarence C. Little, D.Sc., director of cancer research, Roscoe B. Jackson Memorial Laboratory, Bar Harbor. Their subjects are respectively "The Surgeon and His Art" and "Problems Pertaining to Cancer." Clinics, demonstrations and a round table conference will form the remainder of the program.

MASSACHUSETTS

Cancer Clinic Reorganized—The Worcester Cancer Clinic of the Massachusetts State Department of Health has been reorganized and its work concentrated at Memorial Hospital, Worcester, according to the *New England Journal of Medicine*. Its staff has been augmented with the appointment of representative specialists from all Worcester hospitals. At least three specialists will be in attendance at each session of the clinic so that patients may have the benefit of group diagnosis. The clinic is purely diagnostic and each patient will be sent back to the referring physician or hospital with a full report as to diagnosis and treatment advised. There are no charges for this service. The clinic does not interfere in any way with the treatment clinics maintained by the hospitals, it is said, but supplements them by group diagnosis and social service. It will be held every Wednesday morning.

MISSOURI

Annual Clinical Conference—The Kansas City Southwest Clinical Society will hold its thirteenth annual fall clinical conference at the President Hotel, October 7-10. Speakers will include the following physicians:

Arthur C. Christie, Washington, D. C. Diagnosis and Treatment of Carcinoma of the Breast
Harlow Brooks, New York. Hepatitis and Hepatic Degeneration.
Albert Soiland, Los Angeles. American and European Cancer Control Problem.
Cyrus C. Sturgis, Ann Arbor, Mich. Treatment of Secondary Anemias with Special Reference to the Use of Iron.
Alfred I. Folsom, Dallas, Texas. Fundamentals in the Treatment of Gonorrhea and Its Complications.
John Alexander, Ann Arbor. Management of Thoracic Tumors Including Carcinoma of the Lung.
William S. Middleton, Madison, Wis. Coronary Disease.
William Wayne Babcock, Philadelphia. Malignant Diseases of the Intestinal Tract.
Edward A. Schumann, Philadelphia. Difficult Labor.
Mynie G. Peterman, Milwaukee. Nutritional Problems in Children.
Fred H. Albee, New York. Rehabilitation.
Harry S. Gralle, Chicago. Prevention of Blindness.
Francis F. LeJeune, New Orleans. The Human Larynx.

A round table luncheon, Monday, the opening day, will be addressed by Dr. Soiland on "The Sea-Going Medico" and Dr. Sturgis, "An Institute for the Study of Blood Diseases." John Fairbairn, Bunnie—Surgeon and Man" will be discussed by Dr. Babcock at a round table, Tuesday. Dr. LeJeune will discuss "The Cuban Doctor" at a round table Thursday and Dr. Schumann "Maternal Welfare." At a public meeting Monday evening Dr. Soiland will speak on "The Relation of Cancer to Public Welfare." Dr. Brooks, "Exercise and Play for Cardiac Patients" and Dr. Christie "Medical Care for All of the People at Prices That They Can Afford." The annual banquet will be held Thursday evening. The Kansas City Society of Ophthalmology and Otolaryngology will also hold sessions during the conference, the speakers at its dinner Thursday evening, will be Dr. Gralle on "Some Aspects of the Glaucoma Problem" and Dr. LeJeune, who will show a color motion picture study of pathologic changes of the larynx.

NEW HAMPSHIRE

Surgical Meeting at Manchester—The annual meeting of the New England Surgical Society was held in Manchester, September 27-28. Operative and dry clinics were held at Elliott Hospital and the annual dinner at the Manchester Country Club. Among speakers on the scientific program were:

Dr. Edward L. Young Jr., Boston. Secondary Carcinoma of the Large Bowel.
Dr. Horace K. Sowles, Boston. Inflammatory Sclerosis of the Bile Ducts.
Dr. Paul P. Swett, Hartford, Conn. A Form of Sclerosing Osteomyelitis Following Fractures of the Long Bones.
Dr. Frederic J. Cotton, Boston. Statics of the Foot in Relation to Surgery.
Dr. William E. Ladd, Boston. Congenital Absence of the Pericardium.
Dr. Howard M. Clute, Boston. Acute Arterial Obstruction with Arteritis.

NEW JERSEY

Personal—Dr. Theodore Schlossbach, Asbury Park, has been appointed surgeon to the Wilkins-Ellsworth antarctic expedition. He was to sail September 24 for Montevideo, Uruguay, to join Sir Hubert Wilkins and Lincoln Ellsworth.—Dr. Warren G. Parish, Philadelphia, has been appointed physician to the Lawrenceville School.

NEW YORK

Health at Utica—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended September 21, show that the highest mortality rate (217) appears for Utica and the rate for the group of cities as a whole, 103. The mortality rate for Utica for the corresponding week last year was

172 and for the group of cities, 96. The annual rate for eighty-six cities for the thirty-eight weeks of 1935 was 115 and the same rate appears for the corresponding period for the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

District Meetings—The Third District Branch of the Medical Society of the State of New York held a meeting in Troy, September 24, with Drs. Louis C. Kress, Buffalo, and Warren Wooden, Rochester, among others, speaking on "Uterine Cancer" and "Gastric and Duodenal Ulcer," respectively. Speakers before the Fourth District Branch at a meeting in Saratoga Springs, September 27-28, included Drs. Russell L. Cecil, New York, on "Modern Treatment of Lobar Pneumonia," Ambrose L. Lockwood, Toronto, "Empyema," Walter S. McClellan, Saratoga Springs, "Internal Use of Mineral Water," and Howard Lihenthal, New York, "Recent Developments in Thoracic Surgery." Dr. Frederic E. Sondern, New York, president of the Medical Society of the State of New York, made an address at a dinner at the Gideon Putnam Hotel. A symposium on silicosis was presented as part of the program of the Fifth District Branch at a meeting at Watertown, October 1, speakers were Drs. Charles C. Trembley and Daniel M. Brumfield, Saranac Lake, and Mr. O. G. Browne, New York, an attorney. The Sixth District Branch met at Elmira, September 18, with the following speakers, among others on the program: Drs. Herbert M. Bergamini, New York, "Management of Delayed Union and Nonunion and Malunion of Fractures of the Long Bones," Joseph F. McCarthy, New York, "The Prostate and Adnexa Considered from a Standpoint of Obstruction as a Potential Focus of Infection and of Other Constitutional Manifestations," and George W. Crile, Cleveland, "Abatement or Cure of Malignant Hypertension by Dekemetization." Drs. John A. Kolmer, Philadelphia, and Howard M. Clute, Boston, among others, addressed the meeting of the Seventh District Branch at Canandaigua, September 26, on "Susceptibility, Immunity and Vaccination in Infantile Paralysis" and "Clinical Management of Obstructive Jaundice," respectively. At the annual meeting of the Eighth District Branch in Warsaw, October 3, speakers were Drs. Géza de Takacs, Chicago, on "Peripheral Vascular Disease," Howard K. Thompson, Boston, "Management of Arthritis," and Harold Jackson Davis, Albany, "Medical Experiences in the TERA." Dr. Frederic E. Sondern, New York, president of the state society, gave an address.

New York City

First Harvey Lecture—The first Harvey Lecture of the winter series will be delivered by Max Bergmann, Ph.D., associate member of the Rockefeller Institute for Medical Research, October 17, on "The Proteins and Their Enzymic Degradations." The meeting will be at the New York Academy of Medicine.

Personal—Dr. Frederic Brush, medical director of the Burke Foundation, White Plains, received the honorary degree of master of physical education at the annual commencement of Springfield College, Springfield, Mass. Dr. Thomas A. Gonzales, deputy chief medical examiner for Manhattan, the Bronx and Richmond, has been appointed acting chief medical examiner to succeed the late Dr. Charles Norris. Dr. Paul W. Aschner, Brooklyn, has been appointed assistant clinical professor of urology at Long Island College of Medicine.

Substandard Food Rejected—The municipal inspectors rejected more than a million pounds of foodstuffs as unfit for use in the city hospitals and other institutions during the first six months of this year, according to the city controller's report. Meat and poultry were rejected because they were found to be stale or to have been frozen, milk deliveries because of rusty cans, vegetables because they were excessively shrunken, among other details mentioned. Fruits and vegetables formed the largest item in the rejections, 652,429 pounds. The whole amount was valued at \$100,000. Much of it was still fit for consumption but was below the standards set in the city's contracts, it was said. The city spends about \$4,000,000 a year for food delivered to more than forty institutions, hospitals and prisons.

OHIO

Graduate Programs—The alumni association of the Ohio State University College of Medicine announces a program of clinics, lectures and demonstrations to be held in the morning of November 16. The program is arranged to coincide with the homecoming football game of Ohio versus Illinois. Alumni are invited to attend clinics and pathologic conferences every Saturday. Dr. William H. Martin, Detroit, is president of the association and Dr. Jonathan Forman, Columbus, secretary.

PENNSYLVANIA

Society News—Drs. Russell L. Haden and James A. Dickson, Cleveland, addressed the New Kensington Academy of Medicine, September 27, on arthritis. Dr. Edward J. G. Beardsley, Philadelphia, addressed the September meeting of the Lehigh County Medical Society, Allentown, on cardiac diagnosis and treatment. Dr. John A. Toomey, Cleveland, gave an address before the Cambria County Medical Society, Johnstown, September 12, entitled "A Critical Evaluation of Recent Advances in Contagious Diseases."

Philadelphia

Society News—The College of Physicians of Philadelphia will ultimately receive \$40,000 for the preservation of its books and for maintenance, from the estate of the late Dr. James Cornelius Wilson. At a meeting of the North End Medical Society with the North Branch of the Philadelphia County Medical Society, September 26, speakers were Drs. Maurice Brodie, New York, Harry Lowenburg, Nathaniel W. Winkelman and Charles Howard Moore, all of whom discussed anterior poliomyelitis.

Study of Tuberculosis in Indians—Dr. Joseph David Aronson of the staff of the Henry Phipps Institute of the University of Pennsylvania, has been appointed special expert on tuberculosis in the Indian Service under the Department of the Interior. He has been granted leave of absence from the institute and has established headquarters in Albuquerque, N. M., from which he will direct a study of opportunities for preventive work against tuberculosis in New Mexico and Arizona Indians. After several weeks he will make similar observations on the Blackfoot and Crow Indians in Montana. Dr. Aronson is assistant professor of bacteriology at the University of Pennsylvania School of Medicine. Dr. Esmond R. Long, director of the Phipps Institute, has again been appointed special consultant on tuberculosis, in this capacity he made a survey of the Papago Indians for the Indian Service last winter.

RHODE ISLAND

Foundation for Study of Poliomyelitis—The Rhode Island Infantile Paralysis Foundation was established August 31 with a gift of \$5,000 from Mr. William S. Cherry Sr., Providence. Immediately after a charter was received from the state, the foundation was organized with Drs. Edward A. McLaughlin, Providence, state director of public health, and Dennett L. Richardson, Providence, as president and vice president. The foundation will seek more funds with which to conduct research and education, but it will devote itself immediately to relief of convalescents.

SOUTH DAKOTA

Personal—C. M. Austin, Sioux Falls, was elected president of the South Dakota Hospital Association recently and Sioux Falls was designated as the place for the next annual meeting.

Society News—A joint meeting of the Aberdeen and Whetstone Valley medical societies was addressed at Aberdeen, August 28, by Drs. Willard D. White, Minneapolis, on "Fractures of the Neck of the Femur," Paul V. McCarthy, Aberdeen, "Use of the X-Rays as a Diagnostic Agent," and Albert S. Rider, Flandreau, state association problems.

TEXAS

Health Committee Appointed—A health committee has recently been appointed as a part of the Texas Planning Board to take measures to improve the state's health conditions. Gerald C. Mann, secretary of state, is chairman and members are Drs. Ben R. Buford, Dallas, John M. Travis, Jacksonville, Robert D. Gist, Amarillo, Louis C. Heare, Port Arthur, Elbert W. Wright, Bowie, chairman of the state board of health, John W. Brown, Austin, state health officer, and Mr. H. W. Van Hovenberg, Texarkana. At the first meeting in Dallas, August 28, a committee was appointed to prepare and submit legislation considered necessary to improve and control public health and another to map an educational campaign to acquaint the public with health needs.

Society News—Speakers at a meeting of the Twelfth District Medical Society in Cameron, July 9, included Drs. Ross B. Trigg, Fort Worth, on "Compression Fractures of the Vertebrae," Charles M. Simpson, Temple, "Carcinoma of the Prostate," and William T. Shell Jr., Corsicana, "Acute Abdominal Injuries." Dr. George R. Herrmann, Galveston, addressed the Jefferson County Medical Society, Port Arthur, August 12, on "Cardiology in General Practice." Speakers at a meeting of the Dallas County Medical Society, Dallas, September

26, were Drs Merritt B Whitten, on "Recent Advances in Electrocardiography," Ben H Griffin, "Acne Vulgaris," and Harold I Nesbit, "Autonomic Instability During Infancy and Childhood"—Dr Arthur I Hertzler, Halstead, Kan., was guest speaker at a meeting of the Northwest Texas District Medical Association in Mineral Wells, September 10, on "Diagnosis of Nonmalignant Disorders of the Stomach."

GENERAL

Society News—The American Association of Obstetricians, Gynecologists and Abdominal Surgeons at its annual meeting at Skytop, Pa., September 16-18, elected the following officers: Drs James W Kennedy, Philadelphia, president-elect, Frederick H Falls, Chicago, vice president, and James R Bloss Huntington, W Va., secretary. Dr Louis E Pharaeus, Boston, was installed as president. Next year's meeting will be in Bretton Woods, N H., September 14-16.—The Clinical Orthopedic Society will hold its annual meeting in Indianapolis November 15, and in Louisville, November 16.

Suicides Decline—From a study of suicides in 170 cities of the United States, made by Frederick L Hoffman, Ph D., Philadelphia, consulting statistician, it appears that the average suicide rate per hundred thousand of population declined in 1934 to 16.8 from 18.8 in 1933. The rate increased in fifty-nine cities, declined in 109 and remained the same in two. Rates in the five largest cities were as follows: New York, 16.6, Chicago 15, Philadelphia, 16.1, Detroit, 11.4, and Los Angeles 2.6. All these are lower than the 1933 rates. Among the 170 cities those with the highest rates are as follows, given in the order of their importance: Concord, N H. 41.4 Sacramento, Calif., 34.2, Savannah, Ga., 32.7, Galveston, Texas, 32.5, Tacoma, Wash., 32.5 Denver 32.3 San Francisco, 31.9, Seattle, 31.6, Pasadena, Calif., 28.2 and Brockton, Mass., 28.1.

Prevalence of Typhoid—Twenty-four cases of typhoid traced to the eating of clams from a condemned area of Jamaica Bay, Brooklyn, N Y. led Health Commissioner John L. Rice to order the shore cleared of clams. About sixty men were put to work digging and destroying them and will continue through October and November it is reported.—Several cases of typhoid reported from Hackensack, Jersey City and adjacent New Jersey towns in August were traced to swimming in the polluted waters of the Hudson and Hackensack rivers. An outbreak occurred in August in Cambridge, Ohio, as a result of recent floods twenty-eight cases were reported to be active September 10.—Twenty-four cases of typhoid with one death occurred in a nuns' home in Indianapolis in August, the infection was traced to contamination of the water supply through a connection with a sewer.—Light cases of typhoid with six deaths were reported from Spencer County, Ky., September 5.—Three cases of typhoid on the Onondaga Indian Reservation near Syracuse, N Y., led health officials to have all persons living on the reservation immunized.

Aero Medical Association—The seventh annual meeting of the Aero Medical Association will be held in San Antonio, Texas, November 1-3, with headquarters at the Gunter Hotel. Speakers will include

Capt John M Hargreaves, medical corps, director department of ophthalmology and otology School of Aviation Medicine Randolph Field Texas, Interesting Eye Factors in the Selection of Military Aviators

Major Charles F Snell, medical corps, department of aviation medicine General Physical Factors in the Selection of Military Aviators

Capt Walter S Jensen director of neuropsychiatry Neuropsychiatric Factors in the Selection of Military Aviators

Major Neely C Mashburn, director of psychology, Psychologic Factors in the Selection of Military Aviators

At the department of commerce conference Sunday, Dr John L. Walter, Spokane, Wash., will be among the speakers, on "Prevention of Loss of Hearing in Aviators." Speakers at the annual dinner will include Dr James C Braswell, Tulsa, president of the association, Eugene L Vidal, director of aeronautics, U S Department of Commerce, and J Carroll Cone, assistant director of aeronautics.

Regulations for Control of Communicable Disease—A revision of the standard regulations for administrative control of communicable diseases was published in *Public Health Reports*, August 9. This is the second revision of the regulations originally drawn up in 1916 by a committee of the health officers' section of the American Public Health Association and first revised in 1926. The present revision was made by a subcommittee of the committee on research and standards of the association and has been approved by the U S Public Health Service. The terms used are defined and each disease is briefly described. Methods of control are suggested, but

formal regulations are not offered because of local variations in law and sanitary codes. Any person or body with the power to make regulations can by reference to the description and recommendations for methods of control prepare the necessary text on which the educational and administrative acts of the health officer will be based, the committee said in an introductory statement. Members of the committee are Drs Haven Emerson, New York, chairman, Leon Banov, Charleston, S C., James A Doull, Cleveland, A Roger Foley, Quebec, Donald T Fraser, Toronto, John E Gordon, New York, James P Leake, Washington, D C., Alton S Pope, Boston, Stanley W Stryer, Gouverneur, N Y., Adolph Weinzirl, Baltimore, and Charles Edward A Winslow, Dr PH, New Haven, Conn.

American Public Health Association—The sixty-fourth annual meeting of the American Public Health Association will be held in Milwaukee, October 7-10. Among speakers listed in the preliminary program are

Dr Henry Hanson Jacksonville Fla. An Epidemic of Dengue Fever
Dr Gaylord W Anderson Newton Mass. Typhoid Carriers A Study of Their Disease-Producing Potentialities Over a Series of Years as Indicated by a Study of Cases

Dr Clifford E Waller, Washington D C., Federal Health Legislation

Dr Walter J Treadway, Washington, Mental Hygiene in the U S Public Health Service

Dr Frederick O Toney, Chicago Vitamin D and Child Health

Bertha Kaplan Spector, Ithaca, Chicago Significance of the Small Variety of Endamoeba Histolytica Cysts

Dr George E Rockwell Cincinnati Oral Immunization Against Upper Respiratory Infections

Dr William H Park and Maurice Brodie New York Active Immunization Against Upper Respiratory Infections

Dr Morris Fishbein Chicago American Medical Association Committee on Foods and Its Work

Walter G Campbell chief Food and Drug Administration Washington D C., Need for New Legislation for Food and Drug Control

Homor N Calver, New York The Challenge of Commercial Advertising to Health Education

During this meeting the American Association of School Physicians, the Association of Dairy, Food and Drug Officials, the Association of Women in Public Health, the International Society of Medical Health Officers the International Association of Dairy and Milk Inspectors and various other societies and committees will hold their annual sessions. The annual institute on health education was to precede the meeting, October 4-6.

FOREIGN

Epidemic in Japan—The New York Times reports that an epidemic of "sleeping sickness" is current in Japan, 234 cases having been reported in the Tokyo Yokohama area, with a mortality of about 20 per cent. It is said that most of the victims are children, aged persons or adults suffering from excessive fatigue.

Horsley Memorial Lecture—The fifth Victor Horsley Memorial Lecture will be given at University College Hospital Medical School in London, November 19, by Sir Walter Langdon Brown, formerly regius professor of physics, University of Cambridge. His subject will be "The Integration of the Endocrine System."

Dr Learmonth Honored—Dr James R. Learmonth, for several years assistant professor of surgery, Mayo Foundation, University of Minnesota, and since 1932 regius professor of surgery at the University of Aberdeen, Scotland, has been appointed honorary surgeon to King George in Scotland, news papers report. Dr Learmonth is a native of Scotland.

New Medical Journal—The Witwatersrand University Medical Graduate Association, Johannesburg, South Africa, is sponsor for the *South African Journal of Medical Sciences* the first issue of which appeared in July. It is to be devoted to the purely scientific aspects of medicine and expects to publish theses, surveys, researches and new techniques developed among the medical profession of South Africa.

International Congress of Gastro-Enterology—Dr Pierre Duval, professor of clinical therapeutic surgery, University of Paris, was chosen president of the International Congress on Gastro-Enterology during its first session in Brussels, Belgium, August 8-10. Delegates to the congress, appointed by the U S Department of State, were Drs John H Trinder, lieutenant colonel, medical corps, retired, U S Army, chairman, Henry L Bockus, Philadelphia, Russell S Boles, Philadelphia, Max Einhorn, New York, Sara M Jordan, Boston, B B Vincent Lyon Philadelphia, William Gerry Morgan, Washington, D C., De Witt Stetten, New York, and Franklin W White, Boston. Among other Americans present were Drs Samuel Weiss and Anthony Bassler, New York, and William A Swalm, Jacob Geishon-Cohen and Harry M Eberhard, Philadelphia. The next congress will be held in Paris in 1937.

Form to be used by investigators in new health survey

* Cities in which sample studies will be made

The survey will include interviews with 750,000 families in ninety-five cities and towns. An average personnel of 3,500 workers will be engaged in the project at all times, with a peak employment of from 5,000 to 6,000 persons. From four to five

months will be required for enumeration and editing in the field and a somewhat longer period for coding, tabulation and analysis. The field work will consist of a house-to-house canvass of a predetermined number of families in each city or community, careful editing of the results for completeness and consistency, verification of diagnoses by physicians who attended the patients, and in some places transcription of records of hospitals, sick benefit associations, a survey of medical facilities and a survey of communicable diseases.

Food and Nutrition Work of Relief Administration

Food and Nutrition Work of Relief Administration

More than 800 trained home economists are serving forty-three state relief administrations in working out proper diets for relief clients the Federal Emergency Relief Administration recently announced in a review of the food and nutrition work of the administration. As a result of their work it is believed that many families have learned for the first time the importance of a balanced diet, possibilities of improving the family food supply through home gardens, how to make the most of the money available and how to prepare low cost foods in palatable forms with the result that the chances of their eventual rehabilitation have been enhanced and the disease factor lowered. The kinds and amounts of food included in the allowances suggested by the Bureau of Home Economics of the U S Department of Agriculture, which have been the guide in framing state food budgets, have been determined from nutrition studies conducted by scientists in universities and government laboratories, the report points out. Relief home economists have cooperated with hospital dietitians and medical societies in the formulation of therapeutic diets at minimum cost. The home economists have found it necessary also to remedy other factors that menaced health, such as unsanitary practices in handling food and washing dishes, insufficient protection from flies and lack of understanding of fundamentals of personal hygiene.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept 7, 1935

Alcohol and Road Accidents

The minister of transport invited the British Medical Association to make observations on the place of alcohol in the causes of road accidents. The association therefore appointed a committee consisting of leading physicians, physiologists, pharmacologists and police surgeons to report on the question. They confined themselves to examination of the evidence of the effect of alcohol on bodily functioning, particularly of amounts insufficient to produce drunkenness, less than is sufficient to lead to a person being certified as "incapable of proper control of a vehicle." They recognized the part played by alcohol in considerable amounts in the causation of road accidents but thought it desirable to draw public attention to the effect of amounts commonly regarded as without deleterious effect on driving capacity. This aspect of the problem has not received from scientific investigators the attention it merits. A complete solution would require further investigation. Nevertheless important evidence of two types is available. 1 Statistics of accidents in which the question was raised as to whether the driver was 'under the influence of drink.' 2 Experiments made in other connections to determine the effects of alcohol on judgment, memory, reaction time, coordination of muscles and other factors that may be involved in motor driving.

The report of the ministry of transport for 1933 shows that, of the 3,297 causes of fatal road accidents attributed to drivers, twenty-nine are described under the heading 'under the influence of drink or drugs,' while, of 3,607 causes of road accidents attributed to pedestrians, forty-six were included under the same heading. These figures take no cognizance of persons who may have been under the influence of alcohol to an extent insufficient to attract notice. They are derived from police reports and are based on personal impressions. Investigations based on determination of the alcohol content of the blood and urine have been made in America. They show that, in 119 consecutive accidents, seventy-four of the persons examined had an alcohol content of the blood exceeding 0.02 per cent, but there are no figures showing the alcohol content of the blood of drivers not involved in road accidents. In 1933 there were in Great Britain 1,595 convictions for driving under the influence of drink. In 1934 there were 2,016 drivers of motor vehicles medically certified to be under the influence of drink. Thus statistics show that intoxication plays a part in the causation of motor accidents. But opinions may differ as to the part played by amounts of alcohol less than those which would lead to a person being certified as "incapable of proper control of a vehicle." If such amounts render a person a less careful and skilful driver, the percentage of accidents due to alcohol is higher than is indicated by the figures. The committee therefore submits evidence as to the effect of what it calls 'subintoxicant' amounts of alcohol.

The committee refers to the report of the Medical Research Council on alcohol, in which the conclusion is drawn that "the direct effect of alcohol upon the nervous system is in all stages and upon all parts of the system, to depress or suspend its functions, that it is, in short, from first to last a narcotic drug." It leads many persons to take risks and make rapid decisions less judiciously than they otherwise would. This is a serious objection to the consumption of even small amounts by any one who is to drive a car. Psychological tests show that consumption of small amounts of alcohol (in quantities equivalent to $2\frac{1}{4}$ to $3\frac{1}{2}$ ounces, or 67 to 105 cc., of whisky) impairs both mechanical skill and intelligence and reduces speed, while the subject feels that he is doing better. Several hours after

the consumption of such quantities the blood still contains substantial amounts of alcohol, for the body oxidizes alcohol at the rate of only 10 to 12 cc. an hour (the equivalent of 1 ounce, or 30 cc., of whisky). Only when the alcohol in the blood has fallen to a low percentage do the effects on mental processes and neuromuscular coordination disappear. The conclusion of the committee is that alcohol in amounts corresponding to 2 or 3 ounces (60 or 90 cc.) of whisky usually affects adversely rapid and accurate coordination and must frequently affect driving capacity.

The Gas Storage of Foods Important Advances

The Food Investigation Board has issued a report that marks an important advance in the gas storage of food. Researches in the interest of the consumer and the grower are now being applied commercially. They have been carried out under the Department of Scientific and Industrial Research, whose workers have discovered that beef can be stored from sixty to seventy days in a chilled state by the addition of carbon dioxide to the air of the store. This enables chilled beef to be brought from New Zealand and Australia and has been energetically taken up by the firms concerned. During 1934, 4,400 tons of chilled beef arrived in gas storage from New Zealand and Australia. Twelve ships have been built containing chambers specially constructed for gas storage. Three weeks can be added to the storage life of bacon by gas storage in carbon dioxide.

The gas storage of home-grown fruit has rapidly progressed. The number of gas stores has increased from twelve to forty, providing space for 400,000 bushels of apples, which is likely to be doubled in the next twelve months. The winter temperature of English warehouses has been found too low for the ripening of several varieties of imported pears and plums. Conditioning for a brief period at 70 F. greatly improved South African and Australian pears and South African plums.

An important discovery is that wraps treated with iodine retard the fungal rotting of fruit without impairing the appearance or flavor. In the store the vapor given off by fruit such as apples, tomatoes and bananas that have passed the climacteric immediately produces climacteric in their neighbors and hastens ripening. It has been discovered that the active substance in the vapor of ripe apples is the gas ethylene. With regard to the best method of preserving eggs, it is found that the alkalinity of the white increases with age but can be kept down to that present on laying by storage in air enriched with carbon dioxide.

Criticism of Air Raid Precautions

In previous letters the precautions that are being elaborated by the government for the protection of the civil population against air raids have been described. They have aroused considerable criticism in socialist and antimilitarist circles. The "Union of Democratic Control" summoned a conference on the subject. Mr. Kingsley Martin, editor of the *New Statesman* who presided, described a recent government circular as unconvincing and fraudulent. Mr. J. D. Bernal, a Cambridge scientist declared that no methods of defense could prevent heavy casualties. The evacuation of urban population would result in incredible chaos, with starvation and pestilence following the breakdown of the transport of supplies. Gas-proof rooms were certainly a defense, but the highly concentrated character of an air raid and its unexpectedness rendered provision on a huge scale everywhere necessary. Dr. J. R. Marrack, professor of chemical pathology, London Hospital, gave his experience of gas warfare in France, where casualties continued after gas masks and all methods of protection were enforced. This was due to surprise attacks before men had time to put on their gas masks, or to pockets of gas remaining after an attack. It seems to be overlooked in all this criticism that the government is not responsible for the difficulties of the problem of defense against air raids and that no suggestion is made as to better

methods. The dislike of the socialists for anything of the nature of militarism has gone to the suicidal length of saying that they will refuse to obey the air-raid regulations.

Treatment of Maxillofacial Injuries of War

In modern warfare a large percentage of wounds occur in the jaws and face. Experience in the war has been turned to account by the army council, which in 1932 appointed a committee consisting of Col J. P. Helliwell (chairman) of the army dental corps, Sir Harold D. Gillies, Mr. R. W. Kelsey Fry and Mr. W. Warwick James to investigate and report on facilities for the treatment of the maxillofacial injuries of war. All had considerable experience with these injuries in the war. Mr. Fry and Mr. James are dental surgeons and Sir Harold Gillies was chief plastic surgeon of the special hospital for facial injuries and is the leading plastic surgeon of the day. In their report, which is based for the most part on personal experience, the committee points out that only by the earliest treatment can serious deformities and loss of function be averted or mitigated and that equipment and personnel should be available from the beginning of hostilities. Preliminary treatment in the field should be carried out with appreciation of the lines likely to be followed at the special hospital allotted for these cases. Therefore medical and dental officers in the field should have a knowledge of the principles of the treatment and execution of these cases and receive uniform instruction.

In the early stages, preliminary treatment should be restricted to the saving of life—the prevention of suffocation and the arrest of hemorrhage. Danger of suffocation is most commonly due to loss of control of the tongue, which may be so displaced as to obstruct the air passages. Posture is of vital importance and stretcher bearers should not lay the man on his back but on his chest, with his head hanging over the end of the stretcher. If he can walk, he should stoop well forward. Lives may be saved by keeping the tongue well forward. Correct posture will tend to lessen hemorrhage by keeping the tongue forward but it may be necessary to plug wounds external to the mouth and also to apply digital pressure. The main dressing station is the first place where the services of a dental officer are available. Displaced hard and soft tissues should be corrected as nearly as possible to the normal position and fixed there at the earliest moment. When much bone is lost the raw ends of bones should be covered by mucous membrane. In the war overapproximation rendered the after-treatment of many cases difficult, and this should be avoided. The dental officer should be conservative as regards extraction of teeth. As the recuperative power of partly detached fragments of bone is usually good none should be discarded. The slightest attachment of periosteum is justification for the retention of a fragment. Displaced fragments of the jaw should be immobilized by interdental wiring. The case then passes on to a special maxillofacial hospital.

Deaths from Botulism

Botulism is an almost unknown disease in Great Britain. In London an inquest has been held on three women who died from botulism as the result of eating "nut meat brawn," a purely vegetable preparation, in spite of its name, made from peas and carrots. Dr. P. V. Pritchard, health officer for St. Pancras, gave evidence that the infection came from an organism attached to some of the vegetables used in the brawn mixture, but which vegetable it had not been possible to discover. For preparing this particular brawn the peas and carrots were freshly bought every morning at London's great vegetable market, Covent Garden. It had been made for twenty-nine years and no previous case of botulism had been traced to it. Dr. Pritchard knew of no case of botulism that had occurred from food canned in this country or from canned food imported. The deputy director of the Bristol food research station stated that botulism always existed as a danger but could be com-

bated by simple means. Britain produced from 150 to 200 millions of cans a year. All the British vegetable canners were using an absolutely safe process. There had been no instance in this country or in America in which *Bacillus botulinus* had survived this process and caused trouble.

The only previous cases of botulism known in this country occurred in 1922, when eight persons died at a hotel in the West Highlands of Scotland from botulism due to eating wild duck paste in a glass container. Here too there was no indication that the food was in any way abnormal or unfit for consumption and the manufacturer was acquitted of neglect. The Ministry of Health is making further investigations in regard to the recent cases.

Vitamin C in Apples

It has been found that the concentration of vitamin C in apple tissue is six times as great in the peel as in the core, also that the vitamin potency of Bramley seeding apples with rosy or blushed skin is more than twice as great as in those with green skin. Canned apples showed no loss of vitamin C after nine months' storage at ordinary temperature. Investigations were carried out with synthetic vitamin C, which has been shown to be identical with the natural vitamin in chemical structure and biologic activity, in order to discover whether it might be added to such foods as runner beans, which do not naturally contain vitamin C or to spinach apples or apple jelly. Examination of the canned products showed that the loss of the added vitamin was never greater than 25 per cent and usually much less, the artificial vitamin remaining stable during canning.

PARIS

(From Our Regular Correspondent)

Aug 16, 1935

Tuberculous Meningitis in Infant Vaccinated with BCG Vaccine

A committee appointed by the Pasteur Institute, and composed of both clinicians and bacteriologists, is investigating the cases in infants in whom immunization against tuberculosis by the ingestion of BCG vaccine has been attempted. At the April 9 meeting of the Société de pédiatrie of Paris, Eschbach of Bourges reported the case of an infant vaccinated at birth and again at the end of the first year. It died of tuberculous meningitis at the age of 21 months. Examination of the spinal fluid obtained by lumbar puncture after the appearance of typical symptoms of meningitis, revealed the presence of acid-fast bacilli, which on being inoculated into a guinea pig resulted in the animal's death nine months later and the necropsy of the animal confirmed the diagnosis of tuberculosis. The infant had not come in contact with a tuberculous individual so far as could be learned.

In the discussion, Marfan, who is a member of the Pasteur Institute committee, stated that similar cases had been reported but that they seemed to be very rare according to the observations thus far of the committee. The tuberculous nature of the meningitis had not been proved in some of the reports sent to the committee. The presence of the tubercle bacillus in the spinal fluid had only rarely been demonstrated. In seven cases lumbar puncture had not been done, the diagnosis having been entirely on the clinical symptoms. In six cases in which the spinal fluid had been sent to the Pasteur Institute, tubercle bacilli of the human type were found in only three. The latter had been in contact with tuberculous individuals. In a fourteenth case the diagnosis was based on the presence of a lymphocytosis and a hyperalbuminosis. Hence in only three of the fourteen cases was the meningitis proved to be tuberculous on bacteriologic examination. If the meningitis appears before the sixth month, one can assume that the infant has not been immunized and hence has been infected before the BCG immunization has taken place. Vaccinated infants

should be kept from being in contact with tuberculous individuals. In cases in which tuberculous meningitis occurred late, the infants have either not been immunized or, if so, only transiently or to a slight degree.

There is no proof that the BCG vaccine has ever caused a meningitis. In the three cases cited, with positive observations at the Pasteur Institute, the bacillus was of the human type, whereas the BCG bacillus is of the bovine type, hence finding the former excludes any part played by the BCG vaccine.

Angina Pectoris Cured Since Operation in 1932

A successful result following operation in April 1932 for severe angina pectoris was reported at the June 7 meeting of the Société médicale des hôpitaux by Godard and Moussour. A woman, aged 77, was seen in April 1932. The first anginal attack occurred in January 1931. After a free interval of two months there was a recurrence every eight days. In February 1932, attacks lasting from fifteen to twenty minutes occurred four or five times a day. The location of the pain was typically retrosternal, with radiation to the left arm and corresponding side of the lower jaw. A little later the attacks became so severe and frequent that large doses of morphine had to be given. This gave only transitory relief. April 22, 1932, the Danielopolu operation was performed under local anesthesia. The technic is about the same as that of removal of the stellate ganglion, but one does not perform ganglionectomy.

The following are resected: the rami of the seventh and eighth cervical and first dorsal, the two roots of the vertebral, the cervical sympathetic cord and the superior and middle cardiac nerves. The operation was followed by the Claude Bernard-Horner syndrome and vasomotor disturbances of the left half of the face and left arm. For the first three post-operative days, pain was felt over the sternum, but there was an absence of attacks until the fourth day, when two or three severe ones were observed. During the following eleven days the attacks recurred at longer intervals but were severe and of short duration. The attacks ceased two weeks after the operation and there has been no recurrence since this date, now more than three years. The patient's general health is excellent. Electrocardiography recently showed normal conditions.

Hodgkin's Disease with Extreme Anemia and Fever

An unusual case was presented at the June 21 meeting of the Société médicale des hôpitaux by Thoyer and Gauthier-Villars. A man, aged 33, had noted in 1931 a marked enlargement of the lymph nodes on the right side of the neck, which subsided following high voltage roentgen therapy. A year later a severe anemia of the hypoplastic type with many nucleated erythrocytes was noted. The number of erythrocytes during five months of observation was 1,500,000, and there was continuous high fever. There was no improvement following ten months of treatment, the condition ending fatally. Only a discrete involvement of the mediastinal and inguinal nodes, and a splenomegaly, had been found while he was under observation in the hospital. The principal feature had been the severe anemia. The necropsy revealed the presence of many enlarged mediastinal lymph nodes, which on microscopic study enabled a diagnosis of Hodgkin's disease to be made. There were many diffuse minute areas of necrosis in the liver and spleen. Stains for tubercle bacilli were negative. Few similar cases of Hodgkin's disease accompanied by severe anemia have been reported, and even in these the anemia had been terminal. The number of leukocytes in the case reported by Thoyer and Gauthier-Villars was only 1,600 per cubic millimeter, which is also rare in Hodgkin's disease.

In the discussion, Lamy stated that he had seen a number of severe febrile anemias in children with marked diminution in the number of erythrocytes but no changes in the number or character of the leukocytes.

Many of these cases are masked forms of leukemia in which the blood studies do not aid in making a diagnosis. Only such methods as exploratory puncture of the blood-forming structures, such as the spleen or the bones, can help in determining the etiology of the blood changes. Lamy and Debre now carry out puncture of the sternum in children to observe changes in the bone marrow. This is a safe method of diagnosis in children. In adults, puncture of the spleen, as suggested by Emile Weil, is equally useful. Sternal puncture has made it possible to diagnose the blood changes in several recent cases, whereas ordinary examination did not reveal the nature of the disease.

Abscess of the Cerebellum

In a symposium at the annual meeting in April of the French Otoneuro Ophthalmologic Congress, papers were read by Ramadier and Caussee (otologists), Andre-Thomas and Barre (neurologists) and Velter (ophthalmologist). Abscess of the cerebellum most frequently occurs in cases of chronic otitis media. There are symptoms that are of value in localizing the seat of the infection. For example, bradycardia is far more marked in cerebellar than in cerebral abscess. The headache is typical also, being occipital. The neck rigidity stands out in most cases in contrast with the complete absence of the Kernig sign.

Choked disk is more common in cerebellar abscess than optic neuritis, the reverse being true of cerebral abscess. The loss of muscle tonus on the same side of the body as that on which the abscess is situated is an early sign that should always be looked for. The evidences of vestibular disturbance are of almost equal value to the cerebellar symptoms themselves. Spontaneous nystagmus is especially frequently observed.

Death from respiratory paralysis is not uncommon.

Many cases are not diagnosed because the clinical signs are atypical. In a small number of patients the symptoms are manifold and diagnosis is not difficult. In others, some complication, such as diffuse meningitis, thrombophlebitis or labyrinthitis, obscures the underlying condition or the patient is seen in a comatose condition.

The operation should be done in two steps. In the first, the overlying bony structures are removed. Much information as to the existence of vascular or meningeal complications is thus obtained. After an interval of from twenty-four to forty-eight hours, the second step is undertaken to drain the abscess.

The prognosis even in cases in which operation is performed is unfavorable, the mortality varying from 70 to 75 per cent because of the difficulty of finding the abscess even when diagnosed and the fact that even drainage does not prevent the appearance of such complications as encephalitis or meningitis.

Professor Weinberg Elected Fellow of Academy of Medicine

At the July 2 meeting of the Academy of Medicine, Prof. M. Weinberg of the Pasteur Institute was elected a fellow. He is best known to American readers by his work on gangrene-producing infections and the effort to control them by a specific serum. The latter research was begun during the World War and has been continued without interruption at the Pasteur Institute, finally resulting in the preparation of a polyvalent serum that includes antitoxins to combat the five most common forms of severe bacterial infection ending in gas production, gangrene and widespread edema.

At the beginning of the war, before trench fighting began, the only known form of rapidly fatal gas producing infection was that known as "gas gangrene" due to the bacillus of Welch-Nuttall (*B. perfringens*). Weinberg prepared a serum and cured two cases of "gas gangrene," one at the English military hospital, at Versailles, and the other at the American Ambulance at Neuilly near Paris. With trench warfare, when the soil was contaminated with the human and animal excreta,

the bacterial flora of wound infection became more complex. Weinberg was the first to isolate *Vibrio septique*. Then, with Seguin, he found *Bacillus oedematiens*, which produces widespread edema without gas formation. Another organism, *Bacillus histolyticus*, was found in rapidly fatal infections. This bacillus not only elaborated fatal toxins but secreted a ferment that digested fibrous tissue, leading to rapid destruction of important supporting structures, so that in animals following its injection spontaneous amputation of the involved limb occurred. Finally *Bacillus sporogenes* was found by Weinberg in cases of gas gangrene. This organism also dissolves all tissues and favors the development of the gas gangrene bacilli.

In cases of the latter form of infection, Weinberg has found that a polyvalent serum containing the antitoxins prepared following injections of these various types of bacteria should be employed as early as possible and in large doses, from 80 to 100 cc daily. This polyvalent serum will thus neutralize the toxin and tissue destruction due to the five most commonly found bacteria viz. the Welch Nuttal bacillus, *Vibrio septique*, *Bacillus oedematiens*, *Bacillus histolyticus* and *Bacillus sporogenes*. The last named is the most proteolytic of all and produces a very fetid odor in wounds.

More recently Papin, a urologist, has employed this polyvalent antgangrenous serum and an anticolibacillary serum as prophylactics in all operations on the prostate. No accidents have been observed in 450 cases.

Weinberg in many publications has advocated in the treatment of gangrenous appendicitis complicated by peritonitis these two serums mixed with a third, a complementary serum prepared to combat the secondary organisms found in appendicitis.

BERLIN

(From Our Regular Correspondent)

Aug 5 1935

Regulations Controlling the Sale of Medicines

A recent order issued by the minister of the interior established the Reichsarbeitsgemeinschaft für Arznei- und Heilmittelwesen. The merger will handle all questions pertaining to the manufacture and sale of medicines and remedies so far as they affect the public health but will not deal with the purely economic aspects of the problem. Questions coming within its jurisdiction will be carefully considered and the conclusions forwarded to the ministry of the interior. The merger will serve as mediator between all interests that are concerned with the manufacture and sale of medicines and remedies and will endeavor, from the more exalted standpoint of the general welfare, to take a middle-of-the-road position and to effect a compromise, while taking account of the existing economic conditions. The membership of the merger comprises all the industrial leagues concerned with the manufacture and sale of medicines and remedies, together with representatives of the physicians, the pharmacists and (which is especially significant) the nature cure practitioners. The director (at least in scientific circles) has been subjected to many bitter attacks. He is said to have sold at high prices cheap organic acids which served as remedies in his self-invented 'acid therapy,' for which the indications were of an almost endless nature.

Under the direction of the bureau of public health of the national-socialist party, the Arbeitsgemeinschaft für Heilpflanzenkunde und Heilpflanzenbeschaffung, with which all persons interested in the question of the curative values of herbs and plants may associate themselves, has been formed. The purpose of this merger is to unite under uniform standards and a common directorship all endeavors pertaining to medicinal plants and to test and elaborate the problem from the standpoints of public health, science and economics. The direction is in the hands of the reichsarztelführer, or federal leader of

medicine. From various German books that have been published recently, some of which have been caustically reviewed in THE JOURNAL, may be seen how far these endeavors go beyond the limits of scientific research.

Interest attaches to the new modes of criminal procedure that the federal minister of justice has established in connection with charges brought for violations of the regulations pertaining to the manufacture and sale of medicinal remedies. One reads therein. The sale of medicinal remedies in violation of established laws constitutes a serious menace to public health. Violations of the provisions governing the dispensing of medicines outside of pharmacies are especially frequent. It has been observed that medicines that may be dispensed in pharmacies only on medical prescription are often sold, on account of lack of knowledge, in general stores directly over the counter, without any form of prescription. Sharp measures will be taken to check such flagrant violations of the law.

The Tasks of Aviation Medicine

Aviation medicine is controlled by a separate department of the federal air ministry. In recent years special chairs in aviation medicine have been established at some universities, while at others certain instructors have been selected to give courses in aviation medicine. The tasks of aviation medicine were recently concisely described by Dr. Hippke, director of the medical department of the air ministry. The principal task of aviation medicine is to find the hygienic conditions under which man is able to live and carry on in the air. In the new environment the air man may be exposed to unknown dangers and injuries against which his body is not prepared to defend itself. To recognize these damaging influences of the air and to provide means of defense is the task of aviation medicine. Mention need be made only of the consequences of changes in air pressure, of oxygen deficiency of intense cold, of exhaust gases of centrifugal force and of sudden acceleration of speed. In addition to these problems and the research to discover means of protection in the form of drugs, special diets and suitable equipment there is also the organization of means of testing at the numerous aviator testing centers, such candidates as apply for important posts. The leading institutions of research in this field are the Luftfahrtmedizinisches Forschungsinstitut des Reichs-Luftfahrtministeriums, located in the Berlin Medicomilitary Academy, and the Institut für Luftfahrtmedizin in Hamburg. There are, however, several other institutions that cooperate for example, the Kerckhoff Institut für Kreislaufforschung in Nauheim. A special committee for aviation medicine appointed by the Vereinigung für Luftfahrtforschung controls the distribution of labor, utilization of the results of research and financing. The medical department of the Reichs-Luftfahrtministerium serves as a clearing house of information on aviation problems.

Marriages

BEAUFORD IVAN PIPPIN, Richland Center, Wis., to Miss Mildred Forseth of La Crosse at Nashua, Iowa, June 30.

JAMES CHARLES BRADHAM, Johnsonville, S. C., to Miss Frances Kirkpatrick Campbell at Pacolet Mills, July 18.

HENRY JOSEPH BAYON, Jr., Neuilly-sur-Seine, France, to Miss Ada Holmes Davis in Paris, September 7.

EDWARD STEPHEN STAFFORD, Baltimore, to Miss Frances S. Lowell of Winchester, Mass., September 28.

CHARLES ATLAS BLAND, Clover, Va., to Miss Mary Ernest Johnson of Louisville, N. C., August 31.

BYRON WEBSTER BEATTY, to Mrs. Helen Canny, both of Dayton, Ohio, in Tampa, Fla., July 18.

WILLIAM CHARLES WOJTA, to Miss Audrey Le Claire, both of Fond du Lac, Wis., June 25.

Deaths

William Hamlin Wilder ♂ professor emeritus of ophthalmology at Rush Medical College, died at his home in Chicago, September 24, of cerebral arteriosclerosis and paralysis agitans, aged 74. Dr Wilder was born in Covington, Ky., and received his early education at Farmers College, College Hill, Ohio. He received the B.A. degree at Belmont College in 1878 and his medical degree from the Medical College of Ohio Cincinnati, in 1884. He also pursued postgraduate study in the University of Göttingen in 1889 and the University of Vienna in 1890. He began the practice of medicine in Cincinnati in 1884 and removed to Chicago in 1892. In 1907 he became professor of ophthalmology at Rush Medical College and was made professor emeritus in 1926. He served as honorary surgeon to the Illinois Eye and Ear Infirmary and as ophthalmologist to the Presbyterian Hospital. He was chairman of the Section on Ophthalmology of the American Medical Association in 1907-1908 and a member of the House of Delegates during 1926-1927, 1928-1930 and 1931. He was a member and also president in 1931 of the American Academy of Ophthalmology and Otolaryngology, member of the American Ophthalmological Society and president in 1918, member and vice president of the Illinois Society for the Prevention of Blindness, and fellow of the American College of Surgeons. In May 1935 Dr Wilder was awarded the ninth annual Leslie Dana Gold Medal, given by the St. Louis Society for the Prevention of Blindness for outstanding contributions in the preservation of sight. During the World War Dr Wilder served as a major in the Medical Reserve Corps. Dr and Mrs William H. Wilder established recently the William H. Wilder Fellowship in neurology in memory of one of their sons. Another son, Dr Russell Morse Wilder, is a member of the staff of the Mayo Clinic. Dr Wilder contributed notably to preventive medicine in the field of ophthalmology, his most significant efforts concerning trachoma, ophthalmia neonatorum and the rehabilitation of the blind. He also worked assiduously in the promotion of higher standards in ophthalmologic practice, and he was instrumental in the establishment of the American Board of Ophthalmology, giving this organization years of service as secretary.



WILLIAM HAMLIN WILDER
1860-1935

Charles Willis Garrison ♂ Lexington, Ky., Memphis (Tenn.) Hospital Medical College, 1905, at one time secretary of the Arkansas State Board of Health and state health officer, formerly health officer of Lexington, past president of the Conference of State and Provincial Health Authorities of North America, in 1924 appointed United States representative to the League of Nations health conference in Geneva, Switzerland, formerly professor of preventive medicine, University of Arkansas School of Medicine, Little Rock, aged 56, died August 26, in the Julius Marks Sanatorium, of pulmonary tuberculosis.

John Henry Blodgett ♂ Bellows Falls, Vt., University of Vermont College of Medicine, Burlington 1897, member of the Associated Anesthetists of the United States and Canada, past president of the Windham County Medical Society, formerly member of the state legislature and state senator, on the staff of the Rockingham General Hospital, aged 67, died August 2, of diabetes mellitus, cerebral hemorrhage, and arteriosclerosis.

Eugene Julius Grow ♂ Medical Director, Captain, U.S. Navy, retired, Lebanon, N.H., Dartmouth Medical School, Hanover, N.H. 1897, entered the navy in 1898, instructor at

the U.S. Naval Medical School from 1913 to 1917, served during the World War, fellow of the American College of Surgeons, aged 61, died, September 5, of hypertensive heart disease and cerebral thrombosis.

John Otto Groos, Escanaba, Mich., College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902, member of the Michigan State Medical Society, past president and secretary of the Delta County Medical Society, on the staff of St. Francis Hospital, aged 66, died, August 14, of chronic myocarditis.

Wesley Warren Wallace, Bolivar, Tenn., Memphis Hospital Medical College, 1910, member of the Tennessee State Medical Association, formerly member of the state legislature on the staff of the Western State Hospital, aged 52, died, July 27, in the Baptist Memorial Hospital, Memphis, of carcinoma of the bladder and lobar pneumonia.

Daniel Witwer Weaver ♂ Greensburg, Ind., Hahnemann Medical College and Hospital of Philadelphia, 1896, past president and secretary of the Decatur County Medical Society, mayor of Greensburg on the staff of the Decatur County Memorial Hospital, aged 62, died August 26, in a hospital at Madison, Wis., of coronary sclerosis and thrombosis.

Svenning Dahl, Chicago, College of Physicians and Surgeons of Chicago, 1890, member of the Illinois State Medical Society, formerly on the staff of the Norwegian-American Hospital, on the staff of the Lutheran Deaconess Hospital, aged 78, died, August 18, of chronic myocarditis and arteriosclerosis.

William Allen Held, West Unity, Ohio, Chicago Homeopathic Medical College, 1897, member of the Ohio State Medical Association, past president of the Williams County Medical Society, county health officer, aged 67, died, August 11, in the Wauseon (Ohio) Hospital, of cerebral hemorrhage.

George Llewellyn Cole ♂ Los Angeles, Bellevue Hospital Medical College, New York, 1886, at one time professor of therapeutics and clinical medicine, University of Southern California School of Medicine, aged 73, died suddenly, August 19, of heart disease, while visiting a patient.

Clyde Leander Vorhies, Cambridge, Ohio, Starling-Ohio Medical College, Columbus, 1911, member of the Ohio State Medical Association, formerly city health officer, aged 47, died, July 26, in the Barnes Hospital, St. Louis, following an operation for tuberculosis of the lungs.

Francis Joseph Powers, South Bend, Ind., Northwestern University School of Medicine, Chicago, 1908, member of the Indiana State Medical Association, physician to Notre Dame University for many years, aged 62, died, September 17, in St. Joseph's Hospital, of heart disease.

Charles Wesley Griffith, La Porte, Texas, Starling Medical College, Columbus, 1897, veteran of the Spanish-American and World Wars, president of the school board, aged 61, died, July 22, in a hospital at Houston of hemorrhagic necrosis of the pancreas and chronic cholangitis.

Frank Matthews Harrison, Napoleon, Ohio, Jefferson Medical College of Philadelphia, 1896, member of the Ohio State Medical Association, secretary of the Henry County Medical Society, on the staff of the S. M. Heller Memorial Hospital, aged 65, died August 22.

John Jay Ingram, Decatur, Texas, Vanderbilt University School of Medicine, Nashville, Tenn., 1892, member of the State Medical Association of Texas, past president and secretary of the Wise County Medical Society, formerly county health officer, aged 73, died, July 30.

Benejah Gibson Wilbert, Plaquemine, La., Tulane University of Louisiana Medical Department, New Orleans 1906, member of the Louisiana State Medical Society, aged 51, died June 4, in the Plaquemine Sanatorium, of myocarditis and arteriosclerosis.

Carl Austin Weiss Jr. ♂ Baton Rouge, La., Tulane University of Louisiana School of Medicine, New Orleans, 1927, on the staff of Our Lady of the Lake Sanatorium, aged 29, was shot and killed, September 8, when he assassinated Senator Huey Long.

James Luther White, Henderson, Tenn., Memphis Hospital Medical College, 1908, veteran of the Spanish-American War, aged 62, died, July 16, in the Veterans Administration Facility, Memphis, of chronic nephritis and pulmonary edema.

John Joseph Slevin, New York, Long Island College Hospital, Brooklyn, 1900, member of the Medical Society of the State of New York, aged 58, died, August 31, in the Midtown Hospital, of bronchopneumonia and chronic myocarditis.

David Cohn, San Francisco, Medizinische Fakultät der Friedrich-Wilhelms-Universität, Berlin, Germany, 1861, member of the California Medical Association, aged 97, died, August 2, of chronic myocarditis and arteriosclerosis

Sidney Joseph Francis, Luling, Texas, Tulane University of Louisiana Medical Department, New Orleans, 1889, member of the State Medical Association of Texas, aged 68, died, August 3, in Rochester, Minn., of brain tumor

Louis William Thompson, Laurens, S. C., Meharry Medical College, Nashville, Tenn., 1911, aged 54, died, July 12, in the Anderson (S. C.) County General Hospital, of cerebral hemorrhage and cardiovascular renal disease.

James Condra O'Hare, Toledo, Ohio, Loyola University School of Medicine, Chicago, 1935, aged 30, intern at the Lucas County General Hospital, where he died, June 4, of streptococcal cellulitis of the arm and chest

Cecil Garrenton ♂ Bethel, N. C., Medical College of Virginia, Richmond, 1908, past president of the Pitt County Medical Society, aged 52, died, August 10, in the Rocky Mount (N. C.) Sanitarium, of pyonephrosis

Walter William Harris, Bloomington, Ind., Louisville (Ky.) Medical College, 1889, member of the Indiana State Medical Association, served during the World War, aged 69, died August 20, of coronary thrombosis

Harris Garcelon, Arrowhead Springs, Calif., University of Southern California College of Medicine, Los Angeles, 1904, member of the California Medical Association, aged 55, died, August 1, of cerebral hemorrhage

John Junsford Tracy, Sylvester, Ga., University of Georgia Medical Department, Augusta, 1899, member of the Medical Association of Georgia, aged 61, died, July 19, of carcinoma of the prostate

Charles William Kirsch, Hollis, N. Y., Georgetown University School of Medicine, Washington D. C., 1930, aged 28, died, August 22, in the Van Wyck Hospital, Jamaica, of acute appendicitis

Charles Heald Bennett, Sodus, N. Y., Albany (N. Y.) Medical College, 1897, member of the Medical Society of the State of New York, aged 62, died, July 22, of diabetes mellitus and myocarditis

Freeman Clark Wight, Millis, Mass., Tufts College Medical School, Boston, 1921, member of the Massachusetts Medical Society, aged 63, died suddenly, August 4, in Boston, of coronary thrombosis

John P. Wells, Paintsville, Ky., University of Louisville Medical Department, 1909, member of the Kentucky State Medical Association, aged 55, died suddenly, August 19, of heart disease

Mercedes Annette Roberts, Philadelphia, Woman's Medical College of Pennsylvania, Philadelphia, 1904, aged 69, died, August 31, in the Woman's Hospital, of intestinal obstruction

Wheaton Fregeau, New York, University of California Medical School, San Francisco, 1931, aged 29, on the staff of the Willard Parker Hospital, where he was found dead, August 19

John Ellery Lardner Pollard, Hantsport, N. S., Canada, L. R. C. P., Edinburgh, Scotland L. R. C. S., Edinburgh, L. R. F. P. S., Glasgow, 1894, aged 72, died, June 20, of heart disease and influenza

Simon S. Brumbaugh, Philadelphia, Missouri Medical College, St. Louis, 1878, member of the Medical Society of the State of Pennsylvania, aged 83, died, August 13, of heart disease

Jasper Clayton Holland, Grove, Okla., Tennessee Medical College, Knoxville, 1893, aged 68, died, June 29, of burns received when he mistook gasoline for kerosene while building a fire

Joseph Stuart Hume ♂ Norfolk, Va., University of Virginia Department of Medicine, Charlottesville, 1912, served during the World War, aged 45, died, July 29, of heart disease

John Childs Christopher, Choctaw, Ala., Louisville (Ky.) Medical College, 1894, member of the Medical Association of the State of Alabama, aged 70, died, August 10, in Lavaca

Silas Bish Frankhauser ♂ Hillsdale, Mich., Rush Medical College, Chicago, 1894, formerly mayor of Hillsdale, on the staff of the Hillsdale Hospital, aged 66, died, September 2

Robert Andrew Kitto, Racine, Wis., Rush Medical College, Chicago, 1885, aged 72, died, July 25, in the Health Resort, Oconomowoc, of arteriosclerosis and myocarditis

Dellizon Arthur Foote, Omaha, Chicago Homeopathic Medical College, 1887, fellow of the American College of Surgeons, aged 75, died, August 25, of coronary occlusion

Henry Andrew Brandebury ♂ Huntington, W. Va., Miami Medical College, Cincinnati, 1891, formerly mayor of Huntington, aged 78, died, August 18, of coronary occlusion

Ralph Morton Bolman ♂ Fort Wayne, Ind., Fort Wayne College of Medicine, 1905, on the staff of St. Joseph Hospital, aged 57, died, August 19, of coronary occlusion

Edward Blais Woodward, Yardville, N. J., University of Pennsylvania Department of Medicine, Philadelphia, 1896, aged 64, died, August 9, of cirrhosis of the liver

Benjamin H. Guilbeau, Sunset, La., Tulane University of Louisiana Medical Department, New Orleans, 1885, aged 75, died, August 4, of debility following influenza

Joseph Boone Holmes, Hulbert, Ark., Memphis (Tenn.) Hospital Medical College, 1900, aged 63, died, July 29, of cerebral hemorrhage and arteriosclerosis

John Preston Huff, Flemingsburg, Ky., Eclectic Medical Institute, Cincinnati, 1885, Civil War veteran, formerly state senator, aged 88, died, August 18

Philip Hecht, Brooklyn, Long Island College Hospital, Brooklyn, 1931, aged 27, died, August 29, in the Beth El Hospital of pneumococcal meningitis

Matthew Charles Wessel, Trenton, N. J., Hahnemann Medical College and Hospital of Philadelphia, 1923, aged 37, died, September 7, of septicemia

David Carson Davis ♂ Higginsville, Mo., University of Cincinnati College of Medicine, 1921, aged 39, died, June 26, of a self-inflicted bullet wound

Raymond John Cluen, San Leandro, Calif., Drake University Medical Department, Des Moines, Iowa, 1901, aged 55, died, August 7, in Oakland

Norris F. Conner, Red Key, Ind., Eclectic Medical Institute, Cincinnati, 1879, aged 76, died, August 20, of cardiovascular renal disease

Rupert Albert Schrankel ♂ Buffalo, Cornell University Medical College, New York, 1922, aged 38, died, September 5, of cyanide poisoning

Thomas Bernard Patterson, Prescott, Ont., Canada, Queen's University Faculty of Medicine, Kingston, 1923, aged 43, died, August 5

Carl Overy Apps, Mount Pleasant, Ont., Canada, McGill University Faculty of Medicine, Montreal, Que., 1923, aged 40, died July 31

David Kirk White, Shaker Heights, Ohio, Western Reserve University Medical Department, Cleveland, 1886, aged 69, died, July 15

William Patrick Mackasey, Halifax, N. S., Canada, Dalhousie University Faculty of Medicine, Halifax, 1914, aged 54, died recently

Harry Macdonald Parnell, St. Catharines, Ont., Canada, University of Toronto Faculty of Medicine, 1923, aged 35, died, August 9

Melvin Gray, Mountain View, Okla., Eclectic Medical University, Kansas City, Mo., 1900, aged 68, died, July 11, of a brain tumor

Thomas H. Forster, Amelia, Ohio, Medical College of Ohio, Cincinnati, 1897, Civil War veteran, aged 92, died, August 11

Donald Erskine Baxter ♂ Glendale, Calif., University of Louisville (Ky.) School of Medicine, 1909, aged 52, died, July 30

Willard Gillette, Roseboom, N. Y., Albany (N. Y.) Medical College, 1882, aged 79, died, August 12, of chronic myocarditis

Alexander C. Foster, London, Ky., Hospital College of Medicine, Louisville, 1897, aged 63, died, August 12, of carcinoma

Georgianna Warren Harris, Seattle, Hahnemann Medical College and Hospital, Chicago, 1890, aged 80, died, August 15

William Wallace Bennett ♂ Blackstone, Va., University College of Medicine, Richmond, 1899, aged 66, died, August 3

Joseph Martin Hitch, Laurel, Del., Baltimore University School of Medicine, 1897, aged 64, died, September 2

Andrew K. Worthington, Denver, St. Louis Medical College, 1883, aged 75, died, July 27

Correspondence

CEVITAMIC ACID AND CAPILLARY FRAGILITY

To the Editor—In a communication, in *THE JOURNAL*, June 29, page 2384, Dr Gilbert Daildorf concedes to Dr Irving Sherwood Wright the priority of claim of having first reported on the effect of cevitamic acid on capillary fragility. I think there is a certain amount of danger in specializing claims of that sort. Readers not acquainted with the literature might be led to believe that the idea was altogether new. This is not the case. Alfred F. Hess stated in his monograph on scurvy (*Scurvy Past and Present*, Philadelphia, J. B. Lippincott Company, 1920, p. 212) that he had obtained normal capillary fragility in scorbutic children when antiscorbutics (now known to contain cevitamic acid) were given. The work of Gothlin (1931) has later added new interest to the subject. Furthermore, the claim is not quite correct. In 1933 I (*Treatment of Scurvy in Man with Intravenous Injection of Ascorbic Acid*, *Lancet* 2:589 [Sept. 9] 1933) gave the full details concerning a patient suffering from manifest scurvy who was cured by intravenous injections of ascorbic (cevitamic) acid. This patient had an increased capillary fragility that became normal in the course of treatment.

POUL SCHUITZER, M.D., Copenhagen

IN DEFENSE OF THE FASCIA LATA AND THE ILIOTIBIAL BAND A COMMENT ON BACK STRAIN AND SCIATICA

To the Editor—Occasionally in the history of surgery, and in the development of the surgeon's armamentarium, there has arisen an apparent necessity of defending certain tissues in the human body, against hasty and unwarranted surgical attacks. Rarely has it been necessary to defend the deep fascia of the body. Recently there appeared in *THE JOURNAL* (May 4, p. 1580) an article by Dr. Ober entitled "Back Strain and Sciatica," which prompts this defense of the fascia lata and the iliotibial band.

The dual purpose of this communication is, first, to correct some misconceptions of anatomy expressed in Dr. Ober's paper and, secondly, to prevent an epidemic of dangerous operations on this structure.

Under pathology, he has written "It has been observed in many patients with low back disturbances that the iliotibial band is extremely tight and prominent when the patient is lying on his back, with the knees together." It is enough to point out that in the adducted position, with the knees together, the fascia lata and the iliotibial band are normally taut. This is a constant finding, and, if they are not tight, one considers a diagnosis either of fracture of the hip with displacement or of dislocation of the hip.

In the same paragraph, some attention is given to the position of the iliotibial band in relation to the great trochanter. In reality, the relationship of the band to the trochanter at any one moment depends on whether the lower extremity is in internal rotation, midposition or external rotation, and whether the body is flexed or extended at the hips. It is entirely obvious that the great trochanter moves freely anteriorly and posteriorly under the iliotibial band with each movement of external and internal rotation, and that, when the lower extremities are fixed, the iliotibial band moves anteriorly and posteriorly over the trochanter with each movement of flexion and extension of the pelvis on the femoral heads.

The inconsistency of the author at this point is a bit startling. Concerning the iliotibial band, he has written (p. 1580), "This snapping sensation is due to the riding of the band back and forth over the trochanter." It is evident that movement of

the trochanter beneath the fascia lata, or movement of the fascia lata over the trochanter, is here recognized. He proceeds to state that "When both bands are tight and in front of the trochanter, the lumbar spine is held in lordosis, in both the standing and recumbent positions. If contracture is posterior to the trochanter, the spine is held in a lumbar kyphosis." Between the two quotations, the author seems to have withdrawn his recognition of movement between the iliotibial band and the trochanter.

In point 4, under examination, he outlines his procedure in obtaining "the most important diagnostic sign of the contracture." A moment's consideration reveals the importance of this diagnostic sign and the manner in which Dr. Ober's entire thesis with the suggested operative procedure depends on its validity. If it is a true sign, it is a valuable addition to the art and science of physical diagnosis. If it is false, it is pernicious and should be exposed. In checking the soundness and truth of any clinical sign its application to normal individuals is a rapid and revealing method. If the sign is present in normal persons in a high enough percentage to remove its occurrence from the realm of coincidence, one feels that the sign is worthless or of questionable value.

Dr. Ober's sign for contracture of the iliotibial band may be epitomized by stating that a lower extremity is placed in the position of full extension or hyperextension, wide abduction and internal rotation with right angle flexion of the knee, and with the patient on his side. Internal rotation is obtained by lightly holding the patient's ankle, while the weight of the extremity tends to drop the knee down toward the table, thereby yielding rotation inward. The degree of internal rotation possible in full abduction is very slight or nil, and in this test full internal rotation is probably obtained.

Time has not permitted the study of a large series of cases, but I have found this sign positive in four of seventeen normal individuals, in whom the extremity remained locked in abduction when the examiner's hand was entirely removed from contact with the extremity. In another ten persons it was found that a very light pressure on the ankle, holding it back in hyperextension, caused the extremity to remain in abduction. In the remaining three patients the sign was negative. When performing the test, one must see that full extension is maintained. While the maneuver cannot be recommended as a parlor trick, it nevertheless creates some amusement on the part of the onlookers, and no little amazement on the part of the subject.

A possible explanation of the abduction-locked extremity may be found in the following facts. Abduction loosens the iliotibial band, just as adduction tightens it. Flexion of the knee also loosens it somewhat and carries the band's insertion posteriorly. Both internal rotation and full extension of the extremity carry the great trochanter anteriorly, in relation to the iliotibial band. As the extremity is released to go from abduction toward adduction, with the knee flexed to a right angle, and the extremity held in internal rotation, the band becomes taut posterior to the trochanter and is caught in that position. This brings one to the interesting observation that, with the abducted extremity internally rotated, if the ankle is held higher from the examining table than the knee is held, the band actually becomes an internal rotator of the lower extremity, when the knee is flexed at a right angle. That is to say, both the trochanter and the knee joint are anterior to the origin and insertion of the iliotibial band, and the tension produced in it by dropping the extremity downward from abduction develops a force in the direction of internal rotation. It so happens that the powerful external rotator of the thigh, the gluteus maximus, is relaxed in the position of full extension, as set forth in Dr. Ober's sign. In the foregoing maneuver the thigh has been placed in full internal rotation to begin with, and therefore the extremity is locked in abduction.

Ordinarily, when a contracture is spoken of, the long continued contraction of the muscles whose tendons are involved is taken for granted. White fibrous tissue, such as the fascia lata and the iliotibial band, has no power of contraction in itself. Approximately one half of the gluteus maximus muscle inserts on the fascia lata and it is the posterior tensor of the fascia. It probably controls the fascia lata to a greater degree than does the smaller tensor fasciae latae muscle.

It is a known fact that in certain cases of low back strain and sciatica the gluteus maximus is under tension, i. e., the patient has difficulty in relaxing it. In cases of long standing sciatica one may also see an atrophy of the gluteus maximus as well as of the muscles of the thigh. A transverse section of the fascia in such a patient will further handicap an already weakened extremity.

The danger of such an operative procedure is admirably set forth by Allis in his *Gross Prize Essay of 1896 (An Inquiry into the Difficulties Encountered in the Reduction of Dislocation of the Hip)*, page 22 where he relates the following:

In December 1884 I was seized with a pain in the outer aspect of my right thigh which soon developed into an abscess beneath the fascia lata. In order to facilitate drainage I requested Dr. D. Hayes Agnew to cut the fibers of the fascia transversely. This he did and on my recovery after nine weeks of recumbency I was not a little surprised at the insecurity of the head of the femur which became partially dislocated with each step and returned with a decided jar and an audible sound. This could not have been due to anything but the division of the fascia lata and its consequent lengthening and changed relations which withdrew the normal pressure from the trochanter, thus a joint that had never exhibited the slightest disease or tendency to insecurity before the division of the fascia became subsequently upon my first use of it so unstable that I feared for a time that a synovitis would ensue from the constant concussion occasioned by even the gentlest use. By degrees the tensor muscles shortened and reestablished their former control but the security has never fully returned.

In the same work, which should have a much wider reading public than its limited edition has permitted, Allis lists the different functions of the fascia lata. A few of these are first as a tensor of the deep muscles of the thigh, second as a check against the tendency to dislocation of the hip, third as a support for the body at rest while the individual shifts his weight from one extremity to the other with alternate adduction from side to side as the pelvis drops down toward the weight bearing extremity, and fourth its hammock function. It has been my pleasure to verify the work of Allis repeatedly and to record my observations in papers on Perthes' disease on posture in relation to flat feet, and on the treatment of fractures of the hip by adduction.

Dr. Ober's suggested operation represents a tenotomy of the tensor fasciae latae muscle and about one half of the gluteus maximus muscle at one stroke. He observed a separation of the fascia from its insertion when cut, varying from three-fourths inch to 1½ inches. The amount of this separation depends, of course, on whether the extremity is in adduction or abduction when the fascia is cut.

Regarding the gluteus maximus, the operation is a sacrifice of one half the power of that side, to extend the trunk on the hip from the flexed position, with a consequent strengthening of its chief antagonist, the iliopsoas. If both sides are cut an exaggeration of the lumbar lordosis should be anticipated, owing to the increased influence of the iliopsoas muscles. The operation is also a sacrifice of about one half the power of external rotation.

Six or eight weeks in a plaster cast, with the extremity in hyperextension and abduction, would seem a more reasonable price to pay for relaxation of the gluteus maximus muscle. I shall be very much interested in Dr. Ober's end-result study of these patients.

L. C. SNODGRASS, M.D., Philadelphia

[This letter was submitted to Dr. Ober, who replies.]

To the Editor—In the first paragraph, Dr. Snodgrass suggests that the article "Back Strain and Sciatica" is a "hasty

and unwarranted attack." My work was not hasty nor do I think in the light of what has transpired since, an illegal attack on the iliotibial band and fascia lata. The fascia lata has been used for many years as suture material in repair of anatomic difficulties, large sheets of fascia have been employed to repair tissue elsewhere, it has a widespread use in arthroplasty of joints. Dr. Robert Soutter published the description of an operation many years ago for the relief of hip joint contracture which included division of the iliotibial band and many of his colleagues all over the country, including myself, have performed this operation without any untoward results of function of the hip joint. The same operation has been performed also for abduction contracture of the hip many times in the last two years.

My operation is not dangerous. In the last fourteen months my associates and I have performed this operation on forty-two patients, both hips having been operated on in several instances. Dr. Benjamin Farrell of New York has performed nineteen, Chas. Murray has done eight, Maxwell Harbin of Cleveland several and there are many other instances in which men have done the operation with satisfactory results. Dr. Snodgrass talks about vagueness of diagnosis and etiology. Everybody who has to deal with low back conditions knows that diagnosis is not always certain and I feel that I have added one more approach that will help solve the situation. It is distinctly stated in the original article that the abduction sign is important when x-ray evidence of low back condition is lacking. That does not mean that I disregard all other clinical evidence of lumbar back conditions.

The iliotibial band is extremely tight and prominent when the patient is lying on his back with his knees together. Dr. Snodgrass quotes. It is enough to point out that in the adducted position with the knees together, the fascia lata and the iliotibial band are normally taut. The answer to this is that the thighs cannot be adducted with the knees together because this is considered the neutral anatomic position and there should be from 15 to 30 degrees more of passive adduction from this position without moving the pelvis.

The relation of the iliotibial band to the greater trochanter is always the same whether the patient is lying on his back or is standing. It changes with flexion and rotation of the hips, but the two ends of the band are always in the same position, since they are firmly attached above to bone and below to intramuscular septum and along the lateral aspect of the femur and continued down to the head of the tibia and fibula.

I do not understand the point about the "inconsistency." The snapping sensation of which I speak refers to the condition known as "snapping hip" and other authors have pointed out that snapping hip is due to an increased thickening of the posterior part of the iliotibial band. For years many have treated and cured snapping hips by dividing the iliotibial band and have had no bad results.

Dr. Snodgrass further quotes from my original article, "When both bands are tight" and then hints that I have left out something of importance. That is not so, because I am speaking of a patient who is either standing or lying with the legs in the neutral position.

With regard to the sign in normal individuals, if there is a marked abduction contracture the patient is not a normal individual. He may have a lumbar lordosis, an exaggerated flat back, short posterior leg muscles, a lame back or, what is almost as important, a disturbance of posture.

Dr. Snodgrass has seen fit to add internal rotation to my method of examination. It is distinctly stated in my article that the thigh is abducted and extended in line with the body, nothing is said about internal rotation, external rotation or any other positions except abduction and extension. The object of

having the knee flexed and of holding the ankle as described is to help the leg in neutral position as regards rotation

I do not understand the fictitious reference to "the parlor trick, amusement of the onlookers and the amusement of the subject" In all my experience of examining patients, this trilogy of levity has never been observed and I do not think that making this test is any more of a parlor trick than testing knee jerks, straight leg raising or a hand grasp Dr Snodgrass refers to his examination He found the sign positive in four of seven normal individuals in whom the extremity remained locked in abduction, three in whom the sign was negative, and ten in whom the sign was faintly positive It seems to me that I ought to be given an opportunity of seeing these so-called normal individuals My colleagues throughout the country tell me that they do not find many cases in which the abduction sign is positive.

Flexion of the knee does not loosen the iliotibial band when it is tight As a matter of fact, if one tries to flex the knee beyond a right angle the abduction position increases and again I would reiterate that the extremity is never held in internal rotation, as Dr Snodgrass claims

More than one half of the gluteus maximus muscle is inserted into the fascia lata, but it is doubtful whether this muscle has more control of the fascia than the tensor That is, any more than the plantar flexors of the foot have a greater control than the dorsal flexors, although the pull of the plantar flexors is in ratio ten to one.

Everybody who treats lame backs knows that there is atrophy of the gluteus maximus muscle and often of the thigh muscles Dr Snodgrass says "A transverse section of the fascia in such a patient will further handicap an already weakened extremity" How is Dr Snodgrass so sure that this is true since it is evident that he has not performed the operation? In my experience most of the patients with unilateral involvement are able to resume light work in four days and those with bilateral involvement in two weeks without difficulty, provided the sciatica disappears

With regard to the Allis Gross Prize Essay of 1896, is it not possible that Dr Agnew cut the fascia in such a way that the healing resulted in a snapping hip instead of a hip joint lesion?

A patient with a strong iliotibial band contracted in the abducted position but without any power in the abductor muscles in walking always lists toward the paralyzed side and does not walk with alternating adduction from side to side as Dr Snodgrass claims

The statement of Dr Snodgrass that one half of the gluteus maximus muscle is divided at one stroke is a distinct misstatement of the fact The operation is done very carefully The fascia around the tensor fascia lata is divided and then the incision is carried posteriorly and slightly downward, ending just above and slightly posterior to the trochanter, but no part of the gluteus maximus muscle is divided, as Dr Snodgrass states

The operation does not sacrifice one half of the power of the gluteus maximus muscle This is the crux of the situation As paragraph 15 reads, one would think that the function of the gluteus maximus muscle had been ruined forever If in my operation I did something to the gluteus maximus muscle this might possibly be true but since the insertion of the gluteus maximus muscle into the fascia lata and the femur is neither cut nor disturbed no power is sacrificed In cases in which operation has been performed on both sides the lumbar lordosis is not exaggerated as Dr Snodgrass states but is decreased. Hence there is no sacrifice of external rotation

With reference to a plaster cast, orthopedic surgeons and others all over the country have used plaster casts for years in the treatment of sciatica, also bed, braces, traction, drugs and fusion operations, often without satisfactory results Occa-

sionally a plaster spica will give relief, but it does result in a great amount of atrophy of the thigh muscles and patients always object to spicas I do not see that the application of the "cast" is a more reasonable procedure to pay for the relief of sciatica than the division of the iliotibial band

FRANK R OBER, M D, Boston

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed Every letter must contain the writer's name and address but these will be omitted on request

MANOMETRIC READINGS IN PNEUMOTHORAX

To the Editor—Will you please send me reading material on the interpretation of manometric readings in pneumothorax treatment the relation of atmospheric pressure to pneumothorax readings, and any other material you may have on the mechanism of pneumothorax therapy

ANNE B CREMER M D San Haven N D

ANSWER.—An understanding of the development of the intrathoracic negative pressure, on which one depends for the manometer readings in artificial pneumothorax work, is extremely important Before birth the lungs are solid and fill that part of the thoracic cavity not occupied by other structures When respiration begins, the conditions inside the thorax are greatly changed Outside air rushes through the trachea and bronchi into the lungs as the diaphragm descends, and an intrapulmonic pressure is established At the end of expiration in a new-born child all the air has been expelled from the lungs except that entrapped by the collapse of the bronchioles (minimal air) As the thorax enlarges relatively faster than the lungs, the intrapulmonic pressure forces the lungs to expand to fill all available space This, through the elasticity of the lungs, produces a negative pressure Since the intrapulmonic pressure usually is approximately the same as atmospheric pressure, it is obvious that the intrathoracic pressure is equal to one atmosphere less the resistance offered to the intrapulmonic pressure by the elastic tissue of the lungs Therefore the intrathoracic pressure is less than the atmospheric pressure and is spoken of as a negative pressure

Thus, in the normal pleural cavity the pressure is negative When a needle attached to a small syringe containing procaine hydrochloride is inserted into the pleural cavity, the negative pressure actually draws the procaine from the syringe, and one sees the plunger descend, provided it does not fit too tightly With the needle tip still in the pleural cavity, the syringe is replaced by a rubber tubing connected to a manometer Then the negative pressure tends to draw the fluid of the manometer upward on the side to which the tube is connected With ordinary breathing, definite oscillations will be observed in the manometer fluid, that is, when the patient inhales, the intrathoracic negative pressure is definitely increased and the fluid is drawn higher in the manometer When the patient exhales, there is a decrease in the negative intrathoracic pressure and the manometer fluid descends If a water manometer is used, one should not consider the tip of the needle to be in the pleural cavity unless the manometer records a negative pressure of 4 or more centimeters and the fluid in the manometer throughout its oscillations remains well on the negative side. If by accident the tip of the needle penetrates the lung, oscillations may be observed and on deep inspiration a considerable elevation of fluid on the negative side of the manometer is observed However, on expiration one usually observes an equally great positive pressure The proper manometer readings are of great significance since if air is introduced into the lung it may find its way into blood vessels and result in gas embolus, which is a distressing situation and may cause the death of the patient

When one is certain from the negative manometer readings that the tip of the needle is in the pleural cavity, one may safely introduce from 200 to 300 cc of air in most cases, but, during the introduction of this amount, manometer readings should be taken frequently to make sure that the needle has not moved so as to penetrate the lung or to have slipped out of the pleural cavity Moreover, the pleural cavity may be partially obliterated by adhesions and 200 or 300 cc of air would result in a positive pressure, which not only would result in considerable pain to the patient during the next twenty-four hours but might cause tearing of adhesions at their attachment to the visceral pleura, thus opening blood vessels through which air might

enter to cause gas embolus or tearing of the visceral pleura sufficient to result in a bronchopleural fistula, through which pyogenic micro organisms in the bronchial tree might reach the pleural cavity and cause empyema. Therefore, if during the course of administration of air the negative pressure disappears and the oscillations are sufficiently great to indicate that the tip of the needle is still in the pleural cavity, one should discontinue before the usually 200 to 300 cc of air has been introduced.

On subsequent treatments or refills the manometer readings are also important. If they are well on the negative side, it is safe to introduce air. On the other hand, if they are approximately that of atmospheric pressure or are on the positive side, one may suspect that a bronchopleural fistula has developed or that fluid has accumulated in the pleural cavity. If no adhesions are present, one almost never needs to bring about a positive pressure in the pleural cavity in order to produce good lung collapse. When the intrathoracic pressure is reduced to that of atmospheric pressure, through the introduction of air, there is no longer any pull on the lung and because of the preponderance of elastic tissue fibers, which now contract, the lung collapses. However, if consolidation dense fibrous tissue or thick-walled cavities are present one may need to introduce enough air from time to time to bring about a positive intrathoracic pressure in order to collapse the diseased area adequately.

The technique of administering artificial pneumothorax with the description of manometer readings is the same whether one is collapsing the lung in the treatment of pneumonia, tuberculosis and other disease conditions or whether one is introducing air as a diagnostic procedure. The technique has recently been described by Moorman (*Internat Clin* 4 119 [series 44], 1934) and Myers (*Artificial Pneumothorax*, *THE JOURNAL*, Oct 27, 1934, p 1299).

VERMIPHOBIA

To the Editor—A woman aged 35 has for several years complained of indefinite gastro-intestinal discomfort, a moderate nausea with occasional real vomiting attacks. There was also a definite feeling of anxiousness with this picture of stomach discomfort. Repeated and supposedly thorough examinations by three of our leading internists gave no relief one making a diagnosis of anemia (it read 80) and prescribing iron another a diagnosis of avitaminosis and prescribing yeast all this to no profit. Quite by accident the patient discovered about two months ago that she had worms and when they were recovered they were easily identified as *Oxyuris vermicularis*. Both the male and female forms are present. I set about curing the girl (she is my wife) but I cannot get to first base. The usual complaint of anal itching is not present but about once every two days she feels a sharp stinging sensation as though the female had pinched the mucous membrane with her pincers. This sharp discomfort is at the anal end of the gastro-intestinal tract. She takes an immediate enema of strong salt water and reports that careful search reveals one or more female forms some as long as a centimeter or more. This goes on from day to day to the extreme embarrassment of the victim. I have given 15 Gm of bismuth subcarbonate by mouth once a day for three successive days resulting in a rather severe irritation of the bowel lining and no relief. (This prescription is advised by Henry B Ward in *Abts Pediatrics*.) Of course quassia infusion and 10 per cent sodium chloride solution have been repeatedly used as rectal douches. My understanding is that the male and female forms may abide in the entire gastro-intestinal tract particularly the appendix. Could the patient's previously mentioned discomfort and unusual celiac unrest have been caused by a long standing infestation with *Oxyuris*? Can you suggest a method for relieving this trouble? If auto-infection occurs as related in the books why doesn't her family immediately acquire this affliction? The patient's appendix was removed five years ago. Also the most strict regimen of sanitary precautions is practiced by the patient. Her general health is good but I am sure her knowledge of her ailment is to a moderate degree unsteady and her emotional balance. Please omit name.

M D West Virginia

ANSWER—In the case under discussion, one should beware of the development of what might be called 'vermiphobia'. One should, of course, apply the accepted remedies and hygiene found effective in this condition in a systematic and thorough-going manner, until the discomfort is no longer encountered. The patient might take a salt water enema whenever she feels the "stinging sensation," though she might dispense with the "prolonged and careful search for the worms." Indeed, the less attention she pays to the matter of worms, which many persons carry without knowing about them or their doing any harm, the better for her. It is probable that the gastro-intestinal discomfort is not due to the worms but to some form of colon stasis, the nature of which had better be investigated by a gastro-intestinal x-ray series. There might, for instance, be cecal stasis due to adhesions, which could be corrected by courses of saline laxatives. There might be colon spasm, which might be amenable to liquid petrolatum. If there is absolutely no intestinal abnormality, and even if there is, one should contemplate the psychoneurotic background, which may require

treatment by means of one or more of the recognized modalities of psychotherapy suggestion, persuasion, psychoanalysis and mental hygiene.

SCOLIOSIS AND FLAT FEET IN A CHILD

To the Editor—A boy, aged 8 years, had measles complicated by bilateral otitis media, lobar pneumonia of the left lower lobe and a seropurulent effusion of the same side which was absorbed after repeated tapings. He was confined to bed for about two months but has made a good recovery and has now been out of bed for about four weeks. Since he started walking he has complained of pain in the feet particularly the left foot and mainly at the site of the transverse arches and medial side of the plantar surface of the foot. There is no foot deformity but he walks with a limp. Inspection shows that the left side of the chest is smaller than the right and has diminished expansion. The left shoulder is lower than the right the spine showing a curvature to the left. I feel that this posture plays a part in causing the pain in the feet and am mainly interested in knowing what measures should be used to correct the chest deformity and prevent a scoliosis in the future. Whether there is a mechanical appliance that may be used to correct this posture and what exercises would be beneficial. Would arch supports or some appliance in the shoe be beneficial? If published, please omit name and address.

M D., Texas.

ANSWER—The child might have had scoliosis before contracting measles. The factors in the case may be divided into the toxic and the mechanical, or static, factors. Under the mechanical factors should be mentioned pelvic disbalance, flat foot, foot strain, metatarsal depression and plantar fasciitis.

The toxic factors include measles, otitis media, pneumonia and empyema. There may be a toxic synovitis or arthritis present. There is nothing in the query to indicate that a "rheumatic heart" has been eliminated from the picture.

One must determine whether the scoliosis is functional (postural) or organic (structural). One must determine whether there is torsion or rotation of the spine. One should have roentgenograms taken in at least two projections in order to make the diagnosis and prescribe proper treatment. An orthopedic surgeon should be consulted and permitted to treat the patient.

A comprehensive outline of the treatment would include rest in bed on a rigid mattress, Bradford or Whitman frame, special exercises, plaster-of-paris casts and braces. The types of casts used are the Risser bent jacket, the Galeazzi cast or the Brewster plaster jacket. The types of braces most commonly used are the Taylor spine brace, the leather jacket, and the most recent the Chambers brace (described in the *Journal of Bone and Joint Surgery* 17 219 [Jan 1935]). Operation is indicated in some cases but it would not appear necessary in this case.

Concerning the feet, treatment would include rest in bed and local applications and, in due time, proper shoes, resilient arch supports, special exercises, massage and contrast sprays.

BACILLUS PROTEUS IN CYSTITIS

To the Editor—How frequently is *Bacillus proteus vulgaris* found as the etiologic organism in cystitis and pyelonephritis? I have recovered this organism on six different examinations including one cystoscopic examination while using all sterile precautions known to prevent contamination. I would also appreciate knowing whether there are any rational therapeutic measures for its eradication.

W F KELLER M D, Oklahoma City

ANSWER—*Bacillus proteus-vulgaris* is not a common invader of the urinary tract. Justin H Hill (*Young's Practice of Urology*, Philadelphia, W B Saunders Company, 1926) found seven instances of *Bacillus proteus-vulgaris* infection in 356 cultures of urine from infected bladders. J R Caulk (*The Practice of Surgery*, edited by Dean Lewis, volume 8, chapter 6) states that *Bacillus proteus* is occasionally the cause of chronic infections of the kidney. William J Baker (*The Bacteriologic Study of Catheterized Kidney and Bladder Urine*, *Tr Chicago Urol Soc* 1931) reports that this organism was found in three specimens of 136 infected bladder urines and in one specimen of fifty infected kidney urines. The foregoing facts seem contrary to the usual bacteriologic teaching that *Proteus vulgaris* is next in importance to *Bacillus coli communis* in the etiology of cystitis and pyelonephritis.

The same therapeutic measures should be instituted as are used to eradicate any bacillus of the colon group. There should be a daily copious intake of water. The best urinary antiseptic is some form of methenamine along with an efficient acidifying agent, it may be necessary to prescribe a strict ketogenic diet in order to maintain the proper hydrogen ion concentration of the urine. After ten days to two weeks, medication can be changed to strong alkalinizing agents. The various dye urinary antiseptics are less effective in these infections. Bladder irrigations with warm 1:10,000 potassium permanganate solution

are useful. If irrigations are poorly tolerated, instillations of 5 per cent mild silver protein are soothing and effective. Bowel stasis should be corrected. Concomitant infection of the prostate gland and seminal vesicles should receive the proper treatment. Endocervicitis has been proved to be definitely related to bladder infections, discharging cervixes should be treated and cured. Other foci of infection in the teeth, tonsils or gall-bladder should be investigated and treated. Kidney lavage with 1 per cent silver nitrate solution or 1 per cent mercurochrome solution is fairly efficacious in bacillary kidney infections. Autogenous vaccines may be of some aid. A change in residence to a milder and warmer climate is indicated in a few cases. In all of these cases the physician must prove to himself by proper urologic study that there is no obstruction or stasis anywhere along the urinary tract.

CHRONIC CARBON MONOXIDE POISONING

To the Editor—In Queries and Minor Notes in THE JOURNAL, March 23, page 1029 appeared an answer to a question on chronic carbon monoxide poisoning that interested me. The statement is made that it is only after an exposure of many hours to sublethal concentration of carbon monoxide that injuries to the nervous system and mentality and occasionally to other organs and functions develop and persist throughout the remainder of life. I think this statement can well be challenged and although it is true that Dr Alice Hamilton in 'Industrial Toxicology' does arrive at those conclusions it is also true that there are many other workers who sharply disagree. In fact there has been considerable research work done and clinical observations made in which investigators have made the opposite statement that small concentrations of carbon monoxide inhaled over a long period of time do not cause any permanent tissue damage. Particularly is this true when there is an opportunity for partial if not complete desaturation to occur in between the times of absorption. I would particularly refer to the work of the United States Bureau of Mines which has been ably carried out under the direction of R. R. Sayre. I would also refer to a monograph entitled 'Carbon Monoxide Poisoning' by H. M. F. Behneman (*Northwest Med* 33:301 [Sept.] 1934) also Present Day Hazard of Chronic Carbon Monoxide Poisoning by Paul Michael (*California & West Med* 40:19 [Jan.] 1934). I should be interested in hearing from you where I might obtain more information concerning the support of the previous statement of the effects of chronic carbon monoxide poisoning other than the reference to Dr Hamilton's work. Should this communication receive mention in Queries and Minor Notes, please omit name.

M D Nevada

ANSWER—It is not clear what our correspondent is challenging. The only conditions that can properly be termed 'chronic carbon monoxide poisoning' are those of the type to which workers in badly ventilated garages and repair shops are exposed for a considerable time daily over long periods. The effects are a general deterioration of health without specific injury to any particular organ. Change of occupation usually leads to complete recovery of health. The consequences of a severe asphyxia under carbon monoxide lasting for many hours are injuries, especially to the nervous system, that are due to degenerations of a necrotic nature initiated during the temporary deprivation of oxygen while the carbon monoxide is in the blood. In such cases "chronic carbon monoxide poisoning" in the sense of retention of the gas for more than a few hours is not involved. Besides the references previously quoted we suggest the reading of "Respiration" by J. S. Haldane and J. G. Priestley, Oxford University Press, 1935.

NONALLERGIC COSMETICS

To the Editor—One often hears of nonallergic cosmetics. I know that such substances as orris root and starch are two ingredients that are sometimes incorporated in such cosmetic preparations as powder or powder base. Can one really say and be theoretically correct in doing so that a cosmetic preparation is positively nonallergic? Is it not true that of the various ingredients in such preparations there is bound to be some one who will show abnormal reactions to one or another of these ingredients in view of the fact that vast numbers of people use these often? I should appreciate it if you would outline in your columns the names of the substances or groups of substances that are known to give rise to allergic manifestations when they are incorporated in cosmetic preparations that are applied to the skin. Please refer me to some standard works that will describe more fully the information requested.

M D New York

ANSWER—It is true that in the strict sense of the word there is probably no cosmetic that is completely nonallergic. As time goes on, new substances are being found that cause symptoms in certain individuals. But it may safely be said that the various nonallergic cosmetics are nonallergic to an almost 100 per cent degree. The main ingredients in cosmetics that can cause trouble are orris root, rice starch, wheat starch and cornstarch. In addition, one must consider compounds of mercury and lead, quinine, eosin, oil of bergamot, paraphenylenediamine and methyl heptene carbonate. Occasionally a patient is found who has an idiosyncrasy to the coloring material.

In addition to those ingredients in the cosmetics which may be troublesome from an allergic point of view, one must consider other possible factors. The type of glue used in making the package must be thought of, the lacquer used in coloring the containers and the powder puff used in applying the face powder or rouge may cause symptoms in rare cases. It is obvious, then, that 100 per cent allergen-free cosmetics do not exist. However, the manufacturers of these products are on the alert, if allergy to some new substance is found, they attempt to provide a harmless substitute.

For further information one may consult such references as Encyclopedia Britannica edition 14, Poncher, W. A. *Perfumes and Cosmetics*, London: Chapman & Hall Ltd., 1923.

For references that deal with orris root (the most important substance in cosmetics that can cause allergic symptoms) one may consult:

Coca A. F. *Walzer*, Matthew and Thommen A. A. *Asthma and Hay Fever*, Springfield, Ill.: C. C. Thomas, 1931.
Balyeat R. M. *J. Lab. & Clin. Med.* 13:516 (March) 1928.
Rackemann F. M. *Boston M. & S. J.* 10:431 (March 25) 1926.
Phillips E. W. *Southwestern Med.* 11:299 (July) 1927.
Gelfand H. H. *J. Allergy* 1:222 (March) 1930.
Balyeat R. M. *J. Lab. & Clin. Med.* 14:7 (April) 1929.
Ramirez M. A. and Eller J. J. *J. Allergy* 1:489 (Sept.) 1930.
Rowe A. H. *J. Lab. & Clin. Med.* 13:31 (Oct.) 1927.
Eggston, A. A. *Laryngoscope* 32:877 (Nov.) 1922.

CHLORINE IN SWIMMING POOL

To the Editor—The University of Arizona here is about to build a new swimming pool and the state bacteriologist has asked me as to the harmfulness of chlorine treated water for swimming pool use in a strength great enough to act as a disinfectant. In other words one group of those having to do with this project are in favor of having the water treated with chlorine with an amount greater than that ordinarily used for treating drinking water while in other quarters this method is much opposed and the bacteriologist in question has asked me particularly as to the stand taken in such matters by the American Medical Association recently. I know the sense of the recent opinion by one of our ear, nose and throat associations. I would much appreciate your being so kind as to let me know the present status of this question of disinfecting swimming pools with chlorine. Since the number of days is few before some definite action will be taken here about this it would be especially good of you to let me have a reply as soon as practicable.

THOMAS H. CATES M.D., Tucson, Ariz.

ANSWER—Chlorine, either alone or in combination with ammonia, is generally used for the disinfection of swimming pool water. The amount of residual chlorine in water is readily determined by simple tests.

Fletcher and Clark (*Am. J. Pub. Health* 23:407 [May] 1933) have given a discussion of the control of swimming pools in which they say "The consensus of opinion of authorities seems to be that there is a potential danger of person to person transmission of pathogenic bacteria added to the pool by swimmers, and that this danger may be greatly minimized or eliminated by an efficient disinfecting agent, such as chlorine."

If the amount of chlorine is controlled to avoid excessive doses, there appears to be little or no objection to its use. The amount of residual chlorine should be maintained between 0.2 and 0.5 part per million at all times that a pool is in use. Tests should be made at least twice daily, preferably at the time of the greatest bathing load. By using chloramine, somewhat higher amounts of residual chlorine may be maintained without objection.

Fletcher and Clark believe that "with the proper pH control and the use of chlorine and ammonia, no complaints should result from maintenance of residuals as high as 10 part per million."

A great deal depends on the care exercised by the pool operator in controlling the amount and method of application of chlorine, to assure the proper dosage and even distribution of the disinfectant throughout the pool.

EMBOLUS OF CENTRAL ARTERY OF EYE

To the Editor—I have a case in which a Caldwell-Luc operation was done on the left antrum. This was followed by emboli involving the central artery of the left eye and a complete paralysis of the third nerve of that eye. I am trying to find any cases in the medical literature presenting this complication. The librarian of the Seattle Medical Library advised me to write to you. I will appreciate any information or references you can give me.

H. R. Secoy M.D., Everett, Wash.

ANSWER—A short discussion pertaining to this subject is to be found in the "Kurzes Handbuch der Ophthalmologie," vol. 5, p. 698, by H. Ronne of Copenhagen. In the discussion of "Trauma to the Orbit" in the Graefe-Saemisch Handbuch, the volume on Injuries by Wagenmann, the combination of

embolism of the central artery of the retina and complete third nerve paralysis is mentioned as the sequel of hemorrhage into the orbit of traumatic origin. Galewski also stated that, in cases of embolism of the central artery of the retina in persons not afflicted with heart disease, the arterial blood was probably the result of hemorrhage into the sheaths of the optic nerve. In one case a sudden exophthalmos occurred during the course of a Caldwell-Luc operation. This was followed by complete external ophthalmoplegia (third, fourth and sixth nerves) and a blockage of one of the peripheral arteries of the retina. The chain of ocular complications was undoubtedly due in this instance to intra-orbital hemorrhage.

DIABETIS

To the Editor—I have a patient who has symptoms of trembling weakness anxiety and faintness starting from two to three hours after meals and very much aggravated by physical or mental strain. These symptoms are invariably relieved by the ingestion of carbohydrates—in other words presenting typical symptoms of hypoglycemia and yet presenting the following dextrose tolerance curve:

| | |
|-----------------------------------|------------------------------|
| Fasting blood sugar | 95.2 mg per 100 cc of blood |
| 1/4 hr after 100 Gm of dextrose | 168 mg per 100 cc of blood |
| 1 hr after 100 Gm of dextrose | 219 mg per 100 cc of blood |
| 2 hr after 100 Gm of dextrose | 131 mg per 100 cc of blood |
| 3 hr after 100 Gm of dextrose | 105.8 mg per 100 cc of blood |
| 4 hr after 100 Gm of dextrose | 79 mg per 100 cc of blood |
| 4 1/2 hr after 100 Gm of dextrose | 81.6 mg per 100 cc of blood |

The patient shows intermittently in the afternoon various amounts of sugar in the urine from one to two hours after meals. Is this a case of hyperinsulinism in spite of the fasting blood sugar? One fasting blood sugar reading taken a few days before the tolerance test was 77 mg per hundred cubic centimeters of blood. Can this case be one of diabetes mellitus because of the rise of the blood sugar at the end of the first hour to 219 mg and failure to return to the fasting level at the end of two hours as stressed by many authorities on diabetes and the intermittent glycosuria? Please omit name. MD Missouri

ANSWER—The patient would appear to have diabetes because in addition to glycosuria there is a peak blood sugar of 219 mg and the blood sugar at the end of even three hours has not quite reached the fasting level. What was the extent of the glycosuria during the dextrose tolerance test? Has the patient been living on a special diet? What is the blood sugar and what is the amount of glycosuria when he has the peculiar symptoms? Are the data different on days with symptoms than on days without symptoms? Do the attacks always come at the same time of day? Are infections and thyroid complications surely excluded? All such cases require detailed and prolonged investigation.

It is not uncommon for diabetic patients to have normal fasting blood sugar values, and this is particularly true of children.

REPLACEMENT OF RETROVERTED UTERUS

To the Editor—In the nonoperative treatment of retroversions what is the best way of getting a uterus in place which has turned back and slipped down past the promontory of the sacrum? I have tried by bimanual manipulation in the office to replace these uteri, but am absolutely unable to on account of pain to the patient and slipping of fingers on the organ. Please omit name. MD Vermont

ANSWER—Manipulation with the midfinger of the vaginal hand at the external os and the forefinger on the anterior surface of the cervix combined with high gentle deep manipulation with the abdominal hand usually suffices. The replacement is commonly effected with only modest discomfort except in cases in which the uterus is adherent.

Occasionally it is necessary to resort to combined abdominal and vaginal manipulation. Upward midfinger pressure through the rectum, coordinated with elevation by the abdominal hand, may be required to dislodge a fundus deeply placed in the culdesac.

Despite the fact that a skilled gynecologist can almost invariably replace the uterus unless it is fixed by adhesions, no one should hesitate to resort to anesthesia if a replacement cannot be made without causing undue discomfort to the patient.

NEOARSPHENAMINE AND PHLEBITIS

To the Editor—Is it possible for a phlebitis of the arm to develop following the injection of a strong (0.9 Gm) neoarsphenamine solution?

IRWIN I. LUBOWE, MD New York

ANSWER—Neoarsphenamine, even in strong solutions, does not produce a phlebitis when the injection is given intravenously with the usual sterile precautions. When the injection is given in the subcutaneous tissue outside the vein, a firm, doughy, painful, perivascular infiltrate results and a condition simulating a phlebitis may develop.

Medical Examinations and Licensure

COMING EXAMINATIONS

- AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Kansas City Mo. May Sec Dr C Guy Lane 416 Marlboro St Boston.
- AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada Dec. 7. Applications must be filed not later than Oct 1. Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6).
- AMERICAN BOARD OF OPHTHALMOLOGY St Louis Nov 18 Application and case reports must be filed before Oct 15. Sec Dr William H. Wilder 122 S Michigan Ave Chicago.
- AMERICAN BOARD OF ORTHOPAEDIC SURGERY St Louis Jan. Sec Dr Leonard A. Chandler 180 N Michigan Ave Chicago.
- AMERICAN BOARD OF PEDIATRICS Philadelphia Oct. 10 and St. Louis Nov. 20. Sec Dr C. A. Aldrich 723 Elm St. Wrentham Ill.
- AMERICAN BOARD OF RADIOLOGY Detroit Dec 12. Sec Dr Cyril R. Kirshin Mayo Clinic Rochester Minn.
- ARABAS Basic Science Little Rock Nov 4. Sec. Mr Louis E. Chesser 701 Main St Little Rock Medical (Regular) Little Rock Nov 12. Sec State Medical Board of the Arkansas Medical Society.
- Dr A. S. Buchanan Prescott Medical (Felicet) Little Rock Nov 12. Sec Dr Clarence H. Young 207 1/2 Main Street Little Rock.
- CALIFORNIA Sacramento Oct 21-24. Sec Dr Charles B. Pinkham, 420 State Office Bldg Sacramento.
- Collegiate Basic Science New Haven Oct 12. Prerequisite to license examination. Address, State Board of Healing Arts 1895 Yale Station New Haven Medical (Regular) Hartford Nov 12-13.
- Indorsement Hartford Nov 26. Sec Dr Thomas P. Mordock, 147 W Main St Meriden Medical (Homeopathic) Derby Nov 12. Sec Dr Joseph H. Evans 1488 Chapel Street New Haven.
- FLORIDA Tampa Nov 11-12. Sec Dr William M. Rowlett, Box 786 Tampa.
- GEORGIA Atlanta Oct 8-9. Joint Secretary State Examining Boards Mr R. C. Coleman 111 State Capitol Atlanta.
- ILLINOIS Chicago Oct 22-24. Act Supt of Regs Dept. of Regs and Edu Mr Clinton J. Bliss Springfield.
- IOWA Basic Science Des Moines Oct 8-10. Sec Dr Edward A. Benbrook Iowa State College Ames.
- MAINE Portland Nov 12-13. Sec Board of Registration of Medicine Dr Adam P. Leighton Jr 192 State St Portland.
- MASSACHUSETTS Boston Nov 12-14. Sec Board of Registration in Medicine Dr Stephen Rushmore 413 State House Boston.
- MICHIGAN Lansing Oct 8. Sec Board of Registration in Medicine Dr J. Earl McIntyre 202 3/4 Hollister Bldg Lansing.
- MINNESOTA Minneapolis Oct 15-17. Sec Dr Julian F. Du Bos 350 St Peter St St Paul.
- NATIONAL BOARD OF MEDICAL EXAMINERS Part III Baltimore, Oct 22-24, and Boston Nov 5-7. Exec Sec Mr Edward S. Elwood 225 So 15th St Philadelphia.
- NEBRASKA Lincoln Nov 19-20. Dr Bureau of Examining Boards Mrs Clark Perkins State House Lincoln.
- NEVADA Carson City Nov 4. Sec Dr Edward E. Hamer Carson City.
- NEW JERSEY Trenton Oct 15-16. Sec Dr Arthur W. Belting 12 W State St Trenton.
- NEW MEXICO Santa Fe Oct 14. Sec Dr Le Grand Ward Sena Plaza Santa Fe.
- OREGON Basic Science Portland Nov 16. Sec Mr Charles D. Byrne University of Oregon Eugene.
- SOUTH CAROLINA Columbia Nov 12. Sec Dr A. Earle Booser 505 Saluda Ave Columbia.
- WEST VIRGINIA Huntington Oct 28. State Health Commissioner Dr Arthur F. McClure Charleston.

Georgia June Report

Mr R. C. Coleman joint secretary State Examining Boards reports the written examination held by the State Board of Medical Examiners at Atlanta, June 11-12, 1935. The examination covered 10 subjects and included 100 questions. An average of 80 per cent was required to pass. Eighty-nine candidates were examined, 87 of whom passed and 2 failed. Four physicians were licensed by reciprocity. The following schools were represented:

| School | PASSED | Year Grad (1934) | Per Cent |
|--|--|------------------|----------|
| Emory University School of Medicine (1935) | 81 5 83 83 5 84 3 84 4 84 5 84 8 85 2 85 2 85 5 85 7 85 9 86 3 86 1 86 1 86 4 86 4 86 6 86 6 86 8 86 8 86 9 86 9 86 9 87 7 87 7 87 1 87 2 87 2 87 3 87 3 87 3 87 4 87 7 87 7 87 7 87 8 87 9 88 88 1 88 4 88 5 88 5 88 7 89 4 89 4 90 2 | (1934) | 86 94.6 |
| University of Georgia School of Medicine (1935) | 84 2 85 1 85 4 85 5 85 7 85 7 86 3 86 5 86 7 86 7 86 8 87 3 87 3 87 7 87 8 87 9 88 88 88 1 88 2 88 5 88 6 88 6 88 8 88 8 88 9 89 1 89 2 89 4 90 1 90 3 91 5 | (1935) | 83.3 |
| Louisiana State University Medical Center (1935) | 84 2 85 1 85 4 85 5 85 7 85 7 86 3 86 5 86 7 86 7 86 8 87 3 87 3 87 7 87 8 87 9 88 88 88 1 88 2 88 5 88 6 88 6 88 8 88 8 88 9 89 1 89 2 89 4 90 1 90 3 91 5 | (1935) | 91.4* |
| Tulane University of Louisiana School of Medicine (1934) | 84 2 85 1 85 4 85 5 85 7 85 7 86 3 86 5 86 7 86 7 86 8 87 3 87 3 87 7 87 8 87 9 88 88 88 1 88 2 88 5 88 6 88 6 88 8 88 8 88 9 89 1 89 2 89 4 90 1 90 3 91 5 | (1934) | 83.4 |
| University of Tennessee College of Medicine (1932) | 84 2 85 1 85 4 85 5 85 7 85 7 86 3 86 5 86 7 86 7 86 8 87 3 87 3 87 7 87 8 87 9 88 88 88 1 88 2 88 5 88 6 88 6 88 8 88 8 88 9 89 1 89 2 89 4 90 1 90 3 91 5 | (1932) | 84.7 |
| University of Virginia Department of Medicine (1934) | 84 2 85 1 85 4 85 5 85 7 85 7 86 3 86 5 86 7 86 7 86 8 87 3 87 3 87 7 87 8 87 9 88 88 88 1 88 2 88 5 88 6 88 6 88 8 88 8 88 9 89 1 89 2 89 4 90 1 90 3 91 5 | (1934) | 88.9 |
| McGill University Faculty of Medicine (1932) | 84 2 85 1 85 4 85 5 85 7 85 7 86 3 86 5 86 7 86 7 86 8 87 3 87 3 87 7 87 8 87 9 88 88 88 1 88 2 88 5 88 6 88 6 88 8 88 8 88 9 89 1 89 2 89 4 90 1 90 3 91 5 | (1932) | 87.1 |

| School | FAILED | Year Grad (1930) | Per Cent |
|--------------------------------|--------|------------------|----------|
| Meharry Medical College (1917) | 72 6 | (1930) | 69.1 |

| School | LICENSED BY RECIPROCITY | Year Grad (1910) | Reciprocity with |
|--|-------------------------|------------------|------------------|
| College of Physicians and Surgeons of Chicago (1930) | | (1910) | Kansas |
| Johns Hopkins University School of Medicine (1934) | | (1934) | Maryland |
| Medical College of Virginia (1931) | | (1931) | Virginia |
| University of Virginia Department of Medicine (1931) | | (1931) | Virginia |

* This applicant has received an M.B. degree and will receive an M.D. degree on completion of internship.

Hawaii July Examination

Dr James A Morgan secretary, Board of Medical Examiners, reports the oral and written examination held in Honolulu, July 8-11, 1935. The examination covered 10 subjects and included 55 questions. An average of 75 per cent was required to pass. Five candidates were examined, 4 of whom passed and 1 failed. Two physicians were licensed by endorsement after an oral examination. The following schools were represented:

| School | PASSED | Year Grad | Per Cent |
|---|-------------------------|-----------|----------------|
| | | | |
| Northwestern University Medical School | (1929) 86 | (1935) | 81 |
| Rush Medical College | | (1935) | 78 |
| University of Pennsylvania School of Medicine | | (1932) | 83 |
| School | FAILED | Year Grad | Per Cent |
| | | | |
| Jefferson Medical College of Philadelphia | | (1933) | |
| School | LICENSED BY ENDORSEMENT | Year Grad | Endorsement of |
| | | | |
| College of Medical Evangelists | | (1934) | N B M Ex |
| University of Pennsylvania School of Medicine | | (1933) | N B M Lx |

Book Notices

Failure of the Circulation By Tinsley Randolph Harrison M.D. Associate Professor of Medicine Vanderbilt University School of Medicine Nashville Tennessee Cloth Price \$4.50 1 p 396 with 60 illustrations Baltimore Williams & Wilkins Company 1935

The author succeeds in linking present day physiology of the circulation with abnormalities of function seen in cardiac disease. He brings to his subject long experience with the clinical side as well as the experimental and presents his material in a short, concise manner. Probably his chapter on the 'Mechanism of Edema Formation' is, in style and clarity, the best exposition of present knowledge of that subject. Clinically, he recognizes three general functional impairments of the circulation. First is acute circulatory failure, as in shock, collapse and coronary occlusion. Second is the hyperkinetic or overactive heart, featured by palpitation, increased pulse pressure, tachycardia and vigorous heart action. It is best seen in hyperthyroidism, anemia and the neuroses. The third situation is congestive heart failure. The first two of these groups are covered briefly. Much attention is paid to the main features of congestive heart failure. The author emphasizes the importance of cardiac enlargement, dyspnea and edema in this syndrome. He comments on the application of Starling's observations both the law of the heart and his study of energy production in the heart as a function of diastolic ventricular volume. Oxygen utilization by an enlarged heart is the subject of a long theoretical discussion of much interest. The studies of dyspnea are classic examples of clinical experiments. They are recorded with detailed tables of data and easily read graphs. He uses the ventilation to vital capacity ratio as a measure of dyspnea. Dyspnea on exertion is explained as the result of shifts in this ratio which force the ratio above the subjective threshold so that the cortical sensation of difficulty in breathing results. Orthopnea similarly is resolved into these two variables the vital capacity falling while the patient reclines. The mechanism of "evening dyspnea," the increasing difficulty experienced by these patients as the day wears on, results from a reduction in vital capacity following the activity of the daytime. Cardiac asthma is the subject of a chapter. Here the 'trigger' stimuli that precipitate these paroxysms of dyspnea are outlined. Coughing, need of urination, external stimuli, dreams and heat are the commoner excitants of an attack. Cheyne-Stokes respiration follows in sequence. His observations make the theory of humoral control of respiration inadequate. The reflexes controlling respiration must play the chief part. The author uses much of his experimental data to show the completeness of the "backward failure theory" of congestive heart failure. The 'forward failure' hypothesis becomes supplementary to the century old concept of Hope. The value of such a knowledge of physiology is obvious when the subject of treatment comes up. There is a wide application for these principles in the careful management of the individual heart disease and the appreciation of the patient's difficulties and problems. The book should be in the hands of all internists unless they are

already familiar with the ideas of Harrison and his associates as presented during the past ten years in various journals. The book presents clinical cardiologists with the latest applications of the altered physiologic function in heart failure.

La roentgéthérapie des fibromyomes de l'utérus et des métropathies hémorragiques Par Paul Gilbert. Préface du Docteur Antoine Bécclere. 1^{er} tirage 18 francs. Pp 111 with 10 illustrations. Paris: Masson & Cie 1935.

This monograph is the answer to controversial points existing among French surgeons and radiologists. The former claim that bleeding uterine myomas and metropathies should be treated only surgically. The treatment of these diseases with radium was originated by the French, while roentgen therapy was simultaneously applied by the French, the Germans and the Americans as early as 1902. The subjects are discussed as follows. The diagnosis considers the abnormal bleeding, the increase in size of the abdomen and the pressure pain in the pelvis with the resultant disturbances in the urinary tract and intestinal canal. The differential diagnosis comprises carcinoma of the corpus and cervix, normal and ectopic pregnancies and adnexal diseases. It is thoroughly described. The mode of action of roentgen rays is twofold: that occurring in the ovary, and that taking place in the myoma. The merits of roentgen radiation and radium rays lead to the opinion that the former is preferable because of its twofold action on ovaries and myoma, while the activity of gamma rays is confined to the endometrium and the myoma. The indications for roentgen therapy are the patient who is a poor surgical risk, the single fibroma, the age, the size and the location. Adnexitis does not form a contra-indication to roentgen treatment but to radium insertions. The technique consists in the broken dose method of Bécclere. The fractional doses are from 230 to 350 roentgens applied within half an hour. The fields are two, anterior and posterior, and are from 12 to 16 cm. square. The kilovoltage should be above 150. The filter is 0.5 mm of copper, 2 mm of aluminum and a wooden plate 2 cm thick, in which the measuring ionization chamber is placed. The fractions are repeated every two weeks until amenorrhea is attained.

Aids to the Analysis of Food and Drugs By C. G. Moor M.A. F.I.C. Public Analyst for the County of Dorset and William Partridge F.I.C. Fifth edition revised and partly rewritten by John Ralph Nicholls B.Sc. F.I.C. Chemist at the Government Laboratory London. Cloth Price \$1.50. Pp 322. Baltimore: William Wood & Company 1934.

This is essentially a syllabus of pertinent information on composition and analysis of most common foods. It is primarily adapted for the use of practicing food and drug chemists, and although the subject matter is presented from the standpoint of the public analyst of Great Britain, the value of the book in many respects is international. Standard or best recognized methods of analysis are given. The data on composition and items of specialized information gathered by the experienced laboratory analyst are of particular aid for interpreting analyses and detecting adulteration. Analytic standards where set are given. Chapters are devoted to the common foods, alcoholic beverages, preservatives, prohibited colors, poisonous metals in foods and drugs, crude drugs, miscellaneous pharmacopoeial articles, analysis of unknown drugs, commercial disinfectants and soap. The appendix gives some items of legal information.

Endoscopie et pleurolyse (méthodes d'applications et techniques) Par O. M. Mialat médecin directeur de l'établissement Clavelly Montana. Préface du Professeur Jacobéus. Bibliothèque de physiologie sous la direction de Léon Bernard, professeur de clinique de la tuberculose à la Faculté de médecine de Paris. Paper. Price 55 francs. Pp 436 with 184 illustrations. Paris: Masson & Cie 1935.

The author has presented in clear, concise form the modern methods of dealing precisely with pleural bands and adhesions, one by one, as found by local endoscopic methods. All the procedures are outlined in detail and are contrasted with the relatively gross procedures of thoracotomy. Instruments and instrumentation are well illustrated and clearly described. Pleuroscopes of both the open-tube and the lens-system types are used by the author. The anatomy of the pleural cavity is given from the point of view of the pleuroscopist. The technique and results of direct irradiation of the pleural cavity with ultraviolet rays are described in detail, as is also the author's method of endoscopic transpleural phrenicectomy. The book

is a whole is an important addition to the valuable series of publications in the "Bibliothèque de physiologie" that have appeared under the able direction of the late Leon Bernard.

A Textbook of Laboratory Diagnosis with Clinical Applications for Practitioners and Students. By Edwin F. Osgood, M.A., M.D., Assistant Professor of Medicine and Biochemistry, University of Oregon School of Medicine, Portland, Oregon. Second edition. Cloth. Price \$6.15. Pp. 585 with 77 illustrations. Philadelphia: J. B. Lippincott & Co., Inc. 1935.

The subject matter in part I of this book is arranged by systems. For example, chapter II is entitled 'Disorders of the Kidney and Urinary Tract with Special Reference to Nephritis', chapter III, 'Disorders of Carbohydrate Protein and Fat Metabolism with Especial Reference to Diabetes Mellitus, and Disturbances of Acid-Base Equilibrium', chapter IV, 'Pregnancy and Its Complications', chapter VIII, 'Hematology', and so on. The general heading of part II is 'Laboratory Methods', and section I in this part of the book is entitled 'Use and Calibration of Apparatus', section II 'Preparation of Standard Solutions', section III 'Chemistry and Microscopy of the Urine', section IV 'Blood Chemistry' and so on. This edition has been thoroughly revised. Among the additions are the technique and interpretation of the blood urea clearance test, insulin coefficient, the blood bromide determination, the Friedman test, the galactose tolerance test, the Paul and Bunnell test for heterophile antibodies, and the technique for the quantitative determination of plasma proteins, proteins in cerebrospinal fluid and other body fluids and the forensic applications of blood grouping. Attention has been given to developments in the diagnosis of hyperinsulinism, hyperparathyroidism, infectious mononucleosis, teratoma testis and iron deficiency anemias. The author has kept in mind the needs of the practitioner in isolated communities, and most of the methods recommended require little or no expensive equipment.

Kurzgefasstes Lehrbuch der Physiologie. Von Th. Broemser, o. Professor für Physiologie in München. Paper. Price 11.00 marks. Pp. 713 with 177 illustrations. Leipzig: Georg Thieme 1934.

Einführung in die Physiologie der Tiere und des Menschen. Von Gottfried Koller, Privatdozent an der Universität Kiel. Paper. Price 9.80 marks. Pp. 267 with 38 illustrations. Leipzig: Georg Thieme 1934.

These two small books were no doubt designed to be companion volumes, for they are about the same size and were issued about the same time and by the same publisher. Broemser's abbreviated textbook, prepared for preclinical students, purports to present a survey of the important facts of physiology with only so much biochemical material as seemed to the author absolutely essential for his general purpose. Koller's book, on the other hand, is designed to introduce biologists to the current knowledge of living processes. It deals essentially with general physiology, discussing cellular metabolism, the body fluids and their movements, various types of motility, cellular products (glandular secretions, heat production and so on), nervous and hormone correlation, and stimulation to sense perception. Both books are devoid of bibliographic references. Of the two, Koller's book has some value from the point of view of the American medical student who reads German. Broemser's book is, on the other hand, too brief, superficial and antiquated for American college students, who are required to have more modern, accurate and extensive knowledge than it contains.

Clinical Diagnosis by Laboratory Methods. A Working Manual of Clinical Pathology. By James Campbell Todd, Ph.D., M.D., and Arthur Hawley Sanford, A.M., M.D., Professor of Clinical Pathology, University of Minnesota (The Mayo Foundation). Eighth edition. Cloth. Price \$6. Pp. 702 with 370 illustrations. Philadelphia & London: W. B. Saunders Company 1935.

This volume has the same appearance as the previous edition and is about the same size. However, it has been thoroughly revised, with some rearrangement of material. An entirely new chapter on clinical chemistry has been made and the chapter on the blood rearranged. The material on blood chemistry that was formerly in the chapter on the blood is now in the chapter on clinical chemistry, and the discussion of blood parasites has been transferred to the chapter on animal parasites. The chapter on bacteriology has been enlarged by the addition of discussions of several organisms not found in previous editions. The new chapter on clinical chemistry includes such

new material as methods for the determination of cholesterol, lecithin, blood chlorides, uric acid, cysteine and cystine, fibrinogen, calcium, phosphorus and iron. There is a simple test for carotennin. The rose bengal test and the galactose tolerance test are in the present edition. New material has been added on monocytes, filament-nonfilament counts, Sabin's vital staining technique and Isaac's refractile granule. The Papanz test for amyloidosis is included in this edition, also the new Wintrobe and Landsberg sedimentation method. There is a brief discussion of M and N agglutinogens, and a new diagram to illustrate the relation of blood groups to heredity. There are twenty-five new illustrations.

Investigaciones sobre la enfermedad de Chagas. I. Un nuevo caso mortal de enfermedad de Chagas observado en el Norte Santafeino. Por los Doctores Salvador Mazzia, Ceclilio Romafia y Bartolome Parma. II. Dos casos agudos mas de enfermedad de Chagas en el Norte Santafeino. Por el Dr. Ceclilio Romafia. Universidad de Buenos Aires. Misión de estudios de patologia regional Argentina. Jujuy. Publicación No. 1. Paper. Pp. 32 with 6 illustrations. Buenos Aires: Imprenta de la Universidad 1935.

The first paper gives a detailed description of the clinical history prior to death and of the microscopic changes in a fatal case of Chagas disease (*Trypanosoma Cruzi*) in a young child. The second is an outline of clinical and laboratory observations in two acute cases of the same disease. The series of reports to which this publication belongs together with recent publications from both North and South America are extending greatly our knowledge of the varied manifestations of American trypanosomiasis.

Parenthood: Design or Accident? A Manual of Birth Control. By Michael Fielding, M.D. Preface by H. C. Wells. Cloth. Price \$2.50. Pp. 239 with 8 illustrations. New York: Vanguard Press 1935.

This manual of contraception from the pen of a British physician who prefers to write under a pseudonym, is undoubtedly one of the best books on this subject that has yet appeared. The author has a thorough command of the subject and obviously has devoted much careful thought to the preparation of this volume. The subject matter is well arranged and it is presented with a degree of lucidity that may well serve as a model for other writers on medical subjects. The arguments for birth control are developed in remarkably cogent fashion; the criticisms of its opponents are confronted with devastating logic. The author discusses the virtues and deficiencies of all the commonly employed methods of contraception and provides practical instruction on the use of the better ones. The so-called safe period is deflated to its proper dimensions, those of "relative safety." Appendices containing useful information on birth control clinics, commercial contraceptive products and other pertinent subjects are included in the book.

Life Begins: Childbirth in Lore and in Literature. By Morris Braude, Associate Professor of Psychiatry, Rush Medical College of the University of Chicago. Cloth. Price \$2. Pp. 163 with 12 illustrations. Chicago: Argus Books 1935.

In this book the author presents a large variety of peculiar ideas and superstitions about childbirth. Most of these ideas are ancient but as the author demonstrates, a few of them persist to the present day. Most of these superstitions appear ludicrous and are amusing, but even today some semicivilized peoples regard them as truths. The author shows the fallacies of most of them. He also quotes discussions of these ideas that have appeared in the literature among different races of mankind and at different periods of history. The book should prove interesting and entertaining to persons who are not familiar with the myths of childbirth.

Directions for the Dissection of the Cat. By Robert Payne Bigelow. Second edition. Cloth. Price 90 cents. Pp. 65 with 5 illustrations. New York: Macmillan Company 1935.

This small volume is of no interest to the practicing physician nor of much, if any, value to the student who wishes to acquire 'a sound knowledge of the elements of mammalian anatomy,' unless the student is either already familiar with the various organs and their names, has an instructor constantly at his side during the dissections, or has unlimited time at his disposal for reading up on the dissections of this or other common laboratory animals before trying to use this book.

Medicolegal

Malpractice Piece of Broken Tonsillotome Blade in Patient's Body, Statute of Limitations—The defendant, a physician, in May 1925 removed the plaintiff's tonsils. About seven and one-half years later a flat, triangular piece of steel was removed from her rectum or her perineum by another physician. The patient sued the defendant, contending that the piece of steel removed was a piece of the blade of a tonsillotome used by the defendant, which broke in the course of the operation, that he carelessly allowed to escape into her body. In justification of her delay in instituting suit, she contended that the physician defendant had fraudulently concealed from her the presence of the piece of steel, thus arresting the operation of the statute of limitations. On motion of the defendant, a verdict was rendered in his favor. The plaintiff appealed to the Supreme Court of Utah.

The only evidence tending directly to show that a tonsillotome blade broke in the course of the tonsillectomy was given by the plaintiff and her husband. They testified that the defendant himself, while the operation was in progress, had exclaimed that the blade of the tonsillotome had broken and had asked for another blade. The plaintiff testified that after the tonsils had been removed the defendant swabbed and picked in her throat with long instruments, implying apparently a belief on her part that he was then searching for a piece of the allegedly broken blade, but there was evidence to show that what her physician did was part of the ordinary procedure used in clearing up the field of operation after a tonsillectomy. The defendant offered evidence to show that the piece of steel removed was not a part of a blade of such a tonsillotome as the plaintiffs claimed he had used, but at the same time he offered evidence to show that he had never owned or used a tonsillotome of that kind.

The presence of the piece of steel in the plaintiff's body was not suspected by her, but in January 1932, while she was having a bowel movement, she felt it 'move down her bowels and lodge in her rectum.' There it was seen by her husband and her sister-in-law, both of whom saw the physician remove it. That physician testified, however, that he removed the steel not from the plaintiff's rectum but from the perineal tissue near the anus. There was evidence to show that before the tonsil operation the patient had been in good health, that after the operation she was in poor health and suffered much pain and remained under the care of the defendant until July 1930, that after the removal of the piece of steel in January 1932 her health improved, but there was also evidence to show that the conditions of which she complained were not connected with the tonsil operation or the treatment for which she employed the defendant.

On behalf of the defendant, expert witnesses testified that the piece of steel said to have been removed from the plaintiff's body could not have remained in her body for the seven and one-half years or so during which she claimed it had been there and that it could not have lodged in the rectum or elsewhere in the alimentary canal. Three physicians testified that, beyond doubt, it was located in the perineal tissue, that it did not go through the alimentary tract, that if it had gone through the lower bowel and passed the sphincter it would have been expelled, and that it could not have cut its way through the lower bowel and into the perineum, from which the operating physician testified he removed it, without infecting the perineum and producing a painful abscess. There was no evidence to show that the defendant knew of the presence of the steel in the plaintiff's body and at no time while she was under his care did he examine her by the use of x-rays.

Had the plaintiff, said the Supreme Court, proved her allegations of fraud, concealment, false promises or misrepresentations by the defendant, which she claimed prevented her discovery of the facts that she relied on as the basis of her suit, the time when the statute of limitations began to run might have to be considered, but not only did the defendant deny any knowledge of the presence of a piece of steel in the plaintiff's body, but he presented such evidence as in the opinion of the Supreme Court precluded the possibility of any such

knowledge on his part and showed the impossibility of the entrance of the piece of steel into the plaintiff's body in the manner claimed. So far as the record disclosed there was no fraudulent concealment, no false promises, and no misrepresentations.

Expert testimony offered by the defendant showed that even if such a piece of steel as was offered in evidence found its way into the alimentary tract it should, in the ordinary course of medical practice, be permitted to pass through without operative surgery. Such evidence showed, too, the absence of any connection between the tonsil operation and the conditions of ill health complained of by the plaintiff. Four physicians testified that a piece of steel such as was described and offered in evidence would have passed through the body without injury or pain. The plaintiff invoked the doctrine of *res ipsa loquitur*, relying on the alleged presence of the piece of steel in her body to support her claims, but in the opinion of the court, she should have produced expert testimony, if she planned to offset the expert testimony offered by the defendant.

In the light of all the testimony, the Supreme Court could discover no evidence of negligence on the part of the physician-defendant. The judgment of the trial court in his favor was affirmed.

From a lengthy dissenting opinion by Justice Hansen, the following statement of what he believed to be the rule regarding the duty of a physician who has unintentionally left a foreign object in the body of his patient seems worthy of record.

Fraud or deceit may arise from silence where there is a duty to speak the truth as well as from the speaking of an untruth. If the defendant knew that he broke the blade at the time he performed the tonsillectomy, and there is evidence tending to show that he did and if he knew that the blade passed down plaintiff's throat and there is evidence from which the jury might so find then and in such case it may not be said as a matter of law that [defendant] was under no duty to inform the plaintiff of such facts or that he was under no duty to ascertain whether it passed or failed to pass, through her alimentary canal. In view of the existence of the relation of physician and patient, the latter had a right to assume that the former would inform her of such occurrence or that he would take such steps as might be necessary to prevent the blade from causing her any injury. Silence on the part of a physician under such circumstances is calculated to deceive and mislead a patient as well and probably as effectively, as his protestations that no mishap occurred. It is well settled in courts of equity that a fraudulent concealment of a cause of action will postpone the operation of the statute of limitations until the discovery of the fraud. By the weight of authority the same rule prevails in actions at law. 37 C. J. 972 note in 25 L. R. A. 566.—*Passey v Budge (Utah)*, 38 P. (2d) 712.

Compensation of Physicians Patient's Wealth a Factor in Determining Physician's Fee—The plaintiff-physicians sued the executor of Clem's estate for \$2,500, which they alleged was the reasonable value of services they rendered Clem during his last illness. In their petition they alleged that the deceased was reputed to be worth in the neighborhood of one million dollars. The defendant moved to strike out this allegation. The trial court, however, denied the motion and held that evidence of the deceased's wealth and ability to pay was admissible. The court refused to instruct the jury that in arriving at what would be a reasonable charge for the physicians' services they should not consider the wealth of the deceased. From a judgment for \$2,000 in favor of the physicians, the defendant appealed to the court of civil appeals of Texas, Beaumont.

The question presented, said the court of civil appeals, is whether or not the trial court was correct in permitting the physicians to plead and prove the wealth of their deceased patient and in refusing to instruct the jury to disregard that proof. The authorities elsewhere may be conflicting on the question as to whether or not the financial condition of a patient may be considered in determining the reasonableness of his physician's charge, but it is now the settled rule in Texas that this may be done, and in support of that statement the court cited *Caulk v Anderson* 120 Texas 253, 37 S. W. (2d) 1008, decided April 1, 1931. The defendant insisted, however, that in the case cited the patient was benefited, his life prolonged and his death averted by the services rendered, while in this case none of these ends was accomplished. Consequently, the defendant argued, the rule laid down in the case cited by the court could not apply. But the court of appeals refused to accept this contention. The purpose of the services was to

accomplish a benefit to the patient, to prolong his life and if possible to avert his death, but in the judgment of the court the right of a physician to recover the reasonable value of services rendered does not depend on the success or failure of the treatment or operation, unless there is a contract to that effect. In the absence of such a contract, the rule of "no cure, no pay" has no application.

The defendant next claimed that the trial court erred in excluding evidence of the amounts charged by different physicians in Beaumont for appendectomies, the operation on which the claims of the physicians in this case were based. We do not believe, said the court of civil appeals, that the determination of what would be reasonable value of the services of one physician, rendered a patient in performing an appendectomy and giving after-treatment, could justly be ascertained by basing the charge on the amount other physicians had theretofore charged in such cases, all varying in degrees of seriousness, complications, and danger.

For the reasons stated the judgment of the trial court in favor of the physicians was affirmed.—*First National Bank of Beaumont v Powell (Texas)* 76 S W (2d) 870

Taxes Salary of Physician Employed by City Hospital Exempt from Federal Income Tax—Dr Frank B Mallory, a full-time pathologist at the Boston City Hospital, owned and operated by the city of Boston, paid under protest a federal income tax on the salary he received from the hospital. He then instituted this suit in the United States district court, district of Massachusetts, against the local collector of internal revenue, to recover the amount so paid.

Our constitutional system of dual sovereign governments, said the district court, impliedly prohibits the federal government from taxing the instrumentalities of a state government. The question to be determined, therefore, is whether or not Dr Mallory was an officer or employee of a state or of a subdivision thereof, so as to render his salary exempt from the federal income tax. The city of Boston is a municipal corporation and a political subdivision of the state. Furthermore, in the opinion of the court, the Boston City Hospital is an instrumentality of the city. It provides hospital care for the dependent poor and those accidentally injured, prevents and cures contagious diseases and cares for the public health, all of which are, under the circumstances here involved, essential government functions as opposed to proprietary functions. Since Dr Mallory's services were rendered in connection with an essential government function, his salary, in the judgment of the court, was exempt from taxation by the federal government if he was an officer or employee of the city.

In order to determine whether Dr Mallory was or was not an officer or employee of the city, the district court referred to article 643 of regulations 74, promulgated by the Commissioner of Internal Revenue under the revenue act of 1928, under which he sought to collect this tax, which provides—

An officer is a person who occupies a position in the service of the State or political subdivision the tenure of which is continuous and not temporary and the duties of which are established by law or regulations and not by agreement. An employee is one whose duties consist in the rendition of prescribed services and not the accomplishment of specific objects and whose services are continuous not occasional or temporary.

The court was of the opinion that under this definition Dr Mallory was not an officer of the city. The collector of internal revenue contended that Dr Mallory was not an employee, but he was an independent contractor, whose income, although paid by the city, was taxable by the federal government. The court, however, referred to the statute authorizing the trustees of the hospital, among other things, to have the general care and control of the hospital and of all branches thereof. The trustees' right of control over Dr Mallory's work, whether they exercised that control or not, was entirely consistent, in the opinion of the court, with the relation of employer and employee within the meaning of the regulations cited and decisions bearing on the subject. Moreover, Dr Mallory was required to sign the regular pay roll sheet, was paid by the regular city paymaster, and 4 per cent of his salary was deducted for a pension fund. He had regular working hours and his salary was on a yearly basis. Dr Mallory was therefore, in the opinion of the court, an employee within the

meaning of the pertinent regulations and decisions, and his salary was exempt from federal taxation. Judgment was entered in favor of Dr Mallory.—*Mallory v White*, 8 F Supp 989

Compensation of Physicians Patient's Wealth Not a Factor in Determination of Reasonable Medical Fees—The plaintiff, a physician, brought suit for \$2,400 for professional services to the defendants' minor daughter, comprising seventy-two professional calls, ten office treatments, puncturing the ear drum twice, and a simple mastoid operation. From a judgment in favor of the physician for the full amount, the parents appealed to the St. Louis court of appeals, Missouri.

An expert medical witness, in answer to a hypothetical question stated that he and other physicians in the community, in determining what constitutes a reasonable charge for medical services, considered jointly the importance of the services rendered and the wealth of the patient, that for a serious procedure of the kind involved in this case his charges would be 10 per cent of the yearly net income of the patient. The refusal of the trial court to strike out this testimony, the defendants contended, constituted reversible error. The physician plaintiff conceded the soundness of this contention but argued that the error was harmless as no evidence had been offered relative to the defendants' wealth. But even though there was no such evidence said the appellate court, the trial court's refusal to strike out the testimony could have led the jury to but one conclusion, namely that the court believed, and therefore the jury was bound to consider, that the wealth of the parents was a proper element to be taken into consideration in determining the reasonableness of the physician's fee. Such a ruling cannot be considered harmless, continued the court, in view of the strong language used in *Morrell v Lawrence*, 203 Mo 363 101 S W 571 in which the Supreme Court of Missouri said

In a case of this kind if the plaintiff is entitled to recover at all he is entitled to recover the reasonable value of the services rendered. He [a physician] is entitled to a verdict for the reasonable value of his services although the defendant may be a poor man. He is not entitled to a verdict for more than the reasonable value of his services although the defendant may be a man of great wealth. The jury in a case of this kind have no concern with the question of the defendant's ability to satisfy the judgment.

The judgment of the trial court was therefore reversed and the cause remanded for a retrial.—*Scholz v Mackay (Mo)* 75 S W (2d) 604

Society Proceedings

COMING MEETINGS

- American Association of Railway Surgeons Chicago November 13 15
- Dr Louis J Mitchell 86 E Randolph St Chicago Secretary
- American Clinical and Climatological Association, Princeton N J Oct 21 23 Dr Francis M Rackemann 263 Beacon Street Boston, Secretary
- American College of Surgeons San Francisco October 28 November 1
- Dr George W Crile 40 East Erie St Chicago
- American Public Health Association Milwaukee Oct 7 10 Dr Reginald M Atwater 50 West 50th Street New York Executive Secretary
- American Society of Tropical Medicine St Louis November 19 22 Dr Alfred C Reed 350 Post Street San Francisco Secretary
- Association of American Medical Colleges Toronto, Canada Oct 28 30
- Dr Fred C Zapffe 5 South Wabash Avenue Chicago Secretary
- Central Association of Obstetricians and Gynecologists Omaha Oct 10 12
- Dr Ralph A Reis 104 South Michigan Boulevard Chicago Secretary
- Delaware Medical Society of Wilmington Oct 8-9 Dr William H Speer 917 Washington Street Wilmington Secretary
- Indiana State Medical Association Gary Oct 8 10 Mr T A Hendricks 23 East Ohio Street Indianapolis Executive Secretary
- Inter State Postgraduate Medical Association of North America Detroit, October 14 18 Dr W B Peck 27 E Stephenson St Freeport Ill Managing Director
- Kansas City Southwest Clinical Society Kansas City Mo Oct 7 10
- Dr Ralph R Coffey 1103 Grand Avenue Kansas City Mo Secretary
- Nevada State Medical Association Elko Oct 25 26 Dr Horace J Brown 120 North Virginia Street Reno Secretary
- Omaha Mid West Clinical Society Omaha Oct 28 Nov 1 Dr J D McCarthy 107 South 17th Street Omaha Secretary
- Pacific Coast Society of Obstetrics and Gynecology Los Angeles Nov 6 9 Dr T Floyd Bell 400 29th Street Oakland Calif Secretary
- Southern Medical Association, St Louis November 19 22 Mr C P Loranz, Empire Building Birmingham Ala Secretary
- Vermont State Medical Society Rutland Oct 17 18 Dr William G Ricker 33 Main Street St. Johnsbury Secretary
- Virginia Medical Society of Norfolk, Oct 15 17 Miss A V Edwards 1200 East Clay Street Richmond Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J Digestive Diseases and Nutrition, Chicago

2: 333-390 (Aug.) 1935

- Etiology of Peptic Ulcer. Analysis of Seventy Ulcer Patients. S. C. Robinson. Chicago—p. 333.
Follow-Up of Ulcerative Colitis (Nonspecific). B. B. Crohn and B. D. Rosenak. New York—p. 343.
The Acutely Ill Jaundiced Patient. Report of Twenty-One Instances of Hepatic Icterus. Seven of Whom Had High Blood Nitrogen. S. G. Meyers, O. A. Brines, and B. Juhar. Detroit—p. 346.
Clinical Review of Giardiasis. Twenty-Two Cases Observed During Study of Five Hundred and Seventy-Two Private Patients. G. S. de Paula e Silva. Bello Horizonte, Brazil—p. 350.
Consideration of the Patient with Gastrointestinal Complaints But Who Is Without Evidences of Organic Pathology. G. A. Young and R. H. Young. Omaha—p. 353.
Nontuberculous Mesenteric Lymphadenitis in Childhood. L. H. Segar. Indianapolis and B. D. Rosenak. New York—p. 356.
*Effect of Oxygen Inhalation on Gaseous Distention of Stomach and Small Intestine. J. Fine, J. B. Sears, and B. M. Banks. Boston—p. 361.
Role of Serum Calcium Fractions in Effect of Violesterol on Bleeding Tendency in Jaundice. J. S. Gray and A. C. Ivy, Chicago—p. 368.
Appendix Abscess. Roentgenologic Consideration with Especial Reference to Diagnosis Difficulties and Its Differential Diagnosis. M. Feldman. Baltimore—p. 373.
Management of Esophagitis. Article I, II, and III. W. A. Bastedo. New York, J. Friedewald. Baltimore, and H. W. Soper. St. Louis—p. 379.

Effect of Oxygen Inhalation on Distention of Stomach
—In comparing the effect on cats of breathing pure oxygen with that of air on the change in total gas and nitrogen volume in the small intestine distended with nitrogen and ligated at the pylorus and ileocecal valve Fine and his associates observed that: 1. In cats breathing air the total gas volume in the small intestine is reduced 13.1 per cent within twelve hours. 2. In cats breathing oxygen a progressive decline in total gas volume in the small intestine occurs until a maximal reduction averaging 59.2 per cent is reached in twenty-four hours. 3. When air is breathed, the average decrease in volume of nitrogen in the small intestine after twelve hours equals 21.1 per cent. After twenty-four hours this decrease equals only 12.9 per cent. 4. When oxygen is breathed, an average of 44.9 per cent of the nitrogen in the small intestine is absorbed during the first twelve hours. An additional 17.4 per cent disappears in the succeeding twelve hours. A comparison of the effect of breathing pure oxygen with that of air on the change in total gas and nitrogen volume in the stomach distended with nitrogen and ligated at the cardia and pylorus showed that the total gas volume in the stomach was approximately the same after periods varying from six to twenty-four hours as at the beginning and that this was the case whether air or oxygen was used. In many instances a little more gas was recovered than was injected. Cats breathing oxygen, however, usually had a somewhat smaller residual volume than those breathing air. When air is breathed, the absorption of nitrogen from the small intestine at the end of twenty-four hours is 6 per cent and from the stomach 2.1 per cent. When oxygen is breathed, the corresponding figures are 62.3 per cent and 6 per cent. When the small intestine of an air-breathing cat is inflated with hydrogen, the percentage reduction of total gas volume after a given period is much greater than when the intestine is inflated with nitrogen. This is due to the fact that hydrogen has a much higher diffusibility coefficient than nitrogen. The inhalation of oxygen in place of air considerably increases the percentage reduction of total gas volume in the small intestine. When the stomach of an air-breathing cat is inflated with hydrogen the total gas volume is reduced to a much smaller extent than in the small

intestine. The observations are similar to those obtained when nitrogen is used as the distending gas, but the mechanism involved is not the same. It appears that the absorption of hydrogen from the stomach and small intestine is at least as efficient in the cat breathing air as in the cat breathing oxygen. Nevertheless, by preventing the diffusion of nitrogen into the gastro-intestinal tract from the blood oxygen accomplishes a greater eventual decrease in total gas volume in the small intestine. The authors state that, if the use of 100 per cent oxygen for a period of not less than twelve hours is to be considered for clinical application for the relief of gaseous distention, it is essential to inquire whether interruptions to continuous administration, which feeding and nursing may demand, would, by temporarily admitting nitrogen into the blood, substantially reduce the beneficial effects of the oxygen already inhaled. In six experiments, pure oxygen was given for four three-hour periods, with intervals of air breathing varying from one half to one hour. The residual gas volumes compared favorably with those obtained by continuous oxygen inhalation. The volume of nitrogen that may diffuse into the intestine during the air breathing interval is apparently insufficient to vitiate the decrease in volume effected by the oxygen already inhaled. Intermittent oxygen, allowing reasonable periods for rest, feeding or nursing, may therefore be expected to accomplish about the same results as continuous oxygen.

American Journal of Medical Sciences, Philadelphia

100: 145-290 (Aug.) 1935

- The Pituitary in Experimental Cretinism. I. Structural Changes in Pituitaries of Thyroidectomized Rats. I. T. Zeckwer, L. W. Davison, T. B. Keller, and C. S. Livingood II. Philadelphia—p. 145.
*Complete Insulin Resistance in Diabetes. E. Wayburn, San Francisco—p. 157.
Study of Blood Sugar of Epileptics. G. N. Tyson Jr., Louise Otis, Pomona, Calif., and T. F. Joyce, Spadra, Calif.—p. 164.
Relation of Experimental Skin Infection to Carbohydrate Metabolism. Effect of Hypertonic Glucose and Sodium Chloride Solutions Injected Intraperitoneally. D. W. Pillsbury, Philadelphia, and G. V. Kulchar, San Francisco—p. 169.
Lymphopathia Venereum (Lymphogranuloma Inguinale) and Its Relation to Rectal Stricture. J. B. Vander Veer, Philadelphia, F. E. Cormia, Montreal, and J. C. Ullery, Philadelphia—p. 178.
Studies in Hypertension. I. Production of Experimental Hypertension and Correlated Effect on Nitrogen Distribution of Blood Proteins. H. A. Rafsky, A. Bernhard, and G. L. Rohdenburg, New York—p. 187.
Hereditary Onychial Dysplasia. M. E. Hobbs, St. John, N. B.—p. 200.
*Therapy in Carbolic Acid Poisoning with Especial Reference to Use of Oil Antidotes. L. Goodman and A. J. Geiger, New Haven, Conn.—p. 206.
Recognition of Some Forms of Intracranial Lesions. C. W. Schwartz, New York—p. 220.
Cerebrospinal Fluid During and Between Attacks of Migraine Headaches. T. J. C. von Storch and H. H. Merritt, Boston—p. 226.
Allergy in Migraine-like Headaches. J. M. Sheldon and T. G. Randolph, Ann Arbor, Mich.—p. 232.
Relationship Between Urinary Creatinine and Total Body Creatine Surface Area and Body Weight. F. W. Kinard, J. C. Aull Jr., and J. Van de Erve, Charleston, S. C.—p. 237.
Failure of Intravenous Hydrochloric Acid to Shorten Anesthesia. F. W. Kinard and J. Van de Erve, Charleston, S. C.—p. 242.
Multiple Myeloma with Hyperproteinemia. Case Report. C. F. Sweet, San Francisco—p. 245.
Paradoxical Pleural Pressures. Their Relation to Kienboeck Phenomenon. B. P. Stuelman, New York—p. 256.
Familial Purpura. Report of Two Cases. F. R. Bailey and K. R. McAlpin, New York—p. 263.

The Pituitary in Experimental Cretinism—Zeckwer and his associates observed that thyroidectomy in young rats results in stunting of body growth, an increased weight of the pituitary due both to increased solids and to increased fluid content, a marked reduction or nearly complete disappearance of acidophils, an increase in the number of basic staining cells, and the appearance of great numbers of large cells filled with hyaline substance. These "thyroidectomy cells" appear, according to the special staining technique used, to be transformed cells containing blue granules. The "thyroidectomy cells" appear to be secreting and storing a secretory product that is hyaline in appearance. The stunting of body growth in the cretin rat may be due to loss of acidophils of the pituitary, which in turn depends on loss of the thyroid secretion. Acidophils seem to disappear by degranulation rather than by frank degeneration. An abundance of thyrotropic hormone was found to be present in certain pituitaries depleted of acidophils, a finding that rules out the acidophil cell as the producer of thyrotropic hormone.

Since there is no atrophy of the adrenals in cretin rats, it is reasonable to consider that the acidophils cannot be the producers of the adrenotropic hormone. When thyroidectomy is incomplete, the foregoing changes are slight or absent.

Complete Insulin Resistance in Diabetes—Wagburn presents the case of a woman who, before June 1934, had diabetes of moderate severity, with a complication of bilateral pulmonary tuberculosis, both of which were steadily advancing. July 20 she was sugar-free on a diet of carbohydrate 175, protein 75, fat 75, and 87 units of insulin. In the course of a few days she showed large amounts of sugar in the urine despite huge and increasing doses of insulin. The attempt was made to keep her on a diet sufficient for the tuberculosis and to cover the deficiency of carbohydrate metabolism with enough insulin. For a time it seemed as though this might be successful. Later, when it obviously was not, an attempt was made to reduce the insulin dosage abruptly. This was followed by a quick death. It is reasonable to suppose that, had the insulin dosage been further increased, the result would have eventually been the same, as was the case with Root's patient. The patient's ability to utilize sugar was enhanced by the use of large amounts of insulin, but it was apparently impossible to keep her from excreting sugar into the urine until something happened within her own organism to reduce her resistance. During this spontaneous partial remission, little dextrose appeared in the urine. Then, on doses of insulin larger than before, her resistance again increased until there was as much sugar in the urine on 415 units of insulin daily as there had been three weeks before on 200. However, the proof that the insulin, far in excess of what could be utilized was serving a purpose is shown by the fact that within eighteen hours after a smaller dosage was attempted the patient was in coma and died within twenty-eight hours, although the amount of insulin was still far in excess of that ordinarily sufficient. Although the etiology of resistance to insulin is not known, most observers agree in placing the responsible factors outside the pancreas. Häusler and Höglér, and Häusler and Loewy concluded that the cause of the resistance lies in the inaccessibility of the body cells to the action of insulin. Himsworth has brought forth evidence to indicate that the insulin excreted by the pancreas is inactive and requires an unknown activator to transform it into utilizable substance. The absence of this companion substance in the blood might conceivably result in the phenomenon of insulin resistance. That the liver plays a large part in the production of insulin resistance is indicated in the preponderance of cases of liver disease and by the importance of the liver in carbohydrate metabolism. The existence of an antinsulin in the liver has been postulated but has not yet been proved.

Therapy in Phenol Poisoning—From their experiments Goodman and Geiger conclude that there is little doubt that liquid petrolatum has no place in the physician's limited armamentarium against acute phenol poisoning. Phenol and related substances are commonly used chemicals and still cause a large proportion of deaths from poisoning. For this reason they considered it desirable to observe the antidotal value of liquid petrolatum in animal experimentation and to raise a note of warning concerning its use in cases of human poisoning. Experiments with olive oil grew out of the failure of liquid petrolatum to achieve the results that might reasonably be expected of rational treatment. The survival figures for olive oil seem definitely encouraging. While the authors realize all the caution and qualifications necessary for the transference of the conclusions drawn from animal investigation to man, they still feel that, since the treatment of phenol poisoning is so limited and unsatisfactory, the trial of olive oil is justifiable. Olive oil could be administered promptly in as large a quantity as possible preferably by having the patient drink it. Then the stomach tube can usually be quickly passed with safety and lavage performed with generous quantities of olive oil. Before removal of the stomach tube fresh oil could be instilled and allowed to remain. The physiologic principles of treatment outlined recently by Peters and his co-workers for acute mercury poisoning apply equally well to phenol, since there is analogous gastro intestinal, renal and vascular injury with consequent diminution of serum proteins and disturbance of the fluid and sodium chloride stores of the body. Particular attention should be paid to the liberal administration of parenteral

fluids and electrolytes of suitable composition and, perhaps, to the provision of blood by transfusion. If a cathartic is given, the choice should fall perhaps on castor oil, which in itself is an even better solvent for phenol than is olive oil. Poisoning by compound solution of cresol and other derivatives of cresol has in general the same therapeutic implications as those of phenol.

American J Obstetrics and Gynecology, St. Louis

30: 159-308 (Aug) 1935

- Parallel Study of Labor in Young and Old Primiparas Based on Critical Analysis of Three Hundred and Seventy Two Cases Below Twenty and Above Thirty Five Years of Age. J N Nathanson, New York—p 159
- Effect of Administration of Preparations of Growth Hormone of Anterior Lobe of Pituitary on Gestation and Weight of the New Born (Albino Rats). Ruth M Watt, Chicago—p 174
- Hormone Induction of Menstruation in Amenorrheas of from Three Months to Nine Years Duration. C W Dunn, Philadelphia—p 186
- Analysis of Three Hundred and Eighty One Cesarean Section Cases in Ten Year Period at Michael Reese Hospital. I F Stein and M L Ieventhal, Chicago—p 192
- Porro Cesarean Section. Analysis of Fifty Three Cases. Significance of Indications. A F Lash and W G Cummings, Chicago—p 199
- Cesarean Section. Analysis of Five Hundred Consecutive Operations. F F Daly, Chicago—p 204
- Review of Twenty Six Cases of Extraperitoneal (Latzko) Cesarean Section. J I Norton, Jersey City, N J—p 209
- *Therapeutic Value of Low Dosage Irradiation of Pituitary Gland and Ovaries in Functional Menstrual Disorders. C Mazer and L Spitz, Jr, Philadelphia—p 214
- Blood Loss During Cesarean Section. W J Dieckmann and E F Daly, Chicago—p 221
- Treatment of Abruptio Placentae. J A McGinn and W B Harer, Philadelphia—p 226
- Studies in Glutathione. I. Total and Reduced Glutathione, Oxygen Content and Capacity and Cell Volume of Blood in Nonpregnant and Pregnant Women with Especial Reference to Toxemias of Pregnancy. T W Oberst and E B Woods, Iowa City—p 232
- Total versus Subtotal Abdominal Hysterectomy in Benign Uterine Disease. F H Richardson, Baltimore—p 237
- Review of One Hundred and Ninety Cases of Heart Disease Complicating Pregnancy. B J Hanley and J F Anderson, Los Angeles—p 243
- *Primiparous Perineum After Forceps Delivery. Follow Up Comparison of Results With and Without Episiotomy. F B Nugent, Reading, Pa—p 249
- Current Techniques for Obstetric Analgesia and Anesthesia. C Gould and B C Hirst, Philadelphia—p 257
- Extra Uterine Pregnancy. Clinical Study of Five Hundred Cases. J E Fitzgerald and J I Brewer, Chicago—p 264
- Series of Six Hundred and Twenty Seven Vaginal Hysterectomies Performed for Benign Disease with Three Deaths. N S Heaney, Chicago—p 269
- Vaginal Aphasia and Creation of an Artificial Vagina. S L Israel, Philadelphia—p 273
- Cancer of Cervix and Vagina in Case of Complete Proctentia. L Brady, Baltimore—p 277
- Pregnancy in Patient with Complete Double Uterus. B Green and C K Miller, Philadelphia—p 281
- Bilateral Peripheral Paralysis of Radial Nerve in a New Born Infant. L H Smith, Portland, Ore—p 283
- Ovarian Pregnancy. Report of Case. H J Holloway, Evanston, Ill.—p 286
- Human Ovum in Salpingitis Isthmica Nodosa. A F Lash, Chicago—p 287
- Myofibroma of Ovary with Heteroplastic Bone Formation. I F Stein, Chicago—p 289
- Chronic Typhoid Abscess of Ovary. Report of Case. L A Soloff and C S Hermann, Philadelphia—p 290
- Abdominal Pregnancy with Delivery of Living Child. A C Posner, New York—p 293
- Inversion of Uterus in Two Successive Pregnancies. P C Fox, Oak Park, Ill.—p 295
- Lipoma of Broad Ligament. A E Kanter, Chicago—p 296
- Fetus Papryaceus in Twin Pregnancy. Report of Case. J G Crotty, Cincinnati—p 296
- Modified Vaginal Speculum. W D Fullerton, Cleveland—p 297

Low Dosage Irradiation of Pituitary and Ovaries in Menstrual Disorders—Mazer and Spitz state that twenty-three of forty-seven women suffering from severe amenorrhea have been menstruating regularly without the stimulus of incidental pregnancies for periods averaging 23 years following low dosage irradiation of the ovaries and pituitary. Normal menstruation was restored in eight of fifteen women suffering from a milder form of amenorrhea (oligomenorrhea), without the aid of incidental pregnancies. Ten additional patients of the twelve, who conceived soon after roentgen treatment, have been menstruating regularly for periods averaging 25 years. Ten of thirteen patients of child-bearing age suffering from

dysfunctional metrorrhagia of long duration were cured by one course of treatment. Associated sterility was relieved in twenty of thirty-eight women who had no ascertainable cause to account for the condition other than menstrual disturbances. Primary dysmenorrhea was an associated symptom in fourteen of 102 patients treated. Five of the fourteen were completely and permanently relieved without the aid of incidental pregnancies. The menstrual rhythm of seventeen regularly menstruating women was not disturbed by the treatment. Seven of eleven amenorrheic women responded after a second or third course of treatment given at intervals of three months; the condition of the remaining four was not aggravated by repeated exposures. It is assumed, therefore, that the roentgen treatment was not responsible for the aggravation of the amenorrhea of the two patients who had received only single courses of treatment. Twenty-six healthy children were born to women who had received the treatment.

Primiparous Perineum After Forceps Delivery—Nugent compared the results of 202 primiparas delivered at term by forceps with and without episiotomy. An analysis of morbidity suggests that there is a definite increase in morbidity attendant on episiotomy and that the increase is only partially dependent on the increased complexity of operative procedures, the percentage of intercurrent infection and the longer duration of labor in the episiotomy series. The mediolateral type of episiotomy is suggested as the safer in the prevention of third degree lacerations. Much better anatomic results were obtained following episiotomy and repair. The author believes that the better results are attributable to the easier recognition of the extent of injury done in episiotomy and the simplification of the repair when a surgical laceration is produced. It is shown that episiotomy spares the anterior wall and that when the spontaneous laceration approaches adequate episiotomy, the percentage of unsatisfactory results is less. The fallacies of examination in attempting to determine the exact amount of damage done immediately after delivery without episiotomy is shown. It is further suggested that the indication for episiotomy becomes mandatory in proportion as the age of the primipara exceeds 20 years. Many of the series are inconclusive because of the smallness of the subgroups. They are presented not as adequate studies but as indexes of the trends and the need for additional investigation.

American Journal of Ophthalmology, St. Louis

18 699-800 (Aug.) 1935

- Ophthalmomyiasis. Review of Literature and Report of Case of Ophthalmomyiasis Interna Posterior. W. B. Anderson, Durham, N. C.—p. 699
- Sodium Content of Aqueous, Vitreous and Serum. Comparative Study on Oxen. P. W. Salt, Iowa City—p. 706
- Glaucoma Accompanying Nevus Flammeus. E. B. Dunphy, Boston—p. 709
- Some Clinical Observations on Anisokonia. W. L. Hughes, Hempstead, L. I., N. Y.—p. 715
- Cerebrospinal Fluid Studies in Ten Cases of Tobacco Alcohol Amblyopia. F. D. Carroll, New York—p. 720
- Reticulum in Chronically Hyperplastic Conjunctiva. H. D. Lamb, St. Louis—p. 724
- Critique of Glaucoma Operations. H. S. Gradle, Chicago—p. 730
- Uveoparotid Tuberculosis. Report of Two Cases. I. D. Kruskal and J. M. Levitt, Brooklyn—p. 735
- Intracapsular Extraction of Crystalline Lens with Electrodiaphanograph. Method of Lopez Lacarrere. Angel Moreu, Valencia, Spain, translated by W. H. Crisp—p. 739
- Recession Operation with Control Suture. Using Correction Lenses to Effect Muscle Balance During Convalescence. O. B. Nugent, Chicago—p. 744

Recession Operation with Control Suture—Nugent describes an operation for the correction of heterotropia and heterophoria, a suture being used by which the muscle can be readjusted, if necessary, during the first few days of convalescence. The eyes are not occluded with bandages or eye patches but instead correction lenses are worn, thereby preserving a state of functional rest in the extrinsic muscles. Any overcorrection or undercorrection that may appear in the first three or four days can be adjusted by means of the suture. The benefits hoped for are the mechanical correction of the strabismus, producing a cosmetic effect, and the reestablishment of binocular single vision. The former can be secured in almost every case, the latter only when fusion is present or can be developed subsequently.

Archives of Ophthalmology, Chicago

11: 183-324 (Aug.) 1935

- Lymphoma of Eye and Adnexa. Report of Thirteen Cases. P. J. Leinelder and C. S. O'Brien, Iowa City—p. 183
- Bilateral Retinal Glioma Treated by Radiation. Clinical and Histologic Report. A. G. Fewell and W. E. Fry, Philadelphia—p. 190
- Inclusion Bodies in Ophthalmia Neonatorum. Further Note. S. R. Gifford and N. K. Lazar, Chicago—p. 197
- Short Studies on History of Ophthalmology. II. Sir Jonathan Hutchinson, Greatest 'Generalized Specialist', and His Contribution to Ophthalmology. B. Chance, Philadelphia—p. 203
- Primary Melanosarcoma of the Optic Disk. J. Levine, New York—p. 229
- Uveitis with Associated Alopecia, Poliosis, Vitiligo and Deafness. Report of Case. W. S. Davies, Ann Arbor, Mich.—p. 239
- Effect of Extract from Cataractous Human Lenses on Senile Cataract. E. Selinger, Chicago—p. 244
- Intracapsular Cataract Extraction by the Knapp Method as Compared with the Classic Procedure. Further Report. L. F. Appleman, Philadelphia—p. 249
- Effect of Experimental Diabetes on Cornea of Dogs. Its Relationship to Administration of Vitamin A. Elaine P. Ralli, E. B. Gresser and G. Flaum, New York—p. 253

Inclusion Bodies in Ophthalmia Neonatorum—Gifford and Lazar applied a 2 per cent infusion of senega to the conjunctiva of two adults, but no inclusion bodies could be demonstrated. Twenty-six infants several days old were treated with the drug. The infants had shown no previous secretion, and only one eye of each infant was treated. A moderate reaction was produced, which subsided within from twenty-four to forty-eight hours unless the drug was administered again. Scrapings made during the period of discharge showed inclusions in three instances, which the authors considered identical with those found in inclusion blennorrhea. They were especially numerous in the scrapings from one baby, four being found in one microscopic field and many others in the preparation, and these were obtained on several subsequent examinations. Five days after the last instillation of the drug the reaction had subsided entirely and no more inclusions were found. The other eye remained normal during this time, and subsequently in preparations from the other twenty-three infants no characteristic bodies were found. The preparations were submitted to several investigators, all of whom believed that the bodies could not be differentiated from those seen in cases of trachoma and inclusion blennorrhea. After a renewed comparison of this material with preparations from three fresh cases of blennorrhea in which numerous inclusions were evident, the authors were forced to admit that certain differences between the preparations of animal and those of human material were marked enough to differentiate between them. But between the material from their patients with inclusion blennorrhea and that from three normal babies treated with senega no such difference existed. In attempts to repeat their observations, twenty-seven infants were treated, but in no case of this new series were inclusions found. As a result of their experiences they assume that the virus of inclusion blennorrhea was present in their three infants in a latent form and that the use of a chemical irritant stimulated its growth so that it was found easily in preparations for from five to seven days, during which increased secretion was present. Against Thygeson's explanation are the facts that scrapings made before the instillation gave negative results, as did the scrapings after the short period of increased secretion, and that no signs of the chronic stage of inclusion blennorrhea were present, which is a sequence of events unknown in inclusion blennorrhea. There seems to be no reason why the virus cannot be present in a latent stage or in an avirulent form, a condition known to occur in carriers of *Bacillus diphtheriae* or the meningococcus. The finding of inclusion bodies in the normal conjunctiva was reported by McKee and Addario. The authors state that it must not be concluded from the work of Thygeson that inclusion blennorrhea is the only form of non-gonorrheal conjunctivitis of the new-born infant.

Effect of Extract from Cataractous Lenses on Senile Cataract—Selinger states that many factors influence the progress of lens opacities and that the rate of development of senile cataract varies in different patients and even in the two eyes of the same patient. The use of extracts from noncataractous beef lenses should favor, instead of retard, the development of lens opacities. Extracts from cataractous human lenses seem

to have no effect on the progress of senile cataract. The author has employed these extracts in five cases of bilateral incipient progressive senile cortical opacities. Patient 1 had an initial improvement in visual acuity from 6/200 to 0.2 in the left eye, but four months after the beginning of the treatment vision in this eye was reduced to perception of light. In case 4 there occurred a similar early improvement in visual acuity. Examination fifteen months later showed a marked decrease of vision in one eye. Patient 5 had no change in her visual acuity after four months, and patient 3 maintained her original visual acuity for eighteen months. Patient 2 was the only one whose vision remained improved after fifteen months, although the slit lamp revealed that the cataracts were still progressing.

Archives of Pathology, Chicago

20 175 336 (Aug.) 1935

- *Two Rare Instances of Cardiovalvular Disease Presumptively Syphilitic in Origin. A. R. Sohval. New York.—p. 175
- Vascular Lesions in Surgically Excised Stomachs. G. H. Fetterman. Mayview, Pa.—p. 189
- Early Lesions Following Intravenous Administration of Filtrable Staphylococcus Toxin. Study on Dog and Rabbit. R. H. Rigdon. Durham, N. C.—p. 201
- *Histamine and Leukocytosis. V. H. Moon, M. M. Lieber and P. J. Kennedy. Philadelphia.—p. 209
- Behavior of Transplanted Spleen with Especial Reference to Tissue Differential of Hematopoietic Organs. M. Silberberg. Halifax, N. S.—p. 216
- Effect of Hypophysectomy on Natural Resistance of Adult Albino Rats to Histamine Poisoning. D. Perla and S. H. Rosen. New York.—p. 222
- Proteolytic Enzymes of Monocytic and Polymorphonuclear Pleural Exudates. C. Weiss and E. J. Czarnetzky. San Francisco.—p. 233
- *Duplication of Meckel's Diverticulum with Other Congenital Anomalies. L. A. Carlson. Rochester, Minn.—p. 245

Cardiovalvular Disease Presumptively Syphilitic in Origin—Sohval presents two cases that showed macroscopic and histologic lesions which, when considered in connection with those in other cases recorded in the literature, are extremely suggestive of syphilis. They point to the existence of tertiary syphilitic cardiac lesions that are not distinctly gummatous. It appears that, in addition to diffuse and localized gummatous lesions, a third type of syphilitic involvement can be recognized in which coagulation necrosis and giant cells are absent. The gross appearance of the lesion is that of a fairly well circumscribed, densely sclerotic, whitish, cartilaginous mass. In a valve it produces marked thickening of the structure. The histologic picture is one of dense irregular or whorled connective tissue formation. Valvular elastic lamellae are reduplicated and frayed. The entire lesion is apt to be extensively vascularized, capillaries and arterioles with obliterative endarterial lesions are found. These are usually surrounded by focal accumulations of lymphocytes, plasma cells and large mononuclear cells. Diffuse cellular infiltrations are likewise present. In the anterior leaflet of the mitral valve the process arises by extension from syphilitic disease at the root of the aorta. The picture is that of a well scarred granuloma in which necrotic foci have disappeared. The fact that coagulation necrosis is absent should not exclude the diagnosis of syphilis any more than it does in the case of syphilitic aortitis. The lesion in the mitral valve in the cases of Friedman and Staemmler belongs to this type of granulomatous involvement, differing, however, by possessing areas of coagulation necrosis and less prominent fibrosis, i. e., a more active type of granuloma.

Histamine and Leukocytosis—Moon and his associates counted the leukocytes in the blood of adult cats before and at intervals following the intravenous injection of small amounts of a sterile solution of histamine phosphate. Differential counts showed that the increase consisted of polymorphonuclear neutrophils. In each instance the blood picture returned to normal within twenty-four hours. In three instances a decrease in the number of leukocytes was seen within one hour. In each instance the leukopenia was transient and was followed by definite leukocytosis. Injections of 2 mg. usually produced transient shocklike phenomena. In another experiment three monkeys (*Macacus rhesus*) were given subcutaneous injections of varying doses of histamine phosphate in physiologic solution of sodium chloride. Leukocyte counts were made immediately before and at intervals following the injections. A sharp rise

in the leukocyte count followed the injection of even 0.75 mg. of histamine. The increase consisted of polymorphonuclear neutrophils. The maximal leukocytosis usually occurred from two to four hours following the injection. This result may be compared to the high leukocytosis that follows extensive burns of the skin in man. The subcutaneous injection of histamine was followed by leukocytosis in monkeys. Histamine phosphate in doses of from 0.5 to 1 mg. in sterile solution was given intravenously to seven young men. The leukocytes in the blood were counted immediately before and at intervals following the injections. A moderate leukocytosis occurred regularly, with an average increase of 3,000 leukocytes from three to five hours following the injection. The count returned to normal within twenty-four hours. In several instances a slight leukopenia was found one hour after the injection. This was followed by an increase in the leukocyte count in each case. Control counts at corresponding intervals were made on the same subjects. The intravenous injection of histamine produced a characteristic circulatory reaction. The face at first was flushed but immediately became pale. This was accompanied by a metallic taste in the mouth, dizziness, faintness and frontal headache. The radial pulse was rapid and sometimes weak. The headache sometimes lasted several hours, but the other manifestations disappeared within thirty minutes. Histamine phosphate was given by subcutaneous injection to another group of volunteers. In these the results varied with the amounts of histamine given. In three subjects receiving 2 mg. the leukocyte counts remained within normal limits throughout the course of the experiment. One subject receiving 2.5 mg. showed a maximal rise of 4,650 leukocytes in three hours. Another subject receiving 3 mg. showed a maximal increase of 2,200 in five hours. In the four subjects given 5 mg. of histamine phosphate a decrease in the number of leukocytes occurred in the first hour followed regularly by an average increase of 3,340 leukocytes in from five to seven hours. Control counts made at corresponding intervals on another day showed no significant variations from normal. The polymorphonuclear neutrophils were the only cells showing significant numerical variations both in this group and in those receiving histamine intravenously. The subcutaneous injections produced general manifestations similar to those following intravenous injections, but less in degree.

Duplication of Meckel's Diverticulum—Carlson observed duplication of Meckel's diverticulum in a 38 weeks old male hydrocephalic fetus. This condition was associated with anomalies of the nervous cardiovascular and respiratory systems. He reasoned that in this case the process of atrophy of the omphalomesenteric duct was both altered and delayed, resulting in bifurcation of the tip similar to that which occurred in the case reported by Fitz. This bifurcation continued from the tip of the partially involuted omphalomesenteric duct to the base, with the result that the duct was divided neatly into two parts, each of which has a separate opening into the intestine. With the further growth of the intestinal tract each diverticulum grew independently and separated from its fellow by a distance equal to the increase in length of the intervening portion of intestine.

Canadian Public Health Journal, Toronto

26 367 418 (Aug.) 1935

- Administrative Aids to Rural Health Service. C. L. Scamman. New York.—p. 367
- The Alberta Health Insurance Act. A. C. McGugan. Edmonton, Alta.—p. 373
- Vitamin D Milk. E. W. McHenry. Toronto.—p. 377
- The Place of the Family Doctor in a Public Health Program. W. Woolner. Ayr, Ont.—p. 381
- The History of the Department of Public Health of Alberta. M. R. Bow and F. T. Cook. Edmonton, Alta.—p. 384

Indiana State Medical Assn. Journal, Indianapolis

28 365 416 (Aug. 1) 1935

- Appendicitis. P. G. Skillern. South Bend.—p. 365
- Safe Technic for Circumcision. H. D. Cogswell. Indianapolis.—p. 371
- Cancer of Rectum. H. H. Wheeler. Indianapolis.—p. 372
- Surgery of the Thyroid Gland. C. A. Nafe. Indianapolis.—p. 377
- Modified Type of Siphon Drainage Apparatus of Mariotte Principle. H. M. Banks and M. N. Hadley. Indianapolis.—p. 381
- Catgut Allergy. Case Report. H. D. Tripp. Kewanna.—p. 383

Journal of Bacteriology, Baltimore

30: 119 212 (Aug.) 1935

- Studies on *Pneumococcus* Variation II Smooth Virulent Variants Produced by Daughter Colony Dissociation of Smooth *Pneumococcus* Strains M D Laton New Haven Conn.—p 119
- Stimulation of Bacterial Growth Rate by Methyl Cermanic Oxide P L Carpenter M Fulton and C A Stuart Providence R I—p 137
- Can Azotobacter Chroococcum Synthesize Vitamin D? J F Greaves Logan Utah—p 143
- Interrelation of Amount of V Factor and Amount of Air Necessary for Growth of *Hemophilus Influenzae* Type b in Certain Mediums Margaret Pittman New York—p 149
- Some Observations on Germicidal Efficiency of Chloramine T and Calcium Hypochlorite D B Charlton and M Irvine, Ames Iowa—p 163
- Physiologic Studies on *Rhizobium* IV Utilization of Carbonaceous Materials O R Neal and R H Walker Ames Iowa—p 173
- Study of Acid and Gas Formation by Members of Colon Aerogenes Intermediate Groups in Presence of Certain Sugar Alcohols and Their Anhydrides K P Dozois F Hachtel C J Carr and J C Krantz Jr Baltimore—p 189
- Microscopic Method of Distinguishing Dead from Living Bacterial Cells C Knaysi Ithaca N Y—p 191
- Quantitative Differential Method for Counting Mixed Cultures of Bacteria F H Anderson and C A Stuart Providence R I—p 207

Journal of Experimental Medicine, New York

62: 129 288 (Aug 1) 1935

- Studies on Immune Response of Rheumatic Subject and Its Relationship to Activity of Rheumatic Process I Determination of Antistreptolysin Titer A F Coburn and Ruth H Pauli New York—p 129
- Id II Observations on Epidemic of Influenza followed by Hemolytic Streptococcus Infections in Rheumatic Colony A F Coburn and Ruth H Pauli New York—p 137
- *Id III Observations on Reactions of Rheumatic Group to an Epidemic Infection with Hemolytic Streptococcus of Single Type A F Coburn and Ruth H Pauli New York—p 159
- Purification of Antibodies in Type I Antipneumococcus Serum and Chemical Nature of Type Specific Precipitin Reaction B F Chow and W F Goebel New York—p 179
- Pathogenic Organisms of the Genus *Listeria* C A Seastone Princeton N J—p 203
- Influence of Latent Syphilitic Infection on Reaction of Rabbit to Brown Pearce Tumor P D Rosahn New York—p 213
- Spreading Property of Azo proteins in Dermis A Claude New York—p 229
- *Isolation of Poliomyelitis Virus from Nasopharynx J R Paul J D Trask New Haven Conn and L T Webster New York—p 245
- Studies on Mechanism of Production of Specific Bacterial Enzyme Which Decomposes Capsular Polysaccharide of Type III *Pneumococcus* R Dubos New York—p 259
- Use of Graded Collodion Membranes for Concentration of Bacterial Enzyme Capable of Decomposing Capsular Polysaccharide of Type III *Pneumococcus* R Dubos and J H Bauer New York—p 271
- Serologic Relationship Between *Pneumococcus* Type I and Encapsulated Strain of *Escherichia Coli* L A Barnes and Eleanor C Wight Boston—p 281

Reaction of Rheumatic Subjects to Epidemic Infection with Hemolytic Streptococcus—Coburn and Pauli state that of seven children who escaped an epidemic streptococcus infection none developed rheumatic symptoms and that of seventeen children who contracted the epidemic streptococcus infection fourteen developed acute rheumatism and three showed no recognizable rheumatic manifestations. The seven children who failed to contract infection with *Streptococcus haemolyticus* showed clearly that susceptible individuals may live in close association with an epidemic of acute rheumatism, develop no rise in antistreptolysin titer and maintain excellent health. A patient having congenital heart disease demonstrated that a nonrheumatic subject may be infected with a highly effective strain of hemolytic streptococcus and develop a typical antibody response yet escape all rheumatic manifestations. The two patients who, although infected with the epidemic strain failed to show any antibody response also failed to develop rheumatic recrudescences. Environmental, dietary, age and the other factors investigated did not appear to be significant in this outbreak of acute rheumatism. Three factors appeared to determine the development of the fourteen recrudescences (1) infection with a highly effective agent, (2) the disease pattern peculiar to each rheumatic subject, and (3) the intensity of the immune response of the patient as indicated by the rise in antistreptolysin titer.

Isolation of Poliomyelitis Virus from Nasopharynx.—Paul and his associates discuss a single example of mild illness diagnosed as a suspected abortive poliomyelitis, in which the

virus of poliomyelitis was recovered from the nasopharynx by three different methods. Failure to recover virus from a total of twenty-six cases diagnosed as suspected or abortive poliomyelitis and fourteen contacts is reported. The original material from the nasopharynx of the positive case proved unusually infective for the monkey, apparently even more so than are the majority of suspensions of spinal cords from fatal human cases of poliomyelitis. An explanation of this fact is not clear. The method of isolating human virus from the throat, by means of preserving the sediment of washings from this site in glycerin, has been shown to be efficient in one case for a period of 101 days.

Laryngoscope, St Louis

45 573 656 (Aug) 1935

- Function of Central Acoustic Nuclei Examined by Means of Acoustic Reflexes R Lorente de No St Louis—p 573
- Treatment of Brain Abscess P G Flothow Seattle—p 596
- Iontophoresis in Hay Fever and Allergic Conditions L D Volk Brooklyn—p 607
- Response of Allergic Phenomena to Ionization A M Alden St Louis—p 620
- Development of Bronchoscopic Service Report of Thirty Cases of Endoscopy for Foreign Bodies M S Lloyd New York—p 633

Ohio State Medical Journal, Columbus

31: 561 640 (Aug 1) 1935

- Recent Advances in Treatment of Peripheral Vascular Diseases M R Reid Cincinnati—p 577
- Hypochromic Anemia R L Haden Cleveland—p 583
- Chronic Nasal Sinusitis Evaluation of Opaque Oils in Diagnosis and Treatment Some Surgical Observations and Results H M Good year Cincinnati—p 591
- Our Responsibility to the New Born S H Ashmun Dayton—p 594
- Differential Diagnosis of Schizophrenia and Schizophrenic Reaction Types J F Bateman Cincinnati—p 595
- Patent Ductus Arteriosus Case Report of Woman Sixty Five Years Eleven and One-Half Months of Age J G Brody and A Randall Youngstown—p 599

Texas State Journal of Medicine, Fort Worth

31: 251 306 (Aug) 1935

- The Senile Diabetic F H Kilgore Houston—p 258
- Elective and Selective Induction of Labor F J Iiams Houston—p 262
- Practical Control of Diabetic Individual E M McPeak and S Schwartzburg San Antonio—p 266
- Fractures of the Os Calcis C C Green Houston—p 270
- Mycotic Infections in Otolaryngology W D Gill San Antonio—p 272
- Tumors of Spinal Cord S D Swope El Paso—p 278
- External Deformities of Nose and Their Correction S Israel Houston—p 281
- *New Concept in Treatment of Acute General Peritonitis T R Sealy Santa Ana—p 284
- Hypothyroidism in Pregnancy Further Study C F Brown and Genevieve C Shea Dallas—p 287
- Dietometabolic Urology P R Stalnaker Houston—p 292

Treatment of General Peritonitis—The symptoms that Sealy interprets to indicate the presence of acute general peritonitis are. When it occurs postoperatively, early appearance marked by severe diffuse pain with maximal intensity about the umbilicus splinting of the abdominal muscles, with resultant thoracic respiration, because of retraction of the abdominal wall with boardlike rigidity tenderness, usually very acute, which may be general or local, leukocytosis of from 16,000 to 22,000, together with a high proportion of polymorphonuclear cells ranging from 84 to 92 per cent. He considers this high percentage of polymorphonuclears of more diagnostic importance than the leukocytosis. His concept of the most effective treatment of acute general peritonitis after removal of the source of infection and providing ample drainage, is to get the patient's intestine to function. By such measures he believes the prognosis will be more favorable, because toxemia is the chief cause of death and comes not only from the original source of infection but also from the absorption of toxic substances from the intestine above an obstruction and from the inflamed peritoneum. Therefore it is necessary, in the treatment of acute general peritonitis, to prevent or relieve obstruction. Other causes of death are dehydration, starvation and lethal deficiency of sodium and chlorides in the body. His plan of combat entails the removal of the source of infection, the relief of intestinal stagnation and distention, the establishment and maintenance of fluid balance

with sodium and chloride solutions, nourishment, the maintenance of a persistent rhythmic peristalsis, the relief of pain and the increase of the defensive powers of the patient

Virginia Medical Monthly, Richmond

62: 243-302 (Aug.) 1935

- Serodiagnosis of Enteric Fever, with Especial Reference to Method of Qualitative Receptor Analysis S R Damon Baltimore—p 244
Surgical Treatment of One Hundred and Eighty Three Consecutive Thyroid Cases with No Mortality G W Horsley, Richmond—p 249
Obstetric Shock M P Rucker, Richmond—p 254
Significance of Cooperative Clinical Studies in Treatment of Syphilis R A Vonderlehr, Washington, D C—p 262
*Carcinogenesis Line of Research (Second Paper) Role of Lymphatic System in Its Relation to Karyokinesis M Benmosche and J Coull, New York—p 268
Venous Pressure and Body Weight Determinations in Congestive Heart Failure J E Wood Jr, G D Capaccio and W Weaver University—p 271
Gas Bacillus Infections Study of Incidence, Treatment and Mortality H J Warthen Richmond—p 276
Colles Fracture M H Todd Norfolk—p 282
Value of X Ray Examinations in Industrial Surgery J T McKinney, Roanoke—p 285

Carcinogenesis—Benmosche and Coull believe that the stimulus to cellular division is due to weak radiations of low energy density from the element potassium or, more exactly, its isotope K_{41} . Of all the elements that enter the body in appreciable amounts, potassium is the only one known to be radioactive. It is their contention that this radioactive element is essential for the life processes of a cell. The life in a cell may be visioned as a delicately balanced equilibrium between highly complex molecules, tending to break down into inert substances, and radiation of the proper wavelength and density. Radiation plus inert colloidal complexes equals living matter. There is a very narrow range or wave band of radiation as well as a sharply defined radiation density which is necessary to sustain cellular life. Beyond this it is impossible to go without producing death on the one hand or cellular division on the other. An increase in the concentration of the radioactive isotope of potassium will, in terms of the authors' theory, be mainly responsible for cellular division, because the radiant energy content or density has arisen above that which is necessary for its environmental function as a cell unit. If lymph stasis is the histologic picture of all precancerous states, they consider the process through which this takes place. 1 A tissue is subjected to the chronic irritation of any given carcinogenic agent. 2 A persistent inflammatory condition supervenes in which the blood supply to the part is increased with a corresponding increase in the volume of lymph bathing the tissues. 3 The persistent exudate gives rise to the increased presence of fibroblasts. Fibrosis, added to the mechanical pressure of the exudate, produces an occlusion of the afferent lymph channels, and the condition of lymph stasis is the result. This fibrosis may extend to the blood vessels supplying the part, in which case there may be an apparent anemia instead of the more frequent congestion accompanying a neoplasm. 4 The lymph node system finds itself inadequate to cope with the type and continuance of the irritation. 5 The growth hormones of the higher ductless glands are hyperstimulated. 6 The inhibitory calcium is crowded out of the scene. 7 The cells and all subsequent generations of cells are reconditioned with respect to their selectivity for K_{41} . 8 Instability and disorganization follow.

Wisconsin Medical Journal, Madison

34: 517-600 (Aug.) 1935

- Peptic Ulcer F G Connell Oshkosh—p 527
Cause of Peptic Ulcer D J Twobig Fond du Lac—p 530
Sedimentation Rate in General Practice J A Schindler and W B Nagni Jr Monroe—p 531
Diseases of Cervix Uteri C H Davis Milwaukee—p 536
Antiviral Treatment of Ulcerative Colitis E J Oesterlin Springfield Ohio A W Johnson J Kinsey Milwaukee and T Willett, West Allis—p 538
The Treatment of the Patient Who Has Heart Failure. L M Warfield Milwaukee—p 546
Early Spondylolisthesis Case Report R M Carter Green Bay—p 552
Surgical Treatment in Pulmonary Tuberculosis at the Wisconsin State Sanatorium R D Thompson E K Steinkopf K G Bulley and C M Yoran Statesan—p 553

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

19 433-480 (Aug.) 1935

- Vitreous Body and Glaucoma S Duke-Elder and H Davson—p 431
Some Remarks on Recession Operation for Squint. J G Milner—p 448
Experiences with Glaucoman C Hamburger—p 455
Knife for Corneal Grafting H B Stallard—p 459

British Medical Journal, London

2: 195-242 (Aug 3) 1935

- Nutritional Iron Deficiency Anemia with Especial Reference to Prevalence and Age and Sex Incidence. L S P Davidson H W Fullerton and R M Campbell—p 195
Thyroid Gland and Heart Disease O Brenner—p 199
*Results of Antenatal Administration of Quinine P J Ganner—p 205
Further Experience of Use of Quinine in Normal Labor D A Mitchell and H N Bradbrooke—p 206
Physiology of Deep Sea Diving W A R Thomson—p 208

Results of Antepartum Administration of Quinine—

From his observations of fifty consecutive normal primiparas with controls, Ganner believes that 1 The tendency to onset of premature labor is, if anything, diminished by the antepartum administration of quinine. 2 The first and second stages of labor are accelerated without damage to the mother or the child. Inertia is not entirely abolished. 3 The absence of cases of retained placenta or severe postpartum hemorrhage in both series makes it impossible to decide whether the incidence of these conditions is reduced or not. Bearing in mind the increased activity of the uterine muscle during the first and second stages of labor, one would expect a similar increase during the third stage. 4 There is no evidence of any direct influence on involution and the puerperium. The results suggest that the uterine action is strengthened by giving small doses of quinine during the last month of pregnancy. If this fact is accepted the method is surely to be recommended as a routine for use in normal, and especially in abnormal, cases, for there are few if any conditions in obstetrics in which good uterine contractions are not a valuable factor. A method that helps to secure these and is simple and safe enough for use in domestic practice appears to the author to deserve more attention than it has had up to the present time.

Indian Medical Gazette, Calcutta

70: 361-420 (July) 1935

- *Arterial versus Venous Blood Sugar Arteriovenous Sugar Difference as Criterion of Severity of Diabetes J P Bose—p 361
Telcheten in Indian Strains of Malaria R N Chopra, B Sen and S K Ganguli—p 362
Treatment of Obstruction of Lacrimal Duct and Chronic Dacryocystitis J Hansraj—p 366
Rate of Development of Hookworm Eggs P A. Maplestone—p 368
Ewing's Sarcoma Clinical and Pathologic Study of Case. A N Goyle, A Vasudevan and K G Krishnaswamy—p 371
Calcinosis Cutis R N Chopra and J P Bose—p 375
Eupivan Sodium (Intravenous Anesthetic) P N Banerjee—p 380
Relative Vitamin C Values of Milk and Curd Note A R Ghosh and B C Guha—p 382
Vitamin B₁ Values B₂ Values and C Values of Country Liquor Prepared from the Date Note H G Biswas and B C Guha—p 382
Report on Plague in Peermade (Travancore State) N K Tampi—p 383

Arterial versus Venous Blood Sugar—Bose believes that the magnitude of the difference between the sugar content of the arterial blood and the venous (positive arteriovenous difference) after dextrose ingestion is the best indication of the rate of dextrose utilization in the tissues. In diabetes the power of dextrose utilization in the tissues is defective according to the degree of the severity of the disease. That explains why the degree of positive arteriovenous difference becomes less and less as the severity of the disease increases and, in the severe cases, even a negative arteriovenous difference is obtained, i.e., the venous sugar level rises higher than the arterial sugar. The reason for this is probably that there are times when the tissues are discharging more sugar into the venous blood than they are receiving from the capillary blood. The tissues lose the power of retaining the sugar that is stored in them and under the stress of the sudden flooding by extra sugar brought

to them by the arterial blood, after a dextrose meal, not only let it flow through without change but actually give up to the venous blood a little or a good deal of the sugar retained by them. This explanation receives some corroboration from the results of some of the experiments that the author is carrying out at present, viz., the action of insulin on the arteriovenous sugar difference in normal and diabetic subjects. It has been found, for example, that insulin not only helps the tissues to retain the sugar stored in them but often gives its aid in abstracting some of the sugar from the arterial blood, thus converting a negative arteriovenous difference into a positive one.

Lancet, London

2:233 286 (Aug 3) 1935

- Infection and Its Control in Children's Wards E H R Harries — p 233
Dermatitis from Dyed Hair Furs and Fabrics J T Ingram — p 239
Proctalgia Fugax Little Known Form of Pain in Rectum T E H Thaysen — p 243
*Treatment of Tetanus with Continuous Avertin Anesthesia Report of Case L Cole — p 246

Treatment of Tetanus with Tribrom-Ethanol Anesthesia—Cole has used tribrom ethanol in ten cases of tetanus. In severe cases, doses of 0.1 cc. per kilogram of weight control the reflex spasms completely for periods of from two to six hours and produce relaxation of the jaw and lessening of the tonic rigidity. No ill effects have followed this dose given daily for eight consecutive days, and four such doses in twenty-four hours have not given rise to ill effects. In the author's present case tribrom-ethanol produced complete control of the reflex spasms, relaxation of the jaw and lessening of the tonic rigidity about ten minutes after it had been given. Such relief was maintained for from four to eight hours according to the dose (from 0.2 to 0.5 cc.) given. The only ill effect which appeared to be directly due to the tribrom-ethanol was that on the respirations, which became increasingly rapid and shallow about ten minutes after it had been given, and cyanosis came on within half an hour. The cyanosis was relieved by nasal oxygen, which had to be given more and more frequently and continuously as the illness progressed. The rectal irritation caused by the repeated doses cleared up quickly as soon as the doses were reduced in size and frequency. The curve of dosage which was determined solely by the period of freedom from spasms after each dose, showed a steady rise to a maximum on the ninth day and then a steady fall showing that, after the first symptoms appear, it is many days before toxin produces its full effects, and that these subside only gradually. The control of the spasms was so satisfactory that a stomach tube could be passed easily by the nasal route and the child was fed hourly. The child was unable to swallow any fluid until the twenty-first day of the disease. How great is the danger of giving large and repeated doses of tribrom ethanol is not yet known. It is possible too that large and repeated doses given for many days may lead to dangerous cumulative effects.

Medical Journal of Australia, Sydney

2 69 100 (July 20) 1935

- *Place of Surgery in Early Carcinoma of the Breast A Newton — p 69
Place of Surgery in Treatment of Later Stages of Cancer of the Breast B T Edye — p 72
*Place of Deep Therapy in Carcinoma of the Breast A T Nisbet — p 75
Occurrence and Treatment of Metastases in Carcinoma of the Breast Notes T H Ackland — p 80
Focal Factor in Rheumatism R. G. Brown — p 83

Surgery in Early Carcinoma of the Breast—Newton states that of a total of 1,621 patients treated surgically for early carcinoma of the breast over a period of more than ten years 984 have been traced, and of these 57 per cent of the private patients and 46 per cent of the public hospital patients were alive and well more than five years after operation. In each series 8 per cent of the deaths occurred from other causes. In certain of the individual series of cases the "five year or longer" survival rate was more than 60 per cent. The results in the operable group were naturally more satisfactory than those obtained in the borderline group. There is a marked difference in the percentage alive and well in the two series, 22 per cent in the private patients and only 14

per cent in the public hospital series. This is probably due to the inclusion of many advanced cases in the public hospital figures. A study of these two groups of cases does not support the suggestion that the 637 patients who were untraced should be regarded as dead, with a consequent lowering of the percentage survival rate. In point of fact, it indicates that the greater the percentage of untraced patients, the better is the survival percentage. Statistical investigations are of limited value, but the results of this investigation, when compared with a similar inquiry of the results of radium therapy in early cases of carcinoma of the breast, clearly show that better results are obtained by surgical removal. The situation has been summarized recently by Moran, who has pointed out the limitations of surgery and the indications for radiotherapy. Many surgeons do not yet agree with his opinion that preoperative irradiation is of value in the treatment of this disease, nor can there be general agreement with his statement that there should be more frequent removals of unhealthy breasts than at present is sanctioned by practice or sentiment. The wide dissemination of advice of this nature would lead to the unnecessary removal of many breasts afflicted with cystic mastitis, a condition that is an infrequent precursor of malignant disease. These debatable points indicate that there should be the closest cooperation between all those branches of the medical profession concerned with the use of the methods of diagnosis and treatment at present available.

High Voltage Roentgen Therapy in Carcinoma of the Breast—Nisbet feels that, in cases of true mastitis in young women, irradiation gives satisfactory results, thus preventing surgical disfiguration. Roentgen therapy apparently does not destroy the mechanism of lactation when applied to the breast, either before or during pregnancy. A strong plea is put forward for preoperative irradiation in early carcinoma of the breast. Much further histologic and pathologic investigation seems necessary before definite conclusions can be reached as to the action of high voltage roentgen therapy on carcinomatous tissue. These results would aid the clinician in determining how far, if at all, x-rays should replace surgery. If the surgical scar is free from the thoracic wall, the risk of skin recurrences in this region is lessened. The period by statistics in regard to roentgen irradiation of mammary carcinoma is not long enough to warrant any conclusions being drawn. In the preparation of statistics a greater amount of notice should be taken of the age of the patient. It is in the young that carcinoma of the breast is most devastating, while in the old the possibility of cure is much greater. Mammary carcinoma of stages 3 and 4 are benefited by roentgen therapy for some time at least, and in the aged this relief may persist for some years. A technic using modern apparatus is described and the different reactions on the skin with high voltages and increased filtration are noted. The large number of roentgen units delivered to each part is stressed, and also the fact that fibrosis of the lung does not occur. The author believes that cooperation between the surgeon, the physician and the radiotherapist is the only rational attitude and that consultations should be sought in every case.

Quarterly Journal of Medicine, Oxford

4 203 344 (July) 1935

- *Tuberculin Allergy in Acute Infectious Diseases Study of Intracutaneous Test J S Westwater — p 203
*Dietetic Study of Cases of Juvenile Rheumatic Disease E C Warner and F G Winterton with assistance of M L Clark — p 227
Observations on Therapeutic Use of Iodides W R Snodgrass — p 247
Plasma Proteins and Nonprotein Nitrogen and Sedimentation Rate in Chronic Rheumatic Disorders G R P Aldred Brown and J M H Munro — p 269
Comparison of Various Diets in Treatment of Diabetes Mellitus E M Watson and Marion A Wharton — p 277
*Treatment of Tetanus with Observations on Fate of Injected Antitoxin L Cole and E T C Spooner — p 295
Incidence of Intrathoracic Neoplasia in Teaching Hospitals of Great Britain 1894 1928 R. D Passey and J M Holmes — p 321

Tuberculin Allergy in Acute Infectious Diseases—Westwater studied some 2,000 cases of the acute infectious diseases, including measles, scarlet fever, chickenpox, diphtheria and whooping cough. The method adopted was to perform

intradermal tests on admission and thereafter at intervals varying in each disease until the patient left the hospital. Measles and scarlet fever appear to cause a temporary depression of tuberculin sensitivity as determined by the intracutaneous tuberculin test. In about half the cases the response to the Mantoux test in 1:1,000 dilution was completely suppressed following the onset of the acute infection. In measles the use of the stronger 1:100 dilution was not sufficient to counteract the effect of the exanthem. This period of depressed allergy or hyposensitivity usually lasts for a week from the appearance of the rash but may persist into the second week. To avoid the possibility of a fallacious negative result in the clinical use of the Mantoux test, at least a fortnight should elapse from the onset of measles and scarlet fever before a test is done. Chickenpox, diphtheria and whooping cough could not be shown to have any appreciable effect on tuberculin sensitivity. Allergic subjects failed to respond to their initial intracutaneous test. It is recognized that the small amount of tuberculin introduced by an intradermal test can stimulate allergy as shown by an increased response to a subsequent test. Probably the same phenomenon occurs in those cases in which an initial test, although negative, is followed by a positive response to the same dilution of tuberculin when the test is repeated a week or two later. Apparently the individual's sensitivity has required the stimulation of a minute dose of tuberculin in order to rise above the reaction threshold of that particular dilution. This illustrates the importance of repeated tests before a negative result to a given dilution can be accepted for diagnostic purposes. In measles and scarlet fever the depression of sensitivity appears to be due to the action of the rash on the skin itself. The maximal effect is found to follow on the period when the rash is at its height. There is a direct relation between the extent to which sensitivity is depressed and the intensity of the rash. The results of the study of the intracutaneous test favor the view of Rolly that the effect is not a specific one but is due to local effects of the exanthems on the skin. It may be said that whichever reaches the skin first—the tuberculin or the measles toxin—will produce its characteristic response. Once the rash is established, the result of a tuberculin test depends on the two opposing factors, the intensity of the rash and the degree of sensitivity possessed by the subject.

Dietetic Study of Juvenile Rheumatic Disease—The investigations of Warner and Winterton do not show that any one factor can be incriminated as a contributory cause for rheumatism occurring in certain families and certain children. It does appear, however, that the consumption of animal protein and of dairy products by the rheumatic children and by the control children of this social status is low and that the intake of carbohydrate, particularly in the form of potatoes, is high. They have tried the effect of adding extra vitamin A and vitamin D in the form of viosterol as a prophylactic agent, as this was of little value, it does not appear that the imbalance of fats and carbohydrates was working through these agents.

Treatment of Tetanus—Cole and Spooner discuss the treatment of tetanus and give the results obtained in twenty-one cases. The rate of disappearance of injected antitoxin has been investigated in four cases after the injection of a single dose of 200,000 units intravenously. It is shown that antitoxin disappears from the blood of these patients rapidly at first and more slowly later, and that seven days after the injection about 10 units per cubic centimeter and at the end of fourteen days between 3 and 5 units per cubic centimeter remained. They suggest that routine treatment should include a single dose of 200,000 units of antitoxin given intravenously as early as possible, followed after an interval by thorough treatment of the wound. As liberal a diet as possible should be given and an attempt made to give more than 2,000 calories daily. The value of tribrom-ethanol in controlling the spasms and giving sleep is emphasized. The effects of treatment of three cases with a moderately "lissive" sample of curare, that is, a sample that removes pathologic rigidity in man without causing diminution of voluntary power, are described and the possibilities of this treatment are discussed. The prognosis is considered in relation to the incubation period and the period of onset. These two factors should be given greater consideration in assessing results and in choosing cases for any new method of treatment, such as curare.

Archives Méd-Chir de l'App Respiratoire, Paris

10: 261 332 (No 4) 1935

- Malignant Lymphogranulomatosis of Thoracic Form Two Cases P
Nobécourt M Kaplan and P Ducas—p 261
*Pseudotuberculous Forms of Malignant Lymphogranulomatosis L
Goia L Daniello and M Hanganutz—p 283
Miliary Carcinomatosis of Lung Amaler, Leonet and Sourice—p 297
Iodized Poppy Seed Oil Bronchography by Intranasal Route G
Higuet—p 304

Pseudotuberculous Malignant Lymphogranulomatosis.—Goia and his co-workers studied the differential diagnosis of pulmonary lymphogranulomatosis and tuberculosis. The roentgenologic appearance of the pulmonary lesions is the most important. Although usually the parenchymatous lesions produced by lymphogranuloma are not characteristic and may perfectly imitate those of tuberculosis, certain roentgenologic details may suggest the former. These are the constancy of the mediastinal lesions and the almost similar constancy of peribronchovascular lymphangitis. The latter may sometimes have the appearance of tuberculosis, but the opaque peribronchial adhesions are usually larger, are more rounded and resemble cancerous lymphangitis. The pleural changes that are always present may be similarly considered an expression of lymphatic spread. An important criterion of differentiation that can be used in favor of malignant granulomatosis is the prompt regression of the ganglionic and pulmonary lesions after treatment by roentgen rays. It should be noted that not only the granulomatous tissue but also the perifocal congestive reactions regress. In general the disharmony between the clinical symptoms and the roentgenologic picture is also important. The two conditions are frequently combined in such a manner that this fact can be determined only by eventual histologic study.

Presse Médicale, Paris

43 1193 1216 (July 27) 1935

- Form of Habitual Headache of Students A B Marfan—p 1193
*Treatment of Gastroduodenal Ulcer by Histidine E Aron—p 1195
Clinical Study of Functional State of Liver by Hepatic Puncture E
Frola—p 1198

Histidine in Gastric Ulcer—Aron gave daily subcutaneous injections of 1 cc of a 4 per cent solution of histidine hydrochloride to dogs that had been operated on to produce unusual atrophy of the gastrojejunal mucosa. The effects were so good that he decided to try a similar procedure in human ulcers. Thus 5 cc of the same solution was given daily for three weeks to patients suffering from ulcer—a total of 4 Gm of histidine for each patient. In the majority of cases the improvement was manifested rapidly, usually between the fifth and tenth injections. The treatment was always begun during a period of painful crisis and the good results corresponded to a complete disappearance of the pain, burning, vomiting, and so on, during the first two weeks. Mediocre results were recorded when symptoms remained, even though there was marked improvement. Failure was noted when the patients received no immediate relief from the treatment. Of the forty-two patients with ulcer in various locations, thirty-seven obtained good and two mediocre results and there were three failures.

Policlinico, Rome

42: 1671 1718 (Aug 26) 1935 Practical Section

- *Mixed Forms of Dysentery Caused by Endamoeba Coli and Blastocystis
Jalinus and by Blastocystis Jalinus and Trichomonas Intestinalis.
A M Cicchitto—p 1671
Thymic Death Following Application of Gag Case A Caribotti—
p 1679
Modern Methods Used in Treatment of Tuberculous Hemoptysis L
Capaldo—p 1683

Mixed Forms of Dysentery—Cicchitto reviews the literature on the pathogenicity of *Endamoeba coli*, *Blastocystis jalinus* and *Trichomonas hominis* and states that certain mixed forms of dysentery, caused by the association of *Endamoeba coli* and *Blastocystis jalinus* (Perroncito), on the one hand, and by that of *Blastocystis jalinus* and *Trichomonas hominis*, on the other, are frequent in persons living in tropical countries. The author emphasizes the importance of these two forms of intestinal parasitism, the clinical picture of which is so similar to that of intestinal amebiasis that a differential diagnosis between the three forms of infestation is difficult. He states that both *Endamoeba coli* and *Trichomonas hominis* are pathogenic organisms. *Blastocystis jalinus*, which when existing by itself in

the intestinal tract of man is a nonpathogenic form, becomes pathogenic as soon as it is associated with certain forms of parasites and increases the pathogenicity of the parasites. The conclusions of the author are based on the clinical observation of sixteen cases of mixed *Endamoeba coli* and *Blastocystis hominis* infestation and twenty-five cases of mixed *Blastocystis hominis* and *Trichomonas hominis* infestation, in all of which coprologic examinations were repeatedly performed.

Semana Médica, Buenos Aires

42: 445-520 (Aug 15) 1935 Partial Index

- Interruption of Pregnancy Incompatible with Viability of Fetus F A Boero —p 445
Associated Undulant Fever and Acute Miliary Tuberculosis Case P P Piñero García and F R Ruiz —p 451
Nasal Catheterization Applications T Martini and R F Curutchet —p 462
Clinical Beginning of Pulmonary Tuberculosis in Adults O P Aguilar —p 467
Intercostal Herpes Zoster with Spinal Symptoms Case O Iruque and R Pucheta Morecillo —p 485
Paralysis of Associated Horizontal Movements of Eyes in Posterior Cerebral Syndrome Cases R Orlando —p 491
Colometric Method for Determination of Urea in Blood Cerebrospinal Fluid and Tissues J A Sánchez —p 503

Undulant Fever and Acute Miliary Tuberculosis—

Piñero García and Ruiz say that because of the frequency of undulant fever and tuberculosis in Argentina and of their possible association, it is advisable to perform the laboratory tests for both infections in order to make an early diagnosis in cases of combined etiology. Undulant fever like any grave infection, when in patients with latent tuberculosis excites the virulence of the tubercle bacilli and tuberculosis enters a period of more or less activity. The similarity of the clinical picture of undulant fever of the pulmonary form and of pulmonary tuberculosis makes the differential diagnosis difficult. As a rule, in cases of undulant fever of the pulmonary form the clinical pictures and the roentgenograms do not agree while the former indicate the presence of infiltration and ulceration of the pulmonary parenchyma, the latter fail to show the lesions. The early diagnosis of the associated forms is made only by the positive results of the Wright and Huddleson tests for undulant fever and of the inoculation of the sputum, pleural exudates or similar material from the patient into guinea-pigs. The author's is the second case of associated etiology reported in Argentina. The patient aged 21, was a slaughterer with latent tuberculosis which because of the presence of undulant fever of the pleural form (serofibrinous pleurisy with large effusion), developed into acute miliary tuberculosis.

Archiv für klinische Chirurgie, Berlin

182: 299-458 (July 23) 1935 Partial Index

- Studies on Heredity of Harelip and Cleft Palate with Especial Consideration of Mode of Transmission C H Schröder —p 299
Surgical Treatment of New Bone Fractures F Bode —p 331
Technic of Arrest of Hemorrhage in Region of Soft Parts of Head B Schlesinger —p 369
*Surgical Case of Cerebral Schistosomiasis K Shimidzu —p 401
Osteopathrosis H Fuss —p 425
*Pathogenesis of Necrosis of Gallbladder and of Pancreas (Experiments and Clinical Aspects) J Hofhauser —p 443

Heredity of Harelip and Cleft Palate—According to Schröder there is evidence that the cleft formations in lip and palate are caused by a hereditary germinal factor. He maintains that external factors that exert their influence during the embryonal development are not of decisive significance for the development of the cleft formations. Amniotic remnants, observed in the cleft in rare cases are the secondary result and not the primary cause of the cleft formation. The percentage of heredity in the families of seventy-five persons with clefts was 42.7, and in an additional 53 per cent parental consanguinity could be proved. The transmission was recessive in 75 per cent of the cases and dominant in 25 per cent. The children of the persons with cleft formations were found to be affected in 40.5 per cent of the cases. More than one third of the children of externally healthy parents whose family history disclosed the defect had cleft formations. Among the persons with cleft formations who came from families without demonstrable traces of the defect the incidence of the disorder was 22 per cent. In view of the one-sided selection these figures

are rather high, but they permit conclusions regarding the prospects of defective offspring of persons who are affected themselves or who have a family history of the defect. The author observed a much higher incidence in men than in women of 225 patients with this defect, 64.3 per cent were men. The cleft was twice as frequent on the left as on the right side. There were also other deformities in the patients as well as in the members of their families. In some families there seemed to be a tendency to other cleft formations (rachischisis, coloboma iridis and so on). The records about cleft formations in seventeen pairs of uniovular twins disclose that there were four pairs with discordance. This indicates a phenotypical variability the incidence of which, however, does not exceed a certain limit. The hypothesis formulated by Just to the effect that the transmission of the slight cleft formations is generally dominant, while that of the severe ones is usually recessive, could be corroborated by the author on the basis of thirty-two genealogical trees. This also corroborates the assumption of a multiple allelomorphism. The author maintains that harelip and cleft palate have been increasing in recent decades. He thinks that this is due to the fact that surgical repair of the defects tends to counteract natural selection, and he recommends eugenic measures to avoid a further increase.

Surgical Case of Cerebral Schistosomiasis—Shimidzu reports the history of a patient who had symptoms indicating cerebral tumor. Trepanation was done and a hardened area was detected. It was possible to remove nearly all the hardened tissue. Following the operation, the symptoms of cerebral pressure disappeared and the patient is now able to work again. The operative specimen had a sandy feeling and the microscopic examination disclosed that the granules contained numerous ova. *Schistosoma cercariae* must have entered a cerebral sinus, developed there and deposited ova in the veins of the occipital lobe. Visual defects and signs of cerebral pressure were the result. The author points out that a similar case was observed by another author, but in that instance ova were also detected in the lung, and it was assumed that the ova reached the brain by embolism; however in the case reported here, pulmonary symptoms were absent. Another author reports that in animals the parasites have been known to occur in the vena cava or in the right side of the heart and from there to reach the brain by way of the jugular vein.

Necrosis of Gallbladder and of Pancreas—Hofhauser made a comparison between necrosis of the gallbladder and necrosis of the pancreas. He found that the anamnesis, the clinical manifestations (with the exception of the site of origin of the pains) and the histologic aspects are identical. There is a difference in the character of the peritonitis. In necrosis of the gallbladder the bile fluid in the abdominal cavity directs the attention at once to the gallbladder. Focal fat necrosis, which indicates ferment action, may occur in necrosis of the gallbladder as well as in necrosis of the pancreas but in the more extensive form it occurs almost exclusively in pancreatic necrosis. The treatment of the two conditions differs. Conservatism is advisable in pancreatic necrosis, whereas surgical intervention should be resorted to in simple necrosis of the gallbladder. At the bedside, the differentiation of the two conditions is extremely difficult. In view of the great similarity of the two processes the author advances the opinion that identical factors play a part in their pathogenesis. He thinks that simple necrosis of the gallbladder is due to the tissue impairing action of the bile that has been changed by hypersecretion and hypersecretion. In the pathogenesis of necrosis of the pancreas he ascribes the greatest significance to the peculiar, enzyme-like action of the bile that has been altered by the abnormal function of the gallbladder. The canalicular theory of the pathogenesis of necrosis of the pancreas is disproved by the observation that in dogs the active pancreas can be implanted in the gallbladder without necrosis or even a digestive disturbance developing. It was possible to demonstrate in various experiments the tissue impairing or toxic action of even the normal bile, and the bile that has undergone changes as the result of dysfunction of the gallbladder has an even greater toxic action. The significance of the function of the gallbladder is indicated by the hitherto disregarded factor that pancreatic necrosis does not occur in patients who have undergone cholecystectomy. This

is almost as evident as that there is no necrosis of the gall-bladder after cholecystectomy. The dysfunction of the gall-bladder plays the most important part in the classic necrosis of the pancreas. To be sure, inflammation of the pancreas may develop and the necrosis that develops then is gangrenous pancreatitis. The difference between the two forms of pancreatic necrosis lies in the etiology. The author gained the impression that the most acute form of pancreatic necrosis develops in persons with gallstones, in whom the gallstones cause neither difficulties nor a change in the wall of the gall-bladder.

Archiv für Verdauungs-Krankheiten, Berlin

58 1120 (Aug.) 1935

*Guiding Principles of Simple and Rational Treatment of Diabetes Mellitus R. Meier and W. von Drigalski—p. 1

*Gross Hemorrhage of Stomach P. de la Viesca—p. 22

Gastric Mucus F. Baltzer—p. 33

Congenital Idiopathic Pylorostenosis in Adults L. Frank—p. 38

Treatment of Diabetes Mellitus—On the basis of a large material, Meier and von Drigalski discuss the principles of the rational treatment of diabetes mellitus. They differentiate two phases in the metabolic process of diabetic patients. The first phase is that of decompensation. This exists in all diabetic patients not yet adequately adjusted. The metabolic condition during this phase is characterized by the insufficiency of the islands toward the food intake and by a number of somatic and psychic factors that the patient encounters in his social, occupational and private life. As the patient enters clinical treatment, the latter factors are largely eliminated. Without any other measures except the adherence to a diet, the glycosuria becomes reduced, the acidosis may disappear entirely and the blood sugar decreases. The phase of decompensation persists as long as the improvement in the metabolic condition continues. It varies in length, lasting perhaps five or six days or from ten to twelve days, and it may be entirely absent. In cases in which the glycosuria does not disappear there remains a rather constant sugar elimination, which stands in contrast to the sudden changes in glycosuria noticeable during the phase of decompensation. This rest glycosuria corresponds to true insulin insufficiency. It does not become evident until after the extrainsular factors that tax the metabolism have been eliminated. Blood sugar and acidosis often show an analogous behavior. This second phase permits the determination of the tolerance and it makes adjustment of the treatment possible with or without insulin. The authors demonstrate in numerous cases how the metabolic condition may be improved without doing more than awaiting the disappearance of the phase of decompensation, while the patient receives a correctly selected diet that is as regular as possible. Insulin should be avoided during the first phase, or it should be given in subthreshold values. The definite insulin dosage is not decided on until after the degree of insular insufficiency has been determined, which is not possible until the second phase has been reached. The diet differs likewise during the two phases. The authors found it advantageous to arrange the dietetic treatment in three forms. The first form is a low caloric diet that is deficient in protein and fat and contains an amount of carbohydrates sufficient for the permanent treatment. The first form is given during the phase of decompensation. It presents the framework which, by the addition of fats, is changed to the second form and by the further addition of protein to the third form or permanent diet.

Gross Hemorrhage of Stomach—De la Viesca discusses gross bleeding of the stomach on the basis of 177 cases that were observed at the clinic in Leipzig. He found that gross gastric hemorrhage was caused in the majority of cases (73.45 per cent) by gastro-intestinal ulcers, then followed in the order of their frequency those caused by gastric carcinoma (13.56 per cent) and by gastritis (10.16 per cent). Gross bleeding was more frequent in gastric ulcer than in ulcers of the duodenum. Gross hemorrhage was the first symptom in some cases of peptic ulcer, but in the majority the symptoms had existed for three years or more. Whereas hematemesis was more frequent in gastric ulcer, melena showed a higher incidence in duodenal ulcer. Gross hemorrhage of the stomach influenced the blood status and the blood pressure. It was followed by a secondary anemia with reduction in the hemoglobin content as well as in

the number of erythrocytes, and the blood pressure decreased by from 20 to 50 mm of mercury. Quite frequently there was an increase in temperature after gross bleeding of the stomach, but it usually subsided rapidly. The high incidence of hyperacidity (90 per cent) was especially noteworthy in the gross bleeding caused by ulcer. A repetition of the bleeding was observed in 84 per cent of the ulcer cases. More than 27 per cent of these patients died, which indicates an unfavorable prognosis for cases with recurrent gross bleeding. Blood tests in the stool indicated that the hemorrhage lasted from fifteen to twenty days. There was a higher incidence of bleeding ulcers in women than in men. The mortality of gross bleeding in cases of ulcer was 67 per cent. It was higher in men than in women. The prognostic significance of the age of a patient was proved by the fact that 12 per cent of the patients more than 40 years of age died, whereas 15 per cent of younger patients died. In cases of gastric carcinoma, gross bleeding occurred in 5.59 per cent of the cases and the mortality rate caused by the hemorrhage was 16.6 per cent. The incidence of gross bleeding in patients with gastritis was 2.35 per cent, but none of these patients died. In the treatment of gross hemorrhage the author followed the rules that are generally adhered to. Since the mortality of gross hemorrhage is comparatively low and since an exact anatomic diagnosis is but rarely possible, a surgical intervention with its rather high mortality is rarely advisable. He considers an operation during hemorrhage justified only when erosion of an artery is suspected.

Beiträge zur klinischen Chirurgie, Berlin

162 1176 (July 24) 1935 Partial Index

New Type of Elbow Fracture J. Bravo and A. Monsalve—p. 1

Rare Adamantinomas W. Rieder—p. 7

*Significance of Antivirus of Besredka in Surgery S. A. Klein—p. 15

Diagnosis of Tumors of Abdominal Walls T. Körner—p. 25

Internal Incarcerations After Abdominal Operations E. Kaufman—p. 53

*Problem of Spondylolysis F. Reischauer—p. 64

Besredka's Antivirus in Surgery—According to Klein, Besredka's antivirus is a substance that develops from dead and decaying bacteria in the course of the development of a bacterial bouillon culture. This substance, which in the living bacterial cell is supposedly bound to the virus, has as yet not been isolated, but it can be recognized by a number of characteristics that are antagonistic to the virus. The antivirus develops not only in a bouillon culture but also in the animal organism, namely, from the invading bacteria that were destroyed by the natural defense powers. The immunity that develops after an infection is supposedly the result of the immunizing action of the antivirus. The author discusses his preparation and the use of antivirus and then describes his studies on the surgical use of antivirus, particularly in laparotomy and in the treatment of infected wounds. He found that Besredka's antivirus exerts an immunizing and a weak antiseptic action, but type and quantity of the virus play an important part. The immunizing action of antivirus is probably the result of two factors: the activation of the protoplasm and an unknown factor that is produced by retained bacterial products. The antivirus is not specific. The author considers the use of antivirus advisable in selected surgical cases.

Spondylolysis—Reischauer calls attention to the fact that opinions are still divided as to whether the cleft formations in the interarticular portion of the vertebrae, so-called spondylolysis, are congenital or acquired. He shows that their congenital nature, which is accepted by many, is still being denied by Meyer-Burgdorff. The author describes bilateral, symmetrical spondylolyses of the interarticular portion of the vertebrae, which were the result of zones of transformation, although there was no external clamp action of the articular processes stressed by Meyer-Burgdorff. He shows that the cleft formation takes place slowly as the result of a disproportion between supporting capacity and load. This produces zones of transformation at the critical site. A high incidence of the cleft formations has been observed in miners who did not sustain vertebral injuries. Although this may militate against the importance of the clamp action of the articular processes in lordosis, which Meyer-Burgdorff considers the chief cause of acquired cleft formation, it does not prove the congenital nature of spondylolysis.

sis but rather disproves it. The author thinks congenital spondylolysis possible but concedes that there is considerable evidence that in a great number of cases it is acquired, although not necessarily in the traumatic manner. In his own material he likewise noticed a greater incidence of spondylolysis in adults whose vertebral column is exposed to heavy loads when the person is in a bent position. He thinks that further roentgenologic studies on persons with various occupations will be necessary in order to determine whether spondylolysis is more frequently congenital or acquired. Processes of transformation as the cause of acquired cleft formation must be taken into consideration in the cases in which overexertion plays a part. Such transformations may produce an 'elongation' as well as a lysis of the interarticular portion. The author concludes that if considered from this point of view, pseudospondylolisthesis and true spondylolisthesis are without doubt essentially the same, except that belief in their congenital nature makes a definite solution impossible.

Jahrbuch für Kinderheilkunde, Berlin

145 61 116 (Aug) 1935 Partial Index

- Meaning of Parallergy C Bessau and H Fernbach—p 61
So Called Normal Lead in Human Milk M Kasahara and Shin Ichu Nosu—p 78
Chronic Carbon Monoxide Poisoning in Nursing Alice Joss Huber—p 81
In tantaneous and Late Reactions in Allergic Skin Tests O Tezner—p 86
Functional Disturbances of Heart Caused by Overexertion and Symptomatology of Heart Disease in Children W Nissen—p 96

So Called Normal Lead in Human Milk—Kasahara and Nosu point out that other investigators have detected lead in cow's milk as well as in human milk, but, while they gave definite figures for cow's milk (0.04 mg of lead per liter), they did not state the quantity in human milk. In order to determine the normal lead content of human milk, the authors analyzed the milk of eighty-seven women from a city in which a water service system existed, and of fifteen women from rural districts that did not have a water service system. A tabular result of these tests indicates that the milk of thirty-five of the eighty-seven city women was free from lead, while the other fifty-two had lead in their milk. The quantities varied from slight traces up to 0.18 mg per liter. Only three of the fifteen rural women had lead in their milk (0.04 to 0.11 mg per liter). The authors think that the presence of lead is partly due to the water service system.

Chronic Carbon Monoxide Poisoning in Nursing—Joss Huber relates the history of a nursing that came under her observation at the age of 10 weeks. The infant had severe anemia and clonic twitching of the left extremities and the left side of the face. The liver and spleen were enlarged and there was albuminuria. Since the clinical examinations threw no light on the origin of the disorder, carbon monoxide poisoning was considered possible in spite of a negative anamnesis. A specimen of blood was examined for the presence of carbon monoxide and a considerable quantity was detected. After this, further questioning disclosed that the bed of the nursing stood alongside a large tile stove in a comparatively small room that was rarely aired. The stove had cracks from which gas escaped, so that the adults developed headaches. At the clinic the nursing improved rapidly. Following a blood transfusion the blood status improved and after three weeks the child could be discharged as cured. The literature on chronic carbon monoxide poisoning is briefly reviewed.

Functional Disturbances of Heart Caused by Overexertion—Nissen observed in a group of school children a large number with functional disturbances of the heart. The disorders could be traced to overexertion, for in this mountainous region the children applied themselves excessively to snow sports. On the basis of observations on 176 children, the author describes the symptomatology of the functional cardiac disorder. He gave especial attention to the accents of the first and second mitral sounds and detected a sign to which he ascribes pathognomonic significance. He found that, in all cases in which the second mitral sound at the cardiac apex has the accent, some pathologic condition exists, either a functional disturbance or an anatomic lesion.

Klinische Wochenschrift, Berlin

141 1161 1200 (Aug 17) 1935 Partial Index

- Therapeutic Action of Pentavalent Arsenic Compounds in Late Forms of Neurosyphilis B Dattner—p 1161
Studies on Pathogenesis of Diphtheria M Gundel and N Erzlin—p 1164
*Angina Pectoris During Work Test F Kisch—p 1165
Influence of Retroresorption on Iodine Elimination Curve in Blood Following Injection of Iodine Tetraglycolate H Bronner and M J Madlener—p 1170
Incidence of Thrombo-Embolism A E Sitsen—p 1172
*Changes in Sense of Taste During Pregnancy R Hansen and W Langer—p 1173
*Infection with Paracolon Bacilli in Febrile Conditions After Measles K Hassmann—p 1177

Angina Pectoris During Work Test—Kisch shows that the results of former attempts to produce attacks of angina pectoris in patients with a predisposition for this disturbance make it appear probable that a deficiency of the capillarization of the myocardium is an important factor in the development of the attack of cardiac pain. Influences that produce a considerable acceleration of the heart beat in the presence of this deficiency may change a predisposition to angina pectoris to an actual attack in the presence of certain unknown factors. There are indications that the sudden increase in the cardiac frequency is the result of deviations in the reflex regulation of the circulatory system. Apparently angina pectoris is also dependent on an adequate energy reserve of the myocardium. The etiology of the cardiac pain is still unknown. The author made tests to determine the work threshold value for the cardiac pain, that is, he determined the amount of exertion necessary to produce an attack and indicated by the number of repetitions of a standard exertion (sitting up from the horizontal position and resumption of the reclining position). This work threshold value for the cardiac pain permits an objective estimation of the prophylactic or therapeutic action of measures employed to reduce the predisposition for the attacks. Although the work threshold value for the cardiac pain varies in the different patients, it is nevertheless quite constant in the same patient, so that a considerable elevation or reduction of the threshold value in the same patient may be considered the indication of a reduction or an increase in the predisposition for the attacks. The oral administration of glyceryl trinitrate or the injection of ephylline elevates the threshold for the cardiac pain, that is, they reduce the predisposition for the attack. However, the height of the threshold permits no conclusion regarding the functional capacity of the circulation.

Changes in Sense of Taste During Pregnancy—Hansen and Langer believe that a number of disturbances that develop during pregnancy can be explained by a change in the sense of taste. They decided to study the sensitivity of the sense of taste in pregnant women by testing the four main qualities of the sense of taste, the sensitivity for salty, sour, sweet and bitter substances. They found that in pregnant women the threshold for the salty sensation is 114 per cent higher, for the sour 89 per cent higher, for the sweet 35 per cent higher and for the bitter 60 per cent higher than in normal nonpregnant women. There are relations between the sense of taste and the secretion of the gastric and salivary glands, and the authors assume that the subacidity during pregnancy can be explained, at least to a certain extent, by the reduced sensitivity of the apparatus of taste. The craving for sour substances, condiments and sweets can be traced to the reduced sensitivity for the corresponding taste qualities. The elevation of the threshold for the taste of salt can exert an influence on the sodium chloride and water exchange of the organism.

Paracolon Bacilli in Febrile Conditions After Measles—Hassmann points out that the anergic period of measles outlasts the exanthematous period as a rule only for a short while, however, this is the period during which complications of the respiratory tract and of the ear are rather frequent. Disturbances of the digestive tract in the form of inflammation of the oral mucosa or of enterocolitis are rarer. According to von Groer, the latter group of disturbances is usually not severe, the intestinal disturbances, for which he assumes the virus of measles as the primary cause, lead to secondary infections of the intestinal tract, which may assume a dysentery-like

character These enteral disturbances after measles are only rarely caused by an infection with typhoid or paratyphoid bacilli The diagnosis of these disorders is difficult because measles inhibits for some time the positive outcome of the Gruber-Widal reaction, and the demonstration of the bacilli in the stool is the only proof The author observed a number of febrile intestinal disturbances in the course of an epidemic of measles, but there were no indications for an infection with typhoid, paratyphoid, dysentery or *Brucella abortus* He describes the clinical histories of two cases in which paracolon bacilli could be demonstrated A pure culture was made of the paracolon strain detected in the first child, and the serum of the child was tested for its agglutination capacity The Widal test could not be made until after the child had recovered, but even at this time it was still 1:160 positive, whereas the same serum did not agglutinate another paracolon strain The author does not feel justified in implying that paracolon bacilli are the only cause of enteral disturbances that develop after infectious diseases, nevertheless he considers this condition worthy of consideration He says that in a previous report he called attention to the etiologic significance of paracolon strains in enteral disturbances and stresses that animal experiments likewise made the etiologic significance of paracolon strains seem probable He found not only that the sphere of the paracolon strains touches the spheres of the colon group and of the typhoid and paratyphoid groups but also that they overlap The paracolon strains have a considerable tendency to mutation, that is, their fixed virus is relatively small and the range of variation is relatively large The author illustrates these conditions in a graph He thinks that the paracolon strains are an important intermediate factor, for in cultural and biologic experiments he was able to show that paracolon strains may develop from ordinary colon strains and that in the course of this mutation they may assume "pathogenic" characteristics that impair the intestine He believes that the mutation of the colon strains to paracolon strains is an important factor in the etiology of enteral disturbances not only after measles but also after other infectious disturbances

Medizinische Klinik, Berlin

31 1029 1060 (Aug 9) 1935 Partial Index

- Physiology and Pathology of Incretory Functions of Female Gonads
G A Wagner—p 1029
Some Problems of Serotherapy of Diphtheria F von Bormann—
p 1032
Artificial Feeding of Nurslings H Beumer—p 1035
*Behavior of Indole Content of Blood Following Indole Tolerance Test
O Klein and P Mahler—p 1043
*Mucin Treatment of Peptic Ulcer O Wozasek—p 1046

Indole Content of Blood—Klein and Mahler studied the behavior of the indican content of the blood after oral or intravenous tolerance tests with indole in healthy persons and in persons with renal hepatic and cardiac disturbances The indican curves of the blood take a protracted course in renal insufficiency and, as a rule, ascend higher than in normal persons The curve obtained in patients with hepatic disturbances indicates a retardation and a long duration of the increase. The peak of the increase usually appears much later in patients with renal disturbances than in normal persons in normal persons it is usually reached two hours after the tolerance test, whereas in patients with renal disorders the maximum is not reached until from six to eight hours after the test The highest value observed by the authors in patients with renal insufficiency was 35 mm. per hundred cubic centimeters Following intravenous tolerance tests, similar deviations from the normal could be observed in cases with renal insufficiency, except that the course was more rapid and shorter The indican concentration of the urine increases after tolerance tests in healthy persons as well as in patients with hepatic and renal disturbances It may reach 0.42 per cent In patients with renal insufficiency the capacity for the concentration of indole bodies is retained for a relatively long period In this respect these patients differ hardly at all from the normal persons The concentration capacity does not become impaired until severe degrees of renal insufficiency have been reached (preuremic stage), then, however, the concentration capacity decreases rapidly, for, even if large amounts of

indole are administered, the indole concentration does not exceed 0.01 per cent In regard to indole elimination, the renal insufficiency manifests itself not so much in a reduction of the concentration capacity but rather in an elevation of the renal threshold toward the specific elimination stimulus for indole substances Renal as well as hepatic factors are involved in the behavior of the indican curve. In what manner the hepatic function exerts its influence is not clear as yet.

Mucin Treatment of Peptic Ulcer—Wozasek resorted to mucin therapy in fifteen cases of duodenal and three cases of gastric ulcer The cases were typical The symptoms had persisted for two years or longer The majority of the patients came to the hospital after dietetic and other forms of treatment had failed Roentgenoscopy revealed an ulcer in all cases The author did not begin with the mucin treatment until bed rest, milk diet and the administration of alkaline substances had failed to produce improvement, particularly freedom from pain. When the mucin treatment was begun, the patients were put on a soft diet and were given from three to five times daily (before the meals) one teaspoonful of mucin All other medicinal treatments were discontinued during this time. As a rule, the symptoms improved after a few days In about eight days the patients were free from pain and remained so even after the soft diet was replaced by a light mixed diet. In two neurotic patients who had had their symptoms for ten years the treatment was only partly successful in that the pressure pains disappeared but the hunger pains did not In the majority of cases the mucin treatment was continued for from three to eight weeks At the end of the treatment the acidity values were once more determined and compared with the initial values There was no essential change, which indicates that the effect of the treatment is chiefly symptomatic, but as such the author considers it quite satisfactory

Ugeskrift for Læger, Copenhagen

97:793 814 (Aug 1) 1935

- Treatment of Acute Hemorrhagic Nephritis with Fever Diet C Schwensen—p 793
*Arthritis Deformans of Hip Joint Remarks on Disorder with Especial Reference to New Method of Treatment E Jensen—p 794
Acute Leukemia in Child Aged 2 Months Case A. Bertelsen—
p 798
Investigations Concerning Occurrence of Tuberculous Infection Among Pupils in School Class K Halberg and P Helweg Larsen—p 801
*Application of Purified Diphtheria Vaccine (Anatoxin Ramon) with Addition of Aluminum Hydroxide S Schmidt—p 805

Arthritis Deformans of Hip Joint—Jensen considers the Camitz treatment which is really the classic treatment of a spastic paraparesis superior to methods of treatment previously used The procedure requires a brief anesthesia and is thus applicable even to old and weak patients The first of his five personal cases in which operation was performed a year ago, continues without symptoms The first of Camitz's thirty patients continues free from symptoms after ten years' observation

Purified Diphtheria Vaccine with Addition of Aluminum Hydroxide—Schmidt says that purified diphtheria vaccines diluted to the same titer (expressed in sedimentation units) are adsorbed in widely differing degrees by the same amount of aluminum hydroxide. On the whole there seems to be a certain dependence between the nitrogen content in a purified (salt-free) preparation and its ability to be adsorbed in aluminum hydroxide, but the adsorption relation may differ for vaccines with about the same nitrogen content In one case a preparation was made adsorbable by preliminary treatment with aluminum hydroxide. Familiarity with the adsorption relation is important when complex antigens are to be produced, as the immunizing effect depends largely on the antigen depot introduced.

CORRECTION

Enophthalmos Instead of Exophthalmos—In the seventh line of the abstract of Bielschowsky's article on "Influence of Exophthalmos on Parietic Ocular Muscles" in THE JOURNAL, August 10, page 462, the word "exophthalmos" should have been "enophthalmos"

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 105, No 15

CHICAGO, ILLINOIS

OCTOBER 12, 1935

IMPORTANCE OF INDUSTRIAL HYGIENE

HOW IT CAN BEST BE HANDLED THROUGH
STATE DEPARTMENTS OF HEALTH

ALBERT S. GRAY, MD

Director Bureau of Occupational Diseases Connecticut State
Department of Health
HARTFORD, CONN.

My discussion of industrial hygiene will be concerned principally with the effect of industrial environment on health. The effect of an unhealthful working environment was recognized by some of the fathers of medicine even before the beginning of the modern factory system. But the most impressive evidence of the effect of an unhealthful working environment is probably the morbidity and mortality statistics developed by Dublin in 1929 as the result of a study of three and a quarter million wage earners. Although his results have been presented before and are doubtless familiar to many, they show such a clear picture of the widespread effects of an industrial environment on the health of the worker that a few of the more significant conclusions are presented. Dublin's figures include a wide variety of industries, both those which are especially productive of occupational disease and also those which present no outstanding health hazard. The life expectancy of the industrial worker was shown to be seven years less than that of those otherwise engaged. Age for age, their mortality rates were from one and a half times to more than double the rates for the nonindustrial worker, and he concludes that while heredity and innate differences play some part, probably the most important factors are the conditions incident to industrial employment such as toxic gases, dusts, specific occupational disease, extreme temperature variations and numerous other industrial hazards.

Tuberculosis rates are much higher in the industrial group and add to the cases in the general population, and rates for pneumonia and degenerative diseases are much higher in the industrial group.

The numerous investigations of the United States Public Health Service and other health agencies, both here and abroad, have established that morbidity and mortality rates are definitely higher for the general industrial population and that certain occupations are of first importance as factors in the causation of excessive sickness and mortality rates, these excessive rates not only affect the industrial population but increase the rates of morbidity and mortality of the general population. Impressive as these statistics are, they do not tell the whole story, for frequently individuals

working in an unhealthful environment on becoming affected leave their employment for some other work which does not affect their health. A high labor turnover may be the only indication found in some plants in which dangerous conditions exist but in which the incidence of occupational disease is reported as low.

In these days of modern production industry uses a vast array of materials and processes that will affect health if not properly controlled. New materials are constantly being added and their effect on health is frequently not known. Processes become well established and injury to health may occur as a result, for unfortunately the conditions predisposing to occupational disease in many cases are not immediately evident. Various agencies have done much splendid work in accident prevention in the last few years, but occupational diseases are not like accidents in which cause and effect may be clearly defined. They are not so attention compelling, their development is gradual and may appear only as increased labor turnover or decreased production. The effect on the individual is not so self evident and the cause of the condition is not so readily recognized.

There is nothing particularly arresting in the gradual loss of power in the hands of those absorbing lead, nothing to stimulate the interest, no startling appeal in the slowed gait and mental peculiarities of those exposed to certain solvents, in the development of anemia and tiny hemorrhages in those exposed to other poisonous materials, or in the gradual development of fibrosis of the lungs from exposure to certain dusts. The onset is gradual and the change imperceptible from day to day, until the individual either leaves to be replaced by another worker who passes through the same cycle or remains at work under progressively lessened efficiency until he can no longer work or becomes a compensable patient. If he leaves for employment elsewhere he continues at work at lowered efficiency for a greater or less time, dependent on how much of the material he has absorbed. The body is capable of wide adjustment to environment, and much harm may be done before evidence of the condition is noted.

The 1930 census shows that 15,000,000 people in this country are employed in manufacturing and mechanical industries and in the extraction of minerals. There are nearly a thousand occupations in these industries, the materials, processes or conditions of which are hazardous to health unless properly controlled. Aside from the effects on health, the economic implications are tremendous, for these conditions affect the earning capacity of a large part of the productive population.

Wesley M. Graff, director of conservation of the National Bureau of Casualty and Surety Underwriters, representing forty casualty companies writing annually

\$100,000,000 worth of compensation insurance, in a paper before the state and provincial health authorities at their last meeting, said

In the last few years occupational disease claims have grown at an alarming rate. They represent today one of the important problems of industry. It is no exaggeration to say that the financial life of many of our most important industries is at stake and that it will be lost if measures are not taken to remedy the conditions causing occupational disease.

After citing the tremendous increase in insurance rates and amounts paid for compensation, he continued

The figures I have presented relate primarily to compensation costs. There are other, and perhaps greater costs with which you as health authorities are more familiar than am I. Those are the indirect losses which are the resultants of disease. They include the waste involved when life expectancy is shortened, with the cost to the state when morbidity and mortality rates increase due to inadequate preventive measures. The economic waste resulting from occupational disease may be greater in proportion than that accruing from the usual run of diseases, due to the fact that the wage earner is the one primarily disabled. Impairment of the wage earner's health may affect the general welfare and health of his family. I leave it to you to evaluate the costs to the state which are to be superimposed upon those for compensation which I have presented to you. From an economic point of view alone, the occupational disease problem is one of commanding importance.

Within the last few years, consciousness of the importance of maintaining a healthful industrial environment has developed among physicians, health authorities, insurance interests, labor and industry itself. Go through any of the recent volumes of *THE JOURNAL* or the programs of recent meetings and note the increased attention being given to occupational disease. The same is true of the journal and the programs of the annual meetings of the American Public Health Association, of the National Safety Council and of the technical societies such as the American Society of Mechanical Engineers and the American Institute of Mining and Metallurgical Engineers. The trade magazines of the various industries in which occupational disease conditions are found are carrying papers on these subjects in their journals. The literature on the subject is growing so rapidly that it is difficult to keep abreast of it. Recognition of the importance of occupational disease is becoming widespread, and the time has come to institute a constructive program for its control.

Control of conditions so seriously affecting such a large group of the productive population cannot properly be undertaken except by an agency experienced in disease control. The control of communicable disease has always been recognized as a function of the health department. This control is purely for prevention of disease and death.

Occupational disease control represents exactly the same close relationship to the health of the adult population as communicable disease control does to the health of the child population.

A complete program for occupational disease control cannot be undertaken by industry itself. While a few large corporations with laboratory facilities, technical personnel and full time medical directors have done some splendid work for those engaged in their specific plants, the vast majority of industry has not the facilities. Industry is not a health department, it is not to be expected that it assume the attributes of a health department. Industry conserves and increases the monetary assets of the state, health authorities and the medical profession its human assets. The state has a

definite function to perform in the protection of the health of its people which it cannot abrogate or allocate to any other agency. Occupational disease control is a public health problem of the first magnitude requiring the cooperation of industry, the medical profession and the public health authorities for its solution.

In his presidential address at the meeting of the American Public Health Association, Haven Emerson said

We surround the babe unborn with premonitory protection, deal wisely and gently with infancy and childhood, and then hurl the product of a reasonably healthy youth into a maelstrom of blind chances of dusts, fumes and fatigues which wear down the stoutest body and cripple the most willing worker.

I would persuade you to seize and occupy the largest field of preventive medicine, until now excluded from the work of official health organizations in this country. I refer to the prevention of occupational diseases. Let us have the courage to create a division, an office, a sphere of influence in every health department to be concerned with occupational disease. Let us incorporate within the permanent functions of health departments protection of employed persons against health handicaps inherent in the place and nature of their work.

At the same meeting a resolution was passed that

Unhealthful occupational environment constitutes an important and widespread cause of increased morbidity and mortality among the large group of wage earners and among the general population.

Resolved, That it is a function of the department of health to include as an integral part of a complete public health program the protection of the population against health hazards resulting from unhealthful working environment and recommends to each state health department of an industrial state the establishment of a bureau or division of occupational diseases or industrial hygiene under the supervision of a physician trained in public health and industrial hygiene, with adequate technical and laboratory facilities and personnel, empowered to make investigations of working environment, for the control of industrial health hazards and the prevention of occupational diseases.

At the meeting of the State and Provincial Health Authorities of North America a resolution was passed stressing the importance of unhealthful occupational environment and resolving to take action to start an occupational disease prevention program.

Wesley M. Graff, in his address before this meeting said

It is the health department which is concerned with mortality and morbidity rates, and, if faulty industrial conditions increase those rates, both for diseases not specifically occupational and also for the specific occupational diseases, such as silicosis, asbestosis, benzol poisoning, lead poisoning, etc., the power to prevent disease should rest with that department. It is our belief that within the department of health there should be a bureau or a division specifically charged with the prevention of occupational disease.

A controlling mechanism has been built for the prevention of communicable diseases by the use of instruments of precision and exact methods of control and employment of trained personnel—epidemiologist, sanitary engineer, bacteriologist—and necessary laboratory facilities and personnel.

This branch of medicine is now in a position to build a controlling mechanism for the prevention of occupational diseases. The prevention of occupational disease necessitates the application by specially trained technical personnel of precise physical and chemical procedures to conditions affecting health in industrial environment. It is impossible to tell by mere inspection whether any particular environment is safe, whether

the dust or other toxic material in the air of a workroom is present in sufficient quantities to constitute a hazard or whether the illumination is adequate or the ventilation sufficient

The effect is known of many of the potentially hazardous materials and processes used by industry on health. For many of them the smallest amount (threshold dose) that will affect health is known. Precise methods have been developed by which the exposure to these materials may be measured to determine whether this "threshold dose" is exceeded and a hazard to health presented. There are methods by which exposure to these materials can be controlled if exposure is found to be excessive.

The personnel of the health department organization for occupational disease control should be made up of men trained in the various phases of industrial hygiene. The director should be a physician possessed of a broad conception of all phases of the problem, trained in the recognition of occupational diseases, familiar with industrial processes and their effect on health, capable of interpreting the results of studies of working environment in terms of occupational disease control, the engineer, one trained in chemistry and ventilation, familiar with industrial processes, materials and job analysis, capable of making the necessary determinations of working environment to establish the extent of exposure to toxic materials and interpreting results of his determinations in terms of recommendations for control of conditions hazardous to health. Building from this nucleus, a well rounded bureau would include laboratory workers versed in the special procedures of dust counting and determination of the minute amount of poisonous materials to which workers may be exposed, and a secretary capable of acquiring an intelligent appreciation of industrial hygiene in general, to assist in maintaining a complete reference system so important in this work and, if possible, to make abstracts and translations of the most important papers. An industrial physician should be attached to the group to undertake activities to be outlined. With such personnel of technically trained men, who in the aggregate possess a broad knowledge of industrial hygiene, the bureau is in position to cope with the various phases of occupational disease control.

It is essential that adequate tools be placed in the hands of this personnel in the form of a well equipped laboratory and a well chosen library. The laboratory should include facilities for making both the chemical and the physical determinations incidental to learning the amount of injurious material to which the workers may be exposed. Our bureau has made a list of essential equipment and the approximate cost of such equipment, a limited number of copies of which are available to any one interested in developing such a laboratory. The library, of course, contains the standard works on industrial hygiene. The subject is, however, progressing so rapidly that it is necessary to follow the advances in the current journals containing papers on industrial hygiene and to accumulate a reprint collection of the outstanding papers. A reference card system is of course essential to make all this information easily available.

Whenever there is a full time plant physician, the bureau should work through him and make its report to him. When reports of cases are investigated, contacts should first be made with the private physician who reports the case. Information that will assist in diagnosis and in treatment should be made available to

him. The industrial physician attached to the bureau has a large field of activity in connection with such investigation of cases in addition to handling the medical phases of requests for information and consultation on occupational disease subjects.

In Connecticut, in addition to receiving and investigating reports of occupational disease cases and providing a central source of information for physicians, industry or any agency interested in the cause, treatment and prevention of occupational diseases, the Bureau of Occupational Disease makes surveys and field studies of workroom environment, including special determinations of dusts, fumes and gases and other toxic materials, measurements of ventilation, illumination or any condition or process thought to be affecting the health of industrial employees, to determine whether the environment is safe or where and to what extent a health hazard may be present.

Each industry in which a study or survey is made receives a complete report of the study, including the results of actual physical and chemical determinations of the working environment and exposure of the individuals engaged in it, with recommendations for the elimination or control of any hazard that may be shown to exist.

The reports of these investigations are not just mailed to the industry but are presented by a technically trained man and discussed with the physicians and engineers of the organization. The information presented not only establishes the nature and extent of an existing hazard but provides constructive data for its control.

In any program for the control of occupational disease, the cooperation of the medical profession and of industry is essential. The reports of cases of occupational disease coming for treatment to the practicing physician provide an important factor in their control just as do such reports of communicable diseases in their control. A close cooperation with the practicing physician is essential if progress in the solution of the problem is to be made.

In order to obtain the cooperation of industry, it is necessary to provide it with definite data. The exact nature and extent of a potentially hazardous condition should be established as a basis for its control. This procedure is more intelligent and more effective than the use of arbitrary orders issued by law enforcing agencies and based on cursory inspection. Industry is penalized through compensation payments if its environment causes occupational disease. When industry is definitely shown that a health hazard exists, it has been my experience that it takes the necessary measures to control the condition as a matter of good business.

In Connecticut the law requires all physicians having knowledge of a case of occupational disease to report it to the state department of health. These reports are confidential and cannot be used in compensation or court cases. The department is empowered to make investigations of any condition reported to it or suspected of causing occupational disease, and the result of its investigation cannot be used in court or compensation cases.

The cost of development of a bureau or division of occupational disease in the health department need not be excessive. We began the Bureau of Occupational Disease with one physician trained in industrial hygiene and a secretary. The first thing done was to classify Connecticut industry and the potential hazards in them. After the first year we added an engineer, familiar

with industrial processes and trained in industrial hygiene, who did field and laboratory work. A laboratory was established at this time. Three years later another engineer, concerned principally with the laboratory work, was added.

The activities conducted by our bureau have followed this outline. During the first year we had possibly a dozen or two inquiries regarding occupational diseases, industrial processes, the effects of materials and methods of protection. In the past year demand for consultation had grown to 463 requests for information relative to the effect of materials, methods of control of processes, diagnosis and the like, not including consultations in connection with field trips. In addition, thirty-two technical studies were conducted and 148 surveys made. These surveys covered twenty-four specific hazards found in seventy-one types of operations.

The work has resulted in definite improvement in working conditions, changes in processes, substitution of materials, and, in a number of instances, the purchase of entirely new equipment, not as the result of mandatory orders but because of the fact that these industries were given definite concrete information on the effects of the environment on health. Requests for this service from industry have been so numerous that we have had to schedule work months in advance.

SUMMARY

1 There are more than 15,000,000 persons gainfully employed in manufacturing, mechanical industries and extraction of minerals in the United States.

2 In these industries there are more than 900 occupations potentially hazardous to health.

3 The health of workers engaged in industry is affected by the conditions, materials and processes used. An unhealthful industrial environment not only causes specific occupational diseases but increases the incidence of tuberculosis, pneumonia and the degenerative diseases. These excessive rates not only affect the industrial population but increase the rates of morbidity and mortality in the general population.

4 The life expectancy of the industrial worker is seven years less than that of those otherwise employed.

5 Occupational disease costs are increasing and taking tremendous and unnecessary toll from workers and industry.

6 Occupational disease is preventable by correcting unhealthful industrial environment.

7 Occupational disease control is essential to protect this large industrial group from increased incidence of disease.

8 The protection of the health of those engaged in industry against injurious occupational environment is the responsibility of public health authorities.

9 The cooperation of industry and the medical profession is essential in any program of occupational disease control.

With a set-up such as I have described, in which the law provides that the results of investigations cannot be used in compensation claims, with a specially trained technical personnel to make determinations and interpret the conditions found in industrial environment, industry is provided with just the information it has a right to demand before it is required to change its processes, substitute materials or take other necessary control measures.

It is our experience that when industry is approached by a health agency in behalf of a health program and is

presented with definite data regarding its working environment, in a spirit of service, with the assurance that the results of the investigations will not be used in furtherance of claims against it, industry not only accepts the service as a matter of good business but actually requests the assistance of such an organization in the improvement of its general working conditions.

8 Washington Street

ABSTRACT OF DISCUSSION

DR. C. O. SAPPINGTON, Chicago. The bureau that Dr. Gray directs in Connecticut is an outstanding example of organization and system in regard to the control of occupational diseases. An important consideration in the administration of such a bureau is that, when a state managed bureau goes into this type of work, it is essential that the information be confidential and be not used in the adjudication of cases before either commissions or courts, because if that should be done, one can immediately see what confusion would result. Another important thing is the necessity for the training of professional personnel. There is a tremendous lack in that regard. There are some engineers available. There are also a few medical men available who are fairly conversant with this subject. This is a serious problem, and a means of working out the postgraduate training of engineers and practitioners is something of great moment. The economic situation is rather serious in that many states are considering compensation laws regarding occupational diseases, and it is necessary to give due consideration especially to including in those laws such principles as will permit them to be underwritten by insurance companies, thus providing the economic background for the carrying of this difficulty. Unless this can be done, a situation arises that is beyond control.

DR. R. R. SAYERS, Washington, D. C. I should like to ask Dr. Gray whether he will tell how he finds out where hazards are. Various methods have been used at different times and I know that he has had good practical experience in finding where they are. I should like to have him call attention to how one can get doctors to report occupational diseases.

DR. ALBERT S. GRAY, Hartford, Conn. One of the first things that the bureau did was to make a classification of Connecticut industries, and they fall into about a hundred classifications. We then classified the potential hazards that may occur in them and constructed a chart. We have cases reported to us and these are investigated. We know in what industries potential hazards exist. These are surveyed, and if necessary a study is made to determine whether the condition is safe. We have yet to go into an industry in which we knew that a potential hazard existed and where we were not welcome and haven't felt that we would be invited to go back again to give assistance in some other problem. Requests have been so numerous that we have had to schedule our work months in advance. Many industries in Connecticut never think of changing their processes or making any changes affecting hazardous materials without consulting us and calling on us for information relative to the proper method of doing it. I think it is largely due to the fact that they realize that we are not a punitive or a press agency but a service department, for, without at all abrogating our right as health officials to correct a condition in which we do find hazards to health, the work is conducted in a spirit of service rather than law enforcement alone. When industry is provided with definite information that a health hazard exists and what to do to control it, it becomes a matter of good business to take care of it, and mandatory orders are seldom necessary. We have been doing this work for five or six years, and labor, industry and the insurance interests are requesting the service to an extent greater than our capacity to provide it.

DR. HUNTINGTON WILLIAMS, Baltimore. May I ask Dr. Gray if he would not say that his law, which makes the reports not available for subpoena in litigation over compensation, is a fundamental part of his ability to do this work, and, if so, what steps he would suggest for bringing about that kind of change in the law in other states in which it isn't present?

DR. GRAY I think it is fundamental I feel quite sure that, if we went into a plant and they knew that if we found very bad conditions the results of our investigations or reports of cases could be subpoenaed and used in compensation claims we would have much more difficulty in securing their cooperation. The cooperation of industry is essential in eliminating industrial health hazards, and this can best be secured by conducting the work as I have outlined and not penalizing industry by making reports and results of investigations available for claims against industry. When industry realizes the results of our investigations, that the reports cannot be used by either party in compensation claims, they show us the very worst conditions of the plant. It is common experience for us to go into a plant to investigate some particular hazard and, after our report is made, to be requested to investigate other plant conditions. They realize that they are really being given a service of inestimable value by an agency that is absolutely unbiased. I want to say that we are not satisfied with reporting. I don't suppose any health officer is whether it is a communicable or an occupational disease. There are a number of reasons why reporting is not satisfactory, but how much less satisfactory reporting would be if a doctor attached to a factory knew that any report he gave us could be used by a man coming before a compensation court! While reporting has improved considerably there is much more work to be done on this phase of the problem. Close contact must be maintained with industrial physicians and reports of cases carefully investigated.

DR. JOHN SUNWALL, Ann Arbor, Mich. How many of the states have these departments?

DR. GRAY About eight states are doing this work, but one or two of them have had to curtail their program during the depression. Michigan did have a department for this work, but I believe it has not been able to do much during the depression. There are at least five states in addition in which commissions or personnel have been appointed by their legislatures to investigate the problem of occupational diseases and the setup necessary for control.

DR. L. D. BRISTOL, New York. On the assumption that a number of industries throughout the United States have no particular problems from the standpoint of occupational diseases as such but are concerned largely with such things as the common cold and disorders of the upper respiratory tract in general, what does the State of Connecticut Department of Health through the Bureau of Industrial Hygiene do to assist the small industries with reference to some of the other important phases of industrial hygiene? I have in mind health education, medical examinations, periodic health examinations and all those factors in an industrial health program that many small industries cannot cover. It seems to me that the state health department may have a very definite opportunity and responsibility in extending a program of health education and other services of an examination character to smaller industries. The large industries throughout the United States are able to set up their own individual services and personnel, as well as programs for carrying on work not only in the interests of preventing occupational disease but also in the interests of health education of employees.

DR. GRAY The answer is that undoubtedly, while these suggestions are all desirable, we must concentrate on those that are most important. I am not sold on the idea of the state department of health doing physical examinations. That should be left to private physicians. I feel that any industry should be able to pay, when necessary for a private physician to do physical examinations. There is another factor too, that a large industry, with plenty of money and doing splendid things for its personnel, is able to sell the idea of physical examinations to its workers but in the smaller industry, as soon as one suggests physical examinations and reexaminations one is going to run into difficulties. It is difficult to sell the idea of physical examinations to labor in small industries, which are proverbially suspicious of the use that will be made of the results of the examination. Even supposing there could be a law that would not permit such records to be used outside the department of health it would be extremely difficult to persuade labor that they are going to be used for placement

and not for getting rid of some person who has some physical impairment. I acknowledge the desirability of the things the previous speaker mentioned, and I think that after some of the conditions I have mentioned have been cleared up, perhaps something more can be hoped for. The gentleman says that the important things are the colds and conditions incident to ordinary employment. This is not true in Connecticut. We have been overwhelmed with requests to take care of actual, definite hazards to health.

MALARIAL THERAPY IN RHEUMATOID ARTHRITIS

RUSSELL L. CECIL, MD
CONSTANCE FRIESS, MD
EDITH E. NICHOLLS, MD

AND

WARREN K. STRATMAN, THOMAS, MD
NEW YORK

Malarial fever was first used therapeutically in 1917 by Wagner-Jauregg¹ in the treatment of dementia paralytica. This investigator had previously tried tuberculin and typhoid vaccine in the treatment of this disease and had obtained very good results with both these agents. By 1928 he had treated 2,000 dementia paralytica patients with malarial fever, as reported by his co-worker Gerstmann,² and in 1931 Wagner-Jauregg³ summarized the results of malarial therapy in 3,000 cases of cerebrospinal syphilis that had been studied in the Vienna Psychiatric Clinic. Wagner-Jauregg was convinced that malarial therapy was much superior to other pyrogenic agents in the treatment of dementia paralytica, and this view is now quite widely held by neurologists.

In view of the excellent results that are often obtained in rheumatoid arthritis by the intravenous injection of typhoid vaccine, it occurred to us that arthritis, like dementia paralytica, might respond well to malarial therapy.

PRESENT STUDY

The present study is based on thirteen cases of rheumatoid arthritis that were treated by malarial therapy in the wards of the New York Hospital. It is well known that typhoid vaccine produces more striking and permanent results in early cases than it does in late cases of rheumatoid arthritis. It was our original intention therefore to make this a study of the effect of malarial therapy in early cases of rheumatoid arthritis. Much to our disappointment, however, we found it almost impossible to get this type of patient into the hospital for treatment. We finally had to be content with trying malarial therapy in chronic, well established cases. In the present study, twelve of the thirteen patients had been suffering from rheumatoid arthritis for two years or more at the time they received malarial treatment. One patient had had the disease for only four months.

It should be emphasized that all these patients had received various kinds of treatment before admission.

Read before the Association of American Physicians at Atlantic City, N. J., May 7, 1935.

From the New York Hospital, the Department of Medicine of Cornell University Medical College, and the Laboratories of the International Health Division of the Rockefeller Foundation.

¹ Wagner-Jauregg, Julius. Ueber die Einwirkung der Malaria auf die progressive Paralyse, *Psychiat. Neurol. Wchnschr.* 20:132, 251, 1918, 1919.

² Gerstmann, J. Die Malariebehandlung der progressiven Paralyse. Vienna, Julius Springer, 1928.

³ Wagner-Jauregg, Julius. Verhütung und Behandlung der progressiven Paralyse durch Impfmalaria, *Handbuch der experimentellen Therapie Serum und Chemotherapie (Ergänzungsband)* 1931, p. 183.

to the hospital. All had been subjected to tonsillectomy, most of them several years before admission. All had received various forms of physical therapy and vaccine therapy. Five of the patients had received typhoid vaccine intravenously with only temporary benefit. Two patients in the series (9 and 11) had been subjected to hyperthermia by diathermy, with only temporary relief.

All but two of the patients in the series had tried rest in bed for various periods of time (from two weeks to three months).

One of the patients gave a history of having had malaria in childhood, many years before arthritis developed.

The patients included in this study varied considerably in the severity and extent of their arthritis. In six cases the joint involvement was chiefly periarticular and characterized by swelling without appreciable ankylosis or deformity. In the remaining seven cases the disease gave evidence of having involved the joint structures as well. For example, there was more or less grating on movement and in some instances there were contraction deformities and partial ankylosis.

The general condition of the patients was excellent in six, fair in two and poor in five. Six patients showed no appreciable anemia, two had slight anemia, and five showed a definite though not advanced anemia. It was felt that patients with severe anemia should not be subjected to this form of treatment.

All but one of the patients studied were able to walk into the hospital. Patient 7 had to be carried in because of advanced changes and deformities in the knees and feet. Two other patients on admission had to assist themselves with crutches or canes.

METHODS

All the patients were put to bed immediately after admission to the hospital. After a complete physical examination, the following laboratory tests were made:

- 1 Urinalysis
- 2 Renal function tests, consisting of the urea clearance, concentration and dilution tests
- 3 Blood count, including the Schilling count
- 4 Wassermann test
- 5 Sedimentation rate of red blood cells by the Rourke and Ernste method
- 6 Agglutination tests with the patient's serum against *Streptococcus haemolyticus*
- 7 Roentgenograms of the joints chiefly affected by arthritis

Technic of Inoculation.—As it was undesirable to inoculate arthritic patients with blood from dementia paralytica patients who were receiving malarial therapy, all but one of the individuals included in this study were inoculated with benign tertian malaria by the application of anopheline mosquitoes infected with *Plasmodium vivax*. The strain of *Plasmodium vivax* employed was isolated in Florida in 1931, since which time it has experienced sixteen consecutive anopheline-human passages without any perceptible change in virulence. The clinical course of patients infected with this strain of *Plasmodium vivax* and the response of this strain to quinine are so well understood that no fatalities have occurred during its utilization. The anopheline mosquitoes were obtained from a self-perpetuating colony of *Anopheles quadrimaculatus* reared in an insectary in the laboratories of the International Health Division of the Rockefeller Foundation at the Rockefeller Institute. These insectary-bred anophelines were infected with benign tertian malaria

by allowing them to feed on patients who were receiving malarial therapy and who exhibited the sexual forms of the plasmodia in their peripheral blood. After the mosquitoes had taken a blood meal they were incubated at 22 C. The sporogenous cycle of the plasmodia, as evidenced by the appearance of sporozoites in the salivary glands of the anophelines, was completed in from fourteen to sixteen days, after which time the mosquitoes were available for the inoculation of new patients.

For the inoculation of a patient a number of mosquitoes were put in separate cages and applied one by one to the patient's thigh, until four or five had taken a blood meal. The anophelines that had fed on the patient were then dissected and the salivary glands of these mosquitoes examined under the microscope for sporozoites, the presence of which was evidence that the patient had received the desired inoculum.

The remaining patient in this series (patient 13) received a quartan malarial infection by means of blood obtained from a patient with quartan malaria.

The patients were not confined rigidly to bed during the incubation period, which varied from ten to fifteen days. During the period of the paroxysms, however, they were confined to bed even on days when they were afebrile.

The number of paroxysms allowed to each patient varied from three to fifteen, the average being ten. In addition to the paroxysms, however, most of the patients experienced one or more preliminary febrile reactions from one to five days before the first typical paroxysm.

In three cases malarial therapy was temporarily interrupted by small doses of quinine because of the severity of the paroxysms, and in one of the thirteen patients (patient 5) malarial therapy was permanently interrupted by quinine after the third paroxysm because of unusually high fever and prostration.

After what was considered a sufficient period of malarial treatment, the infection was terminated by quinine therapy in doses of 10 grains (0.65 Gm) of quinine sulphate orally three times a day. This was kept up for ten days and, in six cases, resulted in a prompt and permanent termination of the malaria. In eight cases, however, there was a recrudescence of the malarial infection several months after the quinine therapy had been completed. Additional treatment with quinine disposed of the recrudescence, which was never so severe as the original attack.

Patients were not allowed out of bed until at least two weeks after the last malarial paroxysm. Usually they were kept in bed for an even longer period. After they were allowed up, most of the patients had physical therapy and massage to hasten the return of their strength and general muscular tone. Reduced iron in doses of 0.5 Gm three times a day was given to the patients during their convalescence from malaria.

RESULTS

1 Results of Inoculation.—With one exception all the patients developed malarial fever within ten to fifteen days after inoculation. The exception (patient 5) had to be inoculated a second time before the disease developed.

Most of the patients had a more or less typical tertian syndrome. In two cases, however (1 and 11), the course was quotidian. The patient who was inoculated with the quartan parasite had a typical quartan syndrome.

2 Results of Malarial Therapy—The general effect of malarial therapy on the arthritic patient was just what might have been expected. The paroxysms were usually rather severe and caused the patient considerable discomfort and anxiety. During the malarial period all the patients lost weight and showed the usual secondary anemia. In every case, however, the loss in weight and red blood cells was regained during convalescence.

We had expected of course that the immediate effect of malarial fever on arthritic patients would be favorable. The results however were even more striking than had been anticipated. Most of the patients after experiencing two or three paroxysms, were almost if not entirely relieved of pain and stiffness in the affected joints. Even more remarkable was the rapid disappearance of joint swelling and tenderness.

Summary of Arthritis Cases in Which Treatment with Malaria Has Given

| Number | Duration | Degree | Paroxysms | Results | | |
|--------|----------|--------|-----------|-----------|------------------|------------------|
| | | | | Immediate | After 3 Mos* | After 6 Mos* |
| 1 | 4 mos | ++ | 12 | Excellent | Excellent | Excellent |
| 2 | 2 yrs | ++ | 12 | Excellent | Partial relapse | Improved |
| 3 | 2 yrs | ++ | 10 | Excellent | Complete relapse | No improvement |
| 4 | 2 yrs | ++ | 12 | Good | Complete relapse | No improvement |
| 5 | 2 yrs | +++ | 7 | Fair | Complete relapse | No improvement |
| 6 | 2 yrs | ++ | 6 | Excellent | Partial relapse | Much improved |
| 7 | 2 yrs | +++ | 6 | Fair | Complete relapse | No improvement |
| 8 | 2 yrs | + | 7 | Excellent | Partial relapse | No improvement |
| 9 | 3 yrs | +++ | 11 | Excellent | Excellent | Complete relapse |
| 10 | 4 yrs | ++ | 12 | Good | Complete relapse | No improvement |
| 11 | 5 yrs | +++ | 1 | Excellent | Complete relapse | No improvement |
| 12 | 8 yrs | +++ | 5 | Good | Complete relapse | Improved |
| 13 | 9 yrs | +++ | 10 | Fair | Improvement | Improved |

* Compared with status before malarial therapy

In the accompanying table the patients who received malarial therapy are listed together with the duration and severity of their arthritis, the number of paroxysms each had and the results obtained. This table reveals that the immediate effect of malarial therapy was favorable in every case, that is, at the conclusion of the last paroxysm the condition of the joints was better than it had been before treatment was instituted. In seven cases the immediate effect was described as excellent, which meant that the joints were practically free from all pain and swelling. In three others the immediate effect was good, the patient being much more comfortable but not entirely free from symptoms. In the three remaining cases the immediate effect of the malarial treatment was only fairly favorable. The immediate effect appeared to have no relation to either the duration or the severity of the disease. The immediate effect of the treatment was not related directly to the number of paroxysms which the patient had. Indeed, in some cases the maximum benefit was obtained after three or four paroxysms and no further improvement occurred even though the patient continued to have eight or ten additional paroxysms.

Condition of Patients Three Months After Malarial Therapy—Unfortunately the marked benefit achieved by most of the arthritic patients in this series was not of a permanent character. Within a month after com-

pletion of the malarial treatment, most of the patients noted a gradual return of joint symptoms. In the table the status of the thirteen patients three months after conclusion of malarial therapy is indicated. With three exceptions, all suffered a partial or complete relapse with respect to their arthritis within a comparatively short time after the malarial treatment. Patient 1, who experienced no relapse had had arthritis for only four months when she received malaria. Patient 9, though she had had arthritis for three years, was free from all pain and discomfort three months after malarial therapy, though she relapsed later. A third case, in which the immediate improvement was only fair, showed considerable improvement at the end of three months. Three patients had a partial relapse, though their condition was better than before malarial treatment. Seven patients experienced a complete relapse, with their condition practically the same as that before malarial treatment.

Condition of Patients Six Months After Malarial Therapy—Six months after conclusion of the malarial treatment, one of the three patients (patient 9) whose condition had been excellent at the end of three months had suffered complete relapse. The actual status of the thirteen patients at the end of six months was: no joint symptoms, one, improved, four, unimproved, eight. It should be added that all of the five patients who either recovered or improved received other forms of therapy during the six months period. Two went south for the winter, two others received streptococcus vaccine, but since they had previously had vaccine without benefit it is doubtful whether the vaccine was a factor in their improvement, the remaining patient received orthopedic treatment in the form of knee braces.

Studies on the Blood—The bloods and serums of the patients included in this investigation were tested before, during and after malarial therapy by the following methods:

Blood Count As already indicated, blood counts revealed secondary anemia in every patient subsequent to malarial treatment. Succeeding blood counts, following iron therapy, showed a rapid return of the red blood count and hemoglobin to its former level. The white blood count revealed a leukopenia, sometimes quite marked, during the malarial period.

The Schilling count showed an increase of immature cells during the malarial period, with a return to normal percentage shortly after termination of the infection.

Sedimentation Rate All but patient 2 showed an acceleration of the sedimentation rate before malarial therapy was instituted. The rate was still further accelerated during the malarial period. Following the termination of the malaria there was a very gradual return of the sedimentation rate to its pre-malarial level, but in only six of the thirteen patients did the rate fall to a point lower than the pre-malarial rate. In the latter group the fall in rate was with one exception accompanied by clinical improvement in the patient's arthritic condition.

Agglutination Reactions Eight of the thirteen patients gave strongly positive agglutination reactions with *Streptococcus haemolyticus*. Following malarial therapy these agglutinins disappeared entirely in six of the eight cases in which they had been present. In the remaining two cases the agglutination titer was considerably reduced. In no case did malarial treatment induce the appearance of agglutinins in the serum of a patient who had shown none previous to malarial therapy.

COMMENT

Many articles have been written on the use of foreign protein in rheumatoid arthritis. The consensus seems to be that in early cases, in which the symptoms are acute or subacute and the inflammation is mostly periarticular, foreign protein therapy often produces spectacular results, a considerable proportion of the patients making a complete and permanent recovery. In chronic well established cases the immediate effect of fever therapy may be quite striking, but a majority of the patients relapse within a few months after the treatment has been completed. This appears to be the case with malarial therapy. No doubt, if all the cases in the present series had been early ones, the percentage of permanent recoveries would have been higher.

Granted that some form of fever therapy is indicated in many cases of early infectious arthritis, is malarial therapy to be preferred to intravenous typhoid vaccine or to hyperthermia by mechanical measures? One would have to have a considerably larger experience with malarial therapy in arthritis before this question could receive an accurate answer. It is an uncomfortable and in some cases a drastic form of therapy, more enervating to the patients than either typhoid vaccine or hyperthermia. The immediate results have seemed to us more striking than those obtained by the two other methods, but the percentage of relapses is high in all three methods.

In this study we have not attempted to explain the mechanism by which swelling and pain disappear so promptly from the joints immediately after the first two or three paroxysms. It is a fairly safe assumption that the malarial paroxysm produces in the host a reaction quite similar to the febrile reaction that follows the intravenous injection of typhoid vaccine or other foreign proteins. Various theories have been advanced to explain the favorable effects of protein fever, none of them entirely satisfactory. For example, the rôle of the leukocytes has been stressed by some investigators, because of the leukocytosis that accompanies foreign protein reactions. In malarial therapy, however, there is a leukopenia, which is quite marked in some cases. It appears likely that more than one factor is at work in all forms of fever therapy.

SUMMARY

1 Thirteen patients with rheumatoid arthritis received malarial therapy. Twelve of these patients had the disease in a chronic well established form of from two to five years' duration. The remaining case was of four months' duration.

2 All thirteen of the patients received immediate benefit from the treatment. In a majority of cases the improvement was striking, practically all pain and swelling disappeared from the affected joints after three or four malarial paroxysms.

3 In the course of from four to six weeks after termination of malaria, all but two of the patients had more or less recrudescence of joint symptoms, and one of these two suffered a complete relapse later on. The one exceptional patient who did not relapse had had arthritis for only four months at the time malarial therapy was administered. This patient has remained well up to the present time.

4 Six months after termination of malarial therapy, the twelve patients whose joint symptoms returned still had rheumatoid arthritis, but in four of these their general health and the condition of their joints were distinctly better than they had been previous to the

malarial treatment. In eight cases the arthritis relapsed completely to its original state.

5 Malarial therapy had no constant or noteworthy effect on the sedimentation rate of the red blood cells, but in most cases it lowered the titer of streptococcus agglutinins in the patient's serum.

33 East Sixty-First Street

THE CONSERVATIVE OPERATION
FOR "BUNIONS"

END RESULTS AND REFINEMENTS OF TECHNIC

EARL D. McBRIDE, MD

Assistant Professor of Orthopedic Surgery, Oklahoma University
School of Medicine
OKLAHOMA CITY

The surgical treatment of hallux valgus or "bunions" carries with it an unusual responsibility. End results that appear excellent to the surgeon are often not

satisfactory to the patient. The operative procedure, therefore, must be one that not only fulfils surgical requirements but will meet the patient's expectations as to a reasonable temporary disability, and a final functional improvement, including the cosmetic effect, the relief of soreness and the use of the feet.

The operation that I previously described¹ and termed "a conservative operation for bunions" has proved equal to these requirements, as has been shown in an analysis of thirty-nine consecutive cases,

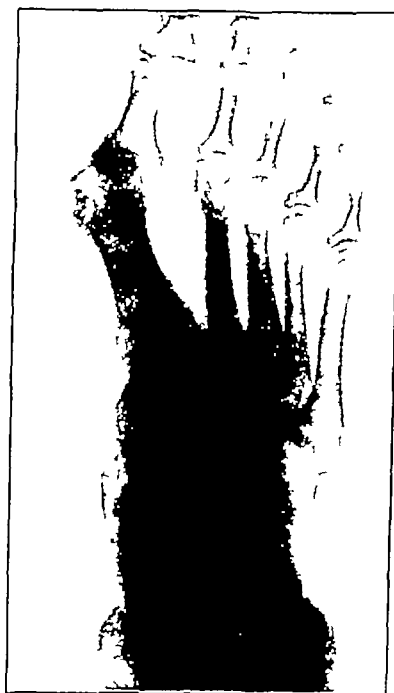


Fig. 1—Before operation typical hyper trophy on the head of the metatarsal and displacement of the sesamoid bones.

based on the records of cases and on answers to the following questionnaire:

- 1 Are your toes well corrected?
- 2 Do you have any pain?
- 3 How soon could you walk normally?
- 4 Is there any stiffness?
- 5 Do you feel that the result has justified the operation?
- 6 Can you rise on your toes and dance normally?

The results thus far obtained seem to confirm the advantages originally suggested,¹ i. e.

- 1 The deformity is corrected without resection of the joint or fracture of the metatarsal bone.
- 2 Normal architecture of the toes is approached.

Read before the Section on Orthopedic Surgery at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.
1 McBride, E. D. A Conservative Operation for Bunions. *J. Bone & Joint Surg.* 10:735 (Oct.) 1928.

3 The mechanical force that causes the deformity is corrected

4 The scar is located safely from irritation

5 The period of temporary total disability is greatly lessened

A sixth point may be added, i. e., the functional results permit early normal activity of the foot in popular shoes

The principle of the operation is similar to a step advocated by Silver. The valgus position of the toe is



Fig. 2.—After operation improved alignment.

corrected by releasing the adductor tension from the outer side of the base of the proximal phalanx, and the improvement is maintained by shortening the capsule formed by the abductor hallucis. From the clinical point of view such a plastic reconstruction is less hazardous than bone resections and eliminates much of the apprehension that has arisen regarding the surgical treatment of "bunions." From the standpoint of surgical mechanics a procedure of direct attack on the forces that produce the deformity is superior to indirect measures that alter the metatarsal shaft or head. There are no muscle insertions about the head of the first metatarsal bone. The structural conformation of this bone with its medial angulation of 25 degrees is of great static importance, but the dynamic resilience of the big toe action is provided through the muscles inserted in the phalangeal section. Independent of muscle action, therefore, except through indirect stress, the projecting metatarsal tongue absorbs a great portion of the body weight through its fixed base and provides a rotundity at its distal end whereby the weight can be buoyantly shifted to the more tactile and resilient phalangeal structures. The forward alignment of the phalanges with the metatarsal shaft is maintained through equilibrium of adductor and abductor forces, but, because of a number of factors, including those created by the fashions of civilization, the attitude of rotated adduction develops an advantage over abduction and through pressure, irritation, inflammation, atrophy and fibrosis, the confirmed state of hallux valgus becomes a fixed deformity.

Correction of the rotation and valgus can be maintained only by restoring equilibrium of the forces of tension laterally and medially as they apply to the phalangeal section of the toe. In this respect the proximal phalanx is a lever, and the head of the metatarsal a fulcrum of indispensable kinetic value. Excision of the metatarsal head is unavoidably incapacitating. Realignment of the metatarsal shaft by osteotomy not only adds the complexity of a fractured bone to the operation but is not, mechanically, the most effective mode of attack because the result depends on the restoration of the transverse axis of the fulcrum, on which a very short lever acts, from an oblique position to a horizontal one. Thorough release of the adductors, including the lateral head of the flexor hallucis brevis, directly loosens the tension that is producing not only the valgus but also the rotation, which usually is a disagreeable part of the deformity. The technic of the operation is as follows:

- 1 Careful preoperative preparation of the nails, toes and feet
- 2 Local, spinal or general anesthesia
- 3 Tincture of merthiolate or iodine preparation
- 4 Tourniquet, of the Esmarch type
- 5 Incision 2 inches in length, starting in the web between the first and second toes and extending along the external border of the extensor hallucis longus tendon so as to expose the lateral aspect of the metatarsophalangeal joint

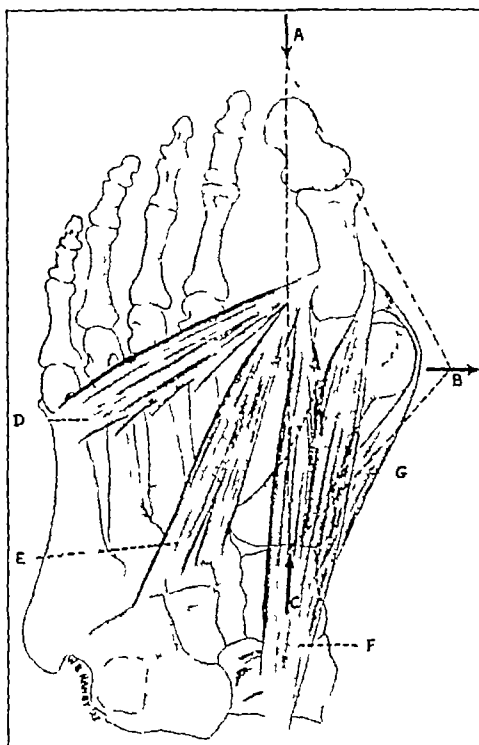


Fig. 3.—Insertion of the adductor, the abductor and the flexor brevis muscles in the base of the proximal phalanx. Arrows A, B and C indicate the direction of forces that create the valgus deformity. D and E denote the adductor hallucis with its two heads. G is the abductor hallucis. In the valgus position the adductors and lateral head of the flexor hallucis brevis produce a rotating force.

6 Severance of the adductor hallucis from its fascial attachment to the base of the proximal phalanx. In exposing this tendon one should keep close to the bone surface to avoid lateral vessels and nerves.

7 Removal of the external sesamoid. If excision of this bone is contraindicated, the lateral head of the

flexor hallucis brevis should be tenotomized. The sesamoid lies embedded in the adductor and the flexor hallucis brevis tendons and its removal is tedious. Care with a towel clamp or small hook (fig 4) and pull it dorsally and upward, as dissection is made medially beneath it. The use of two laterally curved sharp

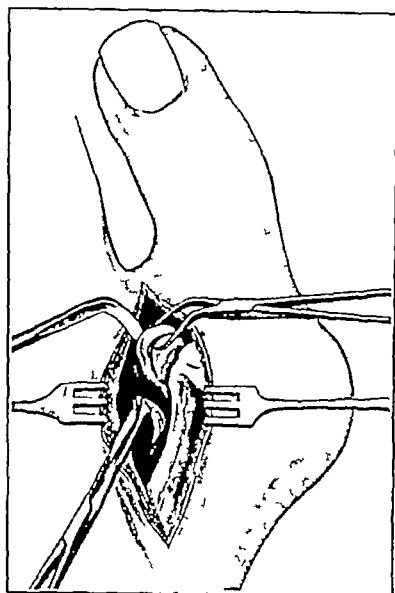


Fig 4—Technic of removal of the external sesamoid

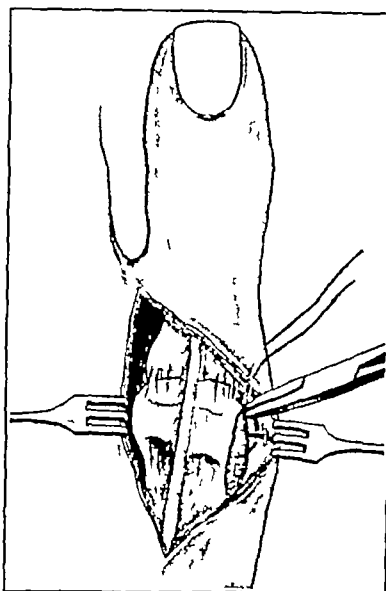


Fig 5—The hypertrophied portion of the metatarsal head has been excised and the bursa shortened sufficiently to maintain the toe in normal alignment

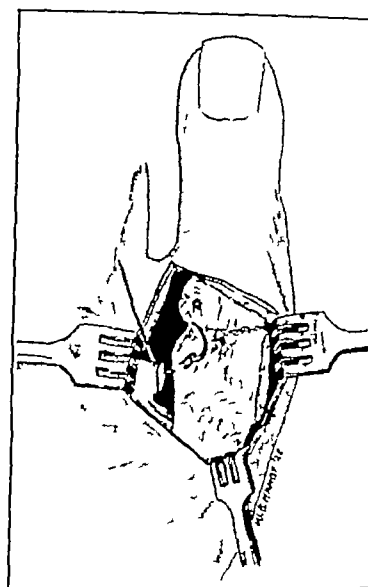


Fig 6—Transplanting the conjoined adductor tendon to the metatarsal head

Analysis of Thirty-Nine Consecutive Cases

| Patient | Age, Years | Time Since Operation, Years | Began Bearing Days | Complications | Reoperation | Pain Relieved | Patient's Expectations Satisfied | |
|---------------|------------|-----------------------------|--------------------|-----------------------------------|---------------------------------|-------------------------|----------------------------------|---------------------|
| | | | | | | | Cosmetic Effect | Motion and Function |
| Mrs W E F | 42 | 2 | 15 | Persistently tender bursa | No | Yes | Yes | Yes |
| Miss B. M. | 35 | 5 | 12 | None | No | Yes | Yes | Yes |
| Mrs K H D | 27 | 6 | 10 | Soreness persistent | External sesamoid removed later | Yes | Yes | Yes |
| Mrs S O | 45 | 7 | 14 | Metatarsalgia | No | Yes | Yes | Yes |
| Mrs E E R. | 60 | 6 | 14 | None | No | Yes | Yes | Yes |
| Mrs E F G | 52 | 7 | 16 | No | Yes | Yes | Yes | Yes |
| Mrs J T H | 63 | 7 | 21 | Poor circulation | No | Yes | Yes | Yes |
| Mrs J W H | 48 | 7 | 11 | None | No | Yes | Yes | Yes |
| Mrs J A S | 63 | 6 | 14 | None | No | Yes | Yes | Yes |
| Mrs H H E | 30 | 5 | 14 | None | No | Yes | Yes | Yes |
| Mrs O A P | 24 | 5 | 17 | Soreness persistent | External sesamoid removed later | Yes | Yes | Yes |
| Mrs F B | 60 | 2 | 21 | None | No | Yes | Yes | Yes |
| Mrs B G | 70 | 6 | 21 | Slow healing | No | Yes | Yes | Yes |
| Mrs E B | 43 | 6 | 23 | Slow healing | No | Yes | Yes | Yes |
| Mrs F E H | 71 | 5 | 28 | Sloughing incision edges | No | Yes | Yes | Yes |
| Mrs L C T | 43 | 7 | 8 | None | No | Yes | Yes | Yes |
| Miss H | 24 | 6 | 9 | None | No | Yes | Yes | Yes |
| Miss A. Mc. | 61 | 3 | 16 | None | No | Yes | Yes | Yes |
| Miss A J R | 18 | 5 | 17 | Overcorrected | Relieved over correction | Yes | Yes | Yes |
| Mrs O T A | 35 | 2 | 16 | None | No | Yes | Yes | Yes |
| Mrs L. F. S. | 27 | 7 | 15 | None | No | Yes | Yes | Yes |
| Mrs A. A. Mc. | 36 | 3 | 18 | None | No | Yes | Yes | Yes |
| Mrs J B N | 33 | 3 | 17 | None | No | Yes | Yes | Yes |
| Miss B S | 44 | 4 | 19 | None | No | Yes | Yes | Yes |
| Miss C B H | 55 | 4 | 21 | None | No | Yes | Yes | Yes |
| Mrs I F | 40 | 3 | 35 | Sepsis | No | Yes | Yes | No |
| Miss A H J | 34 | 4 | 21 | None | No | No information obtained | Yes | No |
| Mrs C H G | 44 | 2 | 21 | Persistent sinus | Excised scar | Yes | Yes | Yes |
| Mrs G V B | 46 | 4 | 16 | None | No | Yes | Yes | Yes |
| Mrs G L N | 62 | 6 mos | 24 | Sloughing skin edges | No | Yes | Yes | Yes |
| Miss N O | 38 | 2 | 12 | Removed too much bone on one foot | Internal sesamoid removed | Yes | Yes | No |
| F A | 16 | 1 | 22 | Congenital absence of second toe | Osteotomy for relapse | Yes | Yes | Yes |
| Mrs. H L H. | 52 | 1 | 18 | None | No | Yes | Yes | Yes |
| Mrs M. L. H. | 25 | 1 | 16 | None | No | Yes | Yes | Yes |
| Mrs M S O | 70 | 7 mos | 18 | Slow healing | No | Yes | Yes | Yes |
| Mrs E F | 24 | 2 | 18 | Overcorrection | Believed over correction | No | Yes | Yes |
| Mrs H H | 46 | 5 | 21 | flexion deformity of distal joint | No | Yes | Yes | Yes |
| Miss E W | 23 | 7 mos | 14 | None | No | Yes | Yes | Yes |
| Mrs F Mc. | 42 | 5 | 28 | None | No | Yes | Yes | Yes |

should be used not to damage the flexor hallucis longus tendon. The operator should stand facing the sole of the foot and, after freeing the sesamoid at its distal and proximal edges with the ordinary scalpel, grasp it

pointed dissectors made of right and left periosteal strippers is of great assistance (fig 4). Narrow bladed curved scissors are also useful. When the sesamoid is removed, there remains a surprisingly large space which

permits the head of the first metatarsal to be squeezed tightly to the side of the second metatarsal. This is ample reward for the tedious work of removing the sesamoid, because

- (a) The flattened forefoot is pleasingly narrowed
- (b) The convexity to the anterior arch is improved
- (c) A troublesome source of soreness is removed
- (d) Relaxation of adductor contraction is complete
- (e) The force that rotates the toe is released

8 The conjoined adductor tendon tissue is attached laterally to the first metatarsal by subperiosteal insertion and suture

9 The incision is now retracted medially over the extensor hallucis tendon to expose the bursa. An incision is made along the dorsal border of the bursa and the thickened tissue is dissected thoroughly from the medial surface of the metatarsal head. The prominence of the head is removed vertically with a thin osteotome, caution being used to leave no rough edges or fragments of bone. The extent of bone excised should be gaged according to cosmetic requirements. The capsule of thick fibrous tissue is then sectioned and shortened sufficiently to maintain slight overcorrection of the toe.

The wound must be dry before it is closed. After the tourniquet has been removed, most of the oozing will stop by compression. As few catgut knots as possible should be placed in the wound. The toe is held in very slight overcorrection and a plaster slipper applied, separately enclosing the big toe. The plaster may be split and removed for dressing at the end of

the fifth or sixth day. If there is evidence of oozing or persistent pain for more than three days, the wound should be inspected. It is preferable to leave the cast on about two weeks, during which time weight bearing is begun. When the plaster is removed the toe should be held in corrected alignment by means of adhesive plaster, and a shoe or sandal with the toe cut out is worn until the end of the third or fourth week. Several of the best results have been obtained when the patient began wearing ordinary shoes

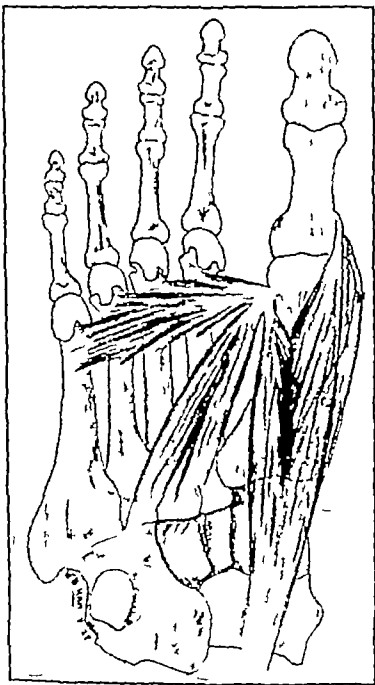


Fig 7—Anatomic reconstruction of the tendons

with roomy toes at the end of three weeks. When weight bearing activity is prohibited more than three weeks, persistent symptoms due to the effect of weakness and atrophy are likely to occur.

Several cautions should be mentioned

- 1 Gentle retraction should be used to prevent necrosis of the skin
- 2 In removing the external sesamoid, difficulty will arise if the bone is crushed. A hook or towel clamp

and sharp pointed dissectors should be used, tension being kept upward on the bone as it is dissected out of its firmly adherent bed.

3 One should avoid the small sensory nerve which lies in the fascia obliquely across the dorsiflexor tendon.

4 There are only two veins of consequence. They may be clamped and tied as exposed.

5 Especial attention should be directed to the occurrence of overcorrection and to flexion deformity of the distal joint. In two

of my cases the forces of abduction seemed to gain too great an advantage, and as weight was borne the toe spread out in a most undesirable varus. Both patients were under 25 years of age, and although the deformity of the toes was rather severe the usual chronic proliferation and fibrotic changes had not



Fig 8—Plaster shoes, worn for about two weeks. Weight bearing can be allowed after ten days.

occurred about the joint, so that lessening the adductor tension permitted the abductors to overdevelop. In both cases the external sesamoid was removed together with complete release of the outer head of the flexor hallucis brevis, whereas in such cases transplantation of the adductor hallucis and the tenotomy of the flexor hallucis brevis would have been sufficient. The complication was well overcome in both cases by lengthening the abductor tendon and by reinforcing the fascia and tendinous tissue at the outer side of the base of the proximal phalanx.

6 Mention should also be made of three cases in which there were circulatory complications. All three patients were past 60 years of age, and, although clinically there were no contraindications except that of age, a portion of the skin along the line of the incision was lost through sloughing. In all three a local anesthetic was used. There should be a great deal of caution in such cases not to traumatize the tissues unduly.

Experience with the procedure brought about the necessity of classifying the cases into types according to the length of time the deformity has existed, the age of the patient, the x-ray appearance of the sesamoid bones and the severity of the deformity, as follows:

- 1 Age under 30, confirmed deformity, thickened painful bursa, no bone atrophy, sesamoids not displaced
- 2 Age from 30 to 60, fixed deformity, large painful bursa, bone hypertrophy or irregularity. Sesamoids displaced and misshaped
- 3 Age over 60, same as in type 2, but with the possibility of circulatory deficiency
- 4 Patients any age with arthritis of rheumatic nature.

In type 1 the adductor tendon is detached and transplanted to the outer side of the metatarsal head. The capsule on the outer side of the articulation is freed thoroughly, and if necessary the flexor brevis is tenotomized to relax completely the proximal phalanx. The external sesamoid is not removed and little or no excision of bone is made from the inner side of the metatarsal head. The bursa is sectioned so that the abductor hallucis is shortened.

In type 2 the external sesamoid is removed and as much bone is excised from the inner side of the metatarsal head as is necessary to satisfy the cosmetic demand

In type 3 endarteritis is a distinct contraindication

In all cases great care is used in respect to trauma and retraction. Release of the adductor tension and excision of the hypertrophied bone and bursa may be accomplished when there is no definite evidence of circulatory deficiency

In type 4 surgery is postponed until acute or subacute inflammatory activity has entirely subsided. The plastic operation is not suitable when the articular surfaces are unsuitable for painless function of the toe

SUMMARY

The results in the surgical treatment of "bunions" should be measured by the following specifications

1 The time of recovery should be not more than from three to four weeks

2 The corrected alignment should give a normal appearance to the foot and toes

3 The soreness and pain should be relieved

4 The joint action should not be appreciably lessened

5 The patient's expectations should be satisfied

Release of adductor tension by direct attack on the tendon insertions on the outer side of the base of the proximal phalanx, excision of the bony prominence of the head of the metatarsal and shortening of the capsule to maintain alignment accomplish results that fulfil these specifications

717 North Robinson Street.

ABSTRACT OF DISCUSSION

DR PAUL W LAPIDUS, New York A bunion is not so much a lateral deviation of the big toe as it is a medial protrusion of the first metatarsal head as the result of the varus position of the first metatarsal. The first metatarsus varus is present in the greater majority of bunions as the primary deformity, the hallux valgus developing secondarily. The first metatarsus varus is often a congenital hereditary condition not infrequently observed in children before the development of real hallux valgus. In the analysis of a typical bunion, at least five mechanical elements may be noted (1) metatarsus varus, (2) hallux valgus with lateral subluxation of the big toe, (3) lateral displacement of the sesamoids, (4) lateral displacement of the tendon of the extensors of the big toe and (5) internal rotation of the big toe so that the nail of the right and left big toes face each other. I cannot agree too strongly in corroborating Dr McBride's warning against resecting the first metatarsal head. The operative procedures aiming at realignment of the big toe with the first metatarsal fail to correct the first metatarsus varus. This type of operation, if successfully performed in a case of marked bunion, will create a foot fit to wear a glove rather than a modern shoe. Recurrence of hallux valgus is just a question of a little time. A permanent result can be expected only when the first metatarsus varus is adequately corrected and this correction maintained. The transplantation of the adductor hallucis tendon, according to Dr McBride's method, is really an attempt at approximation of the first and second metatarsal heads, which are widely separated because of varus position of the first metatarsal. Whether or not this little muscle can accomplish it, especially in case of marked and fixed deformity, is a question in my mind. According to the procedure used in Dr Leo Mayer's service at the Hospital for Joint Diseases, the sesamoids are easily brought into their normal relation with the first metatarsal head and do not cause any mechanical obstacle for correction of the big toe deformity. We have always been able to correct or even slightly overcorrect the deformity at operation, and this correction has

remained when the toe was left unsupported. We do not use any external fixation except a plain postoperative gauze dressing. That is why I do not quite understand the advantage of removing the lateral sesamoid done in some of Dr McBride's cases. About thirty cases of marked bunions were operated on by this method. The youngest patient was 14 years of age and the oldest 59. Some of the cases have been followed over three years. Our late results have been extremely satisfactory.

DR EARL D MCBRIDE, Oklahoma City In answer to the discussion of Dr Lapidus on the spreading apart of the first and second metatarsal heads, I wish once more to direct attention to the great advantage of the adductor forces over the abductor forces on the big toe and the relation this has to the entire forefoot, especially the transverse arch. The adductor muscle and the lateral head of the flexor brevis, together with the pressure of the shoe on the end of the big toe, are the forces that tend to press the first metatarsal away from the second metatarsal and pull the toe in valgus. As soon as the lateral sesamoid is removed and adductor tension released, the abnormal pressure on the head of the metatarsal has been relieved and the forces that cause the valgus deformity have been released. The head of the first metatarsal may be brought tightly to the side of the second metatarsal when the sesamoid bone is taken out. In no case has the base of the metatarsal seemed to be an obstruction after removal of the sesamoid. The first metatarsal bone comes home, so to speak, and the forefoot is narrowed to a more normal appearance in addition to the correction of the toe deformity.

THE ABDOMINAL SYMPTOMATOLOGY OF DIABETIC ACIDOSIS

JOSEPH T BEARDWOOD JR., M.D.
PHILADELPHIA

Diabetes mellitus has definitely increased during the last decade. With the increasing incidence of this disease there has come a greater appreciation of its symptoms and the symptoms of its complications. The disease as well as some of its complications has been named from syndromes which are merely terminal manifestations. In most instances, long before the development of the advanced stages, symptoms have been present which if properly interpreted will enable one to make an earlier diagnosis and in many cases prevent a development of serious and even fatal sequelae.

Thus the symptoms of polyuria and polydipsia from which diabetes has derived its name have developed in only a relatively small percentage of cases when first seen. It is now realized that diabetic gangrene in the vast majority of cases is a terminal condition, the result of definite arterial changes, which many years before the development of gangrene give premonitory symptoms such as intermittent claudication, color and temperature changes in the foot and diminishing or absence of the pulsation of the terminal arteries. The application of the term coma to the terminal picture of diabetic acidosis has resulted in many instances in lack of appreciation of the earlier symptoms and in the postponement of adequate treatment.

The symptoms usually attributed to diabetic acidosis are polyuria and polydipsia, a drowsy restlessness which progresses slowly into coma and is accompanied by a deep regular sighing type of respiration (Kussmaul breathing) and is associated with marked evidences of dehydration. There is another group of symptoms which I feel is of more frequent occurrence and of greater importance from the standpoint of clinical

Read before the Section on Gastro-Enterology and Proctology at the Eighty-Sixth Annual Session of the American Medical Association Atlantic City N J June 14 1935

recognition of this condition, namely, the abdominal symptoms—i.e., nausea, vomiting, abdominal pain and tenderness, accompanied usually by an increased temperature and a leukocytosis. The fact that diabetic acidosis may be associated with abdominal symptoms has been recognized for some time by many clinicians. Joslin¹ speaks of these among the symp-

TABLE 1—Cases in Which There Were Leukocytosis and Fever

| | Cases with Abdominal Symptoms | | Cases Without Abdominal Symptoms | | Total of Series | |
|----------------------|-------------------------------|----------|----------------------------------|----------|-----------------|----------|
| | Number | Per Cent | Number | Per Cent | Number | Per Cent |
| Leukocytosis | 69 | 86 | 10 | 57 | 88 | 77 |
| Fever | 64 | 79 | 12 | 30 | 76 | 66 |
| Total cases in group | 81 | | 33 | | 114 | |

toms of this condition, F. N. Allan² and Joslin, Root and White³ call attention to the fact that nausea and vomiting are important symptoms of diabetic acidosis. From a general perusal of the literature, however, one is impressed with the fact that these symptoms are not properly appreciated by the profession at large and that the frequency of their occurrence is not realized. F. H. Allan⁴ feels that this is a new type or form of coma, and he has found it chiefly among patients who have been under treatment and who have violated their diabetic regimen, rather than in previously unrecognized cases of diabetes. This has not been my experience.

This study was made on the last thousand cases of diabetes admitted to my services at the Graduate Hospital of the University of Pennsylvania, the Presbyterian Hospital and the Abington Memorial Hospital. Each of these hospitals presented different types of patients. The graduate service consisted for the most part of Italians, Negroes and Jewish diabetic patients, those at Presbyterian Hospital were Irish and native Americans, and those at the Abington Hospital native born Americans with a large percentage of farmers and rural workers. In addition I have included the private patients who were admitted in coma, and the whole group, I feel, is a cross section of diabetes as seen in Philadelphia and its vicinity. In these 1,000 cases there are 114 cases showing clinical or laboratory evidences of diabetic acidosis, an incidence of 11.4 per cent. In presenting any series of cases of diabetic acidosis it is well to remember that this condition does not develop suddenly but usually over a period of two to three days or more, although the symptoms first calling for medical aid may appear to develop very abruptly. In this series there were eighty females and thirty-four males, the ages ranging from 3 years to 72 years.

As shown in table 1, eighty-one cases, or 71 per cent, showed one or more of the abdominal symptoms, and thirty-three, or 29 per cent, showed either respiratory or comatose syndromes. As will be noted, many of those showing the abdominal symptoms also showed fever and leukocytosis. In only a small number of cases was there fever associated with any infections, and in all but two cases (one a large apical abscess and

the other osteomyelitis of the jaw) the temperature showed a decided drop following the treatment of the acidosis alone before any attempt could be made to eradicate the infection. Any patient showing a leukocytosis of over 11,000 was included in this group. The highest count obtained in this series was 42,300, occurring in a child of 11 years and associated with a very acute onset of the abdominal picture.

Nielsen⁵ feels that a leukocyte count in these conditions furnishes information not only of the gravity of the acidosis but also as to the indication for insulin therapy. He suggests that a leukocyte count may be used as an emergency differential aid in distinguishing between unconsciousness due to diabetic acidosis and that due to hypoglycemia. The cause for this leukocytosis is not altogether clear.

In diabetic acidosis there is marked dehydration and hemoconcentration, as has been so clearly pointed out by Peters,⁶ who feels that this may account for the leukocytosis, but in many of the cases in the present study in which the white count was elevated there was no evidence of concentration of other cellular elements of the blood. Lawrence, Lucas and McCance⁷ believed that leukocytosis and a shift to the left in the Schilling count are due to the stimulation of bone marrow by the ketones in the blood. I have attempted to duplicate this experience in rabbits by producing acidosis and have failed to note any marked response even when the plasma carbon dioxide was below 30 volumes per cent. In the vast majority of cases those showing leukocytosis also showed fever, and one would seem justified in assuming that the mechanism responsible for the one was also responsible for the other, and that the rise in temperature might be explained by stimulation of the fever center by the ketones in much the same manner as the respiratory center is thought to be stimulated and orthopnea produced.

The Schilling count in all these cases showed a shift to the left and the predominance of neutrophils. John⁸ feels that leukocytosis without a rise in temperature may be a differential point between uncomplicated acidosis and that in which infection is present. However, this has not been my experience in this series of cases. The percentages of these cases showing fever and leukocytosis is shown in table 2.

TABLE 2—Cases of Diabetic Acidosis Classified According to Age and Symptoms

| | Age | | | | | | | |
|-------------------------------------|------|-------|-------|-------|-------|-------|-------|-----|
| | 1-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70+ |
| Nausea, vomiting and abdominal pain | 3 | 10 | 25 | 18 | 12 | 8 | 4 | 1 |
| Dyspnea and orthopnea | 2 | 1 | 1 | 1 | 3 | 0 | 0 | 0 |
| Coma and drowsiness | 0 | 1 | 3 | 6 | 5 | 6 | 2 | 1 |
| Total number of cases | 5 | 12 | 29 | 25 | 20 | 14 | 6 | 2 |

It must be borne in mind that the infections are often the cause of the development of diabetic acidosis, and these naturally would be accompanied by fever and leukocytosis. Theoretically any acute infection in the abdominal cavity might therefore give rise to diabetic acidosis. I therefore selected from these 1,000 cases

¹ Joslin, E. P. *Treatment of Diabetes*. Philadelphia, Lea & Febiger, 1928, p. 649.

² Allan, F. N. *Am. J. M. Sc.* 174: 506 (Oct.) 1927.

³ Joslin, E. P., Root, H. F. and White, Priscilla M. *Clin. North America* 10: 1924 (March) 1927.

⁴ Allan, F. H. in *Cyclopedia of Medicine*. Philadelphia, F. A. Davis Company, 1931, p. 516.

⁵ Nielsen, O. J. *Ugeskr. f. Læger* 91: 1069 (Nov. 28) 1929.

⁶ Peters, J. P., cited by Lande, Herman. *The Uncontrollable Causes of Death in Diabetic Coma*. J. A. M. A. 101: 9 (July 1) 1933.

⁷ Lawrence, R. D., Lucas, H. A. and McCance, R. A. *Brit. M. J.* 2: 145 (July 23) 1932.

⁸ John, H. J. *Am. J. Digest. Dis. & Nutrition* 1: 569 (Oct.) 1934.

of diabetes those which presented definitely proved acute intra-abdominal conditions confirmed by operation. There were fourteen such cases, and they are summarized in table 3. It will be noted that in the very acute conditions, those associated with actual pus, there were none in this series in which acidosis developed, and indeed while it is a dangerous procedure to draw conclusions from such a small group of cases it certainly seems that the acute abdominal emergencies in diabetes do not present the same urgency of symptoms as one sees in the comas alone. I will cite one case of this series.

J. D. K., known to have diabetes for twelve years, was well controlled with diet and was taking 20 units of insulin a day. Rather vague pain developed in the lower right side of the abdomen and for a period of three days there was no rise in temperature and very little muscle guarding. On the fourth day he had a temperature of 99.2 F and a definite area of soreness over McBurney's point. He was admitted to the hospital for operation and a very large appendical abscess was found, which had walled itself very satisfactorily. The blood sugar on admission was 303, the carbon dioxide combining power of the blood was 54 volumes per cent, and the white blood cells numbered 13,000.

TABLE 3—Fourteen Cases of Acute Abdominal Conditions Occurring in a Series of One Thousand Consecutive Patients Admitted Because of Diabetes

| Name | Age | Condition | Blood Sugar Mg | Plasma Carbon Dioxide | White Blood Cells | Fever |
|----------|-----|--------------------------|----------------|-----------------------|-------------------|-------|
| M. K. | 64 | Pyelonephritis | 210 | 54 | 11 000 | 100 |
| W. H. S. | 82 | Gangrene of gallbladder | 450 | 42 | 17 500 | 99.4 |
| A. O. | 64 | Ruptured appendix | 280 | 43 | 14 200 | 102 |
| M. S. | 42 | Acute cholecystitis | 242 | 50 | 15 200 | 100 |
| J. D. K. | 52 | Appendical abscess | 303 | 54 | 13 000 | 99 |
| H. T. K. | 51 | Gangrene of gallbladder* | 114 | 64 | 9 500 | 99 |
| M. W. B. | 47 | Pyelonephritis | 250 | 42 | 10 500 | 103 |
| E. T. | 51 | Acute cholecystitis | 214 | 56 | 11 500 | 99 |
| R. S. | 46 | Empyema gallbladder | 195 | 58 | 13 500 | 101 |
| M. T. F. | 49 | Ruptured appendix | 250 | 44 | 17 500 | 102 |
| P. T. W. | 46 | Pelvic abscess | 243 | 42 | 16 250 | 103 |
| M. B. S. | 59 | Empyema gallbladder | 100 | 40 | 10 250 | 99 |
| R. S. | 14 | Acute appendicitis | 204 | 49 | 10 750 | 89 |
| M. B. | 15 | Acute appendicitis | 190 | 43 | 13 700 | 100 |

* Developed while in hospital.

As will be shown in table 3 none of these fourteen cases showed any marked evidences of acidosis.

ANALYSIS OF CASES

1 *Age*—Seventy-two per cent of these cases occurred in the first four decades of life and of these 77 per cent showed an abdominal symptomatology. Fifty-nine per cent occurring in patients above the age of 40 years showed abdominal symptoms.

2 *Sex*—There seems to be very little difference in the sex distribution of the symptoms. Fifty-three of eighty females and twenty-eight of thirty-four males had a predominance of the abdominal symptoms.

3 *Habitus*—It is relatively rare to find diabetes in a ptotic individual, and while the majority of the thin diabetic patients in this series had abdominal symptoms, these occurred for the most part in cases of severe diabetes. Only one ptotic individual failed to show the abdominal symptoms, and she was admitted in complete coma.

4 *Duration of Diabetes*—There was no correlation between the duration of diabetes and the type of symptoms. In eighteen cases diabetes was not recognized before the onset of acidosis, and in all but three the abdominal syndrome predominated. In the other cases the diabetes had existed for from six months to twelve years.

5 *Severity of Diabetes and Acidosis*—The height of the blood sugar and the carbon dioxide combining power of the blood bore no relationship to the symptoms. The patient having the lowest carbon dioxide reading (7 volumes per cent) had no abdominal symptoms in any stage of acidosis, nor did the patient having the highest sugar (888 mg per hundred cubic centimeters of blood). Many cases with plasma carbon dioxide of 30 volumes per cent presented nausea, vomiting and abdominal pain.

6 *Other Laboratory Changes*—An attempt was made to correlate the symptoms with the height of the blood urea nitrogen, cholesterol and chlorides. All the cases studied with but two exceptions showed a high value of blood cholesterol, the figures varying from 250 to 670, and there was no preponderance of the high values in either of the groups. The blood urea nitrogen showed no diagnostic deviation in the two groups. The blood urea nitrogen reading is increased in all severe cases of acidosis and is associated with progressive dehydration and anhydremia. There may be a relationship between the level of blood chlorides and the development of abdominal symptoms, but too few determinations have been made in this series to draw any conclusion as to whether the hypochloremia is the cause of, results from, or is entirely independent of the abdominal picture.

7 *Intra-Abdominal Pathologic Changes*—Not all the cases were studied for the presence of gastro-intestinal or other abdominal pathologic changes before the onset of acidosis. I am therefore unable to draw any definite conclusions from my figures in this particular. Forty-six of the eighty-one cases presenting abdominal symptoms were studied after recovery from acidosis. Twelve, or 26 per cent, presented some evidence of a pathologic condition of the gallbladder—either cholecystitis or cholelithiasis. None of the younger patients in whom the abdominal symptoms were the most acute showed any clinical or laboratory evidence of gastro-intestinal disease, although two of the children had enlarged livers. This percentage of gallbladder disease is not much greater than that found in any large series of adult diabetic patients.

8 *Symptoms in Previous Attacks of Acidosis*—Fourteen of these patients had been previously admitted with diabetic acidosis, of these, four were admitted five times and three were admitted four times. These patients showed a tendency to develop the same kind of symptoms with each attack of acidosis, whether abdominal, respiratory or comatose, and several patients recognized the oncoming acidosis because of anorexia and nausea. In one child, aged 11 years, however, two of her five attacks were accompanied by coma without gastro-intestinal symptoms, and on three occasions she had marked abdominal pain. It must be remembered that in diabetic acidosis as in other medical conditions the thoroughness of the history is in direct proportion to the diligence spent in developing it but that an accurate history of the chronological development of symptoms in such a medical emergency as acidosis may be hard to elicit after the lapse of some years.

ADMISSION DIAGNOSIS

Nausea, vomiting and abdominal pain with a rise in temperature and white blood cell count are the diagnostic criteria for an acute abdominal condition, and when one considers that the results of the bedside examinations are almost identical with those in surgical

conditions of the abdomen it is not surprising to find that fourteen of these cases were sent in with surgical diagnoses. These were divided as follows: intestinal obstruction, four; acute cholecystitis, three; acute appendicitis, five; peritonitis, one; acute pancreatitis, one; fortunately only one patient was operated on, and a short history of this will be given later. It is more difficult to understand why a case showing typical Kussmaul breathing, acetone odor of the breath, and evidence of marked dehydration and complete coma was sent in "for study." This patient was found to have a plasma carbon dioxide combining power of 8 volumes per cent and a blood sugar of 480 mg per hundred cubic centimeters.

DIFFERENTIAL DIAGNOSIS

From the foregoing description it is obvious that the differential diagnosis of diabetic acidosis with abdominal symptoms and an acute abdominal surgical condition presents many difficulties, and when one considers that the two may exist together the problem becomes even more complex. The leukocyte count is of some value. It is usually higher in cases of acidosis than in acute abdominal conditions. The differential count in my experience has been of little value. In the case of acidosis in spite of severe pain there is apt to be less muscle guarding, although this is not a safe criterion to go by. In the vast majority of cases without the aid of blood chemistry and urinalysis it is impossible to make a differential diagnosis. Any patient who has a history of glycosuria or in whom sugar is found in the urine should never be operated on until investigations of blood chemistry have been made. In this particular it may not be amiss to point out that the blood sugar level is no indication of the presence or absence of acidosis and that the plasma carbon dioxide should be determined. However, from the standpoint of therapy it makes little difference whether an immediate differential diagnosis can be made if there is acidosis present, for unless this is controlled surgical intervention is sure to result fatally. The method of procedure, therefore, is to treat the acidosis energetically, which can be sufficiently controlled in a few hours to make possible the determination of the presence or absence of a surgical abdominal condition.

POSSIBLE EXPLANATIONS OF THIS SYMPTOM COMPLEX

Several theories have been advanced to explain the occurrence of these symptoms in diabetic acidosis. One theory has been that it is caused by acute pancreatitis. It is difficult to imagine, however, that such a condition would definitely subside in a period of two or three hours, by the administration of insulin, dextrose and saline solution and leave no demonstrable impairment behind. Then, too, much of the recent work indicates that diabetes is not a pancreatic disease in the vast majority of cases. Another explanation is that the symptoms may be due to an intense spasm of the gastrointestinal tract. There is no doubt that such spasm exists in many cases, for one can often recover in washings from the stomach of these patients food that had been taken twenty-four hours previously. Another theory is that this is a defense mechanism set up by the organism to rid itself of the acid ions of the gastric juice. It must be admitted that none of these explanations are very adequate and that further work in this field is indicated.

The following three cases are presented in abstract to illustrate the different aspects this syndrome may present.

CASE 1—M S, a woman, aged 52, had had for some years recurring symptoms of gallbladder disease. Three years prior to this admission a diagnosis of cholelithiasis was made and she was admitted to the hospital for operation. At this time it was discovered that she had a mild diabetes. She stood her operation well and was easily standardized. On returning home she became careless of her diabetic regimen and was poorly controlled. For about six months before her second admission she had had no laboratory examinations. Six days before she was admitted, anorexia, nausea and constipation developed. This persisted and, thirty-six hours before she was admitted, severe pain in the right upper quadrant of the abdomen and vomiting started. She was admitted with a diagnosis of intestinal obstruction, thought to be a sequel of her previous operation. On physical examination she was markedly dehydrated, the abdomen was distended and there was what appeared to be a mass in the upper right quadrant. The temperature was 103 F, and the white blood cells numbered 33,000 with 86 per cent polymorphonuclear leukocytes. I was asked to see her previous to operation because of the diabetes. The blood sugar at that time was 660 mg, plasma carbon dioxide, 17 volumes per cent, blood cholesterol, 610 mg. She was immediately started on appropriate treatment for diabetic acidosis and within six hours the symptoms had greatly ameliorated and within twelve hours had entirely disappeared. The abdomen was normal and there was no palpable mass. She was satisfactorily standardized and has had no return of symptoms for the last three years.

CASE 2—A man, aged 43, was known to have had diabetes for eight years and had been standardized satisfactorily with diet and insulin. He was prone to be careless about his diet and insulin and, ten days before he was admitted, anorexia and vague abdominal pain developed. After taking home remedies for several days without relief he went to his family physician, who referred him to a gastro-enterologist. Before he could see the gastro-enterologist severe abdominal pain and vomiting developed, and after twenty-four hours he was admitted in well advanced diabetic coma. Blood sugar, 425 mg, carbon dioxide combining power, 7 volumes per cent, blood chlorides, 390 mg, white blood cells, 24,500. He was treated for diabetic acidosis and after a slow but satisfactory response was restandardized. He was readmitted fifteen months later with an almost identical history, with symptoms lasting for nine days. During his stay in the hospital he was thoroughly studied in the gastro-intestinal department and no pathologic condition was discovered. Quite recently the same symptoms again started but he realized that coma was developing and was able to abort it by proper treatment.

CASE 3—T W, a man, aged 72, had for six days previous to admission indefinite abdominal pain, loss of appetite, and nausea. Two days before admission he started to vomit, and more severe pain developed. He was admitted at 3 a.m. with a diagnosis of abdominal obstruction. The temperature at that time was 101 F, and the white blood cells numbered 17,500. The pulse was rapid and irregular, the patient was obviously toxic and semiconscious. The abdomen was distended, peristalsis could not be heard. A diagnosis of intestinal obstruction or paralytic ileus was made and the patient was prepared for operation. Unfortunately the report of the urinalysis was lost, but the case seemed to be one of such emergency that the surgeon proceeded. Under spinal anesthesia the patient's bowels relaxed and an incision was made and a tube inserted. No obstruction was found at operation but because of the patient's condition no extensive search was made. The patient remained stuporous throughout the night, and the next morning the blood sugar was 393 mg, the carbon dioxide combining power was 12 volumes per cent, and the urine was loaded with sugar, acetone and diacetic acid. A history was then obtained. Ten years before, glycosuria was first noticed, and because of the lack of symptoms no attention was paid to this by the patient or his physician. Unfortunately, in spite of heroic treatment, the patient died ten hours after operation.

SUMMARY

In this study of 114 cases of diabetic acidosis it is obvious that the onset was accompanied in the majority of cases by symptoms referable to the gastro-intestinal tract, this is of more than academic interest when one realizes the number of these patients who are referred for surgical treatment. A wider recognition of this syndrome in relation to diabetes would result in an earlier diagnosis of acidosis, a prompter treatment and a lessened mortality. From this survey it appears that this picture is more prone to develop in the younger diabetic patients but that it has no relationship to the duration or severity of the diabetes or the presence or absence of gastro-intestinal disease. The association of fever and leukocytosis is of great importance because it often clouds the picture and renders the diagnosis difficult.

CONCLUSION

Acidosis should always be first thought of in a diabetic patient having nausea, vomiting and abdominal pain, and because of the increasing incidence of diabetes this diagnosis should be suspected in every case presenting the symptoms of an acute condition of the abdomen.

2031 Locust Street

MANAGEMENT OF UNDESCENDED TESTICLE

CHARLES M. McKENNA, M.D.
AND
EARL EWERT, M.D.
CHICAGO

When the final chapter is written on the subject of cryptorchidism, it will be divided in our opinion into two distinct chapters. One will have to do with the embryology, histology and physiology of undescended testicle, and the second with the anatomy, technic of operation and end results. In the former the name of Dr. Carl Moore¹ of the University of Chicago will stand out prominently, while in the latter the names of Bevan,² Torek,³ Meyer,⁴ Cabot,⁵ Cunningham, Keyes, Wangenstein,⁶ Eccles and others will be noted. Bevan was a pioneer in this work and deserves particular attention, because he has continued to perfect his original operation so that at the present time his technic is more generally accepted than any other.

To date there have been more than forty different operations described in the literature. That is the best evidence that no one technic has been accepted as a standard.

This paper will deal chiefly with the anatomy, technic of operation, and end results. In passing we cannot refrain from mentioning the splendid research work

done by Dr. Carl Moore. He was the first one to point out the thermostatic value of the scrotum. He proved beyond doubt histologically that the germinal cells take on an irregular appearance and are irregular throughout the seminiferous tubules when the testicle is allowed to remain in the peritoneal cavity or high up in the inguinal canal. He proved, further, that when the testicle is brought down again and placed in the scrotum the germinal epithelial cells rearrange themselves in a normal position and the animal is fertile. Further on in his experimental work he took some of the larger animals, such as the bull and the ram, and strapped the scrotum up against the abdomen. He then made cross sections of the testicle and found exactly the same condition. Here again the germinal cells were irregularly placed throughout the lumen and the animal was sterile, but when the scrotum was unstrapped and permitted to occupy its normal position the germinal cells rearranged themselves and the animal was fertile. From his work one would draw the

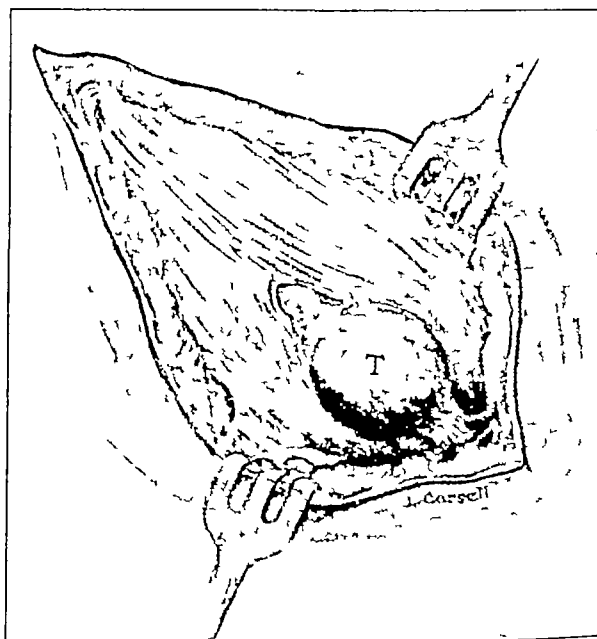


Fig. 1—Testicle in lower part of inguinal canal with gubernaculum attached to superficial fascia.

conclusion that patients suffering with cryptorchidism should be operated on before the age of puberty. Every urologist should be familiar with Dr. Moore's writings.

We believe that the proper time for this operation is between the ages of 5 and 9 years. At this period the tissues of the cord are sufficiently developed so that one can operate with better results than at an earlier age. There is some difference of opinion as to whether or not in cases of bilateral cryptorchidism the patient will be fertile if the testicles are placed in the scrotum after the age of puberty. Dr. Moore is unable to say whether or not fertility will be present in such a case, as his work has been exclusively on animals. We have had a number of patients under our observation past 21 years of age with bilateral cryptorchidism, all of whom were sterile. A number of those patients have been operated on in our clinic with very good results. To date we have not been able to make an examination of the semen to find out whether these patients have living spermatozoa but hope to be able to report on this soon. Unfortunately, most of

Read before the Section on Urology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.

1. Moore, C. R. Hormones in Relation to Reproduction. *Am. J. Obst. & Gynec.* 28:1 (Jan.) 1935.

2. Bevan, A. D. Double Undescended Testicle. *S. Clin. North America* 10: 193-202 (April) 1930. Operation for Undescended Testicle. Further Study and Report. *Ann. Surg.* 90: 847-863 (Nov.) 1929.

3. Torek, Franz. Orchidopexy for Undescended Testicle. *Ann. Surg.* 94: 97-110 (July) 1931.

4. Meyer, H. W. Special Reference to Torek's Method of Orchidopexy. *Surg., Gynec. & Obst.* 44: 53-73 (Jan.) 1927.

5. Cabot, Hugh. Treatment of Cryptorchidism. *Proc. Staff Meet. Mayo Clin.* 5: 198 (July 16) 1930. Cabot, Hugh and Nesbit, R. M. Principles and Methods of Treatment of Undescended Testicle. *Arch. Surg.* 22: 850-856 (May) 1931.

6. (a) Wangenstein, O. H. Experimental and Clinical Study of Undescended Testicle. *Arch. Surg.* 14: 663-731 (March) 1927. (b) Surgery of the Undescended Testis. *Surg., Gynec. & Obst.* 64: 219-231 (Feb.) 1932.

these patients live out of the city. In all the cases we have observed of married men with bilateral cryptorchidism, none have any progeny.

CLASSIFICATION

We have classified this entity into four groups: first, the testicles that are in the peritoneal cavity; second, those in the inguinal canal; third, those just below the inguinal canal; and, fourth, the migrating type in the scrotum and in the canal. This article deals chiefly with the first three groups.

ETIOLOGY

The etiologic factors described by Eccles⁷ are "1. Conditions associated with the mesorchium. 2. Those associated with the testis and its component parts. 3. Conditions associated with the gubernaculum. 4. Conditions associated with the cremaster. 5. Those associated with the route along which the testicle must pass."

John Hunter and Bland Sutton were of the opinion that the testicle failed to descend because of imperfect development. Uffreduzzi was inclined to think that heredity played an important role.

In most of the patients we have seen we believe that the failure of the testicle to descend was due more to the peritoneum covering the spermatic vessels and the vas deferens than to any other one factor. We have seen four cases of anomaly in which the epididymis was not in proximity with the testicle. We have seen two cases in which the patient did not present an external inguinal ring. In one of these, a man, aged 34, no difficulty was experi-

enced at operation at the age of 14 years. This patient was operated on for an inguinal hernia just before entering the army during the World War.

FREQUENCY OF OCCURRENCE

An observer in the Austrian army showed that out of every 1,000 men drafted an average of 22 had undescended testicle. Marshall found eleven in 10,800

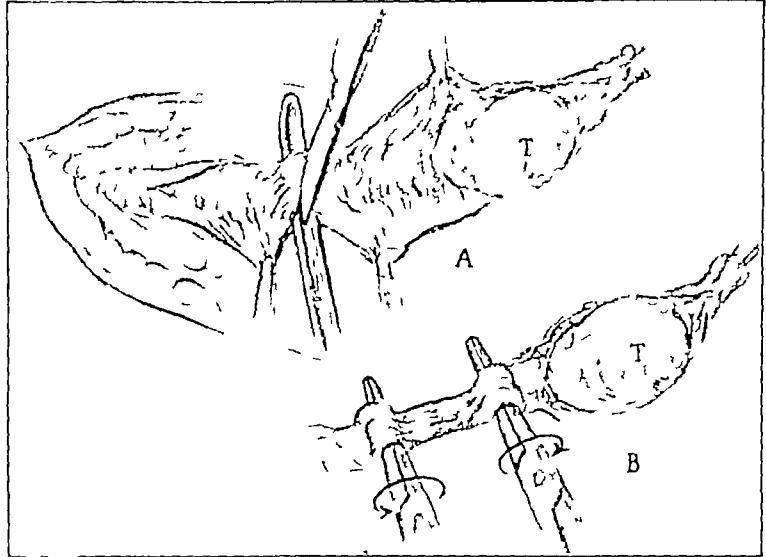


Fig. 3—A, cutting vaginal peritoneum transversely to the cord with groove director underneath peritoneum and over the cord. B, stripping of vaginal peritoneum toward testicle and peritoneal cavity.

cases, Rennie found six in 10,800 cases, while in the late war the records of the United States Army Medical Department showed that 3.1 per thousand cases showed failure of the testicle to descend.

INDICATIONS FOR OPERATION

The indications for the operation are summed up in the following way. First, we believe that all patients with cryptorchidism should be operated on before the age of puberty, provided the general condition permits. However, we have operated on many patients after puberty with good clinical results. Furthermore, we believe that operation is indicated because of the possibility of the undescended testicle undergoing malignant change in later life, because of the association with inguinal hernia, because of the possibility of traumatism, because of pain due to the position of the testicle, and for cosmetic purposes. It has already been pointed out that if the testicle is not placed in its normal bed the patient has a good chance of being sterile on that side. Statistics differ and authors do not agree on the possibility of a malignant outcome. Many surgeons point out that it is sufficiently important that when this condition does arise an operation is strongly indicated. Wangenstein, in a recent article, declares that it is more likely for the undescended testicle than for a normally descended one to become malignant. Bevan, on the other hand, does not recall having operated on a single patient with a malignant condition in an undescended testicle. Cunningham in 1921 found that in 462 cases of malignancy of the testes, forty concerned the undescended testis. Kocher observed one case of cancer in 1,000 cases of undescended testicle and the report by Eccles of 154 cases showed no instance of a malignant growth. In our own series of 110 cases, malignancy was not

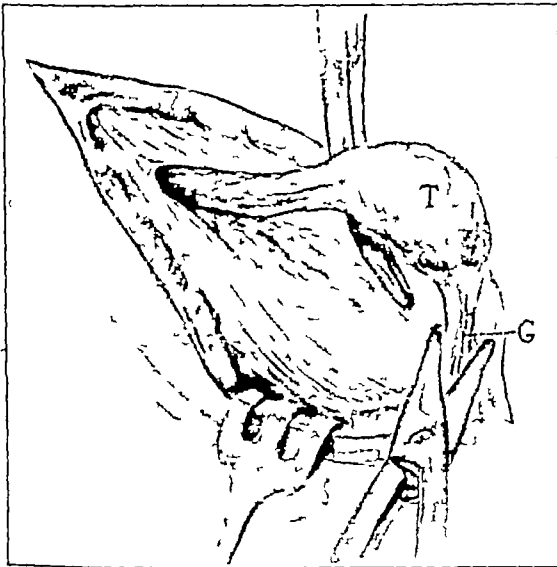


Fig. 2—Testicle and gubernaculum dissected out.

enced at operation in bringing the testicle down to its normal bed.

It is generally agreed that if the testicle does not descend within the first twelve solar months after birth it will not descend of its own accord. One of our patients, however, a dentist aged 40, was born with unilateral cryptorchidism but the testicle did descend of

⁷ Eccles cited by Wangenstein.²⁸

observed in any case, but we did see a malignant condition of an undescended testicle in an adult operated on by another surgeon. We do not believe that the question of cancer should be the sole indication for operation in the adult.

We believe that the question of trauma should be considered in all cases of undescended testicle. This is especially true when the testicle is in the canal or below the canal. It is simple enough to visualize that a testicle in this position is much more easily traumatized than a testicle in the peritoneal cavity or in the scrotum. We have had two patients come to us for cosmetic reasons. One patient stated that he was always embarrassed when undressing before other men because of the anomaly, and he felt gratified when the testicle was put into the scrotum by operation.

the anterior pituitary-like principle from the urine of pregnancy that the interstitial tissue increases but the seminiferous tubules remain the same.³ We cannot say what the histologic result would be in the human being, but according to Moore the interstitial tissue is increased in rats. It has been our observation that the scrotum develops as well as the testicle. There is a definite place, we believe for the use of anterior pituitary like principle from the urine of pregnancy, namely, in the fourth group. We cannot concur in the opinions of some writers in believing that it is helpful in all cases. Until further investigation is made, therefore, we shall employ this gonadotropic principle only in the fourth group.

TECHNIC

Bevan emphasizes in his technic on the operation for cryptorchidism the retention of a tunica vaginalis.

Torek's method is outstanding because he has provided a means of preventing retraction after the operation. Our technic is a modification of both the Bevan and the Torek operation.

There are two factors to be accomplished in the operation: one, the lengthening of the cord, the other, the retention of the testicle in the scrotum. Bevan believes that he gets sufficient lengthening of the cord to retain the testicle in the scrotum, while Torek and Wangenstein point out that by suturing the tunica albuginea to the fascia in the thigh the testicle will remain in its normal position. In our work, when there is any question of shortening of the cord after the operation is completed, we follow out some what the method described by Wangenstein except that we use a portion of the gubernaculum instead of the tunica albuginea to attach to the thigh.

We make the usual incision for hernia parallel to Poupart's ligament, expose the external oblique but do not carry the incision quite as far toward the scrotum as we do in a hernia. This is purposely done to leave as little scar as possible near the spermatic cord. The vacant scrotum is dilated and if a constriction is present, and it usually is, it is incised in two places so that the testicle can remain free without any tension after the operation. We introduce the index finger of each hand for the purpose of dilating and making the scrotum larger. After that, gauze is packed into the scrotum

and allowed to remain there until we are ready to place the testicle in its normal bed.

If the testicle is below the inguinal canal and the gubernaculum is attached to the superficial fascia, this is dissected out and the gubernaculum divided by means of scissors. Regardless of the position of the testicle, it is of prime importance to preserve the gubernaculum, as will be indicated later in the paper. The external oblique is now divided just as in performing an inguinal herniotomy. The testicle with its accompanying sac is dissected out as far up as possible toward the general peritoneal cavity. The sac is opened and the cut edges are grasped with artery forceps, including the cord, which gives the appearance of a flat surface. The peritoneum is then divided at right angles to the cord and a grooved director inserted between the spermatic vessels and the vas deferens. The distal end of the cut

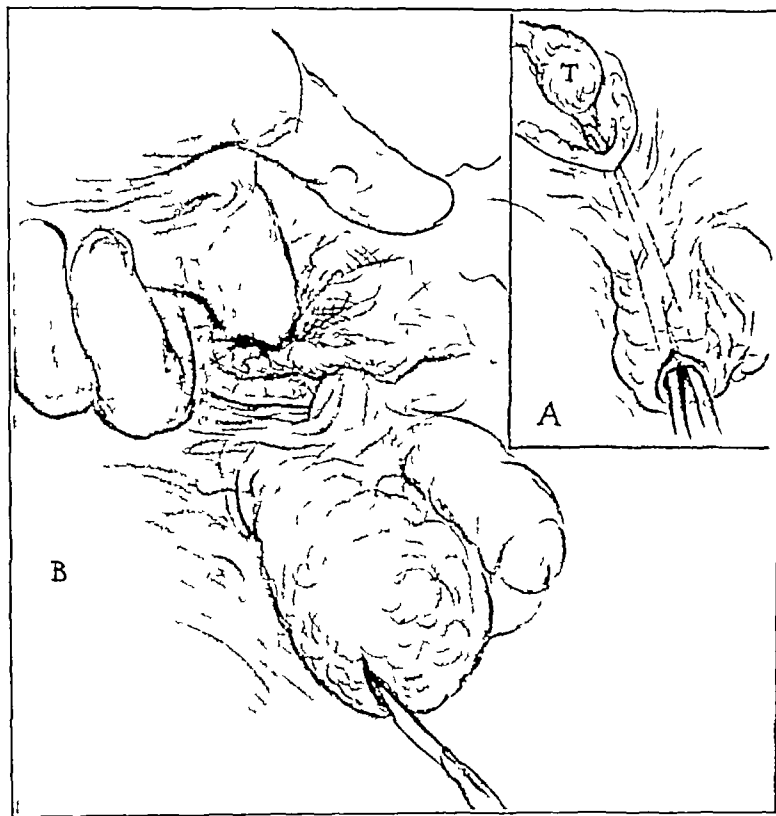


Fig 4—A gubernaculum being grasped with forceps to draw testicle into place and transplant gubernaculum into fascia lata. B gauze in scrotal sac in preparation for testicle, and incision being made in scrotum where gubernaculum passes through for transplant.

Pain is an important factor and is a strong indication for placing the testicle in the scrotum. In the migrating type of testicle, we believe it necessary to suture the testicle to the scrotum in order to prevent torsion of the cord, and we also advocate the use of the anterior pituitary-like principle from the urine of pregnancy.

THE VALUE OF PITUITARY-LIKE PREPARATIONS

Much has been written on the value of the anterior pituitary-like gonadotropic hormone obtained from human urine of pregnancy. We believe that anterior pituitary-like principle from the urine of pregnancy has a value in the fourth group, since the testicle is free and movable and has no mechanical obstruction to overcome. When the testicle becomes hypertrophied, gravity alone will produce the descent. It has been shown on animal experimentation in rats treated with

portion of peritoneum is grasped with an artery forceps. By twisting the forceps, the peritoneum is peeled off the spermatic vessels and vas deferens as far down as the testicle. The proximal end of the peritoneum, which is the upper end of the cord, is now grasped by the forceps and the same procedure is followed toward the general peritoneal cavity. When the peritoneal cavity is reached, it is easy enough to make an incision parallel with the cord on both sides and this peeling process can be carried as far as may be indicated in the judgment of the surgeon. We emphasize this method particularly because in all our cases we have had no hemorrhage. When the cord has been stripped of its peritoneum, it is easy enough to free the connective tissue holding the spermatic vessels and vas deferens. These two procedures we believe are of the greatest help in elongating the cord. At this point one must decide whether to follow out the general technic of Bevan of allowing the testicle to remain free in the scrotum, or

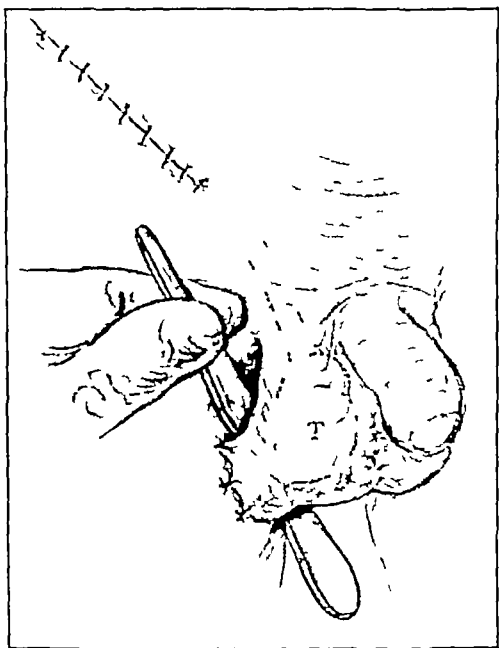


Fig. 5—Operation completed with testicle in sac and gubernaculum fixed.

the technic of Torek. In the event that the cord is short and there is a possibility of retraction, it is always advisable to make an anastomosis between the gubernaculum and the fascia of the thigh through a small opening in the scrotum.

In all our cases we have used this technic, even though the cord seemed sufficiently long. This procedure makes the second stage of the operation much more simple, since there is no danger of trauma to the testicle. The second step of the operation is done from six weeks to three months after the first operation. It is performed under local anesthesia and the patient does not have to remain in the hospital. During the interval between operations the patient may go home and is able to go about his duties as he would at any other time.

CONCLUSIONS

1. Preservation of the gubernaculum is essential for perfect testicle fixation.
2. Removal of the vaginal peritoneum is imperative in order to lengthen the cord.

3. The ideal age ranges between 5 and 9 years, although we have operated on patients up to the age of 34.

4. The thermostatic value of the scrotum cannot be overestimated.

5. So far as we know now, the anterior pituitary-like principle from the urine of pregnancy is of value only in the fourth group.

6. The use of the gubernaculum allows the testicle to remain in the scrotum.

7. We recommend the Ferguson technic for closure of the wound.

8. In our opinion the technic described produces more nearly normal results than any other method employed.

25 East Washington Street

ABSTRACT OF DISCUSSION

DR. R. H. JENKINS, New Haven, Conn. Cases of undescended testicle present a difficult clinical problem. There have been two methods of relief. One is to wait for the testicle to descend spontaneously. This may occur, but it does not seem reasonable to wait for this descent because of the numerous complications and the possibility of abnormal development of the testicle. The other method of relief is to place the testicle in the scrotum surgically. The results of surgery have not been gratifying. A summary of recent literature shows that operations do not always result in bringing the testicle to the normal low scrotal position. In a series of more than 500 operations reported by Burdeck and Coley, satisfactory results were obtained in about 50 per cent of the cases. I am certain that the technic described by the authors will improve the end results. Recently a third possibility has presented itself: the administration of the anterior pituitary-like principle from the urine of pregnancy. Last year Dr. Aberle and I presented the treatment of undescended testes in man and monkey with this substance. Our results were 50 per cent descent of the testicle in the scrotum. Since then I have been using it as an aid to surgery with gratifying results. It can be administered to a patient as young as 2 years of age. The age at which treatment is instituted is an important factor, because the investigators cannot agree at what age anatomic defects occur in the undescended testicle. Cooper found that undescended testicles in boys more than $2\frac{1}{2}$ or 3 years of age almost always show anatomic defects. Thus the available evidence seems to indicate that the sooner the undescended gland can be placed in the scrotum, the better are its chances of being a normal functioning organ. Following a course of this treatment, if the testicle fails to descend in the scrotum it increases in size and becomes more movable. The scrotum becomes full and large. With the development of these tissues one can operate with greater ease and better results. Following operation, hormone therapy is continued for two weeks, as I believe the retraction of the testicle operated on is lessened.

DR. A. I. DONSON, Richmond, Va. As I understood it, the authors stated that they did not know of an instance in which undescended testicle occurred in the Negro. In my practice it occurs in the Negro quite frequently, and I expect that others who practice in Southern cities have had the same experience. In my service during the past two years I know that there have been two such cases in which operation was performed and about six months ago a boy, aged 16 years, came into the outpatient department because of urethritis and a mass in the right inguinal region. Examination showed this mass to be acute epididymitis of an undescended testicle. After the epididymitis had subsided, the testicle could be easily demonstrated. Another case, which probably would not come exactly in this category, was of a Negro boy who I thought had bilateral undescended testicle. With the exception of hypospadias, the penis was normal. At operation an undescended testicle was found on one side, and on the other an ovary and a rudimentary uterus.

DR. CHARLES MORGAN MCKENNA, Chicago. In our experience we have never operated on a Negro who had cryptorchidism, although such cases have been reported.

THE ANEMIAS OF NUTRITIONAL DEFICIENCY

ETIOLOGY, DIAGNOSIS, TREATMENT AND PREVENTION

GEORGE R. MINOT, M.D.

BOSTON

The development of information concerning anemia during the past decade has permitted the clear recognition that this condition often may be dependent on defective or deficient nutrition. This idea, however, is not new, for example, in 1651 was written by an anonymous author "[Chlorosis is] chiefly found in young maidens who foolishly feed upon trash." Wide gaps in our knowledge remain and complete information concerning the mechanism of producing anemia associated with nutritional deficiency must be obtained in the future, but at present one can recognize that anemias may arise because of a lack or nonavailability in the body of at least three classes of dietary substances: (1) iron, (2) vitamin C and (3) a mysterious substance contained abundantly in liver and, to a less extent, in certain other organs which, if absent, makes normal blood formation impossible, and anemias of the so-called pernicious type ensue.

ETIOLOGY

The anemias due to a deficiency of the material effective in pernicious anemia are macrocytic, but all cases of anemia with the red blood cells averaging larger than normal are apparently not due to a shortage of this material. The effective substance or substances are perhaps becoming less mysterious as the result of the work of West and Dakin and of Jacobson, Subba Row and Fiske and appear to bear some sort of relation to the vitamin B complex. A deficiency of the material effective in pernicious anemia may be brought about in several ways and undoubtedly more than one mechanism is operative in many cases. It is to be noted that the normal individual, as Castle has shown, obtains the material from a variety of dietary sources because by means of gastric digestion he can derive it from certain precursors which the food contains. Muscle meat, eggs, rice polishings and yeast contain the dietary factor, which is thus associated with a number of sources of the vitamin B complex but is not identifiable with any of the known portions of this complex. The exact nature of the gastric digestive factor is unknown, but it is not one of the well recognized gastric secretory components. It is probable that the gastric reaction proceeds somewhat according to the law of mass action, so that a little of the gastric factor in the presence of a large amount of the food factor, and vice versa, may produce material sufficient to meet to a significant degree the demands of the body. A lack of the digestive power will result in shortage of the necessary substance, which is what happens in virtually all cases of Addisonian pernicious anemia. The same state of affairs may occur from total ablation of the stomach or its destruction from cancer, and sometimes in pregnancy. If there is little food containing the precursors there is also a deficit of the substance, as may arise in tropical macrocytic anemias, including sprue, in pregnancy and perhaps in certain cases of pellagra. Faulty absorption of the formed material also can create a

deficit of it in the body, as takes place in certain cases of celiac disease, advanced sprue and rare instances of intestinal stenosis and multiple anastomosis, and a deficit may also result from prolonged diarrhea. In liver, kidney and certain other organs the potent material exists preformed, and that is why these organs, in contrast to beefsteak, for example, are effective in pernicious anemia.

Defect of the internal or intermediary metabolism of the effective material may perhaps play a role in the production of some cases of macrocytic anemia. There is no real proof of this disorder, but the variation in the injected dose of the same liver extract required for the maximal effects in apparently similar cases suggests, among other reasons, the existence of such a condition. This mechanism has been speculated on to explain, for example, the macrocytic anemia associated with liver cirrhosis, a condition which may occur in a patient with pernicious anemia. Wilkinson has called certain cases of anemia with megalocytosis not responding to liver extract "achrestic anemia (from *αχρηστος*, to utilize)." However, because an anemia does not respond to liver it does not imply that there is inability to utilize or mobilize the material needed by the pernicious anemia patient. Such a condition may exist, but by similar reasoning one would surely not deduce that because cases presenting purpura did not respond to orange juice they were cases of scurvy failing to utilize vitamin C.

Deficiency of vitamin C (cevitamic acid) leads often to anemia of a normocytic or slightly macrocytic type. This anemia when uncomplicated, responds to this substance and not to liver extract or iron.

The "iron" deficiency anemia or anemias that at present may be thought of as representing this condition are hypochromic and usually microcytic. Hemoglobin deficiency is the feature, and this may arise from lack of material other than iron needed to build the hemoglobin molecule, so that all or some of the conditions referred to for clarity as "iron" deficiency anemia may be primarily dependent on some more subtle or extensive defect. They can, however, be cured or permanently arrested by iron therapy.

These anemias can arise because of an inadequate diet or faulty absorption of iron. The latter condition may depend on various factors altering the motility and secretions of the gastro-intestinal tract and the composition of its contents. Improper mastication and diarrhea may be responsible and gastric achlorhydria can play a rôle in respect to faulty absorption. An improper utilization of hemoglobin-forming materials may also produce these anemias. Information regarding this mechanism is scanty. Certain substances, such as chlorophyll, apparently can enhance the utilization of iron, but little if anything is known regarding the regulation of iron metabolism as compared, for example, with calcium. Loss of iron together with other blood building material is also a common cause of these anemias. This happens from blood loss, especially of chronic nature, and by the fetus obtaining its supplies from the expectant mother.

More than one of these mechanisms is apt to be operative in a given case as, for example, in pregnancy, in which inadequate diet, achlorhydria or otherwise altered digestion and the presence of the fetus are all likely to play a rôle. These anemias, which respond to iron, are especially frequent in women before the menopause. The part played by menstruation is interesting to speculate on. "Idiopathic" hypochromic ane-

Prepared as a chairman's address to the Section on Practice of Medicine at the Atlantic City Session of the American Medical Association in June.

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital and the Department of Medicine, Harvard Medical School.

nutr, both of the very mild and of the severe long standing type, belongs in this group, as does the now rare condition chlorosis. "Iron" deficiency anemias are also common in infants and children, in pregnancy and in individuals with "chronic indigestion," chronic ill health and anxieties as their presenting symptoms. Many cases can be attributed to repeated loss of blood, and this factor, operating together with others, is very frequently observed.

FACTORS ASSOCIATED WITH IRON DEFICIENCY AND MULTIPLE DEFICIENCY

Iron alone cannot make hemoglobin or red blood cells, and there are other blood building factors that may be deficient, particularly when "iron" deficiency exists, for example, material contained in that fraction of liver separated by Whipple, which is effective in anemia due to repeated losses of blood. This material is distinct from the material effective in pernicious anemia. Indeed, the exact role that many elements of the diet play in the manufacture and maintenance of normal blood is yet to be learned. Whipple has, however, placed on a secure quantitative basis the influence of food on blood regeneration. The strikingly beneficial effect of proper doses of iron in what may be conveniently considered "iron" deficiency anemias certainly may not be wholly dependent on deficiency of this element. Much more information is desirable.

There is very little evidence that in man deficiency of copper plays a significant role in the production of anemia. It may perhaps do so occasionally in infants. In human anemia the copper of the blood is usually increased. While it is true that in young children, when iron is supplemented by copper, it sometimes enhances the rate of hemoglobin formation, in adults copper therapy apparently is very seldom of value. These remarks do not detract from the important observations of Hart and Steenbock concerning the role of copper in iron metabolism, as shown by studies on certain experimental animals. Traces of copper are usual in pharmaceutical iron preparations and thus are given when iron is prescribed. It is not difficult to create serious copper poisoning by administering relatively small amounts of copper.

In man, dietary deficiency is seldom confined strictly to one factor, nor are the results of disturbances of gastric secretion, of defects of intestinal absorption, or of utilization necessarily concerned in only one type of metabolic process. The combined deficiency of "iron" and the material effective in pernicious anemia is not rare in the same individual. Other double and multiple deficiencies occur in patients with anemia, but usually one of the deficiencies is outstanding. Whole liver, owing to a factor or factors not effective in pernicious anemia, as well as iron, can regenerate the blood in the anemia due to chronic blood loss. The main effect of liver cannot be attributed to its iron content. It is circumstances like these that make it necessary to appreciate that the term "iron" deficiency does not adequately describe all cases placed under this heading. The withdrawal from the tissues of material to make hemoglobin, the influence of substances or physiologic mechanisms on the utilization of iron and hemoglobin building substances must be studied further before there is final knowledge concerning "iron" deficiency anemias. In observing the influence of specific substances the supplementary effect of diet must not be forgotten, and it is obvious that an adequate diet should be taken by everybody.

INHIBITORY FACTORS

The mechanisms outlined for the production of nutritional deficiency anemias are the same as those for the production of any dietary deficient condition. In addition, it is important to appreciate that there are factors which may inhibit nutrition and intensify a deficient state. Thus, in anemia they inhibit blood formation and hinder the action of such therapeutic agents as liver extract and iron. Such factors are infection, serious damage to vital organs, arteriosclerosis and increased or altered metabolism. It also must be recognized that the body should always contain an appropriate reserve supply of nutrient substances readily available for extra demands. The individual whose body has received for a long time only just enough of a nutritional factor, such as a vitamin or mineral, to maintain health may be precipitated into the zone of partial deficiency with the advent of infection. In this instance no clinical signs of deficiency are apt to become apparent. If, however, the individual's nutrition remains for some time close to the level permitting the appearance of symptoms readily attributable to deficiency, and infection ensues, then anemia, polyneuritis, scurvy or some other nutritional defect is likely to become manifest according to the exact circumstances in the given case. Knowledge of partial deficiency states or nutritional instability in man is meager. It is highly desirable to obtain information as to how to determine precisely such states, only a few hints have been given. It is a problem of concern to the health of the world.

DIAGNOSIS

One cannot, of course, adequately treat a patient until a detailed diagnosis has been made. The hasty administration of both liver and iron before the actual needs of the patient have been intelligently considered may lead to embarrassing circumstances. If the anemic patient does not have pernicious anemia, how unfortunate it is to have prescribed both liver and iron and later on when the blood is approximately normal to be unable to determine whether or not he should continue with liver for the rest of his life.

A catalogue of conditions that may be thought of in establishing diagnoses of anemias due to or associated with nutritional deficiency will serve no useful purpose. A few aspects of diagnosis, however, will be considered. The concept of establishing a diagnosis of a deficient state rather than simply of anemia will probably lead to earlier diagnosis and better treatment. Pernicious anemia should be diagnosed earlier than it usually is. It is often not diagnosed until the patient has had definite symptoms for a year or more attributable to a deficiency of the material he needs. Early diagnosis and complete treatment are important in order to prevent the development of neural lesions and to save suffering. The disease should not be allowed to progress until one sees the typical textbook picture of the blood, a patient with a palpable spleen and a grapefruit colored complexion or other signs of pronounced relapse or long standing illness. Early diagnosis implies detailed attention to the patient's history and being alert to detect the disease in patients with "chronic indigestion," a tendency to loose stools, atrophic or recurrent sore tongue, slight signs of neural involvement, achlorhydria and slight macrocytosis of the red blood cells. The use of the tuning fork to detect impaired vibration sense and careful scrutiny of a blood smear are simple but invaluable aids to diagnosis. Multiple sclerosis, spinal cord tumors and other

neurologic conditions must be excluded. The symptoms of anemia per se, such as palpitation, dyspnea and impaired kidney function, for example, should not cause an established diagnosis of heart or kidney disease. The anemia associated with nitrogen retention may be macrocytic, and lesser degrees of increased mean corpuscular volume occur in liver disorders and in other conditions than the macrocytic anemias responding regularly to liver and allied therapy.

A common error is to diagnose pernicious anemia when a patient has chronic anemia due to a fundamental depressed dysfunction of the bone marrow for which little can be done. This happens especially when the color index is not decreased and large red cells are present. This state of affairs may occur in so-called idiopathic chronic "aplastic" anemia and in comparable states arising from benzene and other poisons. Under such circumstances the correct diagnosis may also be one of the types of leukemia without elevation of the white blood cells, occasionally Hodgkin's disease with invasion of the bone marrow and involvement of the bone marrow with tumor metastases or tuberculosis. Idiopathic chronic purpura haemorrhagica (thrombocytopenic purpura) is to be distinguished from these cases.

Cases called idiopathic chronic "aplastic" or aregenerative anemia may represent several conditions, and more knowledge concerning this group is much to be desired. Some, if not all, cases termed chronic malignant neutropenia, panmyelophthisis, hemorrhagic aleukia and achrestic anemia belong to this group. In these chronic cases the bone marrow may vary widely in appearance from an anatomic fatty aplasia to marked hyperplasia with physiologic inadequacy, either complete or with evidences of attempted regeneration of blood. Although usually there is a slow, progressive decrease of all three formed elements in the peripheral blood which originate in the bone marrow, occasionally a slight and very rarely a marked temporary "spontaneous" remission may occur, thus simulating the natural course of pernicious anemia. Bleeding associated with reduction of blood platelets is more common than in pernicious anemia, and persistent leukopenia is a feature. Macrocytic anemia is the rule, but liver extract, even when given in very large doses parenterally, calls forth no worth while response, although rarely a weak response results which is only temporary. Repeated transfusions of blood offer the best palliative treatment. Gastric achlorhydria is only sometimes present, and signs of involvement of the neural system, such as occur in pernicious anemia, are absent. Rarely is the tongue atrophic, and distinctive signs of glossitis do not seem to occur. Fever, simulating that seen in untreated pernicious anemia, increased pigmentation of the skin and terminal ulcerations in the mouth are not unusual.

The occurrence of concomitant conditions must not cause the diagnosis of pernicious anemia or anemia associated with nutritional deficiency to be overlooked. Chronic arthritis is common in pernicious anemia and may lead to considering neural symptoms due to joint disease. Gallbladder disease occurs in about 25 per cent of cases of pernicious anemia and in such cases operations have been done without an appreciation of the existence of pernicious anemia. The coincidence of diabetes mellitus and pernicious anemia in the same individual, although rare, is more frequent than can be accounted for by chance. I have noted that the incidence of diabetes in relatives of pernicious anemia

patients is distinctly more common than in a control group. Such relationships offer interesting speculations.

In many cases infection may be the chief cause of anemia, and removal of the cause the important aspect in treatment. In such cases, however, defective nutrition may arise and intensify the anemia, and this aspect of diagnosis should not be overlooked. Thus iron therapy may be delayed when it would be distinctly effective, especially as the infection subsides.

The occurrence of slight splenomegaly in "idiopathic" hypochromic anemia and in some cases of chronic anemia arising in children has led to the diagnosis of splenic anemia and splenectomy, when full doses of iron would have cured the condition and permitted the enlarged spleen to recede behind the ribs.

Menorrhagia may be a symptom of "idiopathic" hypochromic anemia as well as a condition acting to intensify the defective nutritional state. The wrong diagnosis may lead to only local treatment of the uterus when full doses of iron will cause the menstruation to become normal.

Removal of "hookworms" alone will not alleviate the anemia so common in patients infested with these parasites. The defective nutrition usually present must be recognized. Full doses of iron will often promptly restore the blood to normal, which will take place more rapidly if the diet is also made complete.

TREATMENT

In prescribing for anemias arising from nutritional deficiency, the realization that one is treating a patient with a generally deficient nutritional state should be paramount. The anemia is often but one symptom of the defective nutrition. For example, in pernicious anemia the tongue and neural symptoms are dependent on deficiency, and in "idiopathic" hypochromic anemia dystrophy of the nails and alteration in the mucosa of the uterus, leading to abnormal bleeding, appear to be of nutritional deficiency origin. The atrophy of the papillae of the tongue in the latter condition, as well as certain other manifestations, quite probably are not due to iron deficiency per se, but they may be decreased by iron therapy, perhaps because of the better appetite that ensues, which results in partaking of a better diet. Here again, however, more knowledge is needed, for example, concerning the possible interrelated effects of iron and the vitamin B complex.

The object of treatment is not only to eradicate symptoms or place them under control but also to restore reserve supplies and the patient's nutritional state to normal for the rest of his life. The aim must be not only to return the hemoglobin and red blood cells to normal levels and keep them there but also to maintain the blood normal in all respects so that the color index, cell size and volume are normal. But the amount of material necessary to accomplish this may be less than the amount needed to prevent the development or progress of other disorders, such as neural manifestations in pernicious anemia—an important point to appreciate. With liver extract, stomach or other preparations effective in pernicious anemia, the common error is to give too little, particularly after the blood has become approximately normal. Each case is an individual problem. Indeed, the amount of parenterally given liver extract required in macrocytic anemia may vary tenfold. The variation for the optimal dose of iron is apparently less. The cases requiring the largest amount of iron are severe ones of long standing "idiopathic" hypochromic anemia, while among the

cases responding maximally to one third or even one fourth of this amount are those of chronic blood loss without achlorhydria or chronic dietary or digestive disorder. In the former condition maintenance of iron therapy is often necessary to prevent relapse, in the latter state the patient is truly cured when the blood and body reserves become normal and he continues to take a satisfactory diet. In practice it is wise to use a large dose, one certain to cover the patient's requirements. Recovery should not be delayed by economy of a relatively inexpensive remedy. To give somewhat too much iron does no harm, except in rare instances of distinct intolerance.

Remedial substances for many nutritional deficiencies may be given parenterally as well as orally. Thus, optimal amounts can easily enter the body and defective absorption be overcome. Some of these substances, such as liver extract, are in the range of from fifty to 100 times as effective by the parenteral route. This route is the one of choice for liver extract in sick individuals, those requiring large doses or those with spinal cord lesions. The procedure is economical and convenient, and it gives assurance of sufficient material entering the body on selection of an appropriate dose for the given patient.

There is no need for the parenteral use of iron except, perhaps, in an extremely rare case. A distinctly effective daily dose parenterally is close to a toxic dose. Thus the injection of small doses every few days is to be deplored. The problem of what preparation of inorganic iron or liver extract or allied substance to use resolves itself into choosing any one of many effective preparations and giving an appropriate amount of that particular preparation for the given patient. The daily dose of the iron salts is variable, the maximum for iron and ammonium citrate being in the range of 6 Gm., and of ferrous sulphate in the range of 1 Gm. Among available liver and allied products there is a wide difference in potency when compared with whole calf's liver or with the amount of material from which an extract originally came. The use of liver extract and iron together should be judiciously decided. The development of hypochromic red cells or a lag in hemoglobin production in a patient with pernicious anemia calls for both. Some patients, particularly benefited by iron, may perhaps have recovery speeded by the use of these two substances. The effectiveness of suboptimal doses of iron with liver in hypochromic anemias may be no greater than an optimal dose of iron. The addition of Whipple's liver factor to iron may be of distinct value in certain cases. The important matters to bear in mind are that either liver extract or the type effective in pernicious anemia or iron will be the chief agents to use and that combinations employed at random will often waste the patient's money and may prevent an understanding of the needs of the patient. It must be remembered, also, that treatment means still more than administering substances to offset deficiency. Satisfaction with great improvement in the patient is not enough, he must be made as well as possible. All aspects of the case must be attended to, including the individual's manifold problems of thought and action.

PREVENTION

The prevention of illness is much simpler and more desirable than successful therapy of the sick man. A diet nicely adjusted with respect to all its constituents at an optimum—not a usual—level permits development of the organism to proceed uninterruptedly and the

health of the individual to be maintained as near the optimum as possible. Ideally, nutritional defects should be detected when individuals begin to pass into the zone of suboptimal nutrition and thus prevent the development of disease. At present this state is usually difficult to prove but often can be suspected, particularly by a detailed study and careful evaluation of the dietary history. The physician should appreciate when he prescribes a diet for one reason or another for more than brief periods of time that it must be complete. It is not very rare to be able to detect nutritional disturbance due to prescribed diets as, for example, for peptic ulcer and chronic nephritis.

Certainly a good diet throughout life will aid in the prevention of anemia. Consideration of such matters as are mentioned later will do likewise. A careful study of near relatives of a pernicious anemia patient may reveal in one or more of them gastric achlorhydria with or without slight abnormality of the blood, although the individual considers himself well. In view of the familial incidence of pernicious anemia, the presence of achlorhydria in such a case may indicate a "latent" one of pernicious anemia. Liver therapy for that person may prevent, perhaps, the development of distinctive disease. The frequency of hypochromic anemia during the first year of life in babies born of anemic mothers may be minimized if such infants are given small doses of iron as a routine procedure. The development of hypochromic anemia in pregnancy is common. Iron administration frequently can prevent the development of hypochromic anemia in pregnant women and thus aid to prevent anemia in the child. Anemia will also become less frequent if an attitude is taken that all edentulous individuals must have properly fitted false teeth and that the diet for all patients with "chronic indigestion" should be very carefully regulated. It is of great importance to recognize the frequency with which repeated losses of menstrual blood in slight excess of normal lead to anemia, as well as repeated small losses of blood from any source. Attention given early to this state of affairs will also minimize the occurrence of anemia.

CONCLUSION

The practice of prevention is the ultimate goal of the physician. Success often depends on inherent interest, on attention to detail and on an understanding of the etiologic and physiologic mechanisms involved in a given case. There is much more to be learned about the anemias and nutrition. With the progress of knowledge there should be much less suffering from disorders due to, or associated with, nutritional deficiency.

Onset of the Menopause—Menstruation ceases ordinarily at about the age of 47, with, however, wide variations in individual women, as I have already mentioned. The function may disappear in either of two ways. In some women the periods occur quite regularly up to a certain age, and then very abruptly the function ceases, with no further appearance of the flow. Much more frequently, however, the disappearance of menstruation is more gradual. A menstruation is skipped, and then there is another period, or perhaps even several periods, often quite normal in character. And then there is another skipping of longer duration, perhaps several months, and thus alternation of normal menstruation and long phases of absence of the flow may stretch over a year or two before the flow disappears for good. Such "dodging" of the periods, therefore, is quite normal at this time of life.—Novak, Emil. *The Woman Asks the Doctor*, Baltimore, Williams and Wilkins Company, 1935.

SHOULD HETEROPHILE ANTIBODY BE USED IN THE TREATMENT OF PNEUMOCOCCIC PNEUMONIA?

MAXWELL FINLAND, M D

BOSTON

JAMES M RUEGSEGGER, M D

DURHAM, N C.

AND

LLOYD D FELTON, M D

BALTIMORE

The investigations of Bailey and Shorb¹ and of Jamieson, Powell, Bailey and Hyde² have prompted the addition of heterophile antibody, produced in rabbits, to the usual antipneumococcus serum in the treatment of human cases of pneumococcic lobar pneumonia. The justification for the use of such a mixture and the alleged claims for the superiority of such a product may be summarized briefly. 1 In human cases of pneumonia, just as in rabbits injected with cultures, the pneumococcus is said to exhibit the properties of a heterophile antigen. 2 The patient's pneumococci and the injected horse serum (which is known to be an active heterophile antigen) are said to combine with the natural heterophile antibody and render the latter inactive with regard to its alleged protective action against invasion by the pneumococcus. 3 This antigen-antibody combination may account for the "primary toxicity" of therapeutic horse serum and the untoward reactions observed after its administration. 4 By virtue of the non-type specific nature of heterophile antibody, serum to which such antibody is added is alleged to be effective against pneumonia due to all types of pneumococci, regardless of its strictly type-specific mouse protective antibody content. 5 By analogy with the therapeutic results in the experimental dermal pneumococcic infection in rabbits, much smaller doses, in terms of mouse protective units, are said to be therapeutically effective when fortified with heterophile antibody. 6 Finally, it is argued that the heterophile antibody combines with the heterophile antigen of the therapeutic horse serum and with that of the residual pneumococcus antigen, which is claimed, though not proved, to reside in antipneumococcus serum. These heterophile antigens may thus be neutralized, thereby eliminating the hazard of untoward reactions and providing a more favorable condition for a curative attack on the pneumococcic infection.

None of these claims are, to our knowledge, substantiated by the published reports of carefully controlled and analyzed series of cases by competent observers, such as have resulted in the adoption of the use of the unadulterated specific antibody in the treatment of the homologous type of pneumococcic pneumonia. On the contrary, these claims are based almost

entirely on reasoning from data derived from rabbit and guinea-pig experiments.

One of the major arguments which are alleged to justify the therapeutic application of the results of the rabbit experiments is the claim that, in convalescence from pneumococcic pneumonia, human patients develop heterophile antibody of comparatively high titer. This observation was first made by Bailey and Shorb^{1a} and is frequently referred to in discussing the rationale of this new form of therapy. We have searched for the evidence for this claim and have found data recorded in only one case.^{1a} This is in striking contrast to the large number of animal experiments recorded in great detail.¹ On the contrary, in several reports of large series of hospital cases, including many varieties of febrile diseases, which have been tested for heterophile antibody, significantly high titers have been recorded only in cases of infectious mononucleosis,⁴ in occasional cases of leukemia⁵ and in cases of serum sickness⁶. In fact, most of the recent reports indicate that the detection of heterophile antibody in large amounts in patients who have not recently received injections of horse serum may be used as a diagnostic test for infectious mononucleosis.

In order to shed some light directly on the relationship of heterophile antibody to the course of lobar pneumonia in man, we studied the content of sheep cell hemolysin in the serums of 120 patients with pneumococcic pneumonia, including twenty-four who were treated with concentrated antibody from antipneumococcus horse serum. The serums of subjects immunized with potent pneumococcus antigenic fractions and of normal controls were tested for comparison. A total of 671 serums were examined. The results of these tests were analyzed in detail and are recorded elsewhere.⁷ Briefly, we felt justified in concluding, on the basis of our observations, that heterophile antibody has no relationship to the course or outcome in human cases of pneumococcic pneumonia.

First and foremost, our data failed to show that pneumococci, when active in causing pneumonia in man, exhibit the characteristics of heterophile antigen. Thus, appreciable decreases in hemolytic titer were not frequently encountered in the serums of fatal or bacteremic patients. On the contrary, cases were encountered in which high and increasing titers were associated with persistent, and even increasing, bacterial invasion. This is in striking contrast to the heterogenic activity exhibited by most of the pneumo-

3 Bailey and Shorb¹ Powell, Jamieson, Bailey and Hyde²

4 Bunnell, W W. A Diagnostic Test for Infectious Mononucleosis. *Am J M Sc* 186:346 (Sept.) 1933. Bernstein A. Antibody Responses in Infectious Mononucleosis, *J Clin Investigation* 13:419 (May) 1933. Stuart C A, Tallman Juanita and Brintzenhoff Esther. Sheep and Rabbit Cell Agglutination in Horse Serum Sickness and Infectious Mononucleosis. *J Immunol* 28:85 (Feb.) 1935. Weinstein G L and Fitz Hugh, T Jr. The Heterophile Antibody Test in Leukemia and Leukemoid Conditions. *Am J M Sc* 190:106 (July) 1935. Boveri, R. Ueber das Vorkommen heterophiler Antikörper bei lymphoidzelliger Angina. *Klin Wchnschr* 12:666 (April) 1933. Bailey G H and Raffel, Sidney. Hemolytic Antibodies for Sheep and O_x Erythrocytes in Infectious Mononucleosis. *J Clin Investigation* 14:228 (March) 1935.

5 Van Ravenswaay A C. The Heterophile Agglutination Test in the Diagnosis of Infectious Mononucleosis. *New England J Med* 211:1001 (Nov 29) 1934.

6 Deicher H. Ueber die Erzeugung heterospezifischer Hämagglutinine durch Injektion artfremden Serums. *Ztschr f Hyg u Infek tionskr* 106:561 1926. Davidsohn I. Heterophile Antibodies in Serum Sickness. *J Immunol* 18:259 (March) 1929. Davidsohn I. Further Studies on Heterophile Antibodies in Serum Sickness. *J Immunol* 18:31 (Jan) 1930.

7 Finland, Maxwell Ruegsegger J M and Felton L D. Heterophile Antibodies in Pneumonia. *J Clin Investigation* 14:683 (Sept.) 1935.

From the Thorndike Memorial Laboratory Second and Fourth Medical Services (Harvard) Boston City Hospital and the Departments of Medicine and of Preventive Medicine and Hygiene Harvard Medical School.

The investigations on which this paper is based were supported, in part by a grant given in honor of Francis Weld Peabody by the Ella Sachs Plotz Foundation and in part by a grant from the Influenza Commission of the Metropolitan Life Insurance Company.

1 Bailey G H and Shorb M S. (a) Heterophile Antigen in Pneumococci. *Am J Hyg* 13:831 (May) 1931. (b) Chemical and Immunological Properties of Pneumococci and Other Heterophile Antigens. *ibid* 17:329 (March) 1933. (c) Immunological Relationships of Pneumococci and Other Heterophile Antigens and Biological Significance in Pneumococcus Infections. *ibid* 17:358 (March) 1933.

2 Powell, H M, Jamieson, W A, Bailey, G H and Hyde R R. A Comparative Study of Antipneumococcus Serum Containing Heterophile Antibody. *Am J Hyg* 17:102 (Jan.) 1933.

coccus strains used by Bailey and Shorb in their rabbit immunization experiments. Most if not all of the organisms with which they worked were laboratory strains of unknown virulence. In fact, the strain most active as a heterophile antigen and used most in producing the heterophile antibody for the curative and protective experiments was a totally avirulent strain derived from a type I pneumococcus.⁸

If heterophile antibody in human serum behaves like many other natural or acquired antibodies, it may be anticipated that the titer will be relatively lower during an acute febrile disorder, later to return to a relatively higher level. This is the so-called anamnestic reaction so well exemplified by the Widal reaction in persons who have previously suffered from typhoid or who have received protective inoculations. This phenomenon may have accounted for the slight changes in heterophile titer observed in a few of the cases. When however, the serums of pneumonia patients were considered as a group, after excluding those obtained following therapeutic horse serum administration and were compared with the serums from the normal controls, on the one hand, and from the immunized individuals, on the other, the various titers of sheep cell hemolysin were encountered with very similar frequency in each of these three groups.

Our observations in cases treated with concentrated pneumococcus antibodies (Felton) indicated that this highly refined product retains the heterophile antigen which has been demonstrated by other observers in normal horse serums and in various crude unconcentrated therapeutic horse serums.⁹ This is evidenced by the sharp drop in the hemolytic titer immediately after the administration of Felton's serum and the marked rise in titer that follows a week or more later, particularly in patients who develop serum sickness. In spite of this finding, untoward immediate reactions were only rarely encountered. Rapid clinical improvement with immediate clearing of bacteremia, on the other hand, is the rule in suitably chosen cases properly treated with adequate amounts of the homologous type-specific antibody.⁹ We therefore feel that there is no justification for the contention that concentrated antipneumococcus serum, in acting as a heterophile antigen is primarily toxic and, by combining with the patient's natural heterophile antibody, may give rise to untoward reactions and otherwise disturb the immunologic mechanism so as to encourage invasion by the pneumococcus.

The claims that were outlined and that are alleged to indicate the superiority of antipneumococcus serum containing heterophile antibody over the unadulterated type-specific antibody may temporarily increase the sale of this material to an ever hopeful and credulous medical public. To our mind, however, such claims, unless based on careful, well controlled observations in a large number of clinical cases, unfairly divert the unsuspecting physician from the use of a therapeutic agent the efficacy of which, within its limitation, is substantiated by a wealth of data collected by a large number of competent observers.

Nor are such claims without their danger. The importance of adequate dosage, in terms of type spe-

cific antipneumococcus mouse protective units, has been emphasized by most physicians with experience in this field. This is particularly true in cases of type II pneumococcal pneumonia. The temptation to use small doses on the basis of such unwarranted claims may spell the difference between success and failure of serum therapy in such cases. In certain cases of type III pneumococcal pneumonia, moreover, there is some evidence to indicate that the administration of heterologous antiserum may be harmful. There is no reason to believe that this possibility is removed by placing on the patient the additional burden of coping with still another foreign substance. Many physicians are still timid with regard to the use of serum that must be given intravenously, even when it is indicated. This is due to the fear of possible reactions of hypersensitivity. This hazard is obviously doubled by the addition of rabbit serum. Many patients will be given serum from which no beneficial effect can be expected because of inadequate potency in the homologous type antibody. Such patients will be exposed unnecessarily to the hazard of serum administered when a curative effect is hardly to be anticipated. The great expense of such procedures, when uselessly applied, also deserves consideration. Physicians will be encouraged to dispense with "typing" their pneumonia cases, thus the chances of obtaining potent homologous specific antiserum which might prove therapeutically useful will be definitely diminished.

The final contention that untoward reactions are eliminated by the addition of heterophile antibody has been answered, in part, in the preceding paragraphs. It may be added that we are aware of no direct evidence to support such a claim. In the only patient treated with this mixture, a case of type I pneumonia in a young adult, whom one of us was privileged to see, severe thermal reactions followed each of five small doses administered with the usual care and precautions, and the effect on the course of the disease was negligible. From general considerations, we feel that more severe and more frequent reactions may be expected from the use of the combined rabbit and horse serum than are now encountered in the use of most of the simple, concentrated antipneumococcus serums. It is to be recalled that the elimination of such reactions from the use of these serums was the result of much painstaking research, although their cause still remains unknown.

It must be emphasized, in all fairness, that this discussion is not based on direct observation of the use of serums fortified with heterophile antibody in a significant number of cases of pneumonia. That, in the last analysis, is the final criterion on which the use or discard of such a product will depend. We feel however, that our study in human cases is significant in showing that the results of the rabbit experiments that have inspired this product are not necessarily applicable in the therapy of lobar pneumonia.

It is now more than a quarter of a century since the use of homologous antiserum was first recommended in the treatment of pneumococcal lobar pneumonia. The field of usefulness of such serum has been extended only slightly during this time. Whatever extension has been made is due, in large measure, to the development of satisfactory methods of concentration, which have materially simplified its application and reduced

8 Bailey and Shorb.¹⁴ Powell, Jamieson, Bailey and Hyde.²
9 Sulfith, W. D. and Finland, Maxwell. Type I Pneumococcal Infections with Especial Reference to Specific Serum Treatment. New England J. Med. 210: 237 (Feb. 1) 1934. Finland, Maxwell, and Sulfith, W. D. The Specific Serum Treatment of Pneumococcus Type II Pneumonia. J. A. M. A. 100: 560 (Feb. 25) 1933.

the hazard of its use. The further classification of pneumococci¹⁰ has also opened a field for the development of new specific serums that may prove to be effective in the future. The present use of homologous antipneumococcus serums and concentrates is dependent on an extensive, collective experience of many observers who have made special efforts at careful study and control. Their full field of usefulness, even within their limitations, has not been attained.

We feel that physicians should weigh this collective experience against theoretical claims that have yet to be justified.

THE ANTIGENIC VALUE OF VARIOUS PREPARATIONS OF DIPHTHERIA TOXOID

A COMPARATIVE CLINICAL STUDY

CLAIRE E. HEALEY, M.D.
CHICAGO

Since 1929 diphtheria toxoid has been used in the immunization of nurses at the Cook County Hospital. Many of the nurses in this group are either in the post-graduate school or come from affiliated schools for the contagious or pediatric service. The time for immunizing them is therefore limited. It is important also that the immunization interfere as little as possible with their training school courses. Because of reactions observed at times in adults on the administration of toxoid, it has been found advisable to give an initial dose of 0.1 cc followed at weekly intervals by 0.25 cc, 0.5 cc, 1 cc and from 1.5 to 2 cc. The small initial doses probably in most instances confer little immunity but may serve to desensitize the individual to the proteins contained in the toxoid mixture so that the larger doses can be tolerated with less reaction. Retests are made after an interval of two weeks has elapsed following the injection of the last dose. If the Schick test is still positive at this time, the last dose is repeated.

During the summer of 1934 it was observed that an increasing number of nurses were requiring one or more extra doses of toxoid in order to obtain completely negative Schick tests. This observation was verified by a study of records kept by the Scarlet Fever Committee, covering the immunization of nurses at the Cook County Hospital and other hospitals in Chicago with diphtheria toxoid. In making this study, consecutive patients were chosen from the records, provided that the sum of the largest diameters of their reactions was at least 30 mm and that these tests were described in the records as bright red and indurated or moderately red and indurated. It was likewise a provision of choice that these persons should have received commercial toxoid in doses of 0.1 cc, 0.25 cc, 0.5 cc, and 1 or 1.5 cc at weekly intervals, and that they should have been retested from two to three weeks following the injection of the last dose. The original Schick tests and retests were read at an interval of forty-eight hours. Any redness or induration at the site of injection of the toxin in excess of redness or induration at the site of injection of the boiled toxin control constituted a positive test.

The persons used in this study were classified according to the year in which they were immunized. The commercial toxoid used was obtained from three different commercial houses. Table 1 shows the results of this study.

Since these results seemed to indicate that commercial toxoid has been decreasing in antigenic value during the past two years, toxoid made by Ramon in the Pasteur Institute at Garches, France, was obtained for comparison.

Two groups of nurses were chosen as nearly as possible of the same age and immune state as indicated by their Schick tests. To one group of ninety-two nurses, the toxoid obtained from Ramon was given. To another group of ninety-five nurses, commercial toxoid purchased in the open market was given. For each series, individuals were chosen the sum of the largest diameters of whose reactions was at least 30 mm, all the tests were bright red or moderately red and indurated. The toxin used for the Schick test was standardized before and following the completion of the experiment. It was found on each occasion to fulfill the requirement for potency as prescribed by the United States Public Health Service. Dilutions of this toxin were made the morning of the day on which these tests

TABLE 1—Commercial Toxoid Giving a Bright Red or Moderately Red Indurated Reaction

| Year | Age Limits Years | Average Age Years | Average Size of Schick Test Mm | Time of Reading of Test | Last Dose to Re-test Weeks | Number Immunized | Positive Retests | | Negative Retests | |
|---------------------|---------------------|----------------------|-----------------------------------|-------------------------|-------------------------------|------------------|------------------|----------|------------------|----------|
| | | | | | | | Number | Per Cent | Number | Per Cent |
| 1930 | 18-35 | 22.52 | 50.89 | 48 hr | 2-3 | 266 | 41 | 15.41 | 225 | 84.58 |
| 1931 | 18-35 | 22.11 | 45.04 | 48 hr | 2-3 | 472 | 108 | 22.88 | 364 | 77.11 |
| 1932 | 18-35 | 22.01 | 44.80 | 48 hr | 2-3 | 201 | 31 | 15.42 | 170 | 84.58 |
| 1933 | 18-35 | 21.81 | 40.60 | 48 hr | 2-3 | 241 | 71 | 29.46 | 170 | 70.53 |
| 1934 Jan to Sept | 18-35 | 22.50 | 44.73 | 48 hr | 2-3 | 71 | 26 | 36.61 | 45 | 63.38 |

TABLE 2—Summary of Experiment with Various Toxoids Resulting in Reactions Described as Bright Red Indurated or Moderately Red Indurated

| Toxoid | Adults Having Original Test and Retest | Average Age Years | Average Size of Test Mm | Time of Reading | Last Dose to Re-test Weeks | Total Amount of Toxoid Used Cc | Positive Retests | | Negative Retests | |
|-----------------|--|----------------------|----------------------------|-----------------|-------------------------------|-----------------------------------|------------------|----------|------------------|----------|
| | | | | | | | Number | Per Cent | Number | Per Cent |
| Ramon 1929 | 70 | 23.0 | 42.02 | 48 hr | 6 | 2.0-3.0 | 5 | 7.14 | 65 | 92.85 |
| Commercial 1930 | 206 | 22.56 | 50.80 | 48 hr | 2-3 | 2.0-3.0 | 41 | 15.41 | 225 | 84.58 |
| Ramon 1934 | 92 | 21.88 | 53.03 | 48 and 96 hr | 2 | 3.75 | 18 | 19.56 | 74 | 80.43 |
| Commercial 1934 | 90 | 21.03 | 52.98 | 48 and 96 hr | 2 | 3.75 | 47 | 49.47 | 43 | 50.52 |

were done. The Schick tests were read at forty-eight and ninety-six hour intervals. Any redness or induration at the point of injection of the toxin at either forty-eight or ninety-six hours in excess of redness or induration at the point of injection of the boiled toxin control was considered as constituting a positive test. Doses of 0.25 cc, 0.5 cc, 1 cc and 2 cc were given at

10 Cooper, Georgia, Rosenstein, Carolyn, Walter, Annabel and Peizer, Lenore. The Further Separation of Types Among the Pneumococci Hitherto Included in Group IV and the Development of Therapeutic Antisera for These Types. *J. Exper. Med.* 55: 531 (April) 1932.
From the John McCormick Institute for Infectious Diseases.

weekly intervals. Retests were made two weeks following the injection of the last dose.

In 1929 Dick and Dick¹ reported the results of a study made on a group of 100 individuals immunized with toxoid prepared by Ramon at the Pasteur Institute. The technique of immunization used in this study consisted of the administration of an initial dose of 0.5 cc followed by a second dose of 1 cc in two weeks and a third dose of from 1 to 1.5 cc fourteen days later. Retests were not made until at least six weeks had elapsed after the last dose was injected. Original tests and retests were interpreted after forty-eight hours had elapsed. Ninety-five per cent of the individuals so immunized had negative Schick tests at this time. Seventy of the 100 individuals in this series were over 18 years of age. Of this number 92.8 per cent were completely immunized. In this group of seventy the reactions had an average size of 42.62 mm and were described as bright red and indurated or moderately red and indurated. This study is used in a comparative manner and attention is called to the points at which the technique of the study differed from that in the present one.

Table 2 summarizes important comparative figures in the present experiment and compares them with the results obtained by the Dicks in 1929 and the results with commercial toxoid in 1930.

COMMENT

The difference in the percentage of persons completely immunized in the present series to whom Ramon's toxoid was given and the percentage completely immunized in the series reported by the Dicks in 1929 may be accounted for by the difference in the average size of the tests, the interval that elapsed between the doses, the length of time that elapsed before the retesting was done and the ninety-six hour as well as the forty-eight hour reading of the tests made in the present experiment. If allowance is made for these differences it may be concluded that toxoid prepared in the United States in 1929-1932 was about equal in antigenic value to that prepared by Ramon in France in 1929 and in 1934.

However, from 1932 to 1934 there has occurred a decrease in the antigenic value of diphtheria toxoid on the market in this country, this decrease being evidenced by a decline of from 20 to 30 per cent in the number of susceptible adults completely immunized by the use of the same technique. Meanwhile the antigenic value of the French toxoid has remained practically the same.

The results obtained for both the French and the American toxoids used in the present experiment might have shown a higher percentage of persons immunized had the retests been made after a longer time had elapsed.

The methods used in the four series reported are comparable, and the results justify the conclusion that the antigenic action of the present American preparations is low as compared with earlier American preparations and as compared with earlier as well as recent French preparations.

The results indicate a need for better application of the present methods or for better methods for control of the antigenic value of diphtheria toxoid in this country.

637 South Wood Street

¹ Dick, G. F. and Dick, Gladys H. Immunization Against Diphtheria. J. A. M. A. 92:2:1901 (June 8) 1929.

LOW CALORY, LOW FAT, KETOGENIC DIET FOR TREATMENT OF INFEC- TIONS OF URINARY TRACT

REED M. NESBIT, M.D.

AND

C. H. McDONNELL, M.D.

ANN ARBOR, MICH.

The value of ketonuria in the treatment of certain types of infections of the urinary tract has become widely recognized and utilized. Although the ketogenic diets recommended by Clark² have proved their worth as a therapeutic agent, it has been constantly observed that a considerable proportion of patients placed on this regimen find it unpalatable, and many are completely unable to tolerate it. In a series of fifty cases treated by this method at the University Hospital, it was observed that practically every patient was upset by the diet at one time or another. The gastric upsets produced

TABLE 1—Menu Plan

| Breakfast | Luncheon |
|---|--|
| Egg 1 Bacon, 2 long strips Cream or milk 1 tablespoonful 5% vegetable ½ cup cooked * Bran wafers as desired Butter as desired Tea or coffee | 2 eggs or 2 ounces of meat or fish or 3 tablespoonfuls of cottage cheese 5% vegetable ½ cup cooked or ½ cup raw, or 5% fruit Cream or milk 1 tablespoonful * Bran wafers as desired Butter or mayonnaise as desired Tea or coffee |
| Dinner the same as luncheon | |
| Sample Menus for Day | |
| Breakfast | Luncheon |
| 1 egg fried with 2 strips of bacon ½ cup of tomato juice Bran wafer with butter Coffee with 1 tablespoonful of cream | Cottage cheese, 3 tablespoonfuls ½ head lettuce with 2 tablespoon- fuls of mayonnaise Bran wafers with butter Coffee or tea with 1 tablespoon- ful of cream |
| Dinner | |
| Steak 2 ounces Cooked spinach ¼ cup with butter Raw celery 2 stalks Bran wafer with butter Coffee or tea with 1 tablespoonful of cream | |

No sugar is allowed. Chewing gum, chewing tobacco, toothpaste, sweetened cathartics and the like are not allowed. Glucose may be used for sweetening. Fruits must be fresh or canned without sugar.

* Bran wafers must have no food value.

Mayonnaise should be made without sugar.

by its high fat content were so objectionable to some that they refused to continue on this regimen. Modifications of the diet were therefore made in an effort to remove this objectionable feature.

It has long been recognized as a fundamental principle of metabolism that the organism is not dependent on exogenous fat for its metabolic mixture, calling on its endogenous supply whenever the energy of the diet is below the expenditure of energy.² This being true, the production of ketosis is solely dependent on an inadequacy of available dextrose, which is supplied

From the Department of Surgery, University of Michigan Medical School.

¹ Clark, A. L. Escherichia Coli Bacilluria Under Ketogenic Treatment. Proc. Staff Meet., Mayo Clin. 6:605-609 (Oct. 14) 1931.
Bacilluria Under Ketogenic Treatment. A Study of Fifty Cases. *ibid.* 7:257-260 (May 4) 1932.
The Ketogenic Diet in the Treatment of Urinary Infections. J. Urol. 36:193-204 (Feb.) 1934.
Clark A. L., and Keltz, B. F. A Simplified Treatment of Bacilluria. J. A. M. A. 104:289-291 (Jan. 26) 1935.

² Newburgh, L. H., and MacKinnon, Frances. Practice of Dietetics, New York, Macmillan Company, 1934.

from exogenous sources. In a starvation regimen, in which the caloric requirements of metabolism are almost entirely dependent on the utilization of endogenous fat, one sees the most rapid and profound degrees of ketosis.

A diet containing 0.66 $\frac{2}{3}$ Gm of protein (normal adult requirement) and 0.33 $\frac{1}{3}$ Gm of carbohydrate per kilogram of body weight has been used as the basis for a diet in the treatment of some eighty patients at the University Hospital. Only a sufficient amount of fat to make the diet palatable is utilized. This diet is necessarily far below the energy requirement of the subject. It was palatable to every patient, no gastric upsets occurred, and ketosis developed as promptly as it did in those patients on the high fat regimen. Estima-

practice. It is a standard diet and is ketogenic for patients weighing 115 pounds (52 Kg) and over. Children's diets must be calculated on the basis of the caloric requirement of the individual.

Since ketosis is dependent on the inadequacy of available dextrose in the metabolic mixture and is not influenced by the amount of fat ingested, it would therefore follow that the administration of 40 per cent cream ad libitum to the ketogenic diet as advised by some authors could not result in an increase of ketonuria. The 40 Gm of fat per hundred cubic centimeters which it contains will simply replace the endogenous fat that the patient would otherwise metabolize if on a low calory diet. If on a maintenance diet, the additional fat will be stored. The chief effect on the metabolic mixture will be the addition of the 6 Gm of available dextrose that the cream contains and consequent lowering of the fatty acid-dextrose ratio. Qualitative and quantitative studies made on some of our patients have failed to reveal any increase in ketonuria following the ad libitum addition of 40 per cent cream to the prescribed diet.

Some patients fail to show ketonuria on the ketogenic diet. In some instances this has been attributed to inadequate exercise with a resultant insufficient total expenditure of energy. In this event the calculated dextrose deficiency of the diet, in fact, becomes adequate in the metabolic mixture. Every patient should therefore be encouraged to exercise, at least moderately, while on the diet. Aside from a lowered total expenditure of energy, failure to develop ketonuria must in nearly all instances be traceable to additional sources of exogenous dextrose. These sources of error are readily corrected.

It should be pointed out that determination of the hydrogen ion concentration must be made on freshly voided specimens. The urea splitting organisms present in these urines are capable of changing the reaction of the specimen within a very short time. It has been our practice to supply all of our patients with chlorphenol red paper indicators so that they can make their own p_H estimations at the time of each voiding.

Osterberg and Helmholz³ have shown that such a test paper will turn from yellow to orange and red at a p_H of 5.5 or over. Since a p_H of 5.5 or lower is necessary in order for the ketone bodies in the urine to be bacteriostatic, it is only necessary that the urine shall not be capable of turning the test paper red. Ammonium chloride is administered orally only in those cases in which the desired acidity does not develop on the diet alone.

CONCLUSIONS

The conventional ketogenic diet, because it is also a maintenance diet, necessarily contains so much fat that it is intolerable to many patients.

Sufficient degrees of ketosis are obtainable by diets that are very low in fat, provided they are also low in calories.

In our series the desired ketosis has been produced without any of the untoward features of the high fat diet.

The ketogenic diet of low fat and low energy content is based on sound metabolic principles.

³ Osterberg, A. E. and Helmholz, H. F. Determination Whether Ketonurine Has Bactericidal Action. J. A. M. A. 102: 1831-1832 (June 2) 1934.

TABLE 2—Classification of Fruits and Vegetables According to Carbohydrate Content*

| 5% Vegetables | 10% Vegetables |
|-----------------|--|
| Asparagus | Beets |
| Bean sprouts | Brussels sprouts |
| Broccoli | Carrots |
| Cabbage | Dandelion greens |
| Cauliflower | Leeks |
| Celery | Olives green |
| Chard | Onions |
| Chinese cabbage | Rutabagas |
| Cucumber | Winter squash |
| Egg plant | |
| Endive | 10% Fruits |
| Greens beet | Blackberries |
| Greens mustard | Cranberries |
| Kohlrabi | Currants |
| Lettuce | Gooseberries |
| Okra | Lime juice |
| Peppers | Oranges |
| Pumpkin | Orange juice |
| Radish | Peaches |
| Spinach | Grapefruit |
| String beans | Tangerines |
| Summer squash | |
| Tomatoes | 1 cup of 5% vegetables = $\frac{3}{4}$ |
| Turnips | cup 10% vegetables |
| Watercress | |
| 5% Fruits | |
| Honey dew melon | |
| Lemon juice | |
| Muskmelon | |
| Rubarb | |
| Strawberries | |
| Watermelon | |

* We are indebted to Miss Frances Mackinnon, A.B. of the Department of Dietetics for her aid in preparing these tables and the classification of fruits and vegetables.

tions of the metabolic mixture in all the cases in this series have shown the fatty acid-dextrose ratio to be between four to one and five to one, regardless of the amount of fat ingested.

The question regarding weight loss resulting from this low calory diet naturally arises. This seems unimportant, since practically all patients requiring treatment are of approximately normal weight or over. However, very little weight loss actually does occur during the short period of treatment and is of little consequence to the patient of normal weight and advantageous to the obese. The emaciated patient is not considered a suitable subject for any form of ketogenic therapy.

A large proportion of our cases are treated as inpatients and the diets for this group are individually calculated and prepared by the department of dietetics. These diets and the method of calculation are being presented in detail in another publication. A simple diet, low in calories and available dextrose, has been devised for our outpatients and is applicable to office

HEMOCHROMATOSIS

REPORT OF AN RARE CASE

JOHN P. CRILD, MD
HAVERHILL, MASS.

This case of hemochromatosis was discovered quite by accident during an abdominal operation. Later I made a survey of the literature and will attempt here to give a short summary of the established facts and the consensus of the theories of this disease.

The disease was first described in 1882 by H. H. and Ch. Ruffard and called bronze diabetes. They described the classic triad of cirrhosis, pigmentation of the skin, and diabetes. Von Recklinghausen in 1889 showed that the pigmentation of skin and viscera was due to a deposit of hemosiderin and hemofuchsin in the tissues. He called the disease hemochromatosis and, appropriate or not, this name has persisted down to the present time.

INCIDENCE

It is a rare disease. Only three cases occurred in 106,000 admissions to the Johns Hopkins Hospital and only four cases were found in 5,000 autopsies at the Bellevue Hospital. The only other case reported in Haverhill was that of a prominent local physician who died of the disease in 1924. From 1882 to 1909 there were only forty-two cases reported in the literature, down to 1925 there were eighty-four cases reported, to 1928, ninety cases, and to 1933, 200 cases. The age incidence is from 25 years up to any age but is most common in the fifth decade. Males are affected more often than females in the proportion of ten to one.

ETIOLOGY

There are two theories on the etiology of hemochromatosis: (1) disturbance of iron metabolism and (2) chronic copper poisoning (Mallory).

1. Iron is taken in the daily diet, in an amount of from 8 to 10 mg. daily, is absorbed in the duodenum and excreted through the large bowel and the kidneys, chiefly the large bowel, only from 1 to 1.5 mg. being excreted daily through the kidneys. Iron is stored in the normal liver and only a small trace is excreted in the bile. The body contains normally less than 5 Gm. of iron, more than half of which is in the hemoglobin. In hemochromatosis the body excretes some iron in the stools but none in the urine or bile. The iron accumulates in the body, which contains as high as 40 Gm. of iron, 30 Gm. of which is held in the liver, an amount more than 100 times greater than that in the normal liver.

2. Mallory has observed a number of cases of hemochromatosis in which he has shown that small amounts of copper have been the exciting cause. There is a mass of evidence to support this. Mallory and others produced hemochromatosis in animals by feeding them copper. These experiments have been confirmed by others, notably Hall and Butt, using rabbits, sheep and white rats. They found that alcohol, given with the copper, did not increase but retarded both the storage of copper and the development of pigment cirrhosis in rabbits and white rats. Further support of this theory lies in the fact that a high percentage of patients with hemochromatosis are those who are copper workers or who are alcohol addicts, whose supply comes from a source in which copper vessels, coils and the like are used.

PATHOLOGIC CHANGES

Hemofuchsin (iron-free pigment) derived from the hemoglobin is deposited in the endothelium of the liver sinusoids and in the smooth muscle fibers of the blood and lymph vessels and of the stomach and intestine. Hemosiderin (iron-containing pigment) is deposited chiefly in the liver cells, the pancreas and the lymph glands. The hemofuchsin is changed to hemosiderin in some way and, after saturating the liver, is deposited in other tissues, chiefly the pancreas, adrenal, thyroid, spleen, heart, skin, stomach and sometimes the brain. The mechanism is as follows: The iron ingested with the diet is retained in the body and is not excreted, owing to some failure of iron metabolism. There is no marked hemolysis of blood and no anemia in hemochromatosis, so that the accumulated iron probably comes from the food rather than directly from the blood. Copper undoubtedly contributes to this retention of iron, and alcohol probably also helps the process by damage to the liver cells. The iron is stored in the liver and causes direct injury and destruction of liver cells and consequent cirrhosis. Then the iron is stored in other organs, as already mentioned. Skin pigmentation is due to iron pigment deposited in the endothelium of the skin vessels and in the sweat glands. Diabetes is due to iron pigment infiltration of the pancreas and destruction of the islands of Langerhans. Addison's disease is due to iron pigment infiltration and destruction of the cortex of the adrenals. The sequence of events is first cirrhosis of the liver, later skin pigmentation, and still later diabetes. Addison's disease is also a late complication of hemochromatosis.

Therefore it is clear that the inability to excrete iron ingested in the food is the root of this condition, that copper is a definite exciting cause, and that alcohol may contribute to the process by hastening cirrhosis. The events following iron retention are clear: mechanical overloading of organs and tissues with iron pigment, causing destruction of liver cells and cirrhosis, pigmentation of the skin, diabetes, Addison's disease and so on. Mallory believes that it takes from fifteen to twenty years for hemochromatosis to develop, so that it is likely that this deficiency in metabolism may be present from birth or at least from early life.

SYMPTOMS

The symptoms are those of cirrhosis, which is the first manifestation of the disease. There is dyspepsia, pain in the right upper quadrant, and progressive weakness. There are signs of liver enlargement and later ascites. Pigmentation of the skin occurs late in the disease, and there may be hemorrhages from esophageal varices. Lastly, a severe progressive diabetes develops with thirst, loss of weight and frequently sudden coma, which is a common cause of death. Evidence of Addison's disease may be present, with an increase in the normal skin pigment (melanosis), profound weakness, low blood pressure, and other manifestations.

DIAGNOSIS

The diagnosis is made from the presence in combination of pigmentation of the skin, enlargement of the liver, and diabetes. In cases in which one or more of this triad is missing, diagnosis may be made by pathologic examination of the skin. The skin will show the presence of iron pigment by giving a prussian blue reaction with potassium ferrocyanide and dilute hydrochloric acid, and by giving a black reaction (hydrate

of iron reaction) when tested with ammonium sulphide. This test, when positive for iron, is conclusive evidence of the presence of hemochromatosis.

PROGNOSIS

The prognosis is uniformly bad. Patients seen early in the disease may live for years, until cirrhosis is well developed, and then death may occur from rupture of an esophageal varix. If this does not occur, diabetes will develop, and it is usually the chief factor in causing death, so much so in fact that it is said that death usually will occur one year after the first appearance of glycosuria.

TREATMENT

1. Prevention. Workers exposed to copper should be protected as far as possible. Copper cooking utensils should be avoided as well as copper parts of distilling apparatus.

2. Treatment of cirrhosis. Restriction of alcohol, suitable diet, drainage of the ascites, and diuretics such as merbaphen and salyrgan.

3. Diabetes. Diet and insulin, special care of the skin, treatment of diabetic coma, and other measures.

4. Addison's disease. Use of adrenal cortical extract and other therapy.

REPORT OF CASE

A man, aged 65, married, Italian, a pharmacist, was admitted to the Haverhill Municipal Hospital complaining of pain in the abdomen and vomiting of five days' duration. The diagnosis of the physician who sent the patient into the hospital was questionable intestinal obstruction. The present illness began five days before admission, with pain in the abdomen and vomiting. The pain was intermittent and cramplike in the right upper quadrant and radiated to the right scapula, and there was general soreness across the upper part of the abdomen. This continued for two days at which time the patient was seen by a physician, and two enemas were given with good results. After the enemas were given the vomiting stopped but the pain persisted. Two days before admission the patient took an ounce (30 cc.) of castor oil, compound effervescent powder, and two caroid and bile tablets. All this increased the pain and he was brought into the hospital for treatment. One year before admission the patient had a similar attack of pain and vomiting which cleared up in a few days without any treatment. Eighteen years before the patient had an attack of nephritis lasting twenty-five days with apparent recovery.

On examination the patient was well developed and well nourished with a dark, sallow complexion. The pupils reacted to light and distance, the sclerae were white, and the mucous membranes were pale. The nose and throat were normal. All the teeth were missing except three lower carious teeth. The chest was asymmetrical, with the right side flat in front and a large prominence over the midpoint of the right side of the chest in back. There was a marked spinal curvature to the right in the dorsal region. The chest in general was barrel shaped. The breath sounds had prolonged expiration, there were no rales and no evidences of consolidation or fluid. The heart was normal and the extremities and reflexes were normal. The abdomen was soft, with tenderness in the right upper quadrant, the liver edge was palpable about two fingerbreadths below the costal margin.

Laboratory studies showed the urine negative for sugar, acetone and bile, and a trace of albumin at one examination but not at all subsequent examinations. Blood hemoglobin was 90 per cent, the red blood cell count was 4,510,000 and the white blood cell count was 13,300 with 76 per cent polymorphonuclear leukocytes, 23 per cent lymphocytes and 1 per cent large mononuclears. The blood smear was negative. The patient was given a series of enemas but still had attacks of colic, severe in character and intermittent, between attacks he was quite comfortable. Gallbladder studies were made with the dye and a roentgen examination disclosed pathologic changes of the gallbladder.

A right subcostal skin incision was made, the fascia was divided and the peritoneum was opened. There was no free fluid. The liver extended three fingerbreadths below the costal margin, the surface was smooth and dark, and was infiltrated with a network of light gray markings. There was a raised knob on the liver surface at the dome of the diaphragm the size of a walnut and of firm consistency. The gallbladder was a light gray, thin walled and emptied easily, the ducts were explored and found to be normal. The gallbladder was not disturbed. The appendix was adherent, retrocecal and chronically inflamed and was removed. The spleen was not enlarged, and the stomach, duodenum and pancreas were normal. A wedge-shaped piece of the liver was removed for pathologic examination. The wound was closed in layers with one cigaret drain through a stab wound in the right flank.

The patient stood the operation well and was given a low fat diet on the fourth postoperative day. The drain was removed on the sixth day and the sutures were removed on the thirteenth day. The pathologic diagnosis of the liver specimen was early cirrhosis with foci of necrosis suggesting hemochromatosis. Then a piece of skin was removed from the right leg just above the external malleolus, and from this specimen a diagnosis of hemochromatosis was made.

After this diagnosis was made the past history was reviewed with the patient and it was found that there was some exposure to alcohol and a questionable history of exposure to copper. The patient had been taking a glass of wine or two with his dinner every day for a number of years. Also during a period of five months he drank wine from a barrel with a copper petcock, which showed signs of corrosion from the wine.

COMMENT

The case described here is one of early hemochromatosis and has some unusual features. First of all, the patient was acutely ill on admission, sufficiently so to have a diagnosis of intestinal obstruction made. Then the cirrhosis was in an early stage before the development of ascites, there was no evidence of diabetes, and, lastly, there was no marked pigmentation of the skin, although there were some pigmented areas over the backs of the hands and over the tibias. These areas and the skin in general were not striking enough to be considered unusual in a man of his age (65).

The patient has been followed for almost four months since his discharge from the hospital. His digestion has been good and there is no evidence as yet of increased pigmentation of the skin, glycosuria or fluid in the peritoneal cavity. His condition will be followed further.

The existing literature on this subject has been reviewed and the essential points have been included and summarized as accurately as possible.

83 Emerson Street

Pioneers in Embryology—Aristotle (B. C. 384-322) gave an excellent account of the development of the chick of the second and succeeding days of incubation. William Harvey (1578-1667), using a simple magnifying glass, was able to give a much more detailed account of chick development (1651). Twenty years later Marcello Malpighi (1628-1694) published an account, with illustrations, relating to the developmental stages of the chick from the end of the first day of incubation to hatching. This account remains a model of keen observation and terse description. Malpighi is generally designated as the founder of embryology. Modern embryology as a science dates from the time of von Baer (1792-1876), who discovered the human egg (1827) and gave the first clear account and interpretation of the significance of the germ layers. Von Baer is by common consent accredited as the "father of modern embryology." In recent years, except for data regarding the first three weeks, human embryology has been brought to the state of a relatively complete science—Jordan, H. E., and Kindred, J. E. *A Textbook of Embryology*, New York: D. Appleton & Company, 1926.

Clinical Notes, Suggestions and New Instruments

CHRONIC HEREDITARY HEMOLYTIC JAUNDICE

GLENN O. SMITH, M.D., PITTSBURGH

This case of chronic hereditary hemolytic jaundice is reported because the disease is relatively infrequent because it presents many typical features, and because the hereditary aspect is represented by four generations.

H. M., a woman, aged 23, admitted to St. Francis Hospital, Dec. 1, 1934, complained chiefly of weakness, fullness of the left side of the abdomen, recurrent attacks of jaundice associated with abdominal pain, fever, nausea and vomiting. The first attack of jaundice occurred at the age of 10 weeks. Frequent menstruation had been present for about six months; it occurred every nine days and was of four or five days' duration. Ulcerations of the malleolar regions of both feet had been present as long as could be remembered.

The patient had had the acute exanthems of childhood and an appendectomy in October 1934.

The family history showed the interesting hereditary nature of this disease. The mother was living at the age of 54 and had had attacks of jaundice and an enlarged spleen for the past thirty-five years. The father was living and well at the age of 62. There were three sisters, aged 14, 20 and 26 years all living. The one aged 14 was 'always played out' and 'always doctoring'; she was never jaundiced but had a pale, sallow complexion. Her spleen was never known to have been enlarged. The one aged 20 had an enlarged spleen and periodic attacks of jaundice. The one aged 26 was in good health. There were two brothers, aged 17 and 28 years both living and well. On the maternal side there were three females who died of jaundice and an enlarged spleen at 18, 24 and 45 years respectively. One male aged 35 was living and well. In the preceding generation on the maternal side the male member, whose age at death was unknown, was jaundiced and unable to work during the last twenty years of his life. In the preceding generation the male died at 90 years and the female died at 105 years. Granting that these advanced ages were correct, which seemed to be true when attempts were made to verify them, either the disease obviously was present in an extremely mild form or the affected individual had a so-called hemolytic constitution and escaped any manifestations of it throughout life. The defect, nevertheless, was transmitted to the offspring and in the one known member the disease did definitely appear.

The accompanying illustration is an outline of the family history, representing the four generations.

In this family history there are represented many typical features of hereditary hemolytic jaundice. It is seen that the disease may exist in many forms, from a mild to an extremely severe degree, that its manifestations may not be typical, that it may have no manifestations throughout life and yet may be transmitted to succeeding generations, and that it may be transmitted by either sex to either sex.

The patient was well developed and well nourished. Pallor was prominent. The sclerae were slightly icteric. Jaundice was not evident in the skin. There were no osseous changes, such as "tower skull" or pseudo-atrophy of the bones of the forearms and hands. The spleen was enlarged and extended to almost the level of the umbilicus and to about the midabdominal line. About the malleolar regions of both feet were irregular circumscribed ulcerations, not of great depth, giving the skin the appearance of having been rather superficially denuded. The ulcers bled easily when traumatized.

Laboratory examination showed erythrocytes, 2,400,000, leukocytes, 10,000, hemoglobin, 42 per cent. The differential count was normal. The red blood cells showed anisocytosis and a diffuse microcytosis. The fragility test of the red blood cells to hypotonic salt solution gave an initial hemolysis at 0.74 per cent and complete hemolysis at 0.44 per cent, the normal being from 0.44 per cent to 0.34 per cent. The reticulocytes were 18 per cent. The blood platelets were reduced. The bleeding time was 13½ minutes and the coagulation time

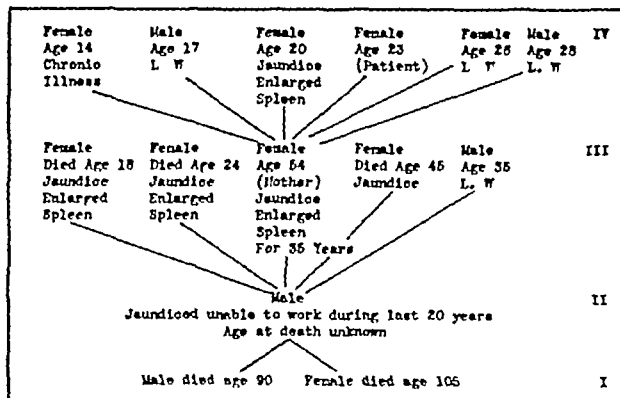
8 minutes. The icterus index was 16, being about the point at which clinical jaundice occurs. The van den Bergh test gave a positive indirect reaction. The blood Wassermann and Kahn tests were negative. The Ewald fractional gastric analysis showed the presence of free hydrochloric acid in all specimens. The urobilinogen test was negative. The blood chemistry was normal.

Treatment consisted of splenectomy, which was done by Dr. Robert M. Entwistle, December 18. Two blood transfusions were given before operation, a third transfusion was given at completion of the operation.

At operation, the spleen was found enlarged about ten times the normal size; it was removed without difficulty and contained 800 cc of blood. The abdominal adipose tissue and viscera were icteric. The liver was not enlarged and appeared normal in every respect. There was a moderate sized stone in the gallbladder. The uterus and adnexa appeared to be normal.

The patient made an uneventful recovery and was discharged from the hospital, Jan. 3, 1935.

The following changes were observed just prior to discharge. The ulcerations over the malleolar regions were almost completely healed. There had been no menstruation since operation in contrast to the frequent periods of every nine days. Erythrocytes were 3,800,000, hemoglobin 75 per cent. The microcytosis and fragility of the red blood cells were unchanged. The icterus index was 8. The coagulation time was 6½ minutes, and the bleeding time was 3 minutes.



Outline of family history I, II, III and IV representing generations. L. W. signifies living and well.

January 18, one month after operation, there was a return of menstruation, the first since operation. The malleolar ulcerations were completely healed. Erythrocytes were 4,100,000, hemoglobin was 90 per cent. Microcytosis and increased fragility of the red blood cells remained the same.

This case represented a typical form of chronic hereditary hemolytic jaundice, it showed malleolar ulcerations and cholelithiasis—two complications of this disease—and lacked only the osseous changes to demonstrate completely all features.

Treatment by splenectomy gave a satisfactory result.

An interesting possible explanation of the mechanism of this disease has been proposed by Haden.¹ He believed that the spherical form of the microcyte was the abnormality that produced the resultant changes in this disease. He pointed out that in some lower animals a spherical red cell was a constant type, also, that the hemolysis of their red cells was increased and that normal human erythrocytes become spherical before hemolyzing and believed that the spherical form of the microcyte was a possible explanation for the increased fragility.

The spleen completes the rest of the picture. This organ enlarges in an attempt to increase its phagocytic function in destroying the abnormal spherical microcyte. The liberated bilirubin, from destruction of the microcytes, is carried to the liver in greater amounts than that organ can excrete, hence the resultant jaundice and frequent complication of gallbladder disease. The destruction of the red blood cells produces the anemia. The reticulocytosis is evidence of increased bone marrow activity in an attempt to compensate for the reduced

1 Haden R. L. *Am J M. Sc.* 188:441 (Oct.) 1934.

erythrocytes The spleen is not the cause of the disease, but, as has been stated by Hellstrom,² it is only the organ that transforms into a disease what was formerly only an abnormality Splenectomy cannot remove this inherited abnormality, the faulty formation of red blood corpuscles, and this persists subsequently, as proved by blood examinations If the spleen is removed, inferior red blood cells have lost their destroyer

415 Highland Building

HEMATOGENOUS OSTEOMYELITIS AND PYARTHROSIS DUE TO SALMONELLA SUIPESTIFER

JAMES B WEAVER M.D. AND LORRAINE SHERWOOD M.D.
KANSAS CITY MO

Salmonella suipestifer, or the "hog cholera" bacillus, is usually found in association with the virus of hog cholera but has also been isolated from cattle, sheep and rodents For several years after its identification it was considered to be nonpathogenic to man, but since 1918 numerous epidemics of gastro-enteritis have been reported in which this organism was ingested with food and was recovered from the stools of the afflicted individuals

Gouley and Israel¹ have recently reported thirty-five instances of bacteremia in man due to *Bacillus suipestifer* which included thirty-four cases found in a review of the literature and one of their own The disease, for the most part, was evidenced as a bronchopneumonia or simulated typhoid or influenza Since only one patient in this series was reported as having a bone or joint involvement, we feel that the following case of osteomyelitis is of interest

A white baby girl, aged 9 months, weighing 16½ pounds (7.5 Kg.), admitted to the University of Kansas Hospital,

cells and 63 per cent lymphocytes, hemoglobin, 60 per cent. The Wassermann and Kahn tests were negative

The roentgenologist reported marked swelling of the soft tissues of the knee The epiphyseal line of the lower end of the femur was ragged and showed a little spurring at the internal surface. The periosteum in this area was slightly raised The diagnosis was probable osteomyelitis

At operation, January 19, the periosteum just above the lower epiphyseal line and on the inner aspect of the femur was found to be ruptured, and a small quantity of thick yellow pus was present The underlying bone was necrotic and a drill was easily pushed into the medullary canal Drainage was established, the wound packed lightly with petrolatum gauze, and a plaster-of-paris bandage applied after the method of Orr

The postoperative course was uneventful until February 8 when there was a moderate rise in temperature, and a localized area of edema was noticed just below the tibial tubercle of the left leg This area was incised, February 12, and about 10 cc. of pus was obtained The adjacent bone was not involved, so we were dealing with a soft tissue abscess in this instance. From this point progress was uneventful and the baby was discharged, March 10, weighing 18 pounds 3 ounces (8.3 kg.) and with both wounds entirely healed, the first one closing some time after the second

The same organism, a very short gram negative bacillus, was isolated in pure culture from the pus procured at operation, from each disease process *Brucella melitensis* was early suspected but quickly disproved by serologic tests Negative agglutination reactions were obtained also with *Bacillus typhosus*, *B. paratyphosus* A and B, and *Bacterium tularensis*, as well as with the patient's serum Cultural tests in our laboratories placed the organism within the food poisoning group and a culture was sent to the National Institute of Health, United

Reported Cases of Bone and Joint Infection Due to *Salmonella Suipestifer*

| Case | Author | Age | Part Involved | Treatment | Result |
|---------------|--|--------|--|--------------------------------------|-----------|
| Osteomyelitis | 1 Naborro and White ² | 8 mos | Upper end of each humerus with extension into shoulder joint | Not stated | Recovery? |
| | 2 Kuttner Ann G. and Zepp H. D. J. A. M. A. 101:269 (July 22) 1933 | 5 wks | Upper end of humerus with extension into shoulder joint | Immobilization | Improved |
| | 3 Gajzágó D. and Ötöche O. Orvosi hetil. 78:893 (Sept. 29) 1934 | 8 mos | Upper end of humerus | Immobilization | Recovery |
| | 4 Weaver and Sherwood | 9 mos | Lower end of femur | Operation | Recovery |
| Pyarthrosis | 1 Kuttner and Zepp | 10 mos | Knee joint | Repeated aspiration and traction | Recovery |
| | 2 Bosch W. J. Geneesk. tijdschr. v. Nederl. Indië 69:42 (Jan. 21) 1929 | 11 mos | Knee joint | | |
| | 3 Creveland and Ruys ⁴ | 5 mos | Knee joint | Aspiration and traction | Recovery |
| | 4 Bruhn and Janssen ⁵ | 13 mos | Knee joint | Aspiration and symptomatic treatment | Recovery |
| | 5 Terrell ⁶ | 15 mos | Shoulder joint | Aspiration and autogenous vaccine | Recovery |

Jan. 18, 1935, had a swollen and painful right knee of one week's duration and of unknown cause The birth weight of the child was 9¾ pounds (4.423 Gm.) She was breast fed for one week but subsequently was on a diet of straight raw cow's milk from the family's privately owned cow Karo syrup was occasionally added to the milk, but cod liver oil and fruit juices were not given In July and August, when the baby was from 3 to 4 months of age, she had diarrhea and some vomiting The other members of the large family were apparently healthy, though living under very insanitary and squalid conditions

The admission temperature was 100.6 F but rose to 103.6 F a few hours later The child did not appear to be acutely ill and positive physical changes were limited to the right knee, which was swollen and held in an attitude of flexion and external rotation There was no hydrops of the knee joint but there was an area of induration over the internal condyle of the femur, which was apparently very tender to pressure.

Laboratory examinations revealed red blood cells, 4,160,000, white blood cells, 22,500 with 33 per cent polymorphonuclear

States Public Health Service, Washington, D. C. The director, Dr. G. W. McCoy, reported as follows "The organism received from you has been identified culturally and serologically as *Salmonella suipestifer*." Repeated blood cultures were negative.

In addition to the foregoing case we have found reports of eight others of pathologic changes of the bones or joints, comprising three of osteomyelitis and five of pyarthrosis The entire series is listed in the accompanying table. We do not include two instances of pyarthrosis due to *B. paratyphosus* B reported by Dijkstra and Van der Hoeden,² though these are classified by some authors under *suipestifer* infection We found no reason to doubt the original authors The case of Naborro and White,² though listed by them as an arthritis, is considered by us to be osteomyelitis, as their description of the roentgen picture is so typical of the latter that one can arrive at no other conclusion

The close similarity of the cases in this collection is striking. The disease was mild in character, recovery under conservative treatment being the rule, with no deaths reported In the cases of osteomyelitis, the primary focus of infection was without

² Hellstrom N. quoted by Cheney W. F. and Cheney Garnett Am. J. M. Sc. 187:191 (Feb.) 1934

From the Departments of Orthopedic Surgery and Bacteriology of the University of Kansas Medical School

¹ Gouley, B. A. and Israel S. D. *Salmonella Suipestifer* Bacteremia with Acute Endocarditis Arch. Int. Med. 63:699 (May) 1934

² Dijkstra O. H. and Van der Hoeden J. Paratyphoid B. Epidemic Probably Caused by Cow Nederl. tijdschr. v. geneesk. 1:1458 (March 23) 1929

³ Naborro D. White P. B. Duke S. C. and Scott W. M. Two Cases of Human Infection by American Hog Cholera Bacillus Lancet 2:868 (Oct. 26) 1929

exception in the epiphyseal line usually with direct extension into the joint, in reality, examples of acute epiphysitis. Agglutination tests were positive in all cases, frequently for several months after alleviation of symptoms. There were no positive blood cultures. The differential white blood cell counts usually showed a preponderance of lymphocytes. The most arresting feature, however, was the age incidence, with the oldest age recorded as 19 months and the youngest as 5 weeks.

In contrast to our series is that of the other type of suppurative bacteremia compiled by Gouley and Israel,¹ in which twenty-one out of the thirty-five cases were in adults with a mortality rate in this class of over 50 per cent. Positive blood cultures were frequently obtained.

Complications of bone or joint infection have been infrequent. Crevel and Ruys⁴ reported lymphadenitis occurring with their case of pyarthrosis, while a soft tissue abscess was a complication in our case of osteomyelitis. However, bone or joint involvement has been preceded in several instances by other manifestations of suppurative infection, namely bronchopneumonia in the cases of Teveli⁵ and of Bruin and Janssen,⁶ and bronchopneumonia and otitis media in the case of Crevel and Ruys.⁴

The source of infection has not been determined in any of the cases in this series. Since all these patients were infants at the time of infection, the milk supply is naturally suspected. Force is lent to this suspicion by the fact that Stewart and Litterer⁷ have reported an epidemic of gastro enteritis which was proved to be of milk borne suppurative etiology. In our case, the cow from which the milk was obtained was not healthy and a veterinarian is authority for the statement that it was infected by the bacillus of Malta fever. Unfortunately the animal was disposed of shortly before the entrance of the child into the hospital.

CONCLUSION

Hematogenous osteomyelitis and pyarthrosis due to *Salmonella* suppurative apparently occur only in infants. The disease is mild in character and the milk supply is suggested as the possible source of infection. In bone lesions the primary focus is in the epiphyseal line and extends toward the joint (epiphysitis). The organism is recovered from the local lesion, seldom from blood cultures. Agglutination tests are positive.

531 Argyle Building

DERMATITIS OF THE PENIS FROM RUBBER

HERBERT RATTNER, M.D., CHICAGO

A dentist, aged 34, married was troubled with an annoying eczema of the penis. His past history was of little importance, neither he nor any members of his family suffered from allergic disease. He had been under treatment for seven months for attacks of balanitis and nonspecific urethritis which had recurred at frequent intervals. When finally there developed a persistent, itchy dermatitis, he was referred for dermatologic care. There was a patch of moist erythematous dermatitis of the skin just proximal to the glans. This had been present for three weeks, and it itched intensely. In addition there were a few scattered lesions elsewhere on the shaft and on the glans, of lesser severity. The clinical picture was that of simple dermatitis—the patches were ill defined and in various stages of development, and there were none of the typical morphologic changes found in the various dermatoses that sometimes affect the site. It had the characteristics of an "irritant dermatitis." The history pointed to rubber condoms as the source of the irritation. The first attack of balanitis had occurred after sexual intercourse with the use of a rubber condom, one from a new supply just recently purchased, and after each such experience there was a recurrence of intense edema of the penis accompanied by urethritis. All other sources of irritation could apparently be eliminated. To con-

firm the impression, a patch test was performed. A piece of the rubber, moistened, was strapped to the inner surface of the patient's arm, and within twenty-four hours there developed a patch of vesicular dermatitis similar to that on the penis. The eruption quickly subsided with the application of a soothing ointment, and when about three weeks later, still incredulous at the simple explanation for his months of trouble, the patient of his own accord gave himself a clinical test, there was a prompt recurrence of edema, urethritis and dermatitis, indicating rather definitely that the rubber was the exciting factor. Subsequently he was able to prove it conclusively.

Obermayer¹ has reported a similar case and has written very fully on the subject of sensitization to rubber. As he has pointed out, dermatitis produced by contact with chemicals used in the manufacture of rubber products has been recognized for many years, but eruptions due to ready made, so-called cold cured rubber goods must be exceedingly rare. His patient was a physician who subsequently developed dermatitis of the hands from rubber gloves. After a painstaking study of the chemistry of the manufacture of rubber, Obermayer found the irritant factor to be a compound that could be rendered nonirritant by treatment with alkali. This was suggested to my patient, who reported that he too was able to render the rubber nonirritant by treating it with a 5 per cent solution of sodium hydroxide.

My case illustrates and emphasizes, along with Obermayer's, that in dermatitis of the penis the possibility of its production by rubber condoms must be recognized. The main point, however, is that along with this there was a condition which a competent urologist recognized as nonspecific urethritis, which was due to the same cause.

7 West Madison Street

UNUSUAL CASE OF LOW CALCIUM TETANY WITHOUT CONVULSIONS IN A NEW BORN INFANT

JACOB L. ROTHSTEIN, M.D., NEW YORK

Cases of tetany in the new-born with a low blood calcium concentration have been reported in the literature with increasing frequency during the past few years. In two recent papers I^{1,2} reviewed the literature and described one case in each report.

REPORT OF CASE

Baby G, a seven and a half months premature female infant, weighing 5 pounds (2,268 Gm.), was delivered without the application of forceps by Dr. Julius Kurzrock at the Sydenham Hospital. During the first thirty-six hours of life, projectile vomiting of all feedings occurred and a constant temperature of 101 F. was noted. No twitches or convulsions were observed. Physical examination revealed the presence of a positive Chvostek sign, a normal Moro phenomenon, and a brawny, sclerema-like edema localized to the vulva, the perineum and the lateral aspects of both thighs. Examination of the heart and lungs was negative. The fontanel was not tense, and no abnormal neurologic signs were noted. Neither carpopedal spasm nor laryngospasm was present. The infant groaned and cried intermittently, drawing its thighs up onto the abdomen as though in pain.

In view of the evidences of marked gastro-enterospasm (projectile vomiting and colicky cry), the positive Chvostek phenomenon and the unusual type of localized edema, a diagnosis of tetany of the new-born was made. Blood was taken for analysis and 10 cc. of a 10 per cent solution of calcium gluconate (1 Gm.) was immediately given intravenously. The blood calcium concentration was 7.0 mg. per hundred cubic centimeters of serum (The phosphorus concentration was not obtained, owing to an insufficiency of serum.) Electrical reactions were not determined because of the difficulty in carrying out the test in a new-born infant. Roentgen examination of the long bones did not reveal any evidences of congenital rickets. Urinalysis was completely negative.

Intensive intravenous, intramuscular and oral calcium gluconate therapy was given. A daily dose of 1 Gm. of the calcium

⁴ Crevel van S. and Ruys A. Charlotte. *Salmonella* suppurative infection bei einem Säugling. *Ztschr. f. Kinderh.* 54: 725, 1933.
⁵ Teveli Z. Suppurative bacillus okozta izulete gyulladas gyermekeknél. *Orvosi hetil.* 78: 927 (Oct. 6) 1934.
⁶ Bruin, A. D., and Janssen E. Hydrops Genui na *Salmonella* Suppurative Infectie bij een klein Meisje. *Maandscr. v. kindergeneesk.* 2: 553 (Aug.) 1933.
⁷ Stewart H. C., and Litterer, William. Outbreak of Gastro-Enteritis. Milk Borne Epidemic of Dyersburg Tennessee. Caused by *Salmonella* Suppurative, J. A. M. A. 87: 1584 (Nov. 5) 1927.

¹ Obermayer M. E. Eczema Due to Hypersensitiveness to Rubber, *Arch. Dermat. & Syph.* 17: 25 (Jan.) 1933.
² Rothstein J. L. (a) Low Calcium Tetany in the New Born, *J. Pediat.* 5: 341-351 (Sept.) 1934. (b) *ibid.* 6: 644 (May) 1935.

gluconate was injected intravenously for a period of ten days. A similar dose of the calcium gluconate was given intramuscularly on each of the first three days. Vitamin D in the form of viosterol was given by mouth to favor better absorption of the calcium from the intestinal tract. Feedings of breast milk were given by gavage. The temperature dropped promptly. The vomiting lessened and finally ceased within thirty-six hours after the beginning of the intravenous therapy. The subcutaneous edema decreased and disappeared within forty-eight hours of the institution of treatment. The positive Chvostek sign was present, though diminished, for the next five days.

Jaundice appeared on the third day of life and lasted until the seventh day. This was considered to be a physiologic icterus of the new-born.

After ten days of calcium gluconate therapy (on the twelfth day of life) the blood calcium concentration was 9.3 mg per hundred cubic centimeters of serum. The phosphorus concentration was 4.5 mg per hundred cubic centimeters of serum. The intravenous calcium gluconate therapy was discontinued, but viosterol and calcium gluconate were administered by mouth. The infant was discharged from the hospital at the age of 1 month weighing 6 pounds (2,722 Gm.), having gained 1 pound (453.6 Gm.) over its birth weight. Oral calcium gluconate and viosterol medication were continued at home for several weeks in order to prevent the possible recurrence of symptoms, such as has been reported by Powers² in his case.

COMMENT

This is the first instance of low calcium tetany in the new-born to be reported in which muscular twitchings or convulsions were completely absent. It is likely that, had the condition not been recognized so early and had treatment not been instituted so promptly (thirty-six hours after birth), convulsions or twitches might have appeared subsequently. In the absence of twitches or convulsions, tetany would ordinarily not even be suspected, but in this case two factors were suggestive: (1) evidences of marked gastro-enterospasm (the projectile vomiting, described by Bass and Karelitz,³ and the apparently painful, colicky cry), and (2) the peculiar type of subcutaneous edema (described by Shannon⁴). The presumptive diagnosis of tetany was proved by the finding of a lowered blood calcium content of 7.0 mg per hundred cubic centimeters of serum. Despite the absence of twitching and convulsions, the presence of the evidences of gastro-enterospasm (projectile vomiting and colicky cry) and of subcutaneous edema causes this case to serve as a connecting link between the type of low calcium tetany with vomiting due to cardiospasm reported by Bass and Karelitz and the type with subcutaneous edema described by Shannon.

In previous reports I⁵ have shown that, whereas the symptom complex of low calcium tetany presented in the new-born may consist of any combination of certain symptoms and signs (hyperpyrexia, vomiting, muscular twitchings, convulsions, a positive Chvostek phenomenon, laryngospasm, carpopedal spasm, and subcutaneous edema), the symptoms and signs usually considered as most suggestive of tetany may be absent. In Craig's⁶ case and in my second case,^{1b} neither laryngospasm nor carpopedal spasm was observed even at the height of the convulsions when the calcium content of the blood was definitely lowered. The absence of carpopedal spasm, laryngospasm, convulsions and twitchings does not necessarily militate against the presence of an active tetany, as has been seen in the case reported herein. Furthermore, although a positive Chvostek phenomenon is an important finding in the tetany syndrome of older infants, it is of very little significance in the new-born, for it may be present in normal new-born infants with normal blood calcium concentrations⁷ and it may be absent in proved cases of tetany.

2 Powers G F Tetany as a Cause of Convulsions in Very Young Infants, J A M A 84 1907-1908 (June 20) 1925

3 Bass M H and Karelitz S Vomiting in the First Days of Life J A M A 97:1372-1375 (Nov 7) 1931

4 Shannon W R Tetany Generalized Edema and Central Compression in the New Born Arch Pediat 48 153-173 (March) 1931

5 Rothstein J B Hellman A M and Rothstein J L Tetany of the New Born as a Problem for the Obstetrician Am J Obst & Gynec 29:686 (May) 1935

6 Craig J D Tetany of the New Born Case Report J Pediat 4:219-220 (Feb) 1934

7 Stevenson F E, Mitchell A G and Koch C A Chvostek's Facial Sign in New Born Infants Am J Dis Child 34:425-428 (Sept) 1927

(as in Small's case⁸ with a blood calcium content of 5.6 mg). Consequently, in the case reported here the only clues to the diagnosis that led to a blood calcium determination were the vomiting and the subcutaneous edema.

1085 Park Avenue

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
HOWARD A. CARTER Secretary

McINTOSH MOBILE DIATHERMY UNIT ACCEPTABLE

Manufacturer McIntosh Electrical Corporation, Chicago

This diathermy machine is of the spark gap type and is recommended for medical and surgical diathermy as practical in both physicians' offices and hospitals.

The McIntosh Mobile Diathermy Unit (fig 1) appears to be well constructed. The power condensers are made of mica and soft copper plates, rigidly clamped together between two metal plates. The spark gap assembly consists of six individual gaps connected in series, and the points are made of tungsten.



Fig 1—McIntosh Mobile Diathermy Unit

Outlets are provided for medical diathermy current, Oudin current, and coagulating, desiccating and cutting currents (Fig 2 is a schematic diagram of the circuit.)

The height of the cabinet over all is 42 inches, width 21 inches, depth 15 inches, and the shipping weight is 200 pounds. A current strength of 900 milliamperes may be obtained.

At the request of the Council, the manufacturer submitted data pertaining to the mechanical and electrical construction of the unit. Among other data the firm reported that when the unit was connected to a load having a resistance of 25 ohms the input power was 620

watts and the high frequency energy output was 518 watts. After a period of two hours operating at this load, the temperature of the transformer was 72 C and of the spark gap 88 C. The frequency of this unit is approximately 1,250,000 cycles per second. The Council's investigator confirmed these data.

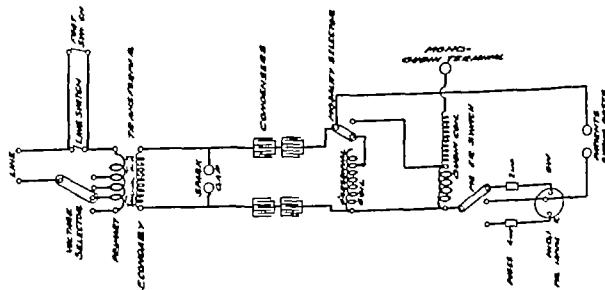


Fig 2—Schematic diagram of circuit.

The McIntosh Mobile Diathermy Unit was used in a clinic acceptable to the Council for almost a year and during that time it was tried out under various conditions. The investigator reports that it gave satisfactory service.

In view of the foregoing favorable report, the Council on Physical Therapy voted to accept the McIntosh Mobile Diathermy Unit for inclusion in its list of accepted devices.

8 Small A S Tetany in Young Infants J Pediat 2 681-684 (June) 1933

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
PAUL NICHOLAS LEECH Secretary

PLY #1, PLY #2 AND PLY #3 NOT ACCEPTABLE FOR N N R

Under the names Ply #1, Ply #2 and Ply #3 the Milburn Co. of Detroit presented for the Council's consideration three preparations designed for use as protective coatings for the hands. The products are intended for use by workmen exposed industrially to the hazards of dermatitis. In composition these are unnecessarily complex, Ply #1 containing eleven ingredients, Ply #2 containing twelve ingredients and Ply #3 containing five ingredients.

Ply #1 is stated to contain

- 10 % Zinc Stearate U S P
- 15 % Aluminum Subacetate Solution N F (7 1/2-8%)
- 3 % Gum Camphor U S P 1X
- 1 % Menthol Crystals U S P
- 1/2 % Acid Carbolie U S P
- 1/2 % Glycerin U S P
- 1/2 % Lanolin Anhydrous
- 4 1/2 % Gum Tragacanth
- 18 % Soap (Low Alkali Content)
- 1/2 % White Rose Oil Technical
- 1/2 % Triethanolamine N(C₂H₅OH)₂
- 46 % Moisture

Ply #2 is stated to contain

- 10 % Zinc Stearate U S P
- 15 % Aluminum Subacetate Solution N F (7 1/2-8%)
- 3 % Gum Camphor U S P 1X
- 1 % Menthol Crystals U S P
- 1/2 % Acid Carbolie U S P
- 1/2 % Glycerin U S P
- 1/2 % Lanolin Anhydrous
- 4 1/2 % Gum Tragacanth
- 18 % Soap (Low Alkali Content)
- 1/2 % White Rose Oil Technical
- 1/2 % Triethanolamine N(C₂H₅OH)₂
- 44 1/2 % Moisture
- 2 % Sulpho Ammonium Ichthyolate

Ply #3 is stated to contain

- 35 % White Rose Technical Oil
- 55 % Paraffin Wax
- 2 % Ammonium Sulpho-Ichthyolate
- 1 % Stearic Acid U S P
- 1/2 % Triethanolamine N(C₂H₅OH)₂
- 7 1/2 % Moisture

The firm stated that the names are "temporary" and "subject to suggestions and revisions if necessary." These names are, of course, noninformative and violate the Council's rules with regard to the use of numbers in names. In view of the multitudinous ingredients, it is difficult to see how a properly informative name could be devised. The firm presented no evidence to establish the prophylactic claims made for the products. No therapeutic claims are advanced.

In the course of the Council's consideration, it developed that the Milburn Co. markets a therapeutic package under the name "Milburn D P E Kit" (Dermatological Prophylactic Emergency Kit). The firm was asked for information concerning this kit and for any advertising material connected with it. In addition, the firm was asked the connection between the products that have been submitted to the Council and the products in the emergency kit. From the information furnished by the firm, it appears that the kit contains the following products: Ply #7, Ply #4, Ply #5, Ply #6, Ply #19, Ply #10, Plydermax, Plythol Ointment, Plythol (Greaseless) and Ply Dusting Powder. In the booklet (which the firm submitted) concerning the kit, these products are listed together with their formulas. The formulas represent the same complexity as was found in the prophylactic forms submitted; they are also similarly objectionable as to name.

In the submitted booklet and in a form letter, not submitted by the firm but available to the Council, wide and unsupported therapeutic claims were made for the products. The Council found that the "Milburn D P E Kit" violates its rules in the following respects: indirect advertising and suggestions of self-medication, unwarranted therapeutic and prophylactic claims, use of uninformative, numbered names, and unnecessarily complex composition.

On account of the similarity of the names, the Council held that the marketing of the D P E Kit makes an additional objection to the submitted prophylactic preparations because the one would advertise the other directly or indirectly.

The Council declared Ply #1, Ply #2 and Ply #3 unacceptable for New and Nonofficial Remedies because no evidence was submitted to support the prophylactic claims, because they are unnecessarily complex in composition, because the names are uninformative and involve the use of numbers, and because of their connection with the unacceptable "D P E Kit."

The foregoing statement of the Council's consideration was sent to the Milburn Company for comment before publication. The firm's reply did not meet the objections which the Council had found to these products. The firm was so informed. No reply having been received, a further communication was sent by registered mail, to this also no reply was received. The stipulated period having elapsed without receipt of a communication from the Milburn Company, the Council authorized publication of this report.

NEW AND NONOFFICIAL REMEDIES

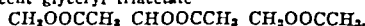
THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH Secretary

AZOCHLORAMID (See THE JOURNAL, July 20, 1935, p 200)

The following dosage form has been accepted

Azochloramid in Triacetin 1 500 A solution containing azochloramid 1 Gm in 500 Gm of triacetin (triacetin, a mixture containing approximately 95 per cent glyceryl triacetate



The triacetin used in Azochloramid in Triacetin 1 500 complies with the following tests and standards.

Triacetin is a colorless somewhat oily liquid with a slight fatty odor and a bitter taste. It is miscible with alcohol, ether, chloroform and benzene, soluble in water, insoluble in carbon disulphide and ligroin. The specific gravity is from 1.154 to 1.158 at 25°C. The refractive index is 1.4295 to 1.4310 at 25°C.

Transfer 25 cc of triacetin to a distillation flask. Determine the distillation range according to method I of the U S P X. Ninety-five per cent distills over at from 258 to 259 (corrected) at 760 mm.

The saponification value as determined by the method of the U S P X, page 457, on 0.5 to 0.6 Gm of triacetin accurately weighed is not less than 762 nor more than 772.

Dilute 0.4 cc of bromeresol green indicator solution (0.04 per cent of monosodium salt according to Clark and Lubbs) to 30 cc. Transfer 15 cc of this solution to 5 cc of triacetin in a separatory funnel and agitate vigorously for two minutes. The color of the clear aqueous extract (centrifuge if necessary) shows no appreciable change from that of the original solution at the end of fifteen minutes.

Reflux a mixture of 150 cc of triacetin and 100 cc of dry toluene for one hour in a glass apparatus for the determination of water as described in the Proceedings of the American Society for Testing Materials A S T M Designation D 9530. Not more than 0.5 cc of water collects in the graduated trap.

PROCAINE-ABBOTT (See New and Nonofficial Remedies 1935, p 63)

The following dosage forms have been accepted

Procaine Hydrochloride Abbott Tablets, 1 14 grains (0.07 Gm.) One tablet dissolved in 1 fluidrachm of distilled water makes a 2 per cent solution of procaine hydrochloride.

Procaine Hydrochloride Abbott Tablets, 2 28 grains (0.15 Gm.) One tablet dissolved in 2 fluidrachms of distilled water makes a 2 per cent solution of procaine hydrochloride.

SALVARSAN (See New and Nonofficial Remedies, 1935, p 75)

The following dosage form has been accepted

Salvarsan 1 2 Gm. Tubes

VIOSTEROL IN OIL (See New and Nonofficial Remedies, 1935, p 436)

Viosterol in Oil—Merrell, Sperti Process—A brand of viosterol in oil-N N R

Manufactured by William S. Merrell Company Cincinnati under U S Patent 1 676 579 (July 10 1928 expires 1945), by license of the General Development Laboratories, Inc.

Viosterol in oil Merrell, Sperti process is prepared by irradiation of a solution of ergosterol by ultraviolet rays of predetermined or selected wavelengths waves shorter than 2753 angstroms being removed. After irradiation the solution is refined to remove the majority of unchanged ergosterol. The solvent is distilled off at a low temperature in an inert atmosphere and the irradiated ergosterol is taken up in a known weight of vegetable oil. The resulting concentrate is adjusted by admixture of a bland vegetable oil so that the final product when assayed according to the U S P X (Revised 1934) method has not less than the vitamin D potency of viosterol in oil N N R.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - CHICAGO, ILL.

Cable Address 'Medic, Chicago

Subscription price Seven dollars per annum in advance

Please send in promptly notice of change of address giving both old and new always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, OCTOBER 12, 1935

INORGANIC ELEMENTS IN THE SKIN

The determination of the identity, amount and distribution of inorganic elements in the skin may frequently become of importance for both physiologic and pathologic reasons. The amounts of certain salts in a tissue are known to exert a profound effect on its physiologic behavior, an increase in potassium, for example, is associated with an increase in irritability, whereas an increase in calcium is accompanied by a diminished irritability. Also, the skin is an important depot for certain salts, particularly chlorides, and it may contain significant amounts of certain toxic metals, such as silver, gold, lead and nickel.

A number of ingenious procedures for studying the inorganic elements of the skin have been developed or improved during the past few years as a result of a wave of interest in this branch of histochemistry. In one procedure, the kind and distribution of inorganic material are determined by carefully preparing thin slices of epidermis and of cutis from frozen specimens of skin by the use of the microtome. A number of such slices may then be analyzed for their inorganic content by standard microchemical procedures. Analyses of this type¹ have demonstrated that there is a greater concentration of potassium and of calcium in the epidermis than in the cutis. This procedure, however, yields no information regarding the distribution of the inorganic elements between the cells comprising the several layers of the skin. Such information may be obtained by the micro-incineration of thin slices of skin directly on microscope slides and by studying the pattern of the residual ash. In this way it has been shown that there is a much greater concentration of minerals in the cells of the epidermis than in those of the cutis. The residue of the elastic and collagenic fibers of the cutis shows little structural detail but is simply a network of scattered fragments of whitish ash. Glandular structures in the cutis, such as the sweat glands, are distinctly outlined with a brilliant white line of minerals, and the cytoplasmic ash of the

cells appears as an evenly distributed bluish residue. The residue of the basal layer of the epidermis consists of large white masses of ash, which correspond in position to the nuclei of the basal cells. The ash of the cells of the stratum corneum appears as a dense white line. It is of considerable interest that the outer layer of the skin contains so great a concentration of inorganic material.

The method of micro-incineration does not permit accurate quantitative studies nor does it give much insight into the natural state of the inorganic constituents of tissues. Some information in this direction, however, has been obtained indirectly by extracting the tissue with various solvents before micro-incineration.² Thus, inorganic elements combined with lipids would probably be extracted by fat solvents and would not appear in the final ash. And indeed it was actually found that the preliminary treatment of skin with lipid solvents invariably removed intercellular and cytoplasmic deposits of minerals whereas the residue from cell walls and nuclei remained. Preliminary extraction of the skin with water, on the other hand, removed much or nearly all of the inorganic material from the nuclei and left only the diffuse cytoplasmic minerals. These interesting results suggest that the inorganic constituents of the cytoplasm and intercellular spaces are intimately associated with fats, whereas those of the nucleus and cell wall are present in a water-soluble form.

Since the skin may be a depository for metals of a toxic nature, a method for their qualitative detection is frequently needed. The spectrographic procedure is usually relied on for this purpose. By subjecting small dermal biopsy specimens to a high temperature in an electric arc, as has recently been described,³ characteristic absorption spectrums of the elements present may be produced, and from these it is possible to detect and identify positively the minerals present. In addition, reliable information as to the quantity of the element present may be secured. The spectrographic procedure has proved extremely valuable recently in the identification of lead, gold, nickel and silver in the skin of individuals exposed to excessive amounts of these elements.⁴ The wide applicability of the spectrograph to the qualitative and quantitative determination of inorganic elements in small biopsy specimens suggests that this method may be of practical value in the diagnosis of metallic poisoning.

2 Kooyman D. J. State and Localization of Inorganic Salts in the Skin as Revealed by Extraction and Micro-Incineration. *Arch. Dermat. & Syph.* 32:394 (Sept.) 1935.

3 Gaul L. E. and Staud A. H. Clinical Spectroscopy. Advantages and Physical Principles of the Spectrograph and Technique in Taking Specimen for Biospectrometric Analysis. *Arch. Dermat. & Syph.* 32:385 (Sept.) 1935.

4 Gaul L. E. and Staud A. H. A Spectrometric Analysis of Biopsy Specimens Obtained from Cases of Plumbism and Workmen in Daily Contact with Lead Paints. *J. Nerv. & Ment. Dis.* 81:265 (March) 1935. A Study of Biopsy Material Taken from Patients Receiving Gold Sodium Thiosulphate. *Arch. Dermat. & Syph.* 28:790 (Dec.) 1933. Seventy Cases of Generalized Argyria Following Organic and Colloidal Silver Medication Including a Biospectrometric Analysis of Ten Cases. *J. A. M. A.* 104:1387 (April 20) 1935. The Quantitative Retention of Nickel in Psoriasis. *Arch. Dermat. & Syph.* 30:697 (Nov.) 1934.

1 Bohnstedt, R. M. Untersuchungen über den Mineralgehalt der Epidermis und Cutis, *Klin. Wchnschr.* 10:1666 (Sept. 5) 1931.

SIR THOMAS BARLOW AND
INFANTILE SCURVY

The ninetieth birthday of Sir Thomas Barlow serves as the occasion for a special issue of the *Archives of Disease in Childhood*—an official publication of the British Medical Association—devoted to infantile scurvy.¹ The historical aspects of the occasion are especially illuminated by the reproduction of Barlow's original communication of 1883. The history has been sketched by Still and supplemented by an article on Cheridle by Poynton. Obviously, speculations prior to Barlow's paper approached the correct interpretation of this condition, but these contributions lacked that definite foundation in clinical and pathologic observation established for the first time by him. Barlow was the first, with the possible exception of Ingerslev—twelve years earlier—who clearly distinguished between rickets and infantile scurvy. His summation can scarcely be improved today. "The characteristic symptoms of the so-called acute rickets, viz., the special limb affection and the cachexia, with or without sponginess of gums, are not due to rickets at all but are truly scorbutic. The anatomic basis of the limb affection is subperiosteal hemorrhage, and this hemorrhage probably accounts for some of the anemia. The disease may occur in rickety children, and perhaps in them more readily than in nonrickety children, but the amount of rickets may be almost nil. Although the disease tends spontaneously in many cases toward a slow but complete recovery, marked improvement often follows a vigorous and especially an early antiscorbutic treatment. The treatment recommended is internally the use of raw meat juice, fresh milk and orange juice, or of some other fresh raw vegetable. The use of the term acute rickets should be abolished for these cases, and that of infantile scurvy substituted."

The succeeding articles in the memorial issue of the *Archives of Disease in Childhood* deal with various phases of newer investigations of infantile scurvy and vitamin C. Zilva discusses the isolation and identification of vitamin C, one of the biologic triumphs of modern chemistry. The crystalline *L*-ascorbic acid is believed to be the active principle in the practically pure form. The isolation of this substance enabled the study of the chemical and physical properties to be made in detail. The ultimate advantages must needs be great.

The article on the recognition of scurvy by Park and others might well serve for consultation in the future. Infantile scurvy should become so rare as to make diagnosis increasingly difficult from lack of opportunity for observation of clinical cases. According to Park there is a long latent period during which scurvy may be manifest in the skeleton without recognizable symptoms. There are thus no known early signs of scurvy. Slight roentgen changes at the epiphyses and the scorbutic deformity of the rib are sometimes useful in

making an early diagnosis. The chief reliance must still be placed on symptoms, of these, pain and tenderness in the legs are the most important. Every infant known not to have received antiscorbutic substances for over two months should be held under suspicion.

An allied problem that has been the subject of much recent investigation is the relation of vitamin C to the structure of the teeth. Pitts points out the most important difficulty so far encountered in the experimental studies—the animals heretofore used present fundamental dental or other differences from man. Malnutrition and latent scurvy are discussed by Frölich of Oslo, the vitamin C content of the liver of new-born infants by Toverud, the pathogenesis of scorbutic dystrophy by Rohmer and Bezssonoff of Strasbourg, and the anemia of infantile scurvy by Parsons and Smallwood of Birmingham. All in all, these admirable discussions of infantile scurvy could not come at a more appropriate time or in more convenient form.

OWNERSHIP OF ROENTGENOGRAPHIC
NEGATIVES IN MICHIGAN

A roentgenographic negative made by a physician as an aid to diagnosis and treatment is, in Michigan, the property of the physician who makes it, unless he has entered into an agreement waiving ownership. The Supreme Court of Michigan rendered this decision September 9,¹ the first rendered by a court of last resort with respect to the ownership of roentgenographic negatives. The decision is binding on all courts in Michigan and it may have persuasive influence on courts in other jurisdictions.

Dr. Burton G. McGarry of Fenton, Mich., on whose initiative this case was brought to a successful issue, had treated an injured employee of the defendant, the J. A. Mercier Company, at its request. The company refused to pay for his services, basing its refusal in part on the ground that Dr. McGarry refused to deliver to the company, for examination by other physicians, certain roentgenographic negatives of the patient, the cost of which was included in Dr. McGarry's bill. At no time did Dr. McGarry refuse to permit other physicians to examine the negatives while they remained in his clinic. In the circuit court judgment was given in Dr. McGarry's favor, and the company appealed to the Supreme Court of Michigan.

Roentgenographic negatives, said the Supreme Court, are practically meaningless to an ordinary layman. They are as much a part of the history of the case as any other record made by a physician. They constitute an important part of a physician's clinical record and preserve much of value in his experience. In a malpractice suit they may constitute unimpeachable evidence that fully justifies the treatment of which a patient complains. They are analogous to the microscopic slides of tissues that physicians make to aid

¹ Sir Thomas Barlow Birthday Number. Arch. Dis. Childhood 10: 211-336 (Aug.) 1935.

1 McGarry v. the J. A. Mercier Co., — Mich. — — N. W. —

them in diagnosis and treatment and which it would hardly be asserted belong to any one other than the physicians by whom they are prepared. Although roentgenographic negatives differ from the negatives of ordinary photographs, the fact that they are the property of the physicians who make them may possibly be inferred from court decisions that have held that, in the absence of express agreements to the contrary, the negatives of photographs belong to photographers, not to the persons for whom the photographs were made.

There is every good reason, said the Supreme Court, for holding that roentgenographic negatives are the property of the physician rather than of the patient or other person who employs the physician, even though the patient or such other person is charged with the cost of making them. Dr. McGarry was fully justified in refusing to surrender possession of the negatives he had made. In the absence of an agreement to the contrary, such negatives belong to the physician who makes them incident to treating a patient.

While the phraseology of this decision, literally construed, limits its applicability to cases in which physicians make roentgenographic negatives for their own use, it may reasonably be assumed that such negatives made for a physician, to be interpreted by him, are his property quite as much as if he had made them himself. The decision leaves undetermined the questions whether a patient, personally or through physicians or others employed by him, has the right to inspect a roentgenographic negative while it remains in the possession of the physician who made it, or to require, on payment of the reasonable cost, that prints of the negative be furnished to him. It is, however, a distinct advance toward the settlement of a troublesome and important question.

Current Comment

PRURITUS

Itching, which is usually considered almost the private domain of the dermatologist, has recently been discussed by Lord Horder¹ as a general medical problem. Both the local and the general factors that cause pruritus to reach a stage of pathologic discomfort are exceedingly numerous. As he points out, all the world itches but for different reasons in different persons. Thus, for example, the two extremes of personal cleanliness as well as excessive or deficient perspiration generally produce itching of more than physiologic proportions. Without in any way attempting to list all the general causes of pruritus, Horder mentions several that might easily be overlooked if the observer's attention is too sharply focused on the offending part. Diabetes, uremia, leukemia and jaundice are well known. The itching that occurs in Hodgkin's disease is less well known but is sometimes severe and may even help in diagnosis. There are numerous others, but the most common, he feels, is gout. In what

manner this symptom is produced it is still impossible to state, and for the present each case must be considered on its own merits. Certain allergic disturbances can unquestionably produce itching, the best known being urticaria and eczema. The fact that serum sickness has frequently an incubation period of from eight to ten days goes to show that considerable latency may exist between cause and effect in pruritic disease, though it is true to say that when the irritant is inhaled, or is absorbed from the alimentary tract, the evidence of sensitization is usually much more rapid. The nervous factor in itching overlaps both causes, such as gout and allergic disturbances. Certainly patients with what is called nervous instability are especially susceptible to the complaint of itching. Organic disease of the nervous system leads to few instances of pruritus. Thus, itching, like other symptoms that become relegated for a time to a special branch of medicine, finds return to general study necessary.

ELECTROLYTES AND WATER BALANCE

The importance of water in the organism is a physiologic axiom. A consideration of the many biologic functions of water explains this circumstance. The tissues with which water is in contact as well as the substances dissolved in it all have the ability to exert a significant influence on the movement and localization of this important solvent. Furthermore, *in vitro* experiments have demonstrated that the water-holding capacity of proteins is altered when the hydrogen ion concentration is changed. The vast importance of water retention and of dehydration in clinical medicine has stimulated persistent effort to shed light on the mechanism involved in these conditions. In a recent study, Davis and Dragstedt¹ have assessed the relative importance of acid-base change in the tissues versus the alteration of osmotically active substances dissolved in the body fluids, causing the retention or loss of water. Normal animals (dogs) eliminate intravenously administered water (as 0.9 per cent sodium chloride solution or 5 per cent dextrose) promptly. After dehydration produced by withholding drinking water, there was marked retention of the fluid after intravenous injection. On the other hand, after total loss of gastric juice with the concomitant loss of electrolyte and the resulting alkalosis, water administered intravenously was not retained much better than when given to normal animals. Essentially the same results were obtained after total loss of pancreatic juice. In both cases there had occurred marked disturbance in the acid-base balance of the blood. From these data the Chicago investigators conclude that the alteration of hydrogen ion concentration in the body fluids plays a minor part in the retention of water, "the ability of the organism to retain water is dependent upon its total content of osmotically active particles." The results of the foregoing study indicate that the reaction of the tissues is of far less importance in this respect and support, again, the rationale of the parenteral use of salt solution in cases in which there is obvious disturbance in the water balance.

¹ Horder T. J. *Pruritus*. *Lancet* 2: 287 (Aug. 10) 1935.

¹ Davis H. A. and Dragstedt L. R. *Am. J. Physiol.* 113: 193 (Sept.) 1935.

Association News

ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES HELD AT ASSOCIATION HEADQUARTERS, CHICAGO, SEPTEMBER 26 AND 27

STANDARD CLASSIFIED NOMENCLATURE OF DISEASE

Approval was given to the Standard Classified Nomenclature of Disease, and the hope was expressed that it will be adopted by hospitals for the classification of their cases, in order to establish uniformity and exactness of diagnostic terminology.

BROADCASTING PROGRAM

The new broadcasting program, 'Your Health,' which has been embarked on over the Blue network of the National Broadcasting Company each Tuesday afternoon at 5 p m eastern standard time (4 p m central standard time), under the general theme 'Medical Emergencies and How They Are Met,' presenting a dramatized program, with music, received approval.

APPOINTMENTS

Dr H B Williams, New York was elected to membership on the Council on Physical Therapy to succeed Dr Yandell Henderson (resigned), Dr David P Barr, St Louis, to membership on the Council on Pharmacy and Chemistry, to succeed Dr Eugene F Du Bois (resigned), and Dr J H J Upham, Columbus, Ohio, to the Committee on Legislative Activities.

Drs Morris Fishbein, Allen H Bunce and W W Bauer were appointed a committee to act in an advisory capacity to the Georgia Warm Springs Foundation.

The following committee was appointed, in accordance with the request of the House of Delegates, to study contraceptive practice and related problems: Drs James R McCord, Atlanta, Ga., chairman, George W Kosmak, New York, W A Coventry, Duluth, Minn., Carl Henry Davis, Milwaukee, Richard J O'Shea, Seattle, John Rock, Boston, and Willard Richardson Cooke, Galveston, Texas, with Drs James R Bloss and W C Woodward, ex officio.

SURVEY OF CHRONIC ILLNESSES

Audience was given to Dr L R Thompson, assistant surgeon general of the United States Public Health Service, for the presentation of plans for a survey, to be conducted under the auspices of the United States Public Health Service cooperating with state and city health departments, of chronic illness and physical impairments in the general population.

TERMS OF SERVICE FOR MEMBERS OF COMMITTEE FOR THE PROTECTION OF MEDICAL RESEARCH

The terms of service for the members of the Committee for the Protection of Medical Research were fixed as follows: Walter B Cannon, 1936, Lewis H Weed, 1936, A J Carlson, 1937, G W McCoy, 1937, Simon Flexner, 1938, M C Winternitz, 1938, Elhott C Cutler, 1939, A C Ivy, 1939, William Pepper, 1939, William J Kerr, 1940, and A M Schwittalla, 1940.

CHAIRMAN OF LOCAL COMMITTEE ON ARRANGEMENTS FOR KANSAS CITY SESSION

The nomination of Dr E H Skinner by the Jackson County Medical Society as chairman of the local committee on arrangements for the Kansas City Session received the approval of the Board.

STATE MEDICAL JOURNALS ONLY TO BE TAKEN INTO COOPERATIVE MEDICAL ADVERTISING BUREAU

Consideration was given to a request that a privately owned periodical, which is serving as the official organ of one of the southern state medical associations, be taken into the Cooperative Medical Advertising Bureau, and the Board reaffirmed its policy that only state-owned medical journals shall be accepted by the Bureau.

FEDERATION OF COUNCILS

A plan for the correlation of the work of the Council on Pharmacy and Chemistry, the Council on Physical Therapy and the Committee on Foods to obviate overlapping and to make for greater efficiency received approval.

NEW VOLUME OF MEDICOLEGAL CASES

Authorization was given for the publication of a second volume of medicolegal cases, to contain abstracts appearing in the Medicolegal Department of THE JOURNAL from 1931 to date.

APPROPRIATIONS

The usual provisional appropriation was made for special exhibits at the next annual session of the Association and one or two small additional appropriations were made for special work in one or two of the councils.

ENLARGING AND REMODELING OF HEADQUARTERS BUILDING

Consideration was given to the following proposals for relieving the crowded and congested condition in the headquarters office: (1) adding two stories on the present building and building an assembly room and a small meeting room on the roof, resurfacing the building with limestone and doing such repairing and remodeling as would seem to be indicated to put the present building in first-class condition, (2) selecting a new site and erecting thereon a new building which will provide for future growth. Bids and offers on these two proposals were received, and the Board approved the first proposal and authorized the closing of contracts.

MISCELLANEOUS BUSINESS

Other resolutions which were referred to the Board at the last session of the Association, as well as other matters that came before it, received careful consideration and report will be made on these in due course.

RADIO BROADCASTS

The American Medical Association broadcasts over the Blue network of the National Broadcasting Company at 5 p m eastern standard time (4 o'clock central standard time, 3 o'clock mountain time) each Tuesday, presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers a toast "Ladies and Gentlemen, Your Health!" The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

The October schedule is as follows:

| | | |
|------------|------------------------------|---------------------|
| October 15 | Unconsciousness | Morris Fishbein M D |
| October 22 | Asphyxiation | W W Bauer M D |
| October 29 | Poisonous Plants and Insects | W W Bauer M D |

The Foramen of Monro—The interventricular foramina and the foramen of Monro together form a Y-shaped tubular connection between the two lateral ventricles and the third ventricle. Each upper arm of the Y, which together form the interventricular foramina, is directed medially and ventrally, while the foramen of Monro, which connects the tubular passageway between the lateral ventricles with the third ventricle, is ventral and slightly caudal to this imperfect tube and forms the lower limb of the Y—Davidoff, L. M., and Duke, C G. The Demonstration of Normal Cerebral Structures by Means of Encephalography V The Ventricles, Interventricular Foramina, and Aqueduct of Sylvius, *Bull Neurol Inst New York* 4 91 (March) 1935.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION PUBLIC HEALTH, ETC.)

ARIZONA

Dr Hays Named State Epidemiologist—Dr George A. Hays, formerly with the Missouri State Board of Health, Jefferson City, has been appointed state epidemiologist of Arizona, succeeding Dr Hugh F. Stanton, resigned. Dr Hays is a member of the U. S. Public Health Service. He graduated from the University of Arkansas School of Medicine in 1918.

Deaths in 1934—Deaths from all causes in Arizona in 1934 totaled 5,599, giving a rate of 1,222 per hundred thousand of population. There were 1,042 deaths attributed to tuberculosis, with a rate of 220. Cancer was responsible for 297 deaths during the year, a rate of 64.9, and diseases of the circulatory system 711, with a rate of 155. Two deaths were recorded for malaria. There were 367 violent and accidental deaths recorded. Motor vehicle accidents were responsible for 211 deaths, an increase over the 155 recorded in 1933 and 166 in 1932. With a total of 868 infant deaths the rate per thousand live births was 104. Of these, 215 were white, 474 Mexican and 156 Indian.

CALIFORNIA

Dr Dickie Again Appointed Health Officer—The appointment of Dr Walter M. Dickie, Berkeley, as health officer of California has been reported. Dr Dickie had held the position from August 1920 to 1931, when he was succeeded by Dr Giles S. Porter. Dr Dickie succeeds Dr Jay D. Dunshee, who resigned.

Society News—Dr Hans Lissner, San Francisco, gave an illustrated address before the San Mateo County Medical Society in San Mateo, September 28, on "Adrenal Tumors and Cushing's Disease."—At a meeting of the San Francisco County Medical Society, October 8, a program was presented with demonstration of patients. Included on the program were Drs Chester L. Cooley on "Effect of X-Ray on the Pregnant Uterus and Fibroma," Franklin A. Lowe, "Fractures of the Lower End of the Humerus," and William L. Rogers, "Progressive Bronchial Stenosis with Abscess Formation in a Tuberculous Patient." All are from San Francisco. A symposium on hypertension will be presented before the section on medicine and pediatrics, October 15, speakers will be Drs Arthur Carol McKenney Jr and George D. Barnett, San Francisco, and Max Peet, Ann Arbor, Mich.

DELAWARE

Society News—Dr Edward Schumann, associate professor of obstetrics, University of Pennsylvania School of Medicine, Philadelphia, presented a review of ectopic pregnancy before the New Castle County Medical Society in Wilmington, September 17, there was exhibited at this meeting a moving picture entitled "Physiology of Fertilization in the Human Female."

Personal—Dr Cleland A. Sargent, Dover, who for many years has held the joint position of director of communicable disease control and director of infant and maternal hygiene in the Delaware State Board of Health, has been provisionally appointed epidemiologist with the New York State Department of Health. Dr Sargent has been associated with the state department of health since 1926, according to the state medical journal.

FLORIDA

Society News—Dr Joseph Lee Kirby-Smith, Jacksonville, was elected president of the Florida Society of Dermatology and Syphilology at its recent quarterly meeting in Jacksonville, and Dr Wiley M. Sams, Miami, secretary.—Dr Robert B. McIver, Jacksonville, spoke on "The Partial Resection of the Prostate Gland" before the Suwanee River Medical Association at its August meeting in Madison.—At a meeting of the Dade County Medical Society, September 6, Drs Joseph H. Luciman, Miami, discussed "X-Ray Therapy in Middle Ear and Mastoid Infections," and John R. Perdue, Miami, "An Unusual Perineal Burn, with Plastic Repair."—The DeSoto-Hardee-Highlands County Medical Society was addressed in

Wauchula, August 13, by Drs William C. Blake and James T. Cowart, Tampa, on "Classification and Treatment of Anemia" and "Vomiting in Infancy," respectively.—The Florida East Coast Medical Association will hold its meeting in St. Augustine, November 1-2, with the St. Johns County Medical Society as host. Speakers will include Drs George M. Green, Daytona Beach, "Repair of Lacerations," Isaac M. Hay, Melbourne, "Endometritis," Gerard Raap, Miami, "Recent Advances in Radiation Therapy," Turner Z. Cason, Jacksonville, "Important Consideration in Handling Diabetic Patients," and Wiley M. Sams, Miami, "Fungus Infections of Hands and Feet."

ILLINOIS

Society News—The Bureau County Medical Society was addressed in Princeton, October 1, by Drs Frederick R. Schmidt and W. A. Newman Dorland, Chicago, on "Nutrition and Skin Diseases" and "Origin of Ovarian Tumors," respectively.—At a meeting of the Sangamon County Medical Society, October 3, in Springfield, Dr Jacob P. Greenhill, Chicago, discussed recent progress in obstetrics.—Dr Olin West, General Manager and Secretary of the American Medical Association, Chicago, addressed the DeWitt County Medical Society, Clinton, September 23, and was guest of honor at a dinner.

Chicago

University News—Included among promotions recently announced at Loyola University School of Medicine are those of Dr Morris A. Glatt from clinical associate to assistant clinical professor of otorhinolaryngology, and Dr Jacob P. Greenhill from associate clinical professor to clinical professor of gynecology.

Society News—A symposium on embryology of the female pelvis in its relation to gynecology and obstetrics will be presented before the Chicago Gynecological Society, October 18, participants will be Leslie B. Arey, Ph.D., Dr Otto F. Kampmeier and Dr Arthur K. Koff.—Dr Frank D. Dickson, Kansas City, Mo., discussed "Low Back Pain with Particular Reference to the Part Played by Congenital Abnormalities" before the Chicago Orthopaedic Society, October 11. Dr Hershel I. Smith spoke on "Osteitis Fibrosa Cystica."—Dr Arthur L. Tatum, professor of pharmacology, University of Wisconsin Medical School, Madison, will discuss "Studies in Specific Arsenical Chemotherapy," October 25, before a joint meeting of the Institute of Medicine and the Chicago Society of Internal Medicine.

INDIANA

Thyroid Tests at State Fair—The Indiana State Medical Association recently sponsored a test for hyperthyroidism and hypothyroidism at the state fair, believing that the persons attending the fair would provide a good cross section of the population in which to determine the prevalence of thyroid disorders. Of 64,193 persons attending the fair, about 800 persons took the test.

Society News—Dr John M. Cunningham, Indianapolis, addressed the Daviess-Martin Counties Medical Society, September 10, on "Common Colds and Coughs."—At a meeting of the Huntington County Medical Society in Huntington, September 3, Dr James F. Balch, Indianapolis, discussed genito-urinary diseases.—Dr Max A. Bahr, Indianapolis, spoke on "Mental Mechanisms of the Mind Diseased" before the Gibson County Medical Society, September 9.—Dr Burrill B. Crohn, New York, will conduct a clinic on gastrointestinal diseases before the Indianapolis Medical Society, October 15.—Dr Sumner L. S. Koch, Chicago, will give an illustrated address before the Eleventh Councilor District Medical Society, October 30, in Peru, on "Diseases and Surgery of the Hand."

IOWA

Society News—Dr Waltman Walters, Rochester, Minn., discussed surgery of the gallbladder before the Scott County Medical Society, September 3 in Davenport.—At the summer meeting of the Upper Des Moines Medical Society in Spirit Lake, recently, speakers included Drs James T. Priestley Jr., Rochester, Minn., on "Serologic Therapy in the Treatment of Appendicitis with Rupture and Peritonitis," and Abraham G. Fleischman, Des Moines, "Differential Diagnosis of Lesions in the Right Side of the Abdomen."—At a special meeting of the Des Moines Academy of Medicine and Polk County Medical Society, October 17, Dr Harold B. Cushing, Montreal, will speak on "Polio-myelitis." Speakers before the September 24 meeting were Drs Verl A. Ruth on "Injuries to the Cervical Spine," Christian B. Luginbuhl, "Treatment of

Rheumatic Heart Disease and Its Complications," and Olin A. Elliott, "Early Diagnosis and Prophylaxis of Cancer of the Uterine Cervix."

LOUISIANA

Personal—Dr. William H. Slaughter, senior surgeon, U. S. Public Health Service, has taken charge of the U. S. Marine Hospital in New Orleans, succeeding Dr. Thomas B. H. Anderson, who has been transferred to the marine hospital in Baltimore.—Dr. William B. Clark was recently made assistant professor of ophthalmology and Dr. Willard R. Wirth assistant professor of medicine at the Graduate School of Medicine, Tulane University of Louisiana, New Orleans.

Health at New Orleans—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended September 26, indicate that the highest mortality rate (17.4) appears for New Orleans, and for the group of cities as a whole 9.9. The mortality rate for New Orleans for the corresponding period last year was 15.3 and for the group of cities, 10.1. The annual rate for eighty-six cities for the thirty-nine weeks of 1935 was 11.4 and the same rate appears for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

MARYLAND

Dinner to Dr. Bloodgood—The Association for the Study of Neoplastic Diseases held a dinner in honor of Dr. Joseph C. Bloodgood, adjunct professor of surgery, Johns Hopkins University School of Medicine, and one of the founders and directors of the association, during its annual meeting in Washington, D. C., September 6. Dr. John Shelton Horsley, Richmond, Va., presided, Clarence C. Little, Sc.D., managing director of the American Society for the Control of Cancer, was among the speakers.

Monument to Johns Hopkins—A monument to Johns Hopkins, who gave \$7,000,000 to establish the university and hospital bearing his name in Baltimore, was dedicated, September 18, in the presence of hundreds of citizens, professors and students of the university, the *New York Times* reported. The monument, which stands in the center of the plaza facing the Johns Hopkins University campus, is the gift of the Municipal Art Society to the city. It is the work of Hans Schuler, director of the Maryland Institute. Douglas H. Gordon, assistant U. S. district attorney and president of the Municipal Art Society, presided. The city was represented by Mayor Howard W. Jackson and the university by its president, Isaiah Bowman, Ph.D.

Semiannual Meeting—The Medical and Surgical Faculty of Maryland held its semiannual meeting at Bel Air, October 10, with headquarters at the Kenmore Inn. Speakers included Drs. Charles Bagley Jr. on "Brain Abscess Due to the Gas Bacillus," and John Mason Hundley Jr., "Treatment of Carcinoma of the Cervix." Both are from Baltimore. At the luncheon, Dr. Charles R. Richardson, president, Harford County Medical Society, gave an address of welcome, Dr. John M. T. Finney Sr., Baltimore president of the Medical and Surgical Faculty of Maryland the response. Dr. William Pepper, dean, University of Pennsylvania School of Medicine, Philadelphia offered a greeting "from John Archer's Medical School," to which Judge Walter W. Preston, Bel Air, responded.

MASSACHUSETTS

Dr. Magrath Retires as Medical Examiner—Dr. George Burgess Magrath, medical examiner of Suffolk County since 1907, has resigned because of ill health. Dr. Magrath graduated from Harvard Medical School in 1898 becoming in that year assistant in pathology. He has been professor of legal medicine at Harvard since 1931. Dr. William J. Brickley, Boston, associate examiner, will succeed Dr. Magrath. The acceptance of Dr. Magrath's resignation has been deferred to allow him to qualify for a pension under the county retirement system.

Personal—Dr. Francis R. Mahony, Lowell, has been appointed a member of the Massachusetts State Board of Registration in Medicine, filling the vacancy made by the retirement of Dr. Robert F. Hovey, Springfield.—Clair E. Turner, Dr. P. H., professor of biology and public health, Massachusetts Institute of Technology, Cambridge, has been invited by the University of Calcutta, India, to deliver a series of six lectures on the organization of health education.—Dr. Samuel F. Marshall, who for ten years has been associated with

the Henry Ford Hospital, Detroit, has joined the staff of the Lahey Clinic, Boston.—Dr. Siegfried Thannhauser, formerly director of the medical clinic and professor of internal medicine at the University of Freiburg in Bremen, has been appointed associate professor of medicine at Tufts College Medical School, Boston.

Commission to Codify Health Laws—A public health commission to codify the health laws of the state, eliminating those which are obsolete and revising others, was appointed by Governor Curley, August 21. Dr. Henry D. Chadwick, state commissioner of public health, is chairman of the commission, Dr. Wilson G. Smilie, professor of public health administration, Harvard School of Public Health, vice chairman, and Dr. Charles F. Wilensky, deputy health commissioner of Boston, secretary. Other members are:

Dr. Winfred Overholser, state commissioner of mental diseases
Dr. Charles E. Mongan, Somerville, president Massachusetts Medical Society
Curtis M. Hilhard, professor of biology Simmons College
Dr. Alexander Begg, dean and Waterhouse professor of anatomy Boston University School of Medicine
Samuel C. Prescott, Sc.D., dean of science and professor and head of the department of biology and public health Massachusetts Institute of Technology
Dr. Dwight O'Hara, professor of preventive medicine Tufts College Medical School
Dr. David Scannell, surgeon-in-chief Boston City Hospital
Dr. Francis X. Mahoney, health commissioner of Boston
Dr. Gerardo Balboni, member of the staff of Massachusetts General Hospital

In addition to the codification of health laws, the commission also expects to establish minimum standards for local health officers, organize county health districts, make a study of industrial hygiene, license hospitals and study milk control practices.

MICHIGAN

Appointments to State Board—Dr. Elmer W. Schnoor, Grand Rapids, was appointed a member of the state board of registration in medicine, September 18, succeeding Dr. Frank A. Kelly, Detroit. Other members of the board who were reappointed are Drs. Jacob D. Brook, Granville, health officer of Kent County, William Ellwood Tew, Bessemer, J. Earl McIntyre, Lansing, and Claude R. Keyport, Grayling.

Society News—Dr. Henri Coutard, Paris, France, addressed a joint meeting of the Wayne County Medical Society and the Detroit Roentgen Ray and Radium Society, October 7, a dinner in his honor preceded the lecture.—Dr. Robert L. Novy, Detroit, addressed the Gratiot-Isabella-Clare Counties Medical Society, September 26, on "The Failing Heart of Middle Age."—At a meeting of the Detroit Obstetrical and Gynecological Society, October 1, Dr. Howard C. Walser presented a case report on "Subacute Hepatitis," and Dr. Loren C. Spademan discussed "The Role of the Amniotic Sac in Labor."—Dr. Robert W. Keeton, Chicago, addressed the Calhoun County Medical Society, Battle Creek, October 1, on "Treatment of Diabetes."

MISSISSIPPI

Society News—Dr. Henry C. Ricks presented a paper entitled "Incidence of Syphilis in Apparently Healthy Adult Applicants for Positions as Food Handlers" before the Central Medical Society at its meeting, September 3, in Jackson. Case reports were presented by Drs. Ross E. Anderson and Frank H. Hagaman on "Removal of Senile Cataract" and "Compound Fracture of Tibia," respectively.—Speakers before the Issaquena-Sharkey-Warren Counties Medical Society in Vicksburg, September 10, were Drs. George F. Carroll, Biloxi, on "Essential Points in Successful Spinal Analgesia," John A. K. Birchett Jr., Vicksburg, "Thyroidectomy," and Willard H. Parsons, Vicksburg, "Surgery in Relation to Pediatrics."—Dr. William L. Little, Wesson, addressed the Tri-County Medical Society at Monticello, among others, on "Care of the Premature Infant," and William H. Frizell, Brookhaven, "Obscure Abdominal Pain."

NEBRASKA

Executive Secretary Appointed—Mr. M. C. Smith, Curtis, has been appointed executive secretary of the Nebraska State Medical Association, pursuant to action taken by the house of delegates at the annual meeting of the association.

Society News—Drs. Sebastian J. Carnazzo and John C. Sharpe, Omaha, addressed the Omaha-Douglas County Medical Society, September 24, on "Subtotal Resection of Suprarenal Glands for Essential Hypertension" and "The Hematocrit as an Aid in the Treatment of Anemias," respectively.—Drs. Howard K. Gray and Edward H. Rynearson, Rochester, Minn., addressed the Madison Six Counties Medical Society, Beemer, September 17, on "Surgical Management of Benign Lesions of

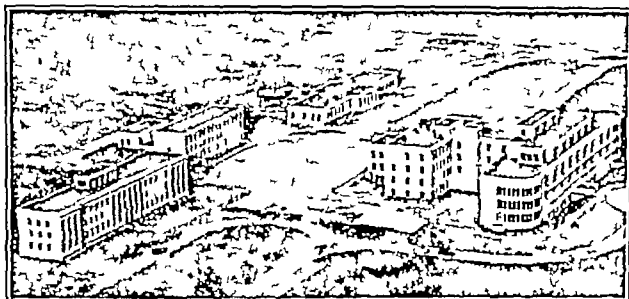
the Stomach and Duodenum" and "Classification and Treatment of Goiter," respectively

NEW HAMPSHIRE

Society News—The New Hampshire Surgical Club held its thirty-eighth annual meeting at Rye Beach, September 7-8. Guest speakers were Drs Irving J Walker, Francis C Newton and Richard H Miller, Boston, who discussed infection of clean operative wounds. Dr Albert Warren Sterns, dean, Tufts College Medical School, Boston, was the speaker at a banquet Saturday evening, September 7. Dr Robert J Graves, Concord, was elected president and Dr Ralph E Miller, Hanover, secretary.

NEW YORK

Nassau County Hospital Opened—Meadowbrook Hospital, a 200 bed institution under the jurisdiction of Nassau County, was recently opened for patients. The completion of a public hospital for the county is the culmination of many years of effort on the part of the Medical Society of the County of Nassau to obtain adequate hospital facilities. In 1922 the society first presented a petition to county authorities, asking for a contagious disease hospital. In 1923 it made a survey of the hospital situation of the county. In 1930 the society took an active part in a campaign for a bond issue of \$1,750,000 to finance the hospital, approved by the voters



Nassau County's Public Hospital

8 to 1 (THE JOURNAL, Nov. 29, 1930, p. 1679). The new hospital is about 4 miles east of Hempstead. All departments of a general hospital are included, with a separate suite for psychopathic patients and a separate building for communicable diseases. The staff consists of 214 physicians and dentists of the county and seventy nurses. Within a few weeks after the opening, the hospital was 90 per cent occupied. Dr Alexander J. McRae is superintendent of the hospital, Mr George L. Hubbell is president of the board of managers and Dr Benjamin W. Seaman, vice president.

New York City

Hospital Positions Open—The Hospital for Joint Diseases announces that appointments will be made to fill six places on the general service, three to begin July 1, 1936, and three, Jan. 1, 1937. All are for two years' rotating service. Graduating students and graduates of class A medical schools (unmarried men) are eligible for the examination, which will be held during Christmas week, the exact date to be announced later. Application should be made before December 15 to the director of the hospital, Madison Avenue at One Hundred and Twenty-Third Street.

Lectures on Dental Medicine—Mount Sinai Hospital announces a course in dental medicine to be given during the coming winter. The first lecturer was Dr Joseph Schroff, October 10, on "Oral Surgical Lesions and Operative Procedure and Treatment." Others will be

Dr. Asher Winkelstein November 14 Dental Infection and Its Relation to Gastro-Intestinal Disease
Dr. Isadore Rosen December 12, Oral Lesions from the Viewpoint of the Dermatologist
Dr. Paul Klemperer January 9 Histopathologic Studies of Dental Tissues
Dr. John H. Garlock February 13, Treatment of Unusual Oral Lesions from the Viewpoint of the General Surgeon
Dr. Herman Lande March 12, Diabetes and Its Relation to Diseases of the Oral Cavities
Dr. Herbert Pollack April 9 Oral Manifestations of Vitamin Deficiency and the Dental Aspect of Abnormal Metabolism

City Opens Drive on Noise—New York's campaign against noise was officially opened, October 1, with instructions from Mayor La Guardia to the police department to warn offenders and try to educate the public without making arrests. The sounding of automobile horns between 11 p. m. and 7 a. m. is forbidden and the citizens have been admonished to keep radios at a moderate level. The city govern-

ment announced that measures would be taken to eliminate as much as possible of the noise made by its own employees. The sanitation department, which has been cited as one of the chief offenders, will have new trucks with pneumatic tires and the garbage collectors have been ordered to be more quiet in their handling of ash and garbage cans in the early morning hours. The police department is to have 400 of its horses shod with rubber shoes. Orders have been issued to keep all blowing of sirens on fire and police equipment to a minimum. Police inspectors were ordered to submit every morning until further notice a consolidated report of admonitions and warnings given by patrolmen during the twenty-four hours ending the preceding midnight. During the first three days 4071 warnings were given and nine summonses were served. The League for Less Noise has established a bureau to receive and investigate complaints, among which it was said that automobile horns and barking dogs were most frequently mentioned, with the department of sanitation trucks a close third. The campaign against night noises is to continue through October, in November action will be taken to reduce the daytime din of the city.

OHIO

University News—Dr. Paul G. Örgy, formerly of the department of pediatrics of the University of Heidelberg, Germany, and recently of Cambridge University, England, has joined the department of pediatrics at Western Reserve University School of Medicine, Cleveland. He will also serve on the staff of the Babies' and Children's Hospital, which was recently reopened (THE JOURNAL, September 21, page 974).

Society News—Dr. Otto J. Seibert, Cincinnati, addressed the Warren County Medical Society, Lebanon, September 3 on diseases of the thyroid—Dr. Chelsea A. Coleman, Dayton, addressed the Greene County Medical Society, Xenia, September 5, on recent advances in treatment for diseases of the kidney—At a meeting of the Hancock County Medical Society, Findlay, September 5, speakers were Drs Francis W. Morley and Lambert J. Herold, Toledo, on infant feeding and hemorrhoids respectively—Dr. Walter M. Simpson, Dayton, addressed the Marion Academy of Medicine, September 4 on artificial fever therapy—Dr. Everett D. Plass, Iowa City, gave an address before the Mahoning County Medical Society, Youngstown, September 17, on "Simplification of Obstetric Care"—The Portage County Medical Society had Dr. Walter A. Hoyt, Akron, as guest speaker at its meeting in Ravenna, September 5, on "Head Injuries in Automobile Accidents"—Dr. Waltham Walters, Rochester, Minn., addressed the Columbus Academy of Medicine, September 30, on "Studies on Surgical Lesions of the Stomach and Duodenum"—Dr. Marion A. Blankenhorn addressed the Academy of Medicine of Cincinnati, October 8, on "Deficiency Diseases of Adults"—Dr. Douglas B. Remsen, Baltimore, will be the speaker, October 15, on "Pathologic Physiology of Cerebrospinal Fluid." Dr. Austin A. Hayden, Chicago, will show a motion picture of the activities of the American Medical Association at the meeting of the academy October 22—Dr. Rosco G. Leland, Chicago, director, Bureau of Medical Economics of the American Medical Association, addressed the Montgomery County Medical Society, Dayton, September 27, on "The Responsibility of the Medical Profession"—Dr. Elias C. Fischbein, Dayton, addressed the Miami County Medical Society, Troy, September 6, on "Traumatic Neurosis."

OREGON

University News—A research fellowship in physiology for \$1,200 a year has recently been established at the University of Oregon Medical School, Portland, by Eli Lilly and Company, Indianapolis. George C. Burget, Ph.D., professor of physiology, will be in charge of research.

State Medical Election—Dr. Thomas Wynne Watts, Portland, was chosen president-elect of the Oregon State Medical Society at its annual meeting in Gearhart, September 21. Drs. William J. Weese, Ontario, Otto C. Hagmeier, Astoria and John C. Vandeventer, Bend, were elected vice presidents and Dr. Morris L. Bridgeman, Portland, secretary. Dr. George A. Massey, Klamath Falls, was installed as president. Next year's meeting will be at The Dalles.

PENNSYLVANIA

Hospital News—Funds for research on serums have recently been made available at Abington Hospital, Abington, the investigation will be carried on under the direction of Drs. Stewart Mudd, Joseph Stokes Jr. and Harry B. Wilmer, all of Philadelphia, and John Eiman, Abington. Dr. Arthur C. Hehn, Philadelphia, was recently elected president of the ex-residents association.

Philadelphia

Newbold Lecture—Dr Cyril N H Long director of the George S Cox Medical Research Institute, University of Pennsylvania, delivered the Mary Scott Newbold Lecture of the College of Physicians of Philadelphia, October 2. Dr Long's subject was "The Interrelationship of the Various Glands of Internal Secretion Concerned with Metabolism."

Professor Appointed at Jefferson—Dr David M Davis, Phoenix, Ariz, has been appointed professor of genito urinary surgery at Jefferson Medical College to succeed the late Dr Thomas C Stellwagen. Dr Davis is a graduate of Johns Hopkins University School of Medicine and was formerly a member of the faculty of the University of Rochester School of Medicine, Rochester, N Y. Dr Louis H Clerf, professor of bronchoscopy and esophagoscopy, made the principal address at the opening of the college, September 23, on "Medicine as a Career."

Society News—The first scientific meeting of the Philadelphia County Medical Society for the current season was held October 9, speakers were Drs James Dowling Trask, New Haven, Conn, on 'Abortive Poliomyelitis,' Howard C Carpenter, 'A Physical Appraisal of the Child,' and Ralph S Bromer, 'Roentgenologic Study of Diseases Affecting the Long Bones in Children.' At the first meeting, September 25, Dr George C Yerger was installed as president—Drs Frederick M Law, New York, and Warren B Davis, among others, addressed the Philadelphia Roentgen Ray Society, October 3 on 'Roentgen Examination of the Nasal Accessory Sinuses' and 'The Paranasal Sinuses in Childhood' respectively—Speakers at a meeting of the Obstetrical Society of Philadelphia, October 3, were Drs Owen J Tolund on 'The Incidence and Treatment of Secondary Anemia,' Catharine Macfarlane, 'Endocrine Therapy in the Menopause' and Edward A Schumann 'Manual Correction of Abnormal Presentations During Labor.'

SOUTH CAROLINA

Program to Aid Crippled Children—The South Carolina Society for Crippled Children and the state department of health have launched a statewide program for rehabilitation, with district headquarters in Greenville, Columbia, Florence and Charleston. Clinics will be held weekly in these cities and in Spartanburg under the following orthopedic surgeons: Drs Joseph Warren White, Greenville; William A Boyd and Austin T Moore, Columbia; and F Adelbert Hoshall, Charleston. Children will be recommended for the clinics by their county health officers and their transportation to the nearest clinic will be arranged by local committees of the society for crippled children. A committee consisting of Drs D Iesene Smith, Spartanburg and Julian P Price, Florence, and Mr P G Sherer, chief of the division of vocational rehabilitation in the state department of education is in charge of the program, which is financed by funds raised by the society and by money available to the state health department for orthopedic work.

SOUTH DAKOTA

Society News—Dr Floyd Coslett, superintendent of the South Dakota State Sanatorium for Tuberculosis, Sanator, among others addressed the Seventh District Medical Association in Sioux Falls, September 10 on early diagnosis and new methods of treatment of tuberculosis.

VERMONT

State Medical Meeting at Rutland, October 17-18—The annual meeting of the Vermont State Medical Society will be held at Rutland, October 17-18 under the presidency of Dr George G Marshall, Rutland. The program includes the following:

- Dr Augustus B Wadsworth, Albany N Y. Practical Limitations of Vaccine and Serum Therapy
- Dr Ward A Woolner, Ayer Ont. Rural Health Problems and Their Control
- Dr Newton D Smith, Rochester Minn. Obscure Abscesses a Cause of Acute Anal Pain
- Drs Edward J Rogers and Louis Rabinowitz, Pittsford. Chronic Cough
- Dr Henry A Christian, Boston. Types of Edema and Their Treatment
- Dr Foster Kennedy, New York. The Biopsychic Approach to Diseases of the Mind. Its Dependence on Neurology and General Medicine
- Dr Oliver N Eastman, Burlington. Hysteroptosis
- Dr Arthur J Bedell, Albany N Y. Causes of Sudden Blindness
- Dr Charles F Whitney, Burlington. Chemistry in Relation to the Practice of Medicine.

Dr Frank C. Phelps, Vergennes, will give the vice president's address. Dr James S McLester, Birmingham Ala., President American Medical Association will speak on 'Modern Trends of Clinical Thought.'

VIRGINIA

State Medical Meeting in Norfolk—The sixty-sixth annual session of the Medical Society of Virginia will be held at the Monticello Hotel, Norfolk, October 15-17, under the presidency of Dr Francis H Smith, Abingdon, and with the Norfolk County Medical Society acting as host. Guest speakers will be Drs Arthur C Christie, Washington, D C, on 'The Answer of the Medical Profession to State Medicine' and James E Paulin, Atlanta, Ga., 'Significance and Diagnostic Importance of Pain in Disease.' Others on the program will include:

- Dr Paul D Camp Jr, Richmond. Essential Hypertension and Bright's Disease. Their Differential Diagnosis and Treatment
- Dr Blanton P Seward, Roanoke. Diagnosis of Coronary Thrombosis
- Dr William H Higgins, Richmond. The Heart in Myxedema. Clinical and Postmortem Findings
- Dr Charles J Andrews and Richard B Nicholls, Norfolk. Unusual Indications for Cesarean Section
- Dr Donald M Faulkner, Richmond. Nonunion of Fractures of the Humerus
- Dr J Shelton Horsley, Richmond. Diagnosis and Treatment of Cancer of the Large Bowel
- Dr Julian L Rawls, Norfolk. Vascular Surgery Necessitated by Trauma
- Dr Vincent W Archer and Walter L Kilby, University. Present Day Treatment of Certain Malignant Diseases
- Dr Raymond Kimbrough, Norfolk. Dermatoses and Cold Weather
- Drs Everett C Drash, University and James B Nicholls, Catawba Sanatorium. Problem of Pleural Adhesions in Pulmonary Tuberculosis
- Dr Charles L Harrell, Norfolk. Nontuberculous Suppurative Condition of the Lung Treated by Artificial Pneumothorax
- Dr Paige E Thornhill, Norfolk. External Version in the Eighth Month for Breech Presentations
- Dr W Ambrose McGee, Richmond. Management of the Allergic Individual
- Dr Frederick M Hodges, Richmond. Results of Roentgen Treatment of Some Very Advanced Malignancies
- Drs Howard R Masters and Lee E Sutton, Richmond. Poliomyelitis. Diagnosis of the Varieties

There will be a symposium on therapy Wednesday afternoon presented by Drs Frederick C Rinker, Norfolk, Joseph F Geisinger, Richmond, Tiffany J Williams, University, and Hugh C Henry, Petersburg. The annual golf tournament will be held Tuesday afternoon at the Norfolk Country Club.

GENERAL

Society News—The Central Society for Clinical Research will hold its eighth annual meeting at the Drake Hotel, Chicago, November 1-2—The American Academy of Tropical Medicine will meet in St Louis, November 20-21. Dr Earl B McKinley, Washington, D C, is secretary—The Pacific Coast Society of Obstetrics and Gynecology will hold its annual meeting in Los Angeles, November 6-9.

Changes in Status of Licensure—The California Board of Medical Examiners reports the following action:

- Dr Robert V Baker, Avalon. License restored July 8 placed on probation for five years without narcotic privileges or possession
- Dr John V Cooke, Los Angeles. License revoked July 10 based on narcotic conviction
- Dr George W Fraser, Bear Valley. Placed on probation for five years without narcotic privileges or possession July 9
- Dr Robert S Friend, Glendale. License restored July 10 placed on probation for five years without narcotic privileges or possession
- Dr James A Hadley, Oakland. License restored July 9 placed on probation for five years without narcotic privileges or possession
- Dr Arthur W Hewitt, Los Angeles. Placed on probation for three years without narcotic privileges or possession, July 9
- Dr William J Jacobs, formerly of Santa Barbara in San Quentin Penitentiary on conviction of murder license revoked July 9
- Dr Ramon Lopez Brawley. License revoked July 10 for narcotic addiction
- Dr Samuel R Lustberg, Los Angeles. License revoked July 9 for conviction of conspiracy to defraud insurance company
- Dr Frances E M McNeely, Los Angeles. License revoked July 10 for narcotic addiction
- Dr Byron H Pelton, Compton. License revoked July 9 for narcotic dereliction
- Dr Charles M Stewart, Los Angeles. License restored July 8 placed on probation for five years without narcotic privileges or possession

The Colorado State Board of Medical Examiners reports the following:

- Dr Ernest Otis McCleary, Ordway, Colo. License revoked for narcotic addiction

The State Board of Medical Education and Licensure of Pennsylvania reports the following:

- Dr Harry C Zimmerly, Quarryville. License revoked September 26 following his conviction on charges of abortion causing death and violation of the narcotic laws

Poliomyelitis Declines—Poliomyelitis is reported to be definitely declining in the East. Sixty-five cases were reported in New York City during the week ended October 4, compared with 122 for the preceding week. The total number of cases for the year is 1,922 and the highest number in any week of the outbreak was 356 for the week ended August 30. Opening of schools in Fall River, Mass, was delayed from September 4 to September 26, when authorities lifted restrictions from public gathering places, there have been 120 cases in the city since

January 1 At the Charles V Chapin Hospital, Providence, R I, there were 102 cases September 24 Schools in Louisville, Ky, were to open September 30, but those in Jefferson County were ordered to remain closed because of the disease. Schools were closed in Owensboro, Ky, September 24, after thirteen cases had been reported in the town and in Daviess County. In North Carolina, where the present outbreak began, fifteen new cases were reported during the week ended September 28, compared with eight the previous week. The U S Public Health Service reported 665 cases from ninety-eight cities for the week ended September 21.

Government Services

Examination for Reserve Corps of Public Health Service

The U S Public Health Service announces an examination for entrance into the Reserve Corps of the U S Public Health Service in the grade of assistant surgeon, to be held November 18. Boards will be appointed in various cities so as to avoid the necessity for travel, which if necessary must be made at the candidate's expense. Applicants must have graduated from reputable medical colleges and must have had at least one year's internship. They must not have passed their thirtieth birthday. Compensation will be \$3,158 per year for an officer with dependents, \$2,699 for one without dependents. Successful candidates will be ordered to active duty in the Reserve Corps, in which it is expected there will be vacancies soon after Jan 1, 1936, they will be eligible for examination for entrance into the regular corps when such examinations are held, provided they have not passed their thirty-second birthdays. Those who wish to take this examination should request the necessary blanks and other information from the Surgeon General, U S Public Health Service, Washington, D C.

General Truby Retires

Brig Gen Albert E Truby, commandant of the Army Medical Center, Washington, D C, retired on account of the age limit, July 31. General Truby was born in Otto, N Y, and graduated from the University of Pennsylvania School of Medicine in 1897, shortly afterward entering the army. He served in Cuba and in the Philippines as health officer of the Canal Zone and superintendent of Ancon Hospital, Panama, during the World War, he was on duty in the office of the surgeon general and later in the office of the chief of air service. Since 1922 General Truby has been in command of Letterman General Hospital, San Francisco, served a second tour in the Philippines and served as surgeon of the Second Corps Area. He was placed in command of the medical center in 1931.

Physiologic Research in Aviation

A new unit for research in connection with development of flying equipment and accessories for protection of the health and lives of fliers has been established at Wright Field, Dayton, Ohio, under the direction of Capt Harry G Armstrong. Among problems that will be investigated are the use of oxygen at high altitudes and its effects, the reaction known as "blackout," endurance of cold in open cockpits and the escape of carbon monoxide into cockpits. The new unit will take up work that was done by the Air Service Medical Research Laboratory at Mineola, L I, during the World War and until 1920 under the direction of Edward C Schneider, Ph D, now of Middletown, Conn.

CORRECTIONS

Ergotamine Tartrate in the Puerperium—In the article by DerBrucke, in THE JOURNAL, September 14, page 868, first line, second column the sentence beginning "On the other hand" should read as follows: "On the other hand in the current series, wherein 1 cc of ergotamine tartrate almost universally replaced solution of pituitary, the average height on the first day post partum was 118 cm."

Calcium in Child's Diet—In the query and minor note entitled "Calcium in Child's Diet," in THE JOURNAL, September 21, page 987, the answer to the first question should have been "A liter of human milk contains about 0.35 Gm of calcium," instead of about 1.24 Gm, as was stated. In the answer to question 3, the ratio of calcium to phosphorus should have been given as about 1.3 : 1 in cow's milk, and 2.3 : 1 in breast milk.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 14, 1935

The British Association for the Advancement of Science

At its annual meetings the British Association for the Advancement of Science epitomizes for the benefit of the public recent advances. At the Norwich meeting this year many of the papers were, as usual, of special interest to physicians.

CONFIRMATION OF THE DOCTRINE OF EVOLUTION

In his presidential address on "Form, Drift and Rhythm of the Continents," Prof W W Watts recalled that when the association met at Norwich sixty-seven years ago the president, Sir Joseph D Hooker, was one of the three scientific men representing botany, zoology and geology whom Darwin had selected as judges with whose opinion he would be content on the soundness of his theory of natural selection. The others were Thomas Huxley and Charles Lyell, and of the three the geologist Lyell was the hardest to convince, chiefly because the record of life then furnished by the rocks was manifestly so incomplete. But by 1863 his "Antiquity of Man" was published and showed that he was convinced. "Although infinitely richer than when Darwin wrote, the geological record," said Professor Watts, "still is and must from its very nature remain imperfect. Every major group of animal life is represented in the Cambrian fauna, and the scant relics that have been recovered from earlier rocks give little idea of what has gone before and no evidence whatever of the beginning of life. But from the Cambrian time onward the chain of life is continuous and unbroken. Type after type has arisen, flourished and attained dominion. Some of them have met extinction in the heyday of their development, others have slowly dwindled away, others, again, have not finished their downhill journey, or are still advancing to their climax. Study of the succession of rocks and the organisms contained in them has revealed that the great majority of species show close affinities with those which preceded and with those which followed them, that indeed they have been derived from their predecessors and given origin to their successors. We may now fairly claim that paleontology has lifted the theory of evolution from the limbo of hypothesis into a fact completely demonstrated by the chain of life which links the animals and plants of today with the earliest of their forerunners. Further, the geographic changes undergone by the earth have been so closely attendant on variation in life and the incoming of new species that it is impossible to deny a relation of cause and effect."

THE PITUITARY THE MASTER GLAND OF THE BODY

In his address to the section of physiology, Prof P T Herring gave a fascinating account of the rise to importance of the pituitary gland from an anatomic curiosity of fifty years ago—a story to which he has contributed largely. For its size the pituitary is the most important organ in the body. In addition to its well known functions of regulating growth and controlling the sex organs, it acts on all the other ductless glands. It is a stimulator to the thyroid, parathyroid, adrenal cortex and endocrine tissue of the reproductive organs, and an inhibitor of the control of sugar utilization by the pancreas. Further, it acts and reacts with the neighboring portion of the brain (the hypothalamus), so that together they form an integrated whole. It has a peculiar blood supply which ensures that part of its secretion is carried directly to the hypothalamus while the rest is thrown into the general circulation. Evidence is accumulating that the hypothalamus is an important, if not the main, site

of integration of the basic vital activities of all vertebrates. The metabolism of solids and of water, with its accompaniment of hunger and thirst, the regulation of body temperature, emotional reactions, sleep, mating and reproduction may have an anatomic basis in the hypothalamus. On the one hand pituitary secretion is under the control of nerve fibers emanating from the hypothalamus, on the other, certain pituitary hormones stimulate the hypothalamus to set in train nervous activities in remote parts of the body. Thus solution of pituitary acts on the hypothalamus to stimulate the vasodilator nerves of the skin, sweating and a fall in blood pressure, temperature and metabolic rate. An example in the reverse direction is that coitus in rabbits stimulates the hypothalamus by nervous means, causing it to stimulate the pituitary to increased secretion. In turn the pituitary secretion, circulating in the blood, acts on the ovary, causing extrusion of ripe eggs which can then be fertilized. A refinement recently discovered is that, by adjusting the blood pressure in two alternative routes, the pituitary secretion can find its way either directly to the hypothalamus or else into the general circulation, and, what is more, it may have different and even opposite effects in the two places. Thus much progress has been made in finding a material basis if not for the soul at least for human temperament and the temperamental foundations of personality, which have been the stronghold of the upholders of vitalistic or transcendental views.

THE MODERN CONCEPTION OF THE ELEMENTS

In his presidential address to the section of mathematics and physics Dr F. W. Aston gave a valuable survey of the story of isotopes, on which he has done so much valuable work. He said that for more than eighty years Dalton's postulate that all the atoms of an element are of the same weight was never questioned until Crocker did so in 1886. But his brilliant speculation remained unverified for more than twenty years, until the results of radioactivity made it a pressing problem. The atomic weight of lead is 207.2. This, however, turns out to be due to mixture of two kinds of lead atoms with weights of 206 and 208. This can be so because atomic weight depends on the total mass of the particles in the nucleus, chemical properties depend on the electrical charge on the nucleus. As the latter is the same in the two kinds of lead, they are chemically indistinguishable. Atoms of the same chemical behavior but of different weights were termed isotopes. They were at first found only among the products of radioactive disintegration, but later research has indicated that they are universal. Today no fewer than 253 stable isotopes are known. A year ago only four elements had not been resolved into isotopes. Since then platinum and gold have gone over to the majority, now only iridium and palladium remain and will certainly yield to improved technique. The most complex element is tin, which has no fewer than eleven isotopes. Dr Aston made the remarkable prophecy that the nuclear chemist will transmute and synthesize elements as his elder brother has done molecules. "I foresee a time not immeasurably far distant, when it will be possible for us to synthesize any element whatever, wherever and whenever we please—alchemy indeed in the service of man."

PERSONALITY AND AGE

In the section of psychology Dr L. Wynn Jones took for the subject of his presidential address Personality and Age. He drew the important distinction between chronological and physiological age. Different persons age in the real or physiologic sense at very different rates. An investigation in Germany showed that the subjective onset of old age—the age at which people begin to feel old—is on the average 49 years, but the range varies widely, from below 20 to over 80 years. Another point which emerged from this investigation was that some persons feel old physically long before they do mentally, and

vice versa. For activities demanding the maximum expenditure of energy per second, such as sprinting, the optimum age is from 22 to 24. When technique and experience counts it rises, to 28½ for tennis and 35 for golf. The deterioration of intellectual ability, as measured by memory and intelligence tests, is small with age. Ability to learn a systematic subject increases up to the age of 20 or 22, then drops very slowly to 35 and then a little faster to 45 or 50, but falls rapidly only quite late in life. Adults between 20 and 40 learn a modern language more rapidly than children of any age between 8 and 12. The applications of these facts run counter to popular beliefs. Industrial accidents (but not pedestrian accidents in traffic) decrease with age. Unemployed adults can well be trained for wholly new occupations. Adult education should play a much larger role in the community. The present break from school to industry is too abrupt, leading to stagnation or even retrogression of a large part of the young people of this country.

Postoperative Tetanus

Though elaborate methods have been adopted for the sterilization of catgut with the express object of destroying the organism of tetanus, cases of postoperative tetanus occur from time to time. An inquest has been held into the death from tetanus of a woman, aged 32, who was operated on for appendicitis in a hospital. The operation wound had soundly healed. It was examined for pieces of catgut, but only a piece of thread was found which was kept for culture. Medical evidence was given that the instruments and catgut used at the operation were sterilized. It was suggested that, as the operation was an abdominal one, the tetanus infection might have arisen from the intestine. Specimens of the catgut used were examined by the pathologic department of the Ministry of Health and showed no evidence of tetanus bacilli, but cultures of tissue from the patient showed them.

Ambulance Service for Ethiopia

Though much has been done in the last few years to modernize part of the defense forces of Ethiopia, there is practically no ambulance service. A unit is now being formed in England. Men with surgical experience or versed in tropical diseases are particularly sought. As the object is purely humanitarian and the expedition is supported entirely by voluntary subscriptions, physicians in a position to offer their services for no remuneration, all expenses being paid are asked to do so. In no case will a salary exceeding \$1,250 a year be available. European medicine in Ethiopia is entirely in the hands of medical missionaries who have established hospitals in the country. They will do what they can for the treatment of the wounded, but their number is appallingly small for such a task.

The Radium Bomb in the Treatment of Cancer

Westminster Hospital, which has specialized for some years in the treatment of cancer by the radium bomb, will soon have a new bomb containing 4 Gm of radium and costing \$200,000. Portions of the new bomb are being made in the annex workshop of the hospital and the whole will be assembled and tested by the hospital physicist. The making of the new bomb is in itself a costly undertaking. A new tungsten alloy, one and a half times the density of lead, will be used in the construction of the hollow globe for the radium. This alloy, a new discovery, will enable the size to remain as at present, although the weight will be greatly increased. Within the lower circumference of the globe there will be a solid gold collar. The great density of the gold will assist in confining within a narrow compass the gamma rays from the radium and so prevent injury of healthy tissues.

The present 2 Gm bomb has been in use day and night for two and one half years, and more than 600 patients have received more than 7,000 treatments. It has been found that

there is a great advantage in working at a greater distance from the patient, and this will be made possible by the greater quantity of radium in the new bomb. A more effective dose will be received at a greater depth below the surface. For five days of the week the present bomb is in constant use throughout the twenty-four hours. Three shifts of operators enable the work to be done. During the remaining days of the week, Saturday and Sunday, the bomb is used by the physicist and the surgeons for experimental work, the need for extensive research into the questions of effect and dosage being always present.

The Regius Professor of Physic in the University of Cambridge

Dr J. A. Ryle, physician to Guy's Hospital, has been appointed regius professor of physic in the University of Cambridge in succession to Sir Walter Langdon Brown, who retires on completion of his term of office. Dr Ryle qualified as recently as 1913 and is one of the youngest physicians to attain this high position. He first became known by his investigations of diseases of the stomach, which are embodied in his book "Gastric Function in Health and Disease." "Ryle's tube" has become a household word in medicine.

PARIS

(From Our Regular Correspondent)

Sept. 9, 1935

Alfred Fournier Institute for Treatment of Syphilis

In an article in the *Siècle médical* by Prof. Constantin Levaditi, director of the laboratory for the experimental study of syphilis, a plea is made for direct support of the Alfred Fournier Institute, which was opened several years ago in Paris. Up to the present, the work of this important center has been supported by a government subsidy of about \$35,000 a year to the league for the prevention of venereal diseases. This appropriation is included in the budget of the ministry of public health. Levaditi fears that, in the current effort to curtail government expenses, this subsidy to the league for the prevention of venereal diseases will be discontinued. He therefore suggests that, in view of its importance as a prophylactic agency against syphilis, the institute should be made directly attached to the ministry of public health and in this way be independent of the sums which are allotted annually to the league.

No syphilologist who visits Paris should miss the opportunity of seeing this unique institution, named after the renowned syphilologist, whose clinics at the Hôpital Saint-Louis were visited by many Americans. The six-story building was opened last year and is not only equipped for prophylaxis and treatment but also has a laboratory for the experimental study of syphilis.

On the ground floor there is a dispensary for diagnosis and treatment. On the first floor are located a well selected library and the offices for the Antivenereal League. The second floor is devoted to serologic tests, a course for physicians and technicians is given here, under the supervision of the Faculty of Medicine of Paris. Lectures by the members of the department for syphilis of the Hôpital Saint-Louis constitute a part of the course. Thousands of serologic tests for syphilis are made annually in this laboratory, which has been transferred from the Pasteur Institute.

On the third floor are the laboratories for the experimental study of syphilis and for applied chemotherapy, which are under the supervision of Professor Levaditi aided by the physicist Paic. A monograph is published annually containing the research work of this department, which also was located formerly in the Pasteur Institute.

The fourth floor is occupied by a laboratory for the biological and chemical control of antisyphilitic preparations. The younger Richet is now director of this laboratory.

It is evident that under a single roof one can find every aspect of syphilis, under the supervision of competent men. Opportunities are abundant for those who wish to study the clinical and experimental features of syphilis in the Alfred Fournier Institute.

Syphilis in Ethiopia

In the same issue of the *Siècle médical* is an interesting article on the widespread prevalence of syphilis in a country on which the eyes of the world are at present focused. It is not considered anything to be hidden from the public to have syphilis in Ethiopia. About half of the native population are syphilitic. Eight of ten children die in infancy as the result of the disease. Abortion and premature births are a frequent occurrence. The children who survive often present evidences of organic lesions, especially of pancreatic diabetes, according to Raoul Bernard, the author of this article. Much of the widespread prevalence of syphilis is the result of the teachings of some native physicians that injections during the early months of the disease are dangerous and give rise to recurrences. It is far wiser, they say, to permit the appearance of as many skin and mucosal manifestations as possible, as the cause is thus eliminated through the skin. The natives feel that such a result is much to be wished and do not consider that they can transmit the disease through these lesions. It is only in the tertiary stage that an Ethiopian accepts treatment with antisyphilitic remedies. A native who is cognizant of having been infected drinks the blood of goats and stays in a dark, superheated room. Overfeeding with the raw meat of goats is considered to be indicated for the first four or five months. The hermit life is then abandoned to take a drug called kousso and a series of hot baths.

When one reads this article, the difficulty of treating syphilis in Ethiopia is fully realized.

Report of Committee on Vaccination Against Tetanus

In the spring of 1935, Fredet, Duval, Gosset, Rouvillous and Bazy were appointed by the Société de chirurgie to ascertain whether vaccination against tetanus was practicable. This committee made its report at the July 3 meeting of the society.

Although the mortality from this form of wound infection has been greatly decreased as the result of prophylactic injections of the antitoxic serum, many patients are not given the benefit of such treatment because the possibility of tetanus is not taken into consideration. In the latter group belong ordinary and electrical burns, effects of exposure to cold, excoriations under plaster casts, and pin pricks. Statistics show that more than 70 per cent of the cases of tetanus follow insignificant injuries, and in an additional 6 per cent there is no demonstrable aetrium. Many patients do not call a physician and, if they do consult one, he is not sure whether the antitoxin should be given as a prophylactic measure or whether he should abstain from giving it on account of possible serum reactions.

The committee recommended vaccination against tetanus as the best method to decrease the mortality. The antitetanic vaccine (anatoxin of the Pasteur Institute) is harmless, not being followed by any local or general reaction. Such vaccination is to be especially recommended for children and those who do manual labor. It can be given simultaneously with vaccination against typhoid-paratyphoid.

The antitetanic vaccination should be repeated every year or two. A person who has been vaccinated should never be given a prophylactic dose of antitoxin in case of injury or a burn. In war, antitetanic vaccination should be made obligatory.

Can Tubercle Bacilli Pass Through Normal Kidneys?

The question whether tubercle bacilli can pass through normal kidneys has been debated since 1901, when Fullerton and Hillier maintained that normal kidneys were found at necropsy in patients suffering from pulmonary tuberculosis and in whose urine tubercle bacilli had been demonstrated by staining methods during life. With the introduction of modern diagnostic technique in urology, more proof is demanded that a renal or genital tuberculosis does not really exist when tubercle bacilli are found in the urine in patients without symptoms referable to the genito-urinary tract.

Two papers read at the June 29 meeting of the Société de biologie add to our knowledge of this question.

The bacteriologic studies were made at the Pasteur Institute and the urine specimens were obtained in various pulmonary tuberculosis services of the large Paris hospitals. In the paper by Saez, Eisendrath, Costil and Sidetlin, the urine of 100 patients with active pulmonary tuberculous lesions was examined by the staining method and by cultures. In the first series of fifty cases the strains of the urinary sediment were uniformly negative. In two cases, on scraping the surface of the culture medium eight days after inoculation, some acid-fast bacilli were found but the cultures after prolonged observation failed to develop a visible growth and the guinea-pig inoculation was negative. In the remaining forty-eight cases of this series the cultures failed uniformly to show any growth. In a second series of fifty similar cases (twenty-five men and twenty-five women) the sputum was positive on staining thirty-four times and the culture positive in thirty-six of forty-six sputums examined. Stains and cultures (observed for three months) of the urine were uniformly negative.

In the second paper, read by Pezzangora and Bacanu, a report was made of the examination of the urine by stain and culture in eighty-two cases of advanced pulmonary tuberculosis. In none of the total of 182 cases included in the papers were any symptoms referable to the genito-urinary organs present. In only one case of the eighty-two included in the second paper was the culture and stain of the urine positive. The renal function tests in this case were, however, negative. The patient had an extremely severe form of pulmonary tuberculosis and died on the day after the specimen of urine was obtained. There was no necropsy.

These two contributions add to the evidence brought out during the past ten years that the presence of tubercle bacilli in the urine should lead to a complete urologic examination, which will almost invariably reveal the presence of either a renal or a genital (male) tuberculous lesion.

Fatal Accidents Following Prophylactic Injections of Antitetanus Serum

In a thesis submitted for graduation at the Faculté de médecine de Paris, fourteen fatal cases are reported in which antitetanus serum was given as a prophylactic. The deaths occurred immediately, soon after or much later after the injections. The principal symptoms were those of vasomotor nature, dyspnea, digestive and circulatory disturbances. These accidents occurred in individuals already sensitized by a previous injection or who presented an individual susceptibility to any serum. In the latter group were those who had suffered from urticaria, migraine, gout or asthma. Anaphylactic or colloidoclastic shock is the best explanation of these accidents. Those which occurred late might be attributed to delayed anaphylactic shock or to the toxicity of the serum.

Such accidents should not deter from the use of the serum as a prophylactic measure. If one suspects serum accidents, desensitisation must first be employed, but it is almost impossible to foretell which patients will react severely to the serum.

BERLIN

(From Our Regular Correspondent)

Aug 12, 1935

A Survey of Social Insurance

Dr Schaffer, president of the reichs-versicherungsamt (the federal bureau of insurance), has published a general survey of the performances of the branches of German social insurance since it was first introduced. He states that all the branches of insurance taken together (excepting only unemployment insurance) have expended for performances, from the beginning of their creation up to 1934, 55,643,400,000 marks, equal in American money to from thirteen to twenty-two billion dollars, depending on whether the old prewar value of the mark at 238 cents or the present value at 40 cents is used as a basis of computation. German accident insurance expended, from 1885 to 1934, 7,660,000,000 marks, 742,000,000 of which was for therapeutic management and 6,500,000,000 in the form of cash benefits. The disability insurance administration expended from 1891 to 1934 more than 17,800,000,000 marks, 15,260,000,000 of which was for cash benefits and 1,200,000,000 for therapeutic procedures. Employees' insurance expended during the period of its existence (from 1913 to 1934) a total of 1,748,400,000 marks, 1,110,000,000 of which sum went for cash benefits. The health insurance administration expended from 1885 to 1934 more than 26,000,000,000 marks in the prosecution of its tasks, 24,800,000,000 of which was paid out for patients and for aid to puerperants. To these sums must be added expenditures for the performances of the federal miners' pension fund, amounting to 1,700,000,000 marks from 1924 to 1934 in the laborers' branch and 313,400,000 marks, during the same period, in the employees' branch. More than two thirds of the total population of Germany enjoy the benefits of social insurance. The present total annual budget of all branches of German social insurance may be placed at about 3,500,000,000 marks. The administration of social insurance requires the services of about 60,000 persons.

The Situation of the Health Insurance Societies

In a widely read article, Dr Goerdeler, the federal commissar for price control, expressed his views recently on the contributions exacted from the members of the federally controlled *kranken-kassen*, or health insurance societies, which have been included within the purview of the commissar for price control. Following investigation, Dr Goerdeler has announced that he is opposed to any increase in the dues, or premiums, because such an increase at present would not be economically sound. The dues must not be increased above the 1933 schedule, for any increase of the present charges would deprive the workman of a part of his buying power needed and heretofore used for other necessities. Any reduction of the workman's buying power would be injurious, because, in general, wages are too small, and would give rise to extraordinary shiftings of a financial nature. By reason of the huge sums collected from persons whose salaries and wages come within the limits of the operation of the compulsory health insurance laws (which in the aggregate for the German reich total about 20,000,000,000 marks, or \$8,000,000,000, current exchange), 0.5 per cent would amount to 100,000,000 marks, so that, as a result of such an increase in the premium dues, 66,666,000 marks would be withdrawn each year that might have been used for other purposes, since the employees have to pay two thirds of the premium dues exacted from members of the health insurance societies, while the employers pay one third. The repercussions would be felt primarily by German industry, which would react on the workmen. Goerdeler expressed the opinion that, if a *kranken-kasse* is at present unable to balance its budget, it must reduce its expenditures, and that the place to begin is the costs of administration. It might be necessary to reduce also the performances.

From other angles, the *krankenassen* must be protected against any increases in their material administrative expenditures and against any augmentation of the prices for medicines, other therapeutic procedures and hospital care.

Dr Martin, the director of the federal league of local *krankenassen*, which is the largest league of *krankenassen*, has stated that the trend of the finances of the local *krankenassen* has caused him anxiety of late. For many local *krankenassen* the situation has become unfavorable, owing in part to the increased expenditures arising from the higher birth rate and in part to the larger outlay for dental treatment, medicines, other therapeutic measures, and hospital treatment. A large portion of the increased expenditures had been brought about by the gratifying success of the new demographic policy of the federal government and the providing of work for the unemployed. In many *krankenassen* current deficits can no longer be made up by drawing on credit balances of recent years, as these have become exhausted. For a number of *krankenassen* it has been impossible to meet their obligations toward physicians, hospitals and other organizations. It seemed, however, that struggle as one might no further retrenchments in administration costs could be attained. The *krankenassen* collect, in the form of premium dues, 5.25 per cent of the income of the insured, the part used for administrative costs amounting to only 0.55 per cent of the income of the insured. The deficit in some instances is nearly equal to the amount of the administrative costs. On the other hand, economies were possible with respect to hospital care and allowances for medicines. The insured should be urged to ask aid of the *krankenassen* only when it is absolutely necessary, and they should be content with what the panel physician, on the basis of the principle that the patient must be restored to health as quickly and thoroughly as possible, prescribes. It should be borne in mind that the physician is in honor bound not to prescribe anything that is unnecessary. Hospital treatment should be limited by the physicians to the actually necessary cases.

Regulations Concerning Vaccination

The subject of smallpox vaccination has again been under discussion for some time. All the well known arguments have been rediscovered, and ways have been pointed out of combating vaccination injuries (*THE JOURNAL*, April 27, p. 1537). All these discussions have now been interrupted by the following regulations of the *Reichsärztführer*, that is, the chairman of the federal medical organization, Dr Wagner. "The question of vaccination is regulated by law, and the federal government has refused to make any changes in the regulations. The federal government has decided that the existing regulations shall be upheld. It is therefore inadmissible to criticize the measures for which the federal government has assumed responsibility, or to encourage agitation against the provisions controlling vaccination. I therefore order that all discussion of the vaccination question in medical and other professional journals be suppressed."

Professor Lydia Rabinowitsch-Kempner

Frau Prof Lydia Rabinowitsch-Kempner, for many years editor of the tuberculosis journal and well known for her researches on tuberculosis, has died in her 64th year. She was the only female co-worker of Robert Koch. Later (from 1896 to 1899) she served as instructor in bacteriology at the Women's College in Philadelphia. Afterward she accepted Koch's invitation to do research, in the Koch Institute, on the occurrence of tubercle bacilli in butter and milk, on serum reactions in human and bovine tuberculosis, and on kindred subjects. From 1920 to 1933 she was the director of the Bacteriologic Institute in the *Krankenhaus Berlin-Moabit*, until, in 1933, under the new regime, she was forced to retire.

ITALY

(From Our Regular Correspondent)

July 31, 1935

Tuberculosis of Bones

Under the chairmanship of Professor Putti of the University of Bologna, the second national convention for the study of osteo articular tuberculosis was recently held at Cortina d'Ampezzo. The first topic was "Internal Foci in Osteo-Articular Tuberculosis in the Child," presented by Professor Frontali of Padua, who furnished evidence that osteo-arthritis in the child is due in the majority of cases (up to 84 per cent) not to the bovine tubercle bacillus but rather to the human bacillus, and that the first localizations of this micro-organism are usually in the respiratory apparatus. The diffusion of the tuberculous virus takes place from internal foci (commonly intrathoracic) by way of the blood stream, giving rise to multiple localizations involving the skin, such as tuberculids and scrofuloderms. Contrary to the accepted belief, children affected with tuberculous osteo arthropathy may spread the contagion among the children in their environment, by reason of the respiratory localizations, which are often overlooked. Sometimes the presence of a pulmonary focus exerts a decisive influence on the outcome of orthopedic treatment. The speaker is squarely opposed to Marfan's view that osteo-articular tuberculosis constitutes a region of greater resistance to specific pulmonary infection and pointed out that tuberculous spondylitis, for example, gives rise to mechanical conditions that favor the evolution of pulmonary types. He emphasized the importance of a unitary conception of tuberculous disease in the child, in which the osteo-articular disorder is only an episode. Rimoni, in his study of 2,300 patients with osteo-articular lesions of a tuberculous nature, found in 1,001 cases (43.52 per cent) a concomitant specific disorder of the respiratory apparatus.

The second topic concerned "The Radiodiagnosis of Osteo-Articular Tuberculosis." Professor Zanoli brought out the weak points of roentgenology in this special field, stating that radiography does not enable one to differentiate between post-traumatic arthritis and incipient tuberculosis or to interpret atrophy. The radiographic interpretation of a cervical lesion is difficult, while the diagnosis of sacrocoxaalgia and of costal and sternal caries is uncertain. Nor has decalcification of the kneecaps any absolute value. The author holds that the radiographic pathologic lesions appear smaller than they actually are and that a caseous focus, in order to be radiovisible, must be larger than a coffee bean. The speaker mentioned also the difficulty of a differential diagnosis with respect to syphilis and osteomyelitis and concluded that, in spite of the great merits of radiology, one should not rely on this means alone but should utilize more particularly clinical methods in studying patients affected with osteo-articular tuberculosis.

Short Wave Therapy

An international convention, organized by the *Accademia medica Lombarda*, was held recently in Milan for the study of problems connected with the use of short waves in medicine.

Leroy (an engineer) of Paris presented the first paper, on "The Physical Aspects of Short Waves." He said there are arrangements of electrodes for carrying the action of the short waves to a certain organ. Modern apparatus enables the investigator to gain a perfect knowledge of the total energy supplied to the organism, but such determinations are not yet adapted to clinical application. Professor Vannoni of Padua discussed short wave therapeutic apparatus of the thermionic vacuum tube type. He pointed out that the essential difference between the various types of apparatus concerned the degree of utilization of the energy generated by the oscillator for therapeutic purposes and the frequency factor. He stated that

the possibilities are greatest therapeutically for the apparatus with an undamped oscillation, not so good for apparatus with half-wave rectified oscillations, and still less in apparatus with damped oscillations

THE BIOLOGIC ACTION OF SHORT WAVES

Prof Gino Bergami of Milan pointed out that the heat produced by short waves develops in the interior of the tissues, the intensity varying with the adaptability of the tissues to the heat waves. The speaker does not, however, deny the possibility that the short waves act on biologic material also with a mechanism different from the thermic action. Some experimental data suggest a specific action that is probably exerted through changes in the surface equilibrium. The author has reached the conclusion that the short waves exert on biologic systems complex actions explainable in the majority of cases by the selective thermic effect.

Professor Schliephake of Jena spoke on the selective effects of the short waves. The greater the effect due to high frequency, the greater will be the effect in the deeper tissues, and the greater will be the selective actions on every part owing to the fact that every part is influenced separately. The heat produced by the short waves may be specific, owing to the different distribution of the heat, of which fact the behavior of the erythrocytes is a proof. In fact, the conductivity of the blood is greater under the influence of short waves than with long waves. The speaker stated that he had secured selective effects by irradiating the brain of the rabbit with waves of varying length and dosage. He observed similar results in cases of superficial suppuration, and also in a case of glioma of the cerebellum in a youth aged 19.

Professors Anclair and Halphen of Paris presented a paper on "Short Waves in Pyretotherapy." According to the speakers, short waves constitute a sure, rapid and practical means of producing an artificial fever. They hold that electropyrexia produces hyperemia in all the organs and develops a directly microbicidal action on certain micro-organisms with weak thermoresistance.

Professor Cignolini of Genoa spoke on the action of short waves on the vegetative nervous system. It is held that the short waves exert a depressive action on the sympathicus and an excitative action on the vagus. The speaker, however, is of the opinion that short waves act in relation to their intensity and that it is incorrect to speak of a selective depressive or excitative action on one or the other parts of the human organism. The action appears to be effected through the supplying of heat to the nerve cell, with effects on its metabolism.

Professor Izar of Messina discussed the use of short waves in internal medicine. The principal therapeutic results secured by various investigators concern disorders in the fields of vascular pathology, the digestive and the respiratory apparatus, and parasitic conditions. The results obtained in diseases of metabolism, however, were either negative or doubtful.

The Medicosurgical Society of Brescia

The Società medico chirurgica Bresciana met recently at Brescia under the chairmanship of Professor Raverdino. Pagani of Cesa spoke on "The Anemias of the Nursling." If one wishes to determine the etiology of an anemia in a nursling and then to institute treatment, four criteria must be kept in mind: the age of the child, the size of the spleen, the nature of the previous diet, and the previous diseases. If one encounters anemic conditions in a child under 3 months of age, one should suspect at once congenital syphilis. If, after a child is a year old, one finds an enlarged spleen (whether or not accompanied by hepatomegalia), the diagnosis should be sought among the large group of leukemic and pseudoleukemic anemias. If, however, the spleen is little larger than normal, one must consider rickets, con-

genital syphilis, tuberculosis, digestive disturbances, pyodermitis and chronic bronchitis. Alimentation should be regarded as the most frequent cause of anemia in the child from 6 to 24 months old. Human milk contains but little iron, and too prolonged breast feeding may bring about an exhaustion of the child's supply of iron. Worse still if the child is kept for a long time on a diet of cow's milk, more or less diluted.

Diencephalic Disease

Professor Lunedei and Dr. Liesch of the Clinica medica in Florence presented recently to the Accademia medicofisica Fiorentina a series of articles in which they consider certain new aspects of the pathology of the diencephalon. Observing a number of cases in which there was an association with Friedreich's disease and familial diabetes, the speakers advanced the view that there existed a variety of heredo-ataxia with neurovegetative lesions, particularly of the upper centers of the middle diencephalon.

In a case of diabetes insipidus that intervened during the course of an attack of undulant fever the authors diagnosed a diencephalic involvement and pointed out that this type of complication had never been described before. Finally the speakers gave the history of a family in which the father was affected with gastric ulcer and Vaquez's disease, a daughter with the adiposogenital syndrome, and two sons with duodenal ulcer. They gave the data on which Cushing bases the theory of the diencephalic pathogenesis of gastroduodenal ulcer. Lunedei and Liesch, without drawing any definitive conclusions, emphasized the value of clinical observations of this type for the purpose of better defining certain aspects of the pathology of the diencephalon.

RIO DE JANEIRO

(From Our Regular Correspondent)

Aug 15, 1935

Etiology of Besnier-Boeck's Disease

Dr. Rabello Filho, in a lecture before the Sociedade de Medicina e Cirurgia of Rio de Janeiro, reviewed the literature on the clinical, roentgen and anatomicopathologic picture of Besnier-Boeck's disease and discussed its etiology. The speaker said that all the symptoms of Besnier-Boeck's disease may be caused by leprosy. The clinical picture of osseous and cutaneous sarcoid may be given by leprosy. Also the anatomicopathologic aspect of pure epithelioid growths unmixed with other types of cells proper of sarcoid may be given by leprosy. A specific rhinitis, nondifferentiable from sarcoid rhinitis, develops in leprosy with negative reaction for *Mycobacterium leprae*. Leprous rhinitis is not amenable to arsenical treatment but it is controlled by treatment with chaulmoogra esters, as in sarcoid rhinitis. Leprosy is associated in about 95 per cent of the cases with the development of adenopathy similar to sarcoid adenopathy from both clinical and histologic points of view. Leprosy, even in its more florid and bacilliferous forms, is associated with phenomena of cutaneous anergy to tuberculin, in sarcoid lesions. Sarcoid reactions with eosinophilia appear in the course of the treatment in both conditions. The cultures of both leprosy and sarcoid tissues give the same type of bacteria, that is, streptothrix and gram-positive organisms. The inoculation of either leprosy or sarcoid tissues results in failure, in development of a special localized disease, with acid-fast organisms or, in rare cases, in tuberculization. The speaker does not believe in the existence of a special virus in the etiology of Boeck's disease in which the tubercle bacilli and the *Mycobacterium leprae* may be concerned. In cases with predominance of the leproid factor, probably *Mycobacterium leprae* is the etiologic factor. It is plausible that certain European races, especially persons in cold climates, as those in the northern regions of Europe, because of their

inherited resistance, develop a systematized disease, probably a modification of leprosy. The problem of sarcoid is an open field for study.

New Hospital in Rio de Janeiro

The Hospital Jesus, in an important location of Rio de Janeiro, will open in the near future for the care of poor children ranging in ages from birth to 13. It has 300 beds. The child is registered at the office for admission on the first floor and is examined by a physician, who decides whether the child shall be treated as an ambulatory or a hospitalized patient and in what department of the hospital. The wards are large, well ventilated and furnished with modern equipment of the best type. The departments for ambulatory patients, the special clinics and the department of dentistry are on the first floor. The departments of pediatrics and surgical orthopedics are on the second floor and that of surgery on the third floor. The wards on the third floor are air conditioned. At the rear of the building is a nursery. The milk supply is constantly supervised. There is no department for contagious diseases of children at present, but the directors have in mind to provide, later on, for this need.

The Care of Brazilian Children

Drs. Olinto de Oliveira, Dante Costa, Eneas Martins Filho, Adamastor Barbosa and some others are the directors of the social center *Campanha Nacional pela Alimentação da Criança*, which deals with the protection of poor Brazilian children. The central office is located at Rio de Janeiro, and there are branches in more than 500 municipalities, 47 per cent of which are located in the towns on the south side of the country. Milk and food are supplied to children in public stations of the institution. Several branches have been opened recently. The aim of the board of directors is to have branches in all the municipalities of the country.

BUCHAREST

(From Our Regular Correspondent)

Aug. 28, 1935

The National Antituberculosis Congress

In June 1931, with the opening of the first antituberculosis congress, in the presence of the king, it was felt that a new epoch had begun in the campaign against tuberculosis, which is nowhere so important as in Rumania, where the number of lives claimed by this disease is excessive. The campaign failed, however, in consequence of economic difficulties, for neither the state nor the community supported the cause.

The first step toward realization of the good intention has been made by Professor Cantacuzino, who in 1933, at the second congress, announced that he had induced the government to grant all the net revenue of the state lotteries to the antituberculosis league. Then Cantacuzino took into his hands the organization of a nation-wide movement. He worked with great energy, but scarcely was he ready with the preparatory work when death overtook him. His work is being continued by C. Dimitriu and F. Costinescu, present minister of public hygiene, who convoked a committee of university professors to prepare the draft of a bill, which has been referred to the chamber of deputies.

The league in a short time made an immense advance in tuberculosis prophylaxis. Now it is in position to erect antituberculosis dispensaries in the larger towns of Rumania and to organize lectures for the rural population. Financial support is on the increase. While the state lotteries allotted the league 25,000,000 lei (about \$160,000) in 1933, the subsidy from the same source was 65 million lei in 1934 and will amount to 72 million this year, to which the ministry of public health adds 40 millions. In the last two years the league has estab-

lished sixteen new institutes. Beside these, it makes provision for every county hospital to have its own tuberculosis section and also for erecting three sanatoriums in the provinces of Muntenia, Banate and Oltenia. In addition the foundation of a sanatorium in Bugas, on the coast of the Black Sea, will be laid in September and an isolation hospital in Erbiceni and Vorniceni will be built.

The third congress was held in Jassy, July 16-19, in the National Theater. The opening speech was by Professor Olteanu, who eulogized the four leaders of the fight against tuberculosis, who have already died. These were Cantacuzino, Bals Gheroghe, Petrini and Radovici. Dr. Costinescu, minister of public health, then gave an account of the work of the league and sketched its future plans. Among the papers on the scientific program was one by T. Irimescu on the early diagnosis of tuberculosis. He said that by modern methods it is possible to diagnose pulmonary tuberculosis at such an early stage as to suggest the possibility of full recovery. Professor Balceanu sketched the importance of the dispensaries in Rumania, in which country the intelligence of the rural population is lower than in the western countries. Among such people the instruction given by the dispensaries in prophylaxis and treatment is inestimable.

On the second day, Balanescu, Daniello and Theodoreanu discussed the present state of gold therapy. Having ample personal experience, their presentation was valuable in this much disputed therapeutic method.

As indications for gold therapy they accept those given by Léon Bernard, the French apostle of gold therapy. The contraindications are general debility, hepatic insufficiency, renal disease and advanced intestinal lesions. They prefer to give small doses. They dissolve the gold preparation in calcium gluconate, which increases the tolerance. If the treatment is individualized and given under continuous clinical and laboratory control in well selected cases, chrysotherapy may favorably modify the course of certain pulmonary lesions.

The third day was devoted to climatotherapy. Rumania abounds in ideal climatic resorts. Marius Sturza read a paper on climatotherapy. It is a pity that as yet there are only a few well equipped sanatoriums, but if sufficient support should be granted by the government for erecting sanatoriums on sites magnificently endowed by nature, Rumania might have first place in attracting foreign patients. To this end, Rumanian universities should teach climatotherapy as a special subject and only such physicians should be engaged as are specialists in the treatment of tuberculosis and in climatotherapy. The observation of this rule would immensely add to the reputation of every sanatorium. Rumania is fortunate, Dr. N. Vladescu said, in having alpine, subalpine, subtropical and dry subtropical climates, high altitudes and sea coast resorts.

Between the sessions the members of the congress visited the medical institutes of Jassy—the faculty of medicine of the university, the tuberculosis dispensaries and the isolation hospital for contagious diseases. Excursions were arranged to some climatic resorts. The city magistrate entertained the guests with banquets, and a ball was given in the picturesque ballroom of the government building.

Foundation of an Orthopedic Society

Prior to the war only three medical societies existed—the Bucharest Medical Society, the Bucharest Surgical Society and the Jassy Medical Society. At present the number of scientific medical societies is sixteen. The latest addition is the *Societatea Romana de Ortopedie*, which was founded May 26, with thirty members. The president of the society is Dr. A. D. Radulescu, director of the Maria Regina Hospital. The honorary president is Prof. G. Balacescu, dean of the faculty of medicine of the Bucharest University.

Marriages

ROBERT FULTON CARMODY to Miss Lucy Mae Lawrence, both of Brookline, Mass., at Wolfboro, N. H., August 17

CLARENCE IVANHOE BUTTE JR. Matoaka, W. Va., to Miss Ruby Binford Hudson of South Hill, Va., June 15

CHARLES NEIL LACFRSON Charleston, W. Va., to Miss Susan Elizabeth Henderson of Milford, Va., June 15

JAMES B. WOODS JR., Chinking Kiangsui, China, to Miss Elizabeth Blaine of Hanchow, June 22

GEORGE HATCHER SNEAD, Richmond, Va., to Mrs. Elizabeth Simmerman Huff of Pulaski, August 17

OLLIE ALLISON RYDER Alexandria, Va., to Miss Elinor Temple Hill of Richmond, July 6

LEWIS LITTLEPAGE JR., Norfolk, Va., to Miss Eleanor Mattingley of Remington, June 29

CHARLES MORRIS NELSON to Miss Charlotte Mercer Purcell, both of Richmond, Va., July 16

FRANK H. BOYD to Miss Helen Rowe, both of Enterprise, Ala., July 16

Deaths

Joseph Clarence Keeler, Philadelphia, Jefferson Medical College of Philadelphia, 1896, professor of otology at his alma mater, member of the American Academy of Ophthalmology and Oto-Laryngology, the American Laryngological, Rhinological and Otological Society and the American Otological Society, fellow of the American College of Surgeons, served during the World War, on the staffs of the Pottstown (Pa.) Hospital, the Newcomb Hospital, Vineland, N. J., and the Germantown Hospital, aged 64, died, September 17, in the Jefferson Hospital, of coronary occlusion

John Ferdinand Morse of Nevada, Iowa, American Medical Missionary College, Chicago, 1899, L.R.C.P., Edinburgh, L.R.C.S., Edinburgh, L.R.F.P.S., Glasgow, 1910, fellow of the American College of Surgeons, at one time connected with the U. S. Public Health Service, for many years on the staff of the Battle Creek (Mich.) Sanitarium, and formerly superintendent of the Hinsdale (Ill.) Sanitarium, aged 63, medical superintendent of the Iowa Sanitarium and Hospital, where he died, August 8, of cerebral hemorrhage

Edward John Meyer, Buffalo, University of Buffalo School of Medicine, 1891, member of the Medical Society of the State of New York, professor of surgery, emeritus, at his alma mater, fellow of the American College of Surgeons, president of the board of managers of the Buffalo City Hospital, consulting surgeon to the Emergency Hospital of the Sisters of Charity, Deaconess Hospital and the Millard Fillmore Hospital, aged 66, died, September 13, of cerebral hemorrhage and cardiovascular disease

George Joseph McKee of Pittsburgh, Harvard University Medical School, Boston, 1906, member of the American Academy of Ophthalmology and Oto-Laryngology, fellow of the American College of Surgeons, on the staffs of the Columbia Hospital, Wilkensburg, Pa., and the Allegheny General Hospital, aged 55, died, August 15, in Point Chautauqua, N. Y., of coronary sclerosis and edema of the lungs

Ernest Russell Kelsey of Albuquerque, N. M., Maryland Medical College, Baltimore, 1901, member of the Connecticut State Medical Society, fellow of the American College of Surgeons, served during the World War, formerly on the staffs of the Charlotte Hungerford Hospital, Torrington, Conn., and the Litchfield County Hospital, Winsted, Conn., aged 61, died, June 26, of coronary thrombosis

Isaac Louis Polozker of Detroit, Detroit College of Medicine, 1897, professor of psychiatry at his alma mater, member of the American Psychiatric Association, fellow of the American College of Physicians, on the staffs of St. Mary's, Providence, Eloyse and Receiving hospitals, director of the psychopathic clinic of the Recorder's Court, aged 61, died, August 21, of coronary thrombosis

John B. Brickell of Emporia, Kan., University of Tennessee Medical Department, Nashville, 1893, member of the Associated Anesthetists of the United States and Canada, past president and secretary of the Lyon County Medical Society, on the staffs of the Newman Memorial County Hospital and St. Mary's Hospital, aged 71, died, August 31, of coronary thrombosis

Charles F. Unterkircher, Saline, Mich., Eclectic Medical Institute, Cincinnati, 1886, member of the Michigan State Medical Society, formerly member of the school board, aged 76, died, July 18, in the University Hospital, Ann Arbor, of carcinoma of the prostate and ascending pyelonephritis

Stanley A. E. Brallier of Conemaugh, Pa., Medical-Chirurgical College of Philadelphia, 1899, formerly member and president of the board of health of Conemaugh, aged 66, died, August 29, in the Conemaugh Memorial Hospital, Johnstown, of cardiovascular disease and coronary thrombosis

Lewis Mann Silver, New York, Bellevue Hospital Medical College, 1885, member of the Medical Society of the State of New York, fellow of the American College of Physicians, on the courtesy staff of the Babies' Hospital, aged 75, died, August 14, of a fractured skull, as the result of a fall

Byron Corydon Eades of Conneaut, Ohio, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1900, past president and secretary of the Ashtabula County Medical Society, on the staff of the Brown Memorial Hospital, aged 58, died, July 29, of chronic myocarditis

Oliver H. Jackson of Meadville, Pa., Marion-Sims-Beaumont Medical College, St. Louis, 1902, past president of the Crawford County Medical Society, on the staff of the Meadville City Hospital, aged 60, died suddenly, July 23, of cerebral hemorrhage, while on a business trip in Warren

Clarence Bartlett, Philadelphia, Hahnemann Medical College of Philadelphia, 1879, professor emeritus of medicine at his alma mater, formerly on the staffs of St. Luke's Hospital, Children's Hospital and the Abington (Pa.) Memorial Hospital, aged 77, died, August 27, of heart disease

Max Dreyfoos of Cincinnati, Medical College of Ohio, Cincinnati, 1902, formerly assistant professor of pediatrics, University of Cincinnati College of Medicine, on the staff of the Jewish Hospital, aged 58, died, September 3, of malignant hypertension, chronic nephritis and uremia

James Harrison O'Neil, Mooers, N. Y., University of Vermont College of Medicine, Burlington, 1890, health officer of Mooers, for two years county school commissioner, aged 68, died, August 26, in the Champlain Valley Hospital, Plattsburg, of cerebral hemorrhage

William Carter Person, Orlando, Fla., Missouri Medical College, St. Louis, 1873, member of the Florida Medical Association, past president of the Orange County Medical Society, Confederate veteran, aged 89, died, September 14, of coronary sclerosis and arteriosclerosis

Cyrus Alvin Gardner of Kendallville, Ind., Rush Medical College, Chicago, 1902, past president of the Noble County Medical Society, on the staff of the Lakeside Hospital, aged 60, died, August 26, of coronary thrombosis, arteriosclerosis and aortic aneurysm

Frank Ballard Hunt, Fairfax, Vt., University of Vermont College of Medicine, Burlington, 1913, member of the Vermont State Medical Society, aged 49, died, July 12, in St. Albans (Vt.) Hospital, of mesenteric embolism, cholecystitis and cholecystectomy

Thomas W. Toler, Astoria, Ill., Northwestern University Medical School, Chicago, 1892, aged 64, died, July 10, in the Peoria (Ill.) State Hospital, of bronchopneumonia, following a fracture of an arm received in a fall and burns incurred the following day

William Y. MacKenzie, Weatherford, Texas, Pulte Medical College, Cincinnati, 1881, New York Homeopathic Medical College and Flower Hospital, 1911, member of the State Medical Association of Texas, aged 74, died, July 31, of Parkinson's disease

Marcus Seidmann of Newark, N. J., Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, Germany, 1886, on the staffs of St. James Hospital and the Newark Eye and Ear Infirmary, aged 75, died, September 6, of heart disease

Harry Merritt Bradley, Manchester, Iowa, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1894, member of the Iowa State Medical Society, health officer of Manchester, aged 66, died, August 11

Benno George Troidle, Albany, N. Y., Albany Medical College, 1898, member of the Medical Society of the State of New York, aged 58, died, August 5, in St. Peter's Hospital, of intraventricular hemorrhage and pyelonephrosis

Francis Henry Callow, Mount Morris, Mich., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1889, member of the Michigan State Medical Society, aged 82, died, August 20, of cerebral hemorrhage

Ira A Keiter, Wiconisco, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1897, aged 72, died, July 26, in the Shamokin (Pa.) State Hospital of shock, following an operation for strangulated hernia

John Nixon, Farmland, Ind., Medical College of Ohio, Cincinnati, 1882, member of the Indiana State Medical Association, aged 76, died, August 24, of a hemorrhage due to a skull fracture received in a fall

Alden Alguire ♂ Belvidere, Ill., Rush Medical College, Chicago, 1897, member of the Radiological Society of North America, past president of the Boone County Medical Society, aged 70, died, August 23

Edward James Wilson, Columbus, Ohio, Long Island College Hospital, Brooklyn, 1879, past president of the board of education, aged 79, died, August 28, of myocardial insufficiency and pulmonary edema

Russell Edward Phillips ♂ Warsaw, Ind., Indiana University School of Medicine, Indianapolis, 1929, secretary of the Kosciusko County Medical Society, aged 30, died, August 29, of bronchopneumonia

Gebhard L Ullman, Albany, N. Y., Albany Medical College, 1871, member of the Medical Society of the State of New York, aged 84, died, August 9, of angina pectoris and chronic myocarditis

Van Buren Thorne ♂ New York, New York University Medical College, 1896, aged 65, died suddenly, August 1 of angina pectoris while spending his vacation at Point Lookout, Long Island N. Y.

Arthur Alonzo Stern, Sacramento, Calif., University of California Medical Department San Francisco 1896, member of the California Medical Association, aged 68, died, July 11, of myocarditis

Hamilton Forline, Los Angeles, Northwestern University Medical School, Chicago, 1893, member of the California Medical Association, aged 70, died, July 6, of nephritis and arteriosclerosis

Robert F McNally ♂ Brooklyn, Long Island College Hospital, Brooklyn, 1928, on the staffs of the Bethany Deaconess Hospital and St. Mary's Hospital, aged 32, died, August 21, of endocarditis

Liston Paine, Flushing, N. Y., University of Pennsylvania School of Medicine, Philadelphia, 1910, served during the World War, aged 53, died suddenly, September 1, in the Flushing Hospital

Edward Horace Cleveland, Middleboro, Mass., New York Homeopathic Medical College and Flower Hospital, 1915, also a clergyman, aged 79, died, August 5, of carcinoma of the cervical glands

William Townsend Brown ♂ Valmora, N. M., Hahnemann Medical College and Hospital, Chicago, 1893, medical superintendent of the Valmora Sanatorium, aged 65, died, August 29

Thomas Deveaux Hall, Saulsbury, Tenn., Tulane University of Louisiana Medical Department, New Orleans, 1908, aged 56, died, July 14, of chronic nephritis and mitral insufficiency

Henry Albert Johnson, Glendale, Calif., John A. Creighton Medical College, Omaha, 1908, served during the World War, fellow of the American College of Surgeons, aged 49, died, July 17

Clarence Hopkins Mercer ♂ Ansonia, Conn., Maryland Medical College, Baltimore, 1905, aged 62, died August 13 in the Griffin Hospital, Derby, following an operation for appendicitis

Karl Herz, Chicago, Deutsche Universität Medizinische Fakultät, Prague, Austria, 1884, an affiliate Fellow of the American Medical Association, aged 75, died, September 18

George Stephen Stell, Brownsville, Texas, Tulane University of Louisiana Medical Department, New Orleans, 1889, aged 68, died, August 13, of myocarditis and chronic nephritis

Clayton Eugene Wheeler, Los Angeles, University of Alabama School of Medicine, 1912, aged 46, was shot and killed, August 4, when his shotgun accidentally exploded

Earl Lester Kirk, Louisville Ky., University of Louisville School of Medicine, 1929, aged 31, died, August 13 in the Waverly Hill (Ky.) Sanatorium, of military tuberculosis

Charles E Smith, Ledger, N. C., University of Tennessee Medical Department Nashville, 1882, formerly county coroner and county health officer, aged 70, died, August 16

Howard Herman Heinrich ♂ Pittsburgh, University of Pittsburgh School of Medicine, 1912, aged 51, was drowned, August 4, in Lake Erie when his rowboat capsized

Frank De Witt Weldon, Grand Harbour, N. B., Canada, Maryland Medical College, Baltimore, 1912, aged 60, died, May 20, of an overdose of chloral hydrate

Rene Raymond, Ste. Scholastique, Que., Canada, Laval University Faculty of Medicine, Quebec, 1926, aged 34, died, July 10, of tuberculosis of the lungs

Charles Parshall Smith Jr ♂ Chester, N. Y., Long Island College Hospital, Brooklyn, 1892, aged 64, died suddenly, August 14, of cerebral hemorrhage

Eugene Robert Hynard, Cedar Grove, N. J., Baltimore University School of Medicine, 1903, aged 63, died, August 4, of arteriosclerosis and endocarditis

Otto Floyd Rogers, Bloomington, Ind., University of Louisville (Ky.) School of Medicine, 1900, aged 63, died, August 30, of cirrhosis of the liver

Allan Beetern Dalton, Chester, Pa., Hahnemann Medical College and Hospital of Philadelphia, 1921, aged 41, was found dead in a swimming pool, July 11

Thomas M Ryall, Pittsburgh, Jefferson Medical College of Philadelphia, 1883, aged 73, died, August 9, of acute dilatation of the heart and cholecystitis

Paul Richard Oeser, Lawrence, Mass., Boston University School of Medicine, 1904, aged 56, was found dead in bed, August 2, of cerebral hemorrhage

George Edgar Bothwell, Mayport, Fla., Atlanta College of Physicians and Surgeons, 1903, aged 59, died, September 9, of a self-inflicted bullet wound

Loranza Frank Jones, Richmond, Ky., Louisville and Hospital Medical College, 1908, aged 53, died suddenly, August 1, of heart disease and pneumonia

Frederick Harry Heck ♂ Pittsburgh, Western Pennsylvania Medical College, Pittsburgh, 1897, aged 65, died, July 25, of carcinoma of the prostate

Wenceslaus James Stech ♂ Council Bluffs, Iowa, John A. Creighton Medical College, Omaha, 1913, aged 46, died, August 22, of heart disease

John R Harrold, Hartford City, Ind., Medical College of Fort Wayne, Ind., 1881, Civil War veteran, aged 87, died, August 24, of epithelioma

Mahlon Mills Wall, Marion Ind., Hahnemann Medical College and Hospital, Chicago, 1881, aged 86, died, August 7, of cerebral hemorrhage

Nicholas Albrecht ♂ Pittsburgh, Western Pennsylvania Medical College, Pittsburgh, 1901, aged 56, died, August 6, of cirrhosis of the liver

Samuel Henry Kanner, New York, Columbia University College of Physicians and Surgeons, New York, 1905, aged 53, died, September 3

John Eugene Folsom, Oakland, Calif., George Washington University School of Medicine, Washington, D. C., 1916, aged 56, died, July 31

J. W. Burns, Appleton, Wis., Rush Medical College, Chicago, 1870, aged 89, died, August 14, in Two Harbors, Minn., of pneumonia

Elisha C Pace, Osawatimie, Kan., American Medical College St. Louis, 1888, aged 73, died, July 31, of chronic valvular cardiac disease

Leslie A Blankenbaker, Jeffersontown, Ky., Louisville Medical College, 1892, aged 65, died, August 14, of cerebral hemorrhage

George Washington Lutz, Indianapolis, Medical College of Ohio, Cincinnati, 1870, aged 87, died, August 21, of myocarditis

Alva Jones, Sapulpa Okla., Kentucky School of Medicine, Louisville, 1892, aged 67, died, August 1, in a local hospital

Theodore Winfield Workman, Akron, Ohio, Medical College of Ohio, Cincinnati, 1879, aged 79, died, September 1

Charles Wesley Wright ♂ Fort Payne, Ala., Medical College of Alabama, Mobile, 1893, aged 69, died, July 13

Peter James McGrath, Lynwood, Calif., Albany (N. Y.) Medical College, 1895, aged 62, died, July 2

James D. M. Powell, Alexander, Ark. (licensed in Arkansas in 1903), aged 77, died, August 5

Albert Bird Royal, Pasadena, Calif., Rush Medical College, Chicago, 1877, aged 81, died, July 23

Thomas Slater Walker, Dallas, Texas, Dallas Medical College, 1903, aged 77, died, July 17

Bureau of Investigation

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE The abstracts that follow are given in the briefest possible form (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the composition, (4) the type of nostrum, (5) the reason for the charge of misbranding and (6) the date of issuance of the Notice of Judgment—which may be considerably later than the date of the seizure of the product]

Nu Vim—Nu Vim Chemical Co Port Gibson Miss Composition Essentially epsom salt an iron compound a laxative plant drug extract alcohol (17 per cent) and water For constipation indigestion blood stomach kidney and liver disorders Fraudulent therapeutic claims—[N J 22375 November 1934]

Seven A's Pain Killer—Clyde Collins Chemical Co Memphis Tenn Composition Essentially wintergreen and a light petroleum distillate such as gasoline Fraudulent therapeutic claims—[N J 22327, November 1934]

Gly Tone Pain Killer—Clyde Collins Chemical Co Memphis Tenn Composition Essentially wintergreen (3 per cent) dissolved in a petroleum distillate such as gasoline Fraudulent therapeutic claims—[N J 22327 November 1934]

Ru Co Skin Remedy—Clyde Collins Chemical Co Memphis Tenn Composition Essentially wintergreen (11.6 per cent) incorporated in petrolatum For pimples bumps itch eczema, old sores etc Fraudulent therapeutic claims—[N J 22327 November 1934]

Wyeth's Wycones—John Wyeth & Bro Philadelphia Composition Essentially oxyquinoline sulphate 1 grain boric acid 5 grains, salicylic acid, 0.9 grain and cocoa butter 32 grains per cone For leukorrhea and other female disorders Fraudulent therapeutic claims—[N J 22329 November 1934]

Skin Ease—Osteen & Co Inc. Orlando Fla Composition Essentially salicylic acid (22.5 per cent) in an ointment base including lard For eczema itch piles blistered feet etc. Fraudulent therapeutic claims—[N J 22329 November 1934]

Keep a Malt—Helpamalt Co New York Composition Ground vegetable material, starch malt extract and 14.9 per cent of ash (mineral matter) including compounds of copper manganese iron magnesium calcium potassium silica phosphorus and iodine Misbranded because of false and misleading claims for composition and also because of false and fraudulent therapeutic claims—[N J 22338 November 1934]

(Penslar) Tonic Hypophosphites Compound—Penslar Co Inc St Louis Composition Essentially calcium potassium iron manganese quinine and strychnine salts principally hypophosphites sugar and water For run-down conditions etc Fraudulent therapeutic claims—[N J 22342 November 1934]

Sweetrest Tablets—Sweet Rest Co St Louis Evanston Ill and Cedar Rapids Iowa Composition 5 grain aspirin tablets For pains fever lumbago toothache earache la grippe rheumatism etc Fraudulent therapeutic claims—[N J 22345 November 1934]

Naturade Tablets—Sweet Rest Co St Louis Evanston Ill and Cedar Rapids Iowa Composition Essentially phenolphthalein plant drug extracts including nux vomica and a laxative with calcium sulphate For stomach liver kidney and bowel disorders dizziness malaria rheumatism skin diseases etc Fraudulent therapeutic claims—[N J 22345 November 1934]

Granny's Cough Syrup—Hennafoam Corp New York Composition Plant drug extracts potassium bromide an ammonium compound, a chloride a small quantity of a sulphate chloroform (0.36 minum per fluid ounce) menthol gum sugars and water Misbranded because statement on label Compound Syrup of Flaxseed Rock Candy and Licorice Mentholated was false misbranded also because chloroform percentage not declared misbranded further because of fraudulent therapeutic claims—[N J 22346 November 1934]

Bostwick's White Pine Cough Syrup—Bostwick Bros Atlanta Ga Composition Essentially plant drug extracts including an alkaloid-bearing drug and wild cherry chloroform alcohol and water Misbranded because ingredients not derived from white pine and alcohol and chloroform percentages not declared misbranded further because of fraudulent therapeutic claims—[N J 22348 November 1934]

Jopp's Salakine Tablets—Jopp's Drug Co Inc Buffalo Adulterated because it contained less acetphenetidin and acetanilid per ounce than claimed misbranded because of false and misleading statements regarding amounts of these drugs present—[N J 22355 December 1934]

Corax Tablets—McKesson & Robbins, Inc Bridgeport, Conn Composition In each tablet 0.96 grain of acetanilid with camphor a bromide of a cinchona alkaloid and a laxative. Misbranded because label did not declare amount of acetanilid present—[N J 22357 December 1934]

O J's Beauty Lotion—O J's Beauty Lotion Co Inc Shreveport, La Composition Essentially water alcohol (32.8 per cent) and small amounts of mercuric chloride zinc sulphate salicylic acid and witch hazel For pimples liver spots, eczema dandruff ringworm and tetter Fraudulent therapeutic claims—[N J 22362 December 1934]

Musbro Skin Ointment—Standard Veterinary Products Co New York Composition Petrolatum sulphur and a lard like material For eczema Fraudulent therapeutic claims—[N J 22363 December 1934]

Watkins' Liniment—Watkins Medicine Co Cherokee Kan Composition Turpentine oil, eucalyptol, small amounts of wintergreen with chloroform alcohol (62 per cent by volume) and water Fraudulent therapeutic claims—[N J 22365 December 1934]

Earle's Palatable Hypo Col—Earle Chemical Co and E I Runner Co Inc Wheeling W Va Composition Calcium manganese and sodium hypophosphites ferric citrate, quinine strychnine alcohol sugar water and flavoring Misbranded because of false claim on label that it contained gaduol a cod liver extract and because of fraudulent therapeutic claims as a tonic—[N J 22370 December 1934]

Earle's Anti Gas Tablets—Earle Chemical Co and E I Runner Co, Inc Wheeling W Va Composition Calcium and magnesium carbonates sugar and peppermint oil For indigestion, auto intoxication acidosis etc Fraudulent therapeutic claims—[N J 22370 December 1934]

Noz Eoz—Strong's Laboratories Portland Ore Composition Essentially boric acid (65.8 per cent) starch (29.5 per cent) and traces of camphor menthol and oxyquinoline sulphate. For nose and throat disorders asthma hay fever catarrh etc Fraudulent therapeutic claims—[N J 22371 December 1934]

Pineforus—Pineforus Co Chicago Composition Essentially cotton balls saturated with volatile oils including menthol camphor and eucalyptol (9 per cent) with 91 per cent of mineral oil Pineforus No 1 for hay fever and asthma, insomnia whooping cough croup etc, Pineforus No 2 for catarrh bronchitis la grippe influenza Fraudulent therapeutic claims—[N J 22372 December 1934]

Acco Aspirin Tablets—Feldman Martin Co New York For painful periods toothache earache headache rheumatism lumbago sciatica etc. Fraudulent therapeutic claims—[N J 22374 December 1934]

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address but these will be omitted on request.

USE OF DIPHTHERIA TOXOID

To the Editor—There is more or less confusion as to immunization against diphtheria. Having just read an editorial comment and noting only 79.8 per cent of negative Schick tests with one dose of alum precipitated toxoid I wonder why two doses of the alum precipitated toxoid should not be given, to get something near the negation that should be obtained. Three doses of the regular toxoid and from 95 to 97 per cent of negative Schick tests would seem to be much superior to the one dose of alum precipitated toxoid. Please comment on this very important problem.

CHARLES H EMERY MD Bedford Ind

ANSWER—About a year ago (*Am J Pub Health*, November 1934) McGinnes, Stebbins and Hart reported on their experience with alum precipitated toxoid. Seventeen hundred and sixty-five Schick positive individuals were given one dose of 0.5 or 1 cc of alum precipitated toxoid of a potency of from 125 to 315 flocculating units per cubic centimeter and retested two months later, 94.4 per cent of these were found to have been rendered Schick negative. Among 1,026 individuals originally Schick positive, ranging in age from 4 years upward, 96.3 per cent were Schick negative two months after receiving one dose of alum precipitated toxoid.

In many instances there have been reports showing that from 98 to 100 per cent of Schick positive children were rendered Schick negative within two to six months after receiving 1 cc of alum precipitated toxoid given subcutaneously.

Park has stated that this procedure can be relied on to produce a Schick negative condition within two months in 95 per cent of the children so treated.

It is now more or less generally agreed that a single dose of alum precipitated toxoid administered subcutaneously is as efficient as two doses of untreated toxoid, provided the alum precipitated toxoid is of sufficient potency.

From the foregoing it is obvious that a single injection for the purpose of diphtheria immunization has many advantages over former procedures in which two or three administrations of the immunizing agent were given.

NORMAL PHYSIOLOGIC STANDARDS OF BLOOD PRESSURE VISION HEARING AND ALBUMINURIA

To the Editor—In Queries and Minor Notes in THE JOURNAL, June 15 page 2202 under 'Normal Blood Pressure' a table appears with the statement "The most extensive and accurately determined averages of normal are those prepared for and by life insurance underwriters." May I ask that you advise me the exact source with reference that I may read the data connected with the original table? I am at the present time engaged in the preparation of a memorandum for use of doctors in various parts of the country who make physical examination of employees wherein we are giving service to the assured, our policy holder, in completing arrangements for physical examination. The most important purpose of these studies is the detection of disease conditions of such minor consequence as yet that they may be corrected and the placement of men in occupations wherein the hazard will not be too great because of some physical disability which they have. My memorandum is to serve in the discussion with the doctors concerning the common abnormalities found to be present and setting up some standard which they may use of normal variation the limit beyond which medical study should be undertaken to determine the significance of the finding and the danger limit indicative of a serious medical condition warranting postponement of employment until medical study is completed with classification of employment depending on the recommendation of the doctor. You will agree that such standards have not been widely disseminated, yet the examining doctor is necessarily faced with the problem of deciding for himself in the consideration of each employee whom he studies. Some uniformity between examiners is necessary as indicated by the exceedingly wide variation shown between their conclusions. As one of the factors I have considered blood pressure based on a rule that the systolic blood pressure is average normal of 120 at the age of 20 with an increase of one half point for each additional year and that the diastolic blood pressure is 80 at the age of 20 with an increase of one-fourth point for each additional year. I have considered that normal limits extend from 10 per cent below to 10 per cent above the calculated figure for a given age and that danger limits are from 20 per cent below to 40 per cent above the average calculated figure. I have considered that normal limits of diastolic pressure are from 10 per cent below to 10 per cent above the average calculated figure and that danger limits are beyond 20 per cent below and 20 per cent above the average calculated figure. Thus there is a slight variation from those which you have quoted. I do not claim authority for mine beyond my experience and conversation with various doctors throughout the country. If your figures are based on the collective judgment of a number of competent men it would be much wiser that I use them than mine. I would therefore request your advice.

Vision—For the purpose of the same memorandum can you advise me what degree of departure in distant vision from 20/20 may be ignored on physical examination with what reading in either eye should the patient have refraction and what limit of vision in either eye should be accepted in driving trucks or stages?

Hearing—For the same purpose, what deficiency in hearing from 20/20 should warrant sending a patient to an aurist for study and what limit should be considered safe in such occupation as driving trucks and stages?

Urine—For the same purpose what limit for albumin and sugar in nulligrams per hundred cubic centimeters may be disregarded on routine physical examination?

R N GRAY MD Hartford Conn

ANSWER—The tabulation that appeared in the reply to the query quoted was derived from data in the Proceedings of the Association of Life Insurance Medical Directors of America. These proceedings report the cooperative studies of the medical directors and actuaries of the majority of the American life insurance companies and represent the results of many thousands of examinations of presumably normal, healthy men, all over the country and from all walks of life. Symonds reported such investigations in these Proceedings in 1923 and also in THE JOURNAL, Jan 27, 1923, page 232. The data in the table, however, are much more recent. The increase in normal systolic arterial tension in these figures is less than 0.5 mm for each year from age 20 onward, in fact, there is but 1 mm rise between the ages 20 and 30. The diastolic tension increases even more slowly. The normal limits are considered to be within plus and minus 10 mm. (not per cent) of the statistical average normal systolic tension. Any abnormality beyond these limits should be considered as suggestive of diseases, especially if observed on repeated examinations. The upper range of normal variation for the diastolic tension is best considered to be even less 5 mm above the statistical norm. The maximum normal diastolic tension irrespective of age, should not exceed 90 mm of mercury. The diastolic tension, which should be read at the fourth phase and not at the fifth, is much more significant as an index to the state of the arterial tone than the systolic tension. It is also notably less fluctuant with emotional stress. What were formerly considered insignificant increases in the diastolic tension are now being viewed with alarm by life insurance medical directors, especially when observed in younger applicants for insurance (Stieglitz E J Abnormal Arterial Tension, New York, National Medical Book Company, 1935). It should be emphasized that hypertensive arterial disease begins insidiously and asymptotically and that in

many respects the earlier the age of onset of hypertension, the more severe and rapid is the course of the disease. This is not only true of hypertensive arterial disease but also characteristic of the other degenerative disturbances of later life, such as diabetes, gout and nephritis. In the problem as outlined in the query, the responsibility is not limited to the discovery of existing disease but includes detection of disease potentialities that notably predispose to future disability.

In connection with the criteria of normal and/or safe vision, it may be said that vision less than 20/20 in either eye should indicate refraction of the applicant's eyes. With corrective lenses the minimum acceptable vision is 20/30 in either eye, such vision in both eyes would not be safe for drivers of trucks or busses. Notable disparity of vision of the two eyes indicates the need for further investigation, and loss of one third of the field of vision in either eye contraindicates employment in the occupations mentioned.

The simplest criterion of normal hearing is the ability to hear distinctly the whispered voice at 20 feet in a quiet room with either ear separately. If the whispered voice is not heard at 15 feet or less, further study of the impairment should be required. Clark and Drinker (Industrial Medicine, National Medical Book Company, 1935) suggest using a dollar Ingersoll watch at 36 inches as a measure of normal hearing.

Not more than 10 mg of albumin per hundred cubic centimeters of urine can be disregarded. The Kingsbury Clark sulphosalicylic acid method of quantitative albumin determination is the most rapid, accurate and economical procedure for the type of examinations contemplated, the standards for this test may be obtained from the Fales Chemical Company, Cornwall Landing N Y. More than 10 mg of protein per hundred cubic centimeters of urine warrants further study, directed particularly toward the elucidation of the cause of the proteinuria. If it should be convincingly proved to be wholly due to orthostatic or postural albuminuria, the risk of acceptance for employment is entirely justified. Should the proteinuria be associated with pyuria, employment should be postponed until the pyuria is entirely eradicated, whether it is due to pyelitis cystitis or gonorrheal urethritis. Hematuria occurring with the proteinuria warrants rejection for employment. Glycosuria exceeding 20 mg per hundred cubic centimeters of urine should cause rejection for employment or at least comprehensive study.

It is felt that such industrial employment examinations have been too lax in their requirements in the past. In positions of responsibility where the lives of the employee and others are in possible jeopardy as in driving motor vehicles, physical fitness should be essential.

INTERFERIN

To the Editor—Should not something be said in THE JOURNAL about Interferin?

JOSEPH M JACKSON MD Pittsburgh

ANSWER—Interferin, "the first American made abortive paste," is said to be "an oil and fat free base containing iodine and iodine compounds, several astringents and antiseptics." A report by the Bureau of Investigation on Abortifacient Pastes (THE JOURNAL, June 11, 1932, p 2155) noted that a similar preparation, Provocol (sold in this country as Leunbach Paste), contained olive oil, cacao butter, potassium hydroxide, sodium hydroxide, iodine, potassium iodide, tincture of benzoin, tincture of myrrh, thymol and water. Wolf (Monatsschr f Geburtsh u. Gynäk 88 442 [Aug] 1931) claimed that another similar product, Interruptin (also cited in the report), was a soft paste containing iodine, thymol, camphor and the "active principles" of crocus, rosemary, eucalyptus, myrrh, "etc."

In a short period the use of abortifacient pastes by German physicians resulted in twenty-five deaths, two of which occurred a few minutes after the injection. Engelmann (Deutsche med Wchnschr 58 166 [Jan. 29] 1932, Zentralbl f Gynäk 56 119 [Jan 9] 1932) reviewed the dangers of using Interruptin and noted deaths due to fat and air embolism. Döderlein (cited by Riddell J Obst & Gynec Brit Emp 39 1 [No 1] 1932) questioned the validity of the cited cause of these deaths and indicated favorable results with Interruptin. Experimentally, poisoning from the paste itself has been noted by Kustner (Zentralbl f Gynäk 76 754 [March 19] 1932. D'Amour and Kiven (Am J Obst & Gynec 29 503 [April] 1935) reported six deaths among forty-four rats aborted with Leunbach Paste. These deaths appeared to be due to a generalized abdominal infection. D'Amour and Kiven found that either the iodine or the soap contained in the Leunbach Paste was an effective abortifacient in these animals.

Since Interferin contains iodine and other ingredients similar to those in Interruptin and Provocol, there would appear to be an equal danger in its use. The firm cites no bibliography in the Interferin folder.

ALCOHOL NEURITIS WITH BULBAR SYMPTOMS

To the Editor—A man aged 52, a Russian laborer in the coal mines has painful erections as a result of fibrous infiltration of the corpora cavernosa (this symptom has no bearing on the neurologic condition). During the history and physical examination the following pertinent points were disclosed. The family history is irrelevant. The patient was quite a heavy drinker previous to 1931 since then he has been an abstainer. There is no history of venereal disease. There are continuous mild frontal headaches and tinnitus aurium some shortness of breath difficulty in swallowing and difficulty in talking for the past four years inability to walk without supporting himself for a similar period he has lost 50 pounds (23 kg.) during the past four years. The onset of the neurologic symptoms dates back to his first admission to the hospital in December 1930. At that time he complained of diarrhea and pain in the stomach and pains in the soles of the feet and the calves of the legs. The condition lasted until the following March. He was able to walk at this time although he noted some difficulty. A rather poor physical examination reported on the chart stated that all tendon reflexes were absent at this time. This is the only pertinent statement in the history. He was returned to the hospital one month later. This time he came in with second degree burns of his ankles. He stated that he felt the usual pain and paresthesia in his feet. He soaked his feet in warm water and felt that it was not warm enough so he poured some scalding hot water over his legs and states that he did not feel the scald at all and at this time he became paralyzed in both lower extremities and in his right arm. He was brought into the hospital in this condition. There was also complete loss of speech lasting for three months. There was no loss of consciousness. This paralysis remained from April of one year until October of the following year when he was left with the condition as presently to be described. With the onset of this paralysis he also noted difficulty in speech and deglutition. The patient is fairly intelligent and talks as though his tongue were swollen. The cardiorespiratory gastrointestinal and genito-urinary systems offer no symptoms bearing on the neurologic condition. Neurologic examination shows that the patient cannot walk unless he supports himself with his hands. There is some wasting of the musculature of the ankles and calves. The patient is able to rise on his toes and heels when supported. Ankle clonus is absent the achilles reflex as well as all the other deep tendon reflexes is absent. The Babinski sign is negative. The cremasteric reflex is considerably suppressed. The abdominal reflex is present. He has good motor power in his hands. The stereognostic sense is normal. There is no evidence of facial palsy. The tongue protrudes in the midline. There is no tremor or atrophy. The pupils are regular equal and of normal size they react to light and in accommodation. There is no nystagmus. Ophthalmoscopic examination shows a blanching of the temporal halves of both disks. There is no relaxation of the sphincters. Laboratory examination has given a negative blood Wassermann reaction on two occasions. The spinal fluid Wassermann reaction is negative in all concentrations. Cell count the colloidal gold test and the globulin are normal. Urinalyses and blood counts during all his admissions to the hospital have shown nothing significant. From the foregoing can you suggest a possible diagnosis or can you suggest any other study to help in arriving at the cause of this condition?

M D Pennsylvania

ANSWER—The wording of the question reads as if the neurologic complaints began before the patient abstained from alcoholic liquors. The condition described is apparently one of an alcoholic peripheral neuritis complicated by bulbar symptoms, which are probably due to lesions within the medullary nuclei. The recession of the peripheral nervous symptoms coincides with the usual course of alcoholic neuritis. The remnant of symptoms in the periphery and the disturbed functioning of the tongue suggests that some of the lesions have become permanent. Recent researches suggest that there is also a deficiency of vitamin B in the etiology of alcoholic neuritis and hence it is suggested that vitamin therapy be given.

FACIAL PALSY AFTER SKULL FRACTURE

To the Editor—What if anything can be done to improve a peripheral facial palsy following a fractured skull? Please omit name.

M D New York

ANSWER—The treatment of a peripheral facial palsy following a fractured skull depends on several factors the reaction of the involved facial muscles and nerves to the faradic and the galvanic current and the location and character of the lesion. A peripheral facial palsy in a fractured skull may be due to an injury of the facial nucleus in the pons or at any point in its path from the pons to the stylomastoid foramen. This lesion may be either edema compression, hemorrhage or actual severance of the nerve. Fortunately, in from 70 to 75 per cent of the cases this type of paralysis is amenable to medical and electrical treatment because it is due to edema or hemorrhage in the nerve. If the muscles and nerve of the involved side react to the faradic and the galvanic current, one may say that the paralysis will disappear in about six weeks with electrotherapy, that is, galvanism to the face three times weekly. If they do not react to the faradic but react abruptly or slowly to the galvanic current, one may say that the paralysis should disappear in from six to eight months with galvanic treatment to the involved side. If, however there is no reaction to either the faradic or the galvanic current, one may say that the facial

nerve is anatomically interrupted and that electrotherapy is of no value. In these cases, various anastomosing operations have been done. One may either do (1) an anastomosis with the cut ends of the facial nerve, (2) anastomosis of the facial and hypoglossal nerves or (3) anastomosis of the facial and spinal accessory nerves. Since it takes from ten to fourteen days for a peripheral nerve to degenerate, electrical examinations must be done from ten to fourteen days after the injury to the facial nerve.

PUPILLARY CHANGES AFTER DENTAL NERVE BLOCKING

To the Editor—It has recently been brought to my attention by two of our local dentists that they noticed certain pupillary phenomena following nerve blocking for extraction. One dentist has found an almost immediate dilatation of the pupil on the side of the injection when 1 cc of 2 per cent procaine hydrochloride solution was injected into the mandibular branch of the fifth nerve. Another dentist informed me that he has found it to occur after injection into the palatine branch of the second division. My purpose in writing is to learn if possible the exact mechanism that takes place. It is known that through anastomosis the fifth nerve is involved in the sympathetic fibers to the iris controlling the dilator muscles, but I would expect procaine injection to have the opposite effect. Whatever interpretation you should put on this I should be very glad to have in view of the fact that I am going to discuss pupillary changes at a medical meeting. Please omit name.

M D Minnesota

ANSWER—The dilatation of the pupil on the side of injection of procaine hydrochloride into the second or third divisions of the fifth nerve may have one of the following explanations. Infiltration into the mandibular or maxillary branches of the fifth nerve extends along the sheaths into the gasserian ganglion irritating the sympathetic fibers along the ophthalmic division of the fifth nerve and causing the pupil to dilate. Another explanation is that of Rochat, who obtained evidence of the existence of pupilloconstrictor fibers running in the fifth nerve of rabbits. Therefore paralysis will cause dilatation. On the other hand Magitot believes that vasodilator impulses known as antidromic are present in the fifth nerve. Stimulation causes constriction of the pupil as the result of engorgement of the capillaries in the iris, whereas paralysis would cause a vasoconstriction and dilatation of the pupil.

IMPEDANCE ANGLE TEST FOR THYROTOXICOSIS

To the Editor—I would appreciate any information you might be able to give me regarding the impedance angle test for thyrotoxicosis. I have at hand the prize essay for 1934 won by M A B Brazier Ph D London, England. Have there been any articles published since then? I am particularly interested in regard to any new information relative to the apparatus used in taking the impedance angle test.

V A KILLOAN M D Sandusky Ohio

ANSWER—Articles on the impedance angle test for hyperthyroidism appeared in the *Lancet* in 1934 (Brazier, M A B *Lancet* 1 125 [Jan 20] 1934. Holaday, E. R., and Smith, F E, *ibid* 2 139 [July 21] 1934). A paper by A C Van Ravenswaay, S Herty and G W Thorn of Boston, "Clinical Evaluation of Impedance Angle," was given at the annual meeting of the Association for the Study of Internal Secretions June 11, 1935. The American workers fail to corroborate the English observations. They found the value constant for an individual but contradicting. Brazier they observed that it would remain fixed while the metabolic rate was falling in hyperthyroidism or rising in treated hypothyroidism. The final report of this work will doubtless appear presently in *Endocrinology*.

LEUKOPLAKIA OF PENIS

To the Editor—A man aged 41 has leukoplakia of the penis of seven years duration. I would greatly appreciate your telling me what the latest treatment would be in such a case. Please omit name.

M D Michigan

ANSWER—Leukoplakia is not a disease entity, it is simply a condition of overgrowth of the superficial layers of the mucous membranes, a manifestation of chronic inflammation most often the result of repeated irritation. Some cases are analogous to the senile keratoses of the skin.

Leukoplakia, whatever its location is potentially dangerous for the patches, especially of the latter type, are prone to undergo carcinomatous degeneration. Actually, however, only a small percentage of the lesions do become malignant if they are carefully protected against repeated irritation. In cases in which there is activity, it is necessary that the lesion be thoroughly destroyed. This is best done by light thermocautery. Unfortunately treatment is not always successful for the lesions often recur.

In the case cited it would probably be best to take a conservative course. The patient has had the lesion for seven years and the probabilities are that he will have it for many years more without trouble. If there is irritation from phimosis or from any other source, that should be corrected. The patient should be examined from time to time, and later, should there be any evidence of degeneration, the lesion can be destroyed.

DETERIORATION OF MATERIAL FOR SCHICK TEST AND DIPHTHERIA IMMUNIZATION

To the Editor—I will appreciate it if you will supply me with some information, which I feel that it is important to have. Recently a detail man told me that oxygen destroys the efficacy of alum precipitated toxoid. Many physicians have been using the 10 cc vials and unnecessarily injecting air into the vial. If this statement is true many are giving their patients and themselves a sense of false security so far as protection against diphtheria is concerned. I should also like to know whether or not the same is true of Schick test material. We have had the experience in our county recently of three or four individuals contracting diphtheria shortly after they had a negative Schick test. I do not think this was the fault of the technic. If we are destroying the efficacy of the toxoid and the Schick test serum in this manner I think that we should know it so that we may better protect our patients by using individual packages for each patient. I will appreciate your setting me right in this matter.

ORVILLE BARBOUR, M.D. Peoria Ill

ANSWER—Material for the Schick test should be used the same day it is prepared. After dilution the toxin deteriorates rapidly, and results obtained with it become unreliable. It is likely that the negative Schick tests in persons who shortly afterward contracted diphtheria may be explained in this way. The undiluted toxin is much more stable and can be kept for some time in the refrigerator. There is doubtless a gradual deterioration of the alum precipitated toxoid, but it takes place so slowly that the solution retains its immunizing properties for some time if kept in the refrigerator. The entrance of air is probably not a determining factor in the deterioration.

CASTOR OIL AND SANTONIN

To the Editor—In *Queries and Minor Notes* in THE JOURNAL, May 25 page 1931, the following answer appears: "Castor oil does not increase the absorption of santonin. The castor oil may be given immediately after the santonin or even combined with it." While I do not presume to offer suggestions regarding the use of santonin in children abundant experience in the use of santonin in the treatment of young dogs has clinically demonstrated the fact that castor oil or purgatives should not be given immediately following the administration of santonin, if one expects ascariocidal effects from santonin. In the canine subject santonin is best given late in the evening four or five hours after a light meal and mildly purgative agents should not be given until eight hours has elapsed. Incidentally is santonin actually harmful to the human patient if given in larger doses than are commonly employed? Two grains (0.13 Gm) is consistently harmless in young puppies weighing as little as 5 pounds (2.3 Kg).

J. V. LACROIX, D.V.S., Evansville Ill

ANSWER—In children, 0.06 Gm has produced serious poisoning and two such doses have been fatal. It has been estimated that human infants are 100 times as sensitive as adults, and they are probably a great deal more sensitive than that in comparison with puppies.

NO MORTALITY REPORTED AFTER SCARLET FEVER IMMUNIZATION

To the Editor—Are there any authentic cases of death following injections of scarlet fever streptococcus toxin for prophylactic immunization to scarlet fever? I have done quite a number without serious results but recently I have been immunizing a child to scarlet fever and had given her four injections with a slight reaction following the third. Between the fourth and fifth injections her father had been visiting some friends who had brought their child to a doctor for scarlet fever immunization and he refused to do it because he said that he knew of three deaths in that city following injections of scarlet fever toxin for immunization. Of course the father is reluctant about having his child take the fifth dose. Is there any danger of allowing more than seven days to elapse between injections? It is two weeks since this child has had her fourth injection. Would you advise giving her the fifth injection or would you advise giving her the Dick test and eliminating the fifth injection if she is negative? Kindly omit name and address.

M.D. Minnesota

ANSWER—There are no authentic cases of death due to injection of scarlet fever streptococcus toxin for prophylactic immunization against scarlet fever. The doctor who claimed that he knew of such deaths should be willing to furnish the names of the patients and their attending physicians so that the matter can be investigated. There is no danger in allowing more than seven days to elapse between injections. If a month has elapsed it is best to repeat the last dose before proceeding. It is advisable to give the fifth injection.

TRISMUS

To the Editor—A woman aged 25 in good health had an impacted right lower molar extracted four months ago. The procedure was rather long and tedious. Mastication was almost impossible for two weeks after which time the patient had difficulty in opening the mouth. The dentist would forcibly open it about once a week. This condition has since improved but she is now unable to taste or feel small objects on the right posterior part of the tongue. She is able to move it in all directions but with apparent effort. She also complains of peculiar sensations as if some one were pulling or twisting her tongue. What could have been the probable cause, and what if anything should be done to improve the condition? What is the probable duration of the disability?

E. L. ST. GERMAIN, M.D., Breaux Bridge, La.

ANSWER—The trismus may have been brought about by the injection of the anesthetic into the pterygoid muscle but was probably brought about by the trauma and subsequent edema of all the muscles of mastication. Forcing open the jaws and exercising them will always remedy this condition.

The lack of sensation in the posterior part of the tongue is due to injury of the lingual nerve, which frequently passes close to the third molar region.

The peculiar sensations involved are signs of regeneration. Time, and time alone, will take care of the condition, which usually lasts from six weeks to nine months, depending on the extent of the injury to the lingual nerve.

OBSTRUCTION TO URINARY FLOW

To the Editor—A white man aged 70 had a suprapubic prostatectomy sixteen months ago. Following this a fistula into the bladder developed through the suprapubic wound. Four months later this was opened and an attempt was made to close it but with no success. Until the present day, leakage has continued through this fistula. The urine is loaded with pus cells. The blood pressure is 180 systolic 100 diastolic. The output of urine in twenty four hours is over 2 liters. Difficulty is encountered in passing even a 14 French sound but a soft rubber catheter of the same caliber can be inserted. The bladder seems to be of small capacity holding only about 150 cc (introduced through the catheter), when it causes a feeling of distention and pain. There is, of course, no force to the stream. The patient refuses further hospitalization for further study or treatment and must be treated at home or in the office. He is able to be up and about but suffers from frequency of urination. He still has some control. Please omit name and town.

M.D. Pennsylvania

ANSWER—The patient evidently has an obstruction to the outflow of urine in the bladder neck. This may be due to incomplete removal of the prostate gland or fibrosis of the neck of the bladder. If the former, nothing short of removal of the obstruction would be likely to be of help. If the latter, the condition might be benefited by gradual dilation.

EPIDEMIC ENCEPHALITIS

To the Editor—A man aged 27 consulted me on May 25 1935 for the following: Since 1918 when he had influenza he has had transitory attacks of amnesia lasting for four or five seconds at which time his eyes roll up. No dizziness, headache or any aura accompanies the attack. He can recall the attack but cannot tell what has happened during it. The attacks come three or four times during the day. Physical, laboratory and neurologic examinations are negative. Phenobarbital makes his condition worse. His occupation is road scraping. Kindly suggest a mode of approach in arriving at a diagnosis and treatment.

M.D. Ohio

ANSWER—From the history of this patient and the subsequent course of the disease, it is obvious that the attack of influenza in 1918 was an acute epidemic encephalitis. The momentary attacks of upward rolling of the eyeballs are termed the oculogyric crises of encephalitis. These occur at rather frequent intervals and are usually associated with fatigue. Frequently there is an amnesia during the attacks. The treatment consists in the use of scopolamine hydrobromide in 0.6 mg (1/100 grain) doses several times a day. Sometimes ephedrine does good in these cases. The attacks often spontaneously cease but there is no specific therapy for them.

VITAMIN C IN MILK

To the Editor—If a breast fed baby refuses all sources of vitamin C will a sufficient amount of the vitamin be transmitted in the mother's milk granted that she take a large amount of orange juice or tomato juice?

FREDERICK B. DEWITT, M.D. Oneonta N.Y.

ANSWER—Extensive investigations have been conducted on the variation of vitamin C content of cow's milk with the diet of the animal. It has been noted that at the end of the winter period when the cows are being fed on concentrates and hay, the vitamin C content of their milk is at a minimum. However, in the summer, when the animals are in open pasture and plenty of fresh vegetable food is available, the vitamin C content of the milk is materially enhanced. In periods of drought, where

suitable pastures are not available, there is a fall in the amount of vitamin C in the milk. There are few accurate studies on the relation of the diet of the mother to vitamin C in breast milk. It has been said that scurvy is comparatively rare in breast fed infants, and it is known that breast milk contains higher quantities of vitamin C than fresh cow's milk. Until further investigation has conclusively shown the influence of vitamin C containing foods in the mother's dietary on the amount of vitamin C in breast milk, it would seem unwise to rely on the breast milk as the sole supply of this vitamin for the nursing infant.

UNDULANT FEVER

To the Editor—I have a patient suffering from undulant (Malta) fever. He has had this disease about two months. I recently gave him six injections of undulant fever vaccine containing 1000 million *Brucella abortus* and 1000 million *Brucella melitensis* organisms per cubic centimeter. I started with 0.3 cc and ended with 1.2 cc per injection. He has no more fever but complains of frequent attacks of generalized severe aching. I should like to know whether additional vaccine injections would be advisable. Can the dosage be increased? He weighs about 190 pounds (86 Kg).

A C SCOTT M D Evansville Ill

ANSWER.—Those who have had the widest experience with the use of *Brucella melitensis* (abortus) vaccine therapy for undulant fever (brucellosis) suggest that the minimum course should consist of the injection of 10 cc. of the vaccine in divided doses, beginning with injections of 0.25 cc and gradually increasing the dosage, at three day intervals to 1 cc. In cases of chronic brucellosis, doses larger than 1 cc may be required.

DISINFECTION AGAINST SCABIES

To the Editor—Will you please give me the easiest way of disinfecting leather suitcases used by a traveling salesman with scabies. The patient has had it two months before knowing it and all articles such as papers, brushes and matches are infected. Would these parasites die in a period of three months if suitcases were not used and render them sterile? Could you suggest a fairly easy and safe way to disinfect them or would it be necessary to discard them? Any information you can give me on this subject will be appreciated. (Important papers hard to sterilize.)

S MOYER KALEN M D East Pittsburgh Pa

ANSWER.—The acarid of scabies dies within a few days after its removal from the skin, and immersed in liquids, such as water and oil which deprive it of air. It is unlikely that the parasites would survive for a period of three months in suitcases that were not used. To safeguard further against the presence of live acarid, the suitcases could be given a coating with an oil leather dressing for a few days, thus excluding air.

DOSAGE OF VIOSTEROL IN OIL

To the Editor—For the past two years I have been giving a woman, aged 49, viosterol in oil for calcium deficiency. At first, small doses were accompanied by good results. Lately she had not been taking any medication and again got weak and could not do her work. When she returned to me I gave her calcium in the form of calcium gluconate wafers and viosterol in oil. I told her to increase the latter until she felt better. Today she came in with the information that she felt much better but that she has to take 50 drops three times a day. Is there any danger in so large a dosage of viosterol?

M D Michigan

ANSWER.—There is practically no danger. Children have been given, apparently without harm, as much as 200 drops of viosterol in oil daily.

ALCOHOLIC LIQUORS AND BASAL METABOLISM

To the Editor—Will the ingestion of several ounces of spirituous liquor on the night preceding the morning of a basal metabolic rate determination affect the result of this test?

J PHILLIPS EDMUNDSON M D Kansas City Mo

ANSWER.—If the individual is a habitual user of alcohol, the ingestion of several ounces of spirituous liquor twelve hours before having a basal metabolic rate determination would probably not affect the test. Otherwise, spirituous liquor should be interdicted at least twelve hours before having a test made.

URETHRAL CYST

To the Editor—Where can I obtain detailed methods of treatment both medical and surgical for a cyst located just below the urethral orifice in a young married woman? Kindly omit name.

M D New York

ANSWER.—A cyst located just below the urethral orifice may be treated in one of two ways. The cyst may be excised under local anesthesia or it may be destroyed with the high frequency spark.

Medical Examinations and Licensure

COMING EXAMINATIONS

- AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Kansas City Mo May Sec Dr C Guy Lane 416 Marlboro St, Boston
- AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada Dec. 7 Applications must be filed not later than Nov 1 Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6)
- AMERICAN BOARD OF OPHTHALMOLOGY St Louis Nov 18 Application and case reports must be filed before Oct 15 Asst Sec Dr Thomas D Allen 122 S Michigan Ave Chicago
- AMERICAN BOARD OF ORTHOPAEDIC SURGERY St Louis Jan Sec, Dr Fremont A Chandler 180 N Michigan Ave Chicago
- AMERICAN BOARD OF PEDIATRICS St Louis, Nov 20 Sec Dr C A Aldrich 723 Elm St Winnetka Ill
- AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY New York, Dec 30 Sec Dr Walter Freeman 1726 Eye St N W, Washington D C
- AMERICAN BOARD OF RADIOLOGY Detroit Dec. 12 Sec Dr Byrl R Kirklin Mayo Clinic Rochester Minn
- ARKANSAS Basic Science Little Rock, Nov 4 Sec. Mr Louis E Gebauer 701 Main St, Little Rock Medical (Regular) Little Rock Nov 12 Sec State Medical Board of the Arkansas Medical Society Dr A S Buchanan Prescott Medical (Eclectic) Little Rock Nov 12 Sec Dr Clarence H Young 207½ Main Street Little Rock.
- CALIFORNIA Sacramento Oct 21 24 Sec Dr Charles B Pinkham 420 State Office Bldg Sacramento
- CONNECTICUT Medical (Regular) Hartford Nov 12 13 Endorsement Hartford Nov 26 Sec Dr Thomas P Murdock, 147 W Main St Meriden Medical (Homeopathic) Derby Nov 12 Sec Dr Joseph H Evans 1488 Chapel Street New Haven
- FLORIDA Tampa Nov 11 12 Sec, Dr William M Rowlett, Box 786 Tampa
- ILLINOIS Chicago Oct 22 24 Act Supt of Regis, Dept of Regis and Edu Mr Clinton P Bliss, Springfield
- MAINE Portland Nov 12 13 Sec Board of Registration of Medicine Dr Adam P Leighton Jr, 192 State St, Portland
- MASSACHUSETTS Boston Nov 12 14 Sec Board of Registration in Medicine Dr Stephen Rushmore 413 State House Boston
- MINNESOTA Minneapolis Oct 15 17 Sec, Dr Julian F Du Boss 350 St Peter St St Paul
- MISSOURI Kansas City, Oct. 24 26 State Health Commissioner Dr E T McLaugh Capitol Building Jefferson City
- NATIONAL BOARD OF MEDICAL EXAMINERS Part III Baltimore Oct 22 24 and Boston Nov 5 7 Exec Sec Mr Edward S Elwood, 225 So 15th St Philadelphia
- NEBRASKA Lincoln Nov 19 20 Dir Bureau of Examining Boards Mrs Clark Perkins State House Lincoln
- NEVADA Carson City Nov 4 Sec Dr Edward E. Hamer Carson City
- NEW JERSEY Trenton Oct 15 16 Sec Dr Arthur W Belting 28 W State St Trenton
- OREGON Basic Science Portland Nov 16 Sec Mr Charles D Byrne University of Oregon Eugene.
- SOUTH CAROLINA Columbia Nov 12 Sec Dr A. Earle Boozer, 505 Saluda Ave Columbia
- TEXAS Houston Nov 18 20 Sec. Dr T J Crowe 918 Mercantile Building Dallas
- WEST VIRGINIA Huntington Oct 28 State Health Commissioner Dr Arthur E. McClue Charleston

National Board of Medical Examiners

The National Board of Medical Examiners reports that its certificate was awarded to 421 candidates who passed the final examination held during June and July 1935. The following schools were represented:

| School | PASSED | Year Grad | Number Passed |
|---|----------------------------|-----------|---------------|
| College of Medical Evangelists (1925) | (1930) | (1931) | |
| (1932 2) (1933 3), (1934)* (1934 10) | (1935 42) | | 61 |
| Stanford University School of Medicine | (1935 3) | | 3 |
| University of California Medical School | (1934) | | 1 |
| University of Southern California School of Medicine (1935 2) | | | 2 |
| University of Colorado School of Medicine (1920) | | | |
| (1932) (1933) (1934 6) | | | 9 |
| Yale Univ School of Medicine (1932 2), (1933 10) | (1934 11) | | 23 |
| George Washington University School of Medicine | (1933) | | 1 |
| Georgetown University School of Medicine (1933) | (1934, 2) | | 3 |
| Howard University College of Medicine | (1934 3) | | 3 |
| Emory University School of Medicine | (1930), (1933) | | 2 |
| Loyola University School of Medicine | (1935 6) | | 6 |
| Northwestern Univ Medical School (1933) | (1934 2) (1935 4) | | 7 |
| Rush Medical College (1930) (1933) (1934 5) (1935, 10) | | | 17 |
| School of Medicine of the Division of the Biological Sciences | (1934) (1935 3) | | 4 |
| University of Illinois College of Medicine | (1933) | | 1 |
| State University of Iowa College of Medicine | (1933) | | 1 |
| University of Louisville School of Medicine (1933) | (1934) | | 2 |
| Tulane University of Louisiana School of Medicine (1931) | | | |
| (1933 7) (1934, 4) | | | 12 |
| Johns Hopkins University School of Medicine (1930), | (1933 5), (1934 2) | | 8 |
| Boston University School of Medicine (1933 2) | (1934, 10) | | 12 |
| Harvard University Medical School (1919) | (1929 4) | | |
| (1931, 2) (1932 8) (1933 20) (1934, 9) | | | 44 |
| Tufts College Medical School | (1932), (1933 9), (1934 8) | | 18 |
| Univ of Michigan Medical School (1932), (1933 2) | (1934 3) | | 6 |
| University of Minnesota Medical School (1933, 2)* (1933), | (1934, 7) (1935 11) | | 21 |
| St. Louis University School of Medicine | (1933 3) (1934 2) | | 5 |
| Washington Univ School of Medicine | (1933 2), (1934 2) | | 4 |

| | | |
|---|--|----|
| Creighton University School of Medicine | (1934) | 1 |
| University of Nebraska College of Medicine (1933) | (1934) | 2 |
| Albany Medical College | (1933) | 1 |
| Columbia University College of Physicians and Surgeons | (1930), (1931), (1932 2), (1933, 11), (1934 5) | 20 |
| Cornell Univ. Medical College | (1932), (1933 8), (1934 5) | 14 |
| Long Island College of Medicine | (1934) | 1 |
| New York Homeopathic Medical College and Flower Hospital | (1934, 2) | 2 |
| New York University, University and Bellevue Hospital Medical College | (1933) | 1 |
| Syracuse University College of Medicine | (1934) | 1 |
| University of Buffalo School of Medicine | (1933), (1934 8) | 9 |
| University of Rochester School of Medicine | (1933), (1934 5) | 6 |
| Duke Univ. School of Medicine | (1932 3), (1933 7), (1934 3) | 13 |
| University of Oklahoma School of Medicine | (1932), (1934) | 2 |
| University of Oregon Medical School | (1929), (1931), (1933 2) | 7 |
| Hahnemann Med. College and Hospital of Philadelphia | (1934) | 1 |
| Jefferson Medical College of Philadelphia | (1931), (1933), (1934, 3) | 5 |
| Temple University School of Medicine | (1933), (1934) | 2 |
| University of Pennsylvania School of Medicine | (1929), (1932, 2), (1933, 6), (1934 11) | 20 |
| Woman's Medical College of Pennsylvania | (1933 3), (1934 3) | 6 |
| Meharry Medical College | (1927), (1934) | 2 |
| Vanderbilt University School of Medicine | (1934) | 1 |
| University of Texas School of Medicine | (1924) | 1 |
| Univ. of Vermont College of Medicine | (1933 6), (1934 2) | 8 |
| Medical College of Virginia | (1933) | 1 |
| Marquette Univ. School of Medicine | (1933 2), (1934), (1935) | 4 |
| University of Wisconsin Medical School | (1933) | 1 |
| Dalhousie University Faculty of Medicine | (1933) | 1 |
| University of Toronto Faculty of Medicine | (1928), (1934 2) | 3 |
| University of Western Ontario Medical School | (1934) | 1 |
| McGill Univ. Faculty of Medicine | (1932), (1933), (1934 3) | 5 |
| Licentiate of the Royal College of Physicians, of the Royal College of Surgeons Edinburgh and of the Royal Faculty of Physicians and Surgeons Glasgow | (1928) | 1 |
| American Univ. of Beirut School of Medicine | (1933) † (1934) † | 2 |

* M.D. degree has not been issued.

† Verification of graduation in process

Book Notices

Industrial Medicine By W. Irving Clark A.B. M.D. Assistant Professor of the Practice of Industrial Medicine Harvard School of Public Health Boston and Philip Drinker S.B. Ch.E. Associate Professor of Industrial Hygiene Harvard School of Public Health National Medical Monographs Edited by Morris Fishbein M.D. Cloth Price \$4 Pp 262 with 32 illustrations New York National Medical Book Company Inc. Doubleday, Doran & Co Inc 1935

The happy teaming of an industrial physician and surgeon and a research engineer versed in applied physiology, both well known, has led to the production of this volume, which is intended as a "vade mecum" for the general practitioner as well as for the industrial physician and engineer. The aim has been to clarify what is meant by industrial medicine and the nature of the principle health hazards to which workers may be exposed, with a chapter on the industrial surgical program. The problems divide themselves into two groups: maintenance of health, and diagnosis and treatment of minor sickness and of injuries. Prevention is largely an engineering problem (it might have been better to say chemical engineering) but is perfected only by a close cooperation of the medical department. In no other field is there such a close relation between these two professions (an exception might be found in public health). "Either profession alone is unable to find the answer." Essentially, the subject is a branch of preventive medicine and public health.

Twelve chapters with a comprehensive bibliography, index and index of authors cover the items of organization, surgical and medical services, industrial diseases, dusts, pneumoconiosis (three chapters), lead and metal fume fever, dermatoses, gases, benzene, asphyxia and artificial respiration, and the prevention of industrial diseases. The forms, charts and reproductions of photographs are well selected.

In particular the standards of procedure, the reference of cases to family physicians, with cooperation in diagnostic work, an invitation to physicians to visit plants where their patients work, and the duty of industry to assist in rehabilitation, in which no little part is the restoration of mental confidence, all contribute to the solution. In regard to industrial accidents, the full responsibility for treatment lies with the plant physician. Here the standards of the American College of Surgeons for Medical Service in Industry are the guide. After all, the most severe health hazards usually occur in small plants.

Metabolism in working environment and the adaptability of man is keenly sensed. "The familiar 30 cu ft. [of fresh air] per person, so widely used in various state laws, should be changed and conditions judged on the basis of results obtained." Modern

air conditioning, with cooling in warm weather, necessitates limited air change, the basis being essentially that of odor comfort. The dust question climaxes the discussion and is a broadly conceived, commensurate summary of facts and theories, although the positive relation between silicosis and tuberculosis, in the absence of necropsies, is probably overstated in view of recent reports from many sources. Also the failure to recognize the importance of anaerobic infection is to be noted. Some thing of a vernacular tinge occurs in the fact that several pages are devoted to anthrax, which is of limited occurrence even in coastal cities. Again, the space given to industrial arsenic poisoning (now almost a curiosity) might have gone to acid vapors, mercury, sulphur compounds or the newer toxic solvents. The practical problems of organized labor relations, the allocation of costs of service, and methods of education are not touched on. There are a goodly number of instances of crediting discoveries or significant summaries to "moderns" when older works and workers were the real contributors. The little volume is indispensable to the physician in contact with industrial work. It is a valuable companion volume to half a dozen others that have recently appeared in a field of sorely neglected economics, which is a wayward child of medicine and society at the present time.

The Maternity and Child Welfare Movement. By G. F. McCleary M.D. D.P.H. Principal Medical Officer National Health Insurance Commission (England). Cloth Price 7s 6d Pp 227 London P. S. King & Son Ltd 1935

To his recent volume "The Early History of the Infant Welfare Movement" the author adds this book, which brings down to date his historical consideration of the development of child welfare. The title of this book is significant in that it includes the question of maternal health, which logically and actually is inseparable from child health. His primary interest is in the child welfare movement in England, and he pays even less attention to American developments in this book than he did in the earlier volume, in which there was a chapter on developments in America. Since, however, the English movement is his topic, this is not unfavorable criticism. He devotes chapters to the origin of the maternity and child welfare movement, its progress during the World War, the growth of "health visiting," which we call public health nursing, the maternity and child welfare center, antepartum care, the unmarried mother and her child, the unwanted baby, the preschool child, state recognition of midwives, maternal mortality and morbidity, the new attack on infant mortality, and the administration of maternal and child welfare service in the British Isles. Of particular interest are the chapters on maternal mortality and morbidity and those relating to midwives. He sets forth the advantages and disadvantages of the various legislative acts and appraises the progress of the movement with what seems to be an eminent sense of fairness. He appears to be a proponent of greater participation in welfare service by governmental agencies. Of particular interest to American readers will be his enumeration of the failures of health insurance to go as far in providing for maternal welfare as the author thinks should have been done.

Gynecological and Obstetrical Tuberculosis By Edwin M. Jameson B.S. M.D. Attending Surgeon Saranac Lake General Hospital and Reception Hospital Saranac Lake N.Y. Cloth Price \$3.50 Pp 256 with 31 illustrations. Philadelphia Lea & Febiger 1935

Here is a book which every obstetrician, gynecologist, phthisiologist and internist should have in his library not only to be read through and through but as a book of reference. The author is to be highly commended not only for the excellence of the book but also for calling attention to a subject which unfortunately has not received the attention it should. The average physician, and even the average gynecologist, considers tuberculosis of the female genitalia a rare complication, though this is far from the truth. If all fallopian tubes were examined microscopically as a routine, physicians would quickly learn that tuberculous salpingitis is not uncommon. The author's purpose in writing the book was to present a critical study of (1) the alterations in the pathologic physiology of the female genital apparatus brought about by pulmonary tuberculosis, (2) the various forms of female genital tuberculosis and (3) a survey of the problem of pregnancy in the tuberculous woman. The book is therefore divided into three parts. The author has thoroughly reviewed the literature of the world down to date.

and he critically evaluates the data and opinions of numerous authorities. The suggestions concerning therapy are excellent and are based on the author's extensive personal experience with tuberculous women at Saranac Lake. At the end of the book is a complete and highly valuable bibliography dealing with every phase of tuberculosis in the female. This book will long remain a classic on the subject of gynecologic and obstetric tuberculosis.

Hugh Owen Thomas. His Principles and Practice. By D. McCrae Allen, M.A. M.B. Ch.B. Director of Surgery Robert Jones and Agnes Hunt Orthopaedic Hospital London. Cloth Price \$4.25 1 p. 96 with 8 illustrations. New York & London: Oxford University Press, 1935.

This is a supplementary volume to the delightful "The Personal Study," by Watson, which was reviewed recently in this column. The author, who was closely associated with Sir Robert Jones, a nephew of Hugh Owen Thomas, has written an authoritative, instructive and inspiring little book. It is intended to be a study of how Thomas came to formulate his special methods of treatment and to trace his influence on the practice of the present day. Thomas is remembered for his systematic treatment of joint injuries and diseases and for the splints he devised to give effect to his system of treatment. Hugh Owen Thomas was the son of a well known "bonesetter" established in practice for twenty-five years, which had a definite influence on the cool reception given to Thomas by the medical profession of Liverpool. Fate and the condition of his birth and environment plunged him into general practice in the slums of Liverpool. Sir Arthur Keith, in "Menders of the Maimed," wrote "It is true that Thomas never did study those conditions in the postmortem room, dissecting room or experimental laboratory, but there never was a man who studied more persistently and observed more closely the manifestations of disease and injury as seen in the living state. It was Hugh Owen Thomas's great merit to have proved that a busy general practitioner can, by purely clinical methods, win for himself a permanent place among the benefactors of medicine." His passion for accurate knowledge and his recognition of physiologic principles of tissue life and repair made him seek fundamental rules of treatment. His appreciation of the value of physiologic rest drove his logical mind to reduce the management of disease to a definite system and to design splints to achieve his purpose with efficiency. The rule laid down by W. J. Little in 1839 that the splint must be adjustable by the surgeon has always held good, if the surgeon does not know how to adjust his splint he ought not to do orthopedic surgery. The bounds of Owen Thomas's practice were the shores of the seven seas, though inland, in his own country, he was not so well known. An effort has been made to show that Thomas was no mere mechanical inventor of splints, as some still think, but a practitioner of wide experience who brought to his work keen clinical acumen and a profound respect for physiologic laws. This little book is an interesting companion volume to its predecessor.

Christine Murrell, M.D. Her Life and Her Work. By Christopher St. John. Preface by Lady Barrett, C.B.E. M.D. Cloth Price 5/- Pp. 133 with one illustration. London: Williams & Norgate Ltd., 1935.

This is a worthy monument to a woman worthy of a monument. Christine Murrell followed closely after the generation of British medical women who pioneered to gain admittance to medical schools and the right to practice medicine. So quickly were their positions consolidated that Dr. Murrell was able to achieve the highest politico-medical position, membership on the Medical Council of Great Britain. Although an ardent suffragette and keenly, often actively, interested in every phase of the woman's movement, Dr. Murrell considered herself "a representative of the whole (medical) profession, and not of medical women only." In preparing this most readable account of Dr. Murrell's public and private life, Christopher St. John has consulted her colleagues, friends and employees. Through the eyes of many witnesses one sees forming the picture of a busy and successful general practitioner who was especially interested in the neurologic approach to her patients' problems and who yet found time for a vast range of other interests and activities.

Synopsis of Genito Urinary Diseases. By Austin I. Dodson, M.D. F.A.C.S. Professor of Genito Urinary Surgery, Medical College of Virginia. Fabrikoid. Price \$3. Pp. 275 with 111 illustrations. St. Louis: C. V. Mosby Company, 1934.

This small volume is a satisfactory attempt to produce a synopsis of genito urinary diseases for the student. The author has stressed the importance of etiology, symptomatology and diagnosis. The facts are well ordered and inclusive. The illustrations for the most part are excellent but occasionally fail to depict, especially to the student, the condition seen by cystoscopy. Naturally there are omissions in a book of this small size, but the only two striking ones noticed are the failure to discuss the importance of the parathyroid in relation to urinary calculus and the failure to mention the quantitative hormone determination in the urine in its relation to tumors of the testes. The statement on page 143 that brilliant cures of chronic arthritis have followed excision of infected seminal vesicles may not be accepted as the experience of most urologists but of course cannot be categorically denied. For the most part this book encompasses in a small space a wealth of informative material and should be highly valuable not only to the student but to the general practitioner as well.

Unsere Nahrungs- und Genussmittel ihre Zusammensetzung ihre Verfälschung und die lebensmittelrechtlichen Bestimmungen. Von Dr. med. Ewald Gerfeldt, Regierungsrat und Medizinalrat in Allenstein. Paper Price 4 marks. Pp. 118. Leipzig: Georg Thieme, 1935.

The introduction briefly portrays the historical development of German food laws. The main section of the book, on "Food Hygiene and Food Legislation," discusses such topics as the diet as a whole, illnesses and deaths due to contaminated food, fundamental food legislation and ordinances, including laws governing commerce in foods and commercial articles, the labeling of foods, articles containing lead and zinc, the sale and storage of petroleum, and the industry in general, and the surveillance maintained over commerce in foods and commercial articles. Separate chapters are devoted to the sanitary examination, composition, adulteration and legal status of the main classes of foods, such as meat, fish and eggs, milk, butter and cheese, fats, grains, legumes and potatoes, sugar products, vegetables, mushrooms and fruits, ice for food preservation, coffee, tea, chocolate, spices, vinegar, salt and tobacco, alcoholic beverages, and mineral water and lemonade. References to the sections of the various laws and ordinances affecting the respective foods and the specific requirements are given. In brief, the book is a syllabus on German food legislation and food control.

The Anatomy of the Rhesus Monkey (Macaca mulatta). By T. H. Bast and others. Edited by Carl G. Hartman, Department of Embryology, Carnegie Institution of Washington, and William L. Straus, Jr., Department of Anatomy, Johns Hopkins University. Baltimore. Cloth. Price \$6. Pp. 383 with 128 illustrations. Baltimore: Williams & Wilkins Company, 1933.

This volume, a pioneering handbook on the anatomy of the Rhesus monkey, is divided into eighteen chapters and written by a total of nineteen contributors. In addition, there is a short appendix on the housing and care of this type of monkey written by the senior author, who has incorporated in it not only his own experiences in these respects but also those of Dr. George E. Corner. The book was compiled partly for research workers who intend to use this species of monkey as a laboratory animal, partly for students of comparative anatomy. Excellent as it is for the groups for which it was intended, most physicians would find it a dud on their book shelves.

Laboratory Experiments in Physiology. By W. D. Zoethout, Ph.D. Professor of Physiology in the Chicago College of Dental Surgery (Loyola University). Second edition. Cloth. Price \$2.25. Pp. 256 with 95 illustrations. St. Louis: C. V. Mosby Company, 1934.

Six years has elapsed since the appearance of the first edition of this laboratory guide in experimental physiology and biochemistry. The section on physiologic chemistry was added by request. The preface contains no inkling of the type of student for whom this manual was written, but the nature of both the text and the experiments would indicate that it was prepared for use in colleges and dental schools. The author has introduced numerous "whys" and "why nots" in each experiment which ought to be helpful to both student and teacher. Most of the illustrations are reproduced from other sources.

Medicolegal

Alcoholism "Intoxication" Defined—The plaintiff, a guest and passenger in an automobile driven by one of the defendants, was injured in a collision. She sued the driver of the automobile and the husband of the driver, alleging that her injuries were caused by the driver's intoxication. From a judgment in favor of the plaintiff, the defendants appealed to the district court of appeal, third district, California.

Definitions of "intoxication" laid down by the courts of Iowa and Mississippi were quoted by the court from 33 California Jurisprudence, page 479, note 32.

"There are degrees of intoxication varying all the way from slight stimulation to complete coma. It is only at some point along the line between the two extremes that the loss of control of the mental faculties occurs. (*State v Yates* 132 Iowa 475 109 N W 1005). In order for a person to be intoxicated it is not necessary for him to be so much under the influence of intoxicating liquor as to be mentally and physically incapable of taking care of himself" (*Yazzo etc R Company v Davidson* 106 Miss 108, 63 So 340).

In Arkansas, "intoxication" has been defined as follows:

A man may be said to be drunk whenever he is under the influence of intoxicating liquors to the extent that they affect his acts or conduct so that persons coming in contact with him could readily see and know that the intoxicating liquors were affecting him in that respect. (*St Louis etc Ry Co v Waters* 105 Ark 619, 152 S W 137).

In Texas, a person was held to be intoxicated where a sufficient quantity of intoxicating liquor had been taken into the stomach to deprive him of normal control. (*Lockhart v State*, 108 Texas Cr R. 597, 1 S W (2d) 894). In Minnesota, the court, in discussing the term "under the influence of intoxicating liquor," said:

"When a person is so affected by intoxicating liquor as not to possess that clearness of intellect and control of himself that he otherwise would have, he is under the influence of intoxicating liquor. (*State v Graham* 176 Minn 164, 222 N W 909).

If the faculties of a person driving a car, said the court of appeal, are so far affected that he cannot appreciate the hazard involved in the manner in which he is driving his automobile or the imminent dangers arising from cutting in and out, fast driving and quick stopping, on a street where the traffic is heavy and school children are passing to and fro, the conclusion is justified that such a person is so far under the influence of intoxicating liquor as to have reached an unlawful degree of intoxication within the meaning of the California vehicle act. While the driver in the present instance denied intoxication and offered evidence to support her contention, the issue was a question of fact for the trial court to determine and the court of appeal was bound by the finding of that court, even though two physicians and a police officer testified that in their opinions the defendant driver was not intoxicated. The judgment of the trial court in favor of the plaintiff was affirmed. —*Tracy v Brecht et al (Cal)*, 39 P (2d) 498.

Health Insurance "Confined Within Doors" and "Total Loss of Time" Construed—The defendant insurance company promised to pay certain benefits if Wade suffered disability resulting from disease "which confines the insured continuously within doors and requires regular visits therein by legally qualified physician, provided said disease necessitates total loss of time." Wade developed appendicitis and his appendix was removed. During the following year he underwent three major operations and was regularly attended by a physician. He remained either in his home or in a hospital, except on a few occasions when he was outdoors. Wade sued the insurance company, claiming that he had suffered a confining illness within the meaning of the policy, for a period of one year. From a judgment in his favor, the insurer appealed to the Supreme Court of Appeals of West Virginia.

The insurer contended that Wade suffered a confining illness for a period much shorter than he claimed. It relied on evidence showing that sometimes Wade walked to his physician's office, a distance of 100 yards, for treatment, that on a few occasions

he walked to his place of business, although he took no active part in the conduct of the business, and that occasionally, on the advice of his physician, he took short walks, not for amusement or for profit but to aid physical recovery. The Supreme Court of Appeals, however, was of the opinion that during the twelve month period for which he claimed indemnity Wade was totally disabled and by necessity suffered total loss of time, within the meaning of his policy. Total disability, said the court, within the meaning of an insurance policy, does not mean absolute helplessness. An insured may recover indemnity "where, because of injury or illness, he has become unable to do substantially all the material acts necessary to the conduct or prosecution of his business or occupation in substantially his usual and customary manner." (*Hayes v Prudential Insurance Co (W Va)*, 171 S E 824).

Furthermore, said the court, a policy provision requiring continuous confinement within doors must be reasonably construed and applied. Where an insured person has become totally disabled and has been confined in the house substantially all the time, and regularly attended by a physician, but has gone out occasionally under medical advice and in furtherance of his efforts to regain his health, the courts generally hold that the house-confinement clause of the policy has been sufficiently complied with and the insured should be indemnified thereunder. To hold that the insured plaintiff forfeited his right to full indemnification because he did not literally remain within the four walls of his house would be to exalt the letter and submerge the spirit of the contract. The phraseology employed to denominate confining and nonconfining illness was not intended to prescribe or limit the conduct of the insured but to describe the condition, extent and degree of illness. Necessary confinement within doors because of illness does not mean an absolute and indubitable constraint, but a practical and intelligent "staying in," the nature of the illness considered. Consequently, said the court, the infrequent departures of the plaintiff from within doors were not such as to imply any lessening of the gravity of his illness. His illness is of the first degree of seriousness and so remains notwithstanding that a few times he sought the benefit of a little sunshine and mild exercise.

Accordingly, the Supreme Court of Appeals affirmed the judgment of the trial court in favor of the plaintiff, Wade. —*Wade v Mutual Ben Health & Accident Assn (W Va)*, 177 S E 611.

Charitable Hospitals Basis for Exemption from Liability for Negligence of Nurse—The plaintiff, a minor, by her guardian ad litem, instituted an action for damages against the defendant, a charitable hospital, for injuries alleged to have been suffered on the day of her birth at the hospital, through the negligence of a nurse employed by the hospital. The trial court directed a verdict in favor of the hospital but later ordered a new trial, and the hospital appealed to the district court of appeal, second district, division 1, California.

It was not disputed that a charitable hospital, not negligent in the selection of its servants, is immune against the claims of patients injured through the negligence of hospital servants. The plaintiff argued, however, that California decisions base this exemption from liability on the theory of implied contract—that is, that one who accepts the benefits of a charitable hospital exempts his benefactor from any liability for the negligence of the benefactor's servants. She contended, therefore, that as at the time she was injured she was an infant incapable of contracting, no implied contract could be imputed to her, and that since the reason of the rule of nonliability was not applicable, this case did not come within the rule.

The courts in the various American jurisdictions, said the district court of appeal, are almost unanimous in holding that charitable hospitals are immune against the claims of patients who suffer injuries through the negligence of hospital servants. There is a wide divergence, however, in the theories adopted to support this doctrine of nonliability. We do not feel it necessary, said the court, to make a judicial declaration as to the doctrine which should be considered as forming the proper basis for the doctrine of nonliability. In arriving at this conclusion we are moved to quote from the opinion of the United States circuit court of appeals, in *Powers v Massachusetts*

Homeopathic Hospital, 109 Fed 294, 65 L R A 372, in which the author of the opinion made an exhaustive review of the cases in which this question was considered

Though we feel constrained to differ from the reasoning followed by some other courts in reaching the same conclusion we are not unmindful that the identity of conclusion reached though by different roads is a strong proof of its correctness. Doubtless a weight of authority is more overwhelming if it is identical in reasoning as well as in result but identity of result is in itself no mean argument for its justice

No case, continued the court has been brought to our attention in which the rule of nonliability of charitable institutions is recognized, in which an exception has been made to its application on the ground that the injured person was a minor

The district court concluded that the trial court erred in granting the plaintiff a new trial and ordered that a judgment be entered in favor of the defendant hospital—*Shane v Hospital of the Good Samaritan (Calif)*, 37 P (2d) 1066

Malpractice Burn Following Application of Diathermy—The plaintiff consulted the physician defendant, a specialist in dermatology, relative to a ringworm infection on the fingers and under the finger nails of both his hands. To remove the nail of the little finger of the left hand, to sterilize the space beneath the nail and to kill the organism in the nail bed the defendant administered procaine hydrochloride and epinephrine [suprarenin] locally and applied diathermy. Within a few hours the finger began to pain the patient severely and a blister formed. The finger became blackened and mummified and eventually the terminal joint of the finger and one half of the intermediate joint had to be amputated. Claiming that the defendant had subjected his finger to excessive heat, the patient instituted the present action for malpractice against him.

At the trial, a dermatologist, the plaintiff's brother-in-law testified that the defendant admitted to him that he had made a mistake and must have given the patient "a pretty heavy shot," by which the witness understood the defendant to mean that he had overexposed the finger to diathermy. This witness stated that the condition of the patient's finger was due to a burn. The defendant denied the conversation attributed to him and testified that the heat administered was not excessive and the attention given to the patient was such as would be approved by medical authorities. He denied that the finger had been burned and stated that its condition resulted from gangrene, which, he "surmised," was attributable to the epinephrine. Two dermatologists testified on behalf of the defendant that the procedure pursued by him was such as was approved by the highest medical authority. The court directed a verdict for the defendant and the plaintiff appealed to the Court of Appeals for the District of Columbia.

We are of the opinion, said the court, that the lower court erred in directing a verdict for the defendant. It is familiar law that "where uncertainty as to the existence of negligence arises from a conflict in the testimony or because, the facts being undisputed, fair-minded men will honestly draw different conclusions from them, the question is not one of law but of fact to be settled by the jury." *Gunning v Cooley* 281 U S 90, 50 S Ct 231. While the failure of an operation alone creates no presumption of lack of skill or care, it is a circumstance entitled to some consideration, when coupled with the testimony. *Crist v White* 62 App D C 269, 66 F (2d) 795. The case presented a question of fact for the jury and the Court of Appeals accordingly reversed the judgment of the trial court in favor of the defendant and ordered a new trial—*Weisenberg v Hazen (District of Columbia)* 73 F (2d) 318.

Poisons Liability of Druggist for Selling Poison to Adult Imbecile—The plaintiff's imbecile daughter, an adult ordered by telephone a quantity of carbolic acid from a drug store operated by the defendant. The poison was delivered to the daughter, who, 'being ignorant of its deadly quality and being demented and irresponsible, drank same and in consequence thereof died.' The plaintiff sued the defendant for the death of her daughter. The trial court dismissed the suit on the ground that the petition set forth no cause of action. The court of appeal of Louisiana affirmed this ruling and the

plaintiff petitioned the Supreme Court of Louisiana for a review of the adverse decision.

Among the acts of negligence alleged in the plaintiff's petition was the defendant's failure to comply with a regulation of the Louisiana state board of health requiring dispensers of poisons to keep a written record of all sales. The lower court correctly concluded said the Supreme Court, that there was no causal connection between the death of the plaintiff's daughter and the failure of the defendant to keep the proper record. The plaintiff further alleged, however, that, if the defendant's clerk had attempted to obtain from the daughter all the information which under the state board of health regulation should have been recorded, he would necessarily have discovered in the telephone conversation with her, that she was wholly irresponsible. In other words, it was alleged that the defendant's agent had the opportunity of learning the true facts relating to the mental condition of the plaintiff's daughter and failed to avail himself of that opportunity. Thus the petition contained a direct charge that the defendant's agent was negligent in dispensing the drug. It was the clerk's duty, said the court, to make inquiry as to the purpose for which the drug was ordered. If the plaintiff's daughter was, as alleged, an imbecile and if the defendant's clerk could have gained knowledge of that fact through the process of getting such information as the law requires and which he, as a druggist, was in duty bound to get, his failure to get that information was a breach of duty which he owed to the imbecile daughter. A druggist, continued the court can no more escape liability to a parent for placing a poison in the hands of an imbecile who is of age, where injury or death results from the use of it, than he could if he had placed it in the hands of an infant, if the infant had swallowed it and died as a result. Even in the absence of a special statutory regulation requiring druggists who dispense poisons to obtain information as to their intended use and to record the same said the court, they are liable for such damage as may result from their negligent handling of such drugs.

The plaintiff alleged furthermore that had the defendant's agent, who delivered the package containing the carbolic acid to the plaintiff's daughter in person, exercised proper precaution, he would have discovered that she was idiotic and irresponsible. The defendant in answer to this contention, argued that it was hardly probable that the deliveryman knew the contents of the package and therefore it was not incumbent on him to exercise precaution. But, answered the court, this is a matter which pertains to the evidence. In determining whether the petition sets out a cause of action, the court cannot indulge in speculations as to what a plaintiff may be able to prove on the trial of the case.

In the opinion of the Supreme Court, the plaintiff's petition did set forth a cause of action. The court therefore ordered the case remanded to the trial court to be reinstated on the docket—*Trumbatur v Katz & Besthoff (La)*, 158 So 16.

Malpractice Standard of Skill and Care Required of Specialist, Necessity for Expert Testimony—To facilitate the delivery of the plaintiff's child, the physician-defendant, a specialist in obstetrics, made an incision in the plaintiff's perineum. After delivery the incision was sutured, and the sutures were removed a few days later. On the eleventh day after delivery the patient was discharged from the hospital with instructions to call on the physician-defendant four weeks later for examination. According to the plaintiff's testimony in the trial that followed, a few days after leaving the hospital she noticed pus coming from the "sutured holes" and felt pain. She telephoned to the defendant and reported the facts to him immediately, thereafter she called him five or six times during the following two weeks, but each time she was told to wait until six weeks after delivery for a further examination. The physician-defendant, however, denied that the plaintiff ever informed him during the period stated of a discharge of pus and in fact had no recollection that she had telephoned to him at all. At the end of the six weeks period after delivery, he examined the plaintiff and observed what appeared to be a dimple in the skin at the bottom of the incision that he had

made, but he was unable to insert a probe into it. About three weeks later he found a small sinus, opening at the point where the dimple had been. He treated it by irrigation, curettement and the application of silver nitrate. The plaintiff, however, found her way into the hands of another physician, who operated twice to excise the sinus. After the second operation, at which time he discovered an opening into the rectum, the patient promptly recovered. She then sued the physician-defendant. A verdict in her favor was set aside on motion of the defendant and she appealed to the Supreme Court of Errors of Connecticut.

The plaintiff contended that the physician-defendant, having been informed concerning the presence of pain and of pus, was negligent in not discovering her condition more promptly. The defendant denied that he had been so informed. The Supreme Court of Errors pointed out that one who holds himself out as a specialist in the treatment of a certain organ, injury or disease is bound to bring to the aid of one employing him that degree of skill and knowledge which is ordinarily possessed by those who devote special study and attention to that particular organ, injury or disease, its diagnosis and treatment, in the same general locality, having regard to the state of scientific knowledge at the time. It was the duty of the defendant to exercise that degree of skill at the time of his employment, in determining the nature of his patient's ailment as well as in the treatment of it. There was evidence before the jury, said the court, which, if believed, would support the finding that the physician-defendant failed to use proper care, in that he did not see the plaintiff more promptly after being informed of her condition after she had left the hospital, provided the jury believed that she informed him of it.

But, said the court, the question presents itself as to whether the physician-defendant's failure to see his patient more promptly caused any injury to her. The uncontradicted medical testimony was that the method of treatment employed by the physician-defendant was proper. Whether it would have effected a cure if it had been applied more promptly was not shown by the testimony. One expert witness did testify that a sinus could be better treated at an early stage than at an advanced stage but that no one could tell whether irrigation or cauterization with silver nitrate would have cleared up the patient's condition. The probability of effecting a cure by various methods involves questions requiring the special knowledge of expert witnesses and is a field in which it is not permissible for laymen, as nonexperts, to set up any artificial standards as to methods of treatment or probability of cure. The jury were left purely to speculation as to whether the conduct of the defendant was a cause of the plaintiff's subsequent condition, and under the circumstances the trial court did not err in setting aside the verdict.—*Green v Stone (Conn.)*, 176 A 123

Malpractice Failure of Physician to Remove Bean from Ear—The plaintiff, it was alleged, put a bean into his ear. He was taken to a hospital, where an unsuccessful attempt was made by a house officer to remove the bean. The physician-defendant in this case, who had specialized in diseases of the ear and the throat for over fifteen years, was then called. He examined the patient under ether but did not remove from the ear the bean supposed to be there. If there was a bean in the ear, the record does not show when and by whom it was removed. The patient, however, sued the physician-defendant because of his failure to remove it. The superior court, Suffolk County, Mass., directed a verdict for the defendant, and the plaintiff thereupon appealed to the Supreme Judicial Court of Massachusetts.

According to the record, the physician-defendant testified that he could look into the ear as far as the drum, that he "did not discover the bean," that if it was in the ear it was behind the drum, and that "if it was there at all" he could not see it. There was testimony, however, that at the time of his examination of the plaintiff's ear he told the plaintiff that he saw the bean and that it ought to be removed, and that he told the plaintiff's cousin, who accompanied the plaintiff to the hospital, that he saw the bean and would remove it.

The physician-defendant, said the Supreme Judicial Court, as a physician who had specialized in diseases of the ear and throat, owed his patient the duty of having and using in the operation the care and skill commonly possessed and exercised by similar specialists in like circumstances. There was no evidence that he did not possess the required care and skill. Whether, in operating on the plaintiff, he did not exercise them was the issue raised by the pleadings and the evidence. There was no direct medical evidence that he did not. Such a finding, if made, would have to be reached by way of inference by the jury from the circumstances shown in the evidence. Expert medical testimony is not always essential to proof of negligence or other malpractice of a physician. The jury could have found on the evidence that the defendant saw the bean but did not remove it. In the judgment of the court, the jury from the evidence and from their common experience and knowledge could, in the absence of some other explanation, have found that the defendant in failing to remove the bean failed to exercise the care and skill required of him as an ear specialist. The patient's exceptions were therefore sustained and the trial court erred in directing a verdict for the defendant.—*Gabrunas v Munter (Mass.)*, 193 N E 551

Malpractice Care and Skill Required.—The patient fractured both bones of one of her legs, nearly severing the foot from the body. After the physician-defendant began treatment, gas gangrene developed and he amputated near the hip. His patient sued him for malpractice and from a directed verdict in his favor his patient appealed to the Supreme Court of Utah.

An expert witness testifying on behalf of the patient was asked to give his opinion of various steps in the method of treatment adopted by the physician-defendant. Then he was asked to give his opinion of the method of treatment as a whole. In a case such as this, said the Supreme Court, confusion often arises over a failure to distinguish between an expert's opinion as to what he regards as the proper method of treatment and his opinion as to whether or not the treatment conforms to what is generally accepted as the proper method. Questions asked this witness were fatally defective because they called for a comparison with only one opinion, his own, rather than with the opinion of a general group. The trial court correctly ruled out his answers.—*Coon v Shields (Utah)*, 39 P (2d) 348

Society Proceedings

COMING MEETINGS

American Academy of Tropical Medicine, St. Louis Nov. 20-21 Dr. Earl B. McKinley 1335 H Street N.W., Washington D. C. Secretary
American Association of Railway Surgeons Chicago November 13-15 Dr. Louis J. Mitchell 86 E. Randolph St. Chicago Secretary
American Clinical and Climatological Association, Princeton N. J. Oct. 21-23 Dr. Francis M. Rackemann, 263 Beacon Street, Boston Secretary
American College of Surgeons San Francisco October 28-November 1 Dr. George W. Crile, 40 East Erie St. Chicago
American Society of Tropical Medicine, St. Louis November 19-22 Dr. Alfred C. Reed 350 Post Street San Francisco Secretary
Association of American Medical Colleges Toronto Canada Oct. 28-30 Dr. Fred C. Zappfe 5 South Wabash Avenue, Chicago Secretary
Clinical Orthopedic Society Indianapolis and Louisville, Nov. 15-16 Dr. J. E. M. Thomson 1307 N. Street, Lincoln Neb. Secretary
Inter State Postgraduate Medical Association of North America Detroit October 14-18 Dr. W. B. Peck, 27 E. Stephenson St. Freeport Ill., Managing Director
Nevada State Medical Association Elko Oct. 25-26 Dr. Horace J. Brown 120 North Virginia Street, Reno Secretary
Omaha Mid West Clinical Society Omaha, Oct. 28-Nov. 1 Dr. J. D. McCarthy, 107 South 17th Street, Omaha Secretary
Pacific Coast Society of Obstetrics and Gynecology Los Angeles Nov. 6-9 Dr. T. Floyd Bell, 400 29th Street Oakland Calif. Secretary
Radiological Society of North America Detroit Dec. 2-6 Dr. Donald S. Childs 607 Medical Arts Building Syracuse N. Y. Secretary
Southern Medical Association St. Louis November 19-22 Mr. C. P. Loranz, Empire Building Birmingham Ala. Secretary
Vermont State Medical Society Rutland Oct. 17-18 Dr. William G. Ricker, 33 Main Street St. Johnsbury Secretary
Virginia, Medical Society of Norfolk, Oct. 15-17 Miss A. V. Edwards, 1200 East Clay Street Richmond Secretary
Western Surgical Association Rochester Minn. Dec. 6-8 Dr. Albert H. Montgomery 122 South Michigan Boulevard Chicago Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to fellows of the Association and to individual subscribers to *THE JOURNAL* in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below

American Heart Journal, St. Louis

10:705-848 (Aug) 1935

Clinical Observations on Syncope and Sudden Death in Relation to Aortic Stenosis II M Marvin New Haven Conn, and A G Sullivan Hot Springs Ark—p 705

Further Experiences with Total Thyroidectomy in Treatment of Intractable Heart Disease S A Levine and E C Eppinger, Boston—p 736

Coronary Arteriosclerosis, Coronary Thrombosis and Resulting Myocardial Changes Evaluation of Their Respective Clinical Pictures Including Electrocardiographic Records Based on Anatomic Findings O Saphir W S Priest, W W Hamburger and L N Katz, Chicago—p 762

*The Heart in Typhoid Fever Clinical Study of Thirty Patients W B Porter and N Bloom Richmond Va—p 793

Use of Chest Leads in Clinical Electrocardiography I R Roth New York—p 798

The Heart in Typhoid—Of thirty typhoid patients Porter and Bloom state that 46.6 per cent showed significant changes in the electrocardiograms, although the changes were transient in nature. The fact that evidences of cardiac dilatation and heart failure were absent suggests that the pathologic changes which were responsible for the electrocardiographic alterations were either mild in degree or were localized. No disturbances of rhythm occurred, a gallop rhythm was not observed, and the symptoms of congestive failure were absent. From a clinical point of view the heart presents no significant problem in the treatment of typhoid. A study of the literature dealing with typhoid prior to the use of high caloric diets indicates that the toxemia of the disease was much greater and serious cardiovascular complications were common. In comparing the recent studies of Brow and their own studies with former ones the authors conclude that the reduction in the serious circulatory complications may be attributed to the character of the diet now employed in the care of typhoid patients.

American Journal of Diseases of Children, Chicago

50:309-572 (Aug) 1935

*Value of Convalescent Serum for Prevention of Common Contagious Diseases of Children Camille Kereszturi D Hauptman and W H Park, New York—p 309

Influence of Special Cereal Mixture on Infant Development M L Blatt and I E Schapiro Chicago—p 324

Prenatal Conditions and Status of Infants at Birth Observations L W Sontag S I Pyle and Jane Cape, Yellow Springs, Ohio—p 337

Erythrocyte, Hemoglobin Cell Volume and Color, Volume and Saturation Index Standards for Normal Children of School Age E E Osgood and R L Baker Portland Ore—p 343

Chronic Galactemia Report of Case with Studies on Carbohydrates H H Mason and Mary E Turner New York—p 359

Respiratory Exchange in Children Following Administration of Various Carbohydrates Relation to Curves for Blood Sugar J L Law with technical assistance of H Gay Ann Arbor Mich—p 375

Choice of Formulas Made by Three Infants Throughout the Nursing Period. Clara M Davis Winnetka Ill—p 385

Blood Cells in Healthy Young Infants II. Comparison of Routine and Special Techniques in Differentiation of Leukocytes A H Washburn, Denver—p 395

Id. III Study of Six Hundred and Eight Differential Leukocyte Counts with Final Report on Nine Hundred and Eight Total Leukocyte Counts A H Washburn, Denver—p 413

Convalescent Serum for Prevention of Contagious Diseases—For the last three years Kereszturi and her co-workers used convalescent serum prophylactically without quarantine against measles, German measles, chickenpox, whooping cough, scarlet fever and mumps in 1,717 hospital admissions. In cases of whooping cough, scarlet fever and German measles neither the controls nor the treated patients showed any cross infections. After one outbreak of mumps

no second case was observed either among the treated or among the untreated patients. In a second outbreak the controls showed an incidence of cross infection of 28 per cent, whereas the treated patients showed none. In one outbreak of chickenpox, no cross infection was noted in either group. However, in the second outbreak the treatment with serum seemed to fail. In this one, among the untreated group the frequency of cross infection was 15 per cent, among the treated group the rate of cross infection was 15 per cent. The different outbreaks of measles produced different amounts of cross infection, the rate varying from 0 to 22 per cent among the treated patients and from 0 to 50 per cent among the controls. The average rate of cross infection in the different outbreaks of measles was 7 per cent among the treated patients and 25 per cent among the controls. The authors were unable to draw conclusions about the ideal time to collect convalescent serum or about the optimal prophylactic dose of the serum. After their experience they are convinced that, unless control patients are observed simultaneously with treated patients, one cannot determine the value of the convalescent serum.

American Journal of Psychiatry, New York

92:1-258 (July) 1935

Presidential Address Administrative Psychiatry C F Williams Columbia S C—p 1

Charles Frederick Williams M D President 1934-1935 Biographic Sketch E L Horger Columbia S C—p 13

Postencephalitic Behavior Disorders Ten Year Review of Franklin School E D Bond and L H Smith Philadelphia—p 17

Theory of Chaotic Sexuality A J Rosanoff Los Angeles—p 35

Encephalographic Studies in Mental Disease Analysis of One Hundred and Fifty Two Cases M T Moore D Nathan Philadelphia

Annie R Elliott and C Laubach Norristown Pa—p 43

Utilizing Institutionalized Mental Patients to Influence Other Patients Psychotherapeutically F Storchheim Wauwatosa Wis—p 69

Chemical Studies in Epileptic Syndrome II Nocturnal and Diurnal Rhythm in Blood Chemistry Helen Hopkins Los Angeles—p 75

Psychiatric Concept of Acute Alcoholic Intoxication R Fleming Boston—p 89

Some Results Obtained with Rorschach Test Objectively Scored W Line and J D M Griffin Toronto—p 109

Relationship Between Various Emotional Disturbances and Sugar Content of Blood E F Gildea Virginia L Mailhouse and D P Morris New Haven Conn—p 115

Meteorologic Factors in Mental Diseases E T Hoverson Chicago—p 131

Varieties of Homosexual Manifestations G S Sprague White Plains N Y—p 143

Teaching Psychiatry Vermont Plan J C O Niel Burlington Vt—p 155

The Humm Wadsworth Temperament Scale D G Humm and G W Wadsworth Jr—p 163

Aschner Treatment of Schizophrenia Therapeutic Note K E Appel C B Farr and F J Braceland, Philadelphia—p 201

Role of Occupational Therapy in Modern Psychiatry Minna Emch Worcester Mass—p 207

Father Divine Holy Precipitator of Psychoses Report of Three Cases J A Brussel Brentwood, L I, N Y—p 215

American Review of Tuberculosis, New York

32:1-126 (July) 1935

Results of Surgical Treatment of Pulmonary Tuberculosis C A Hedblom Chicago—p 1

Apical Thoracoplasty F S Dolley Los Angeles—p 32

Phrenicectomy in Closing Pulmonary Cavities and End Results O A Beatty, Waverly Hills Ky—p 41

Cultural Characteristics of R1 Strain of Tubercle Bacillus with Particular Reference to Dissociation G R Dowd Saranac Lake N Y—p 50

Bacteriologic Study of Attenuated (R1) Tubercle Bacilli Recovered from Silicotic and Normal Guinea Pigs G R Dowd Saranac Lake N Y—p 62

*Observations on Multiple Tuberculous Calcifications H C Sweany Chicago—p 73

Pharmacologic Action of Tuberculo-protein in Normal and Tuberculous Animals M I Smith, Washington D C—p 98

Multiple Tuberculous Calcifications—After studying more than 600 necropsies of multiple pulmonary calcifications, Sweany concluded that any parenchymal tuberculous lesion that does not excavate into a cavity may become calcified, if the time is sufficiently long. Perhaps the most common form of multiple calcification is the calcified acinous-nodose clusters of tubercles representing the most common form of tuberculous reinfection. Such tubercles are frequently found in healed minimal and moderately advanced lesions of long standing. Occasionally they appear in healed advanced disease. They are usually asymmetrical, angular, poorly encapsulated and

poorly infiltrated with calcium. Next in importance is the hematogenic seeding, which is quite variable as the various reports indicate. The older work considers that the hematogenic origin of pulmonary localizations is common and that the latter are to be found in calcified residues as discrete miliary tuberculous, dense fibrous tuberculous and diffuse fibrous tuberculous. Since the author has established by complete reports in his presentation that certain forms of bilateral calcifications can be only hematogenic, it follows that the early bilateral seeding coming at one time or in showers, as suggested by Huebschmann and others, has been confirmed. While isolated unilateral localizations may occur by the blood stream, particularly in the apex, and in certain regions of the lung, as suggested by Huebschmann, the majority of asymmetrical seedings must be looked on as bronchogenic until more evidence is produced than there is at present. Some forms of asymmetrical seeding appear to be a type of calcification resulting from a complete or partial resolution of an infiltrating benign type of lobar tuberculous pneumonia. This type seems to occur as a part of primary infection or an infection in a host having had only an insignificant primary. Acute pneumonic consolidation may be due to atypical forms that are not sufficiently protected to survive and cause typical caseation, as in a true caseous pneumonia. The only other explanation is to assume an inspiration of a few bacilli into each of several hundred foci and around each of which there forms a perifocal reaction. The author believes there is no fixed form of benign lobar pneumonia but a series of transition forms from the so-called benign types through to the most caseous types. Regarding the pathogenesis of many of the forms formerly described as dense and diffuse fibrous tuberculous, he believes that the strictly hematogenic origin of all these forms is open to question. Most of them have a hematogenic aspect, but the encroachment on bronchi by the formation of such large masses can scarcely be avoided. In some cases the hematogenic origin seems to be the only possible source, yet the calcifications do not vary greatly from those cases in which the route seems to be suggestive of a bronchogenic origin. Bronchogenic seeding may simulate the hematogenic and vice versa, and seeding may come by the two routes simultaneously. The uniform seeding by round shotlike nodular tubercles is obviously not on the same basis as any of the foregoing groups. In this type there is a strong resemblance to primary tubercles microscopically. They are evenly distributed throughout and they may have been laid down during the anteallergic period of the disease when the allergy-immunity complex has not been well developed. This is manifest, first, because the tubercles resemble the primary type in every way. There are usually two ages of "primary" tubercles present, a true early single primary and then the many small primary-like lesions. Again, the localizations extend evenly all the way to the base. In hematogenic seedings in late reinfection there is a tendency for the seeding to be more exaggerated in the upper parts of the lungs.

Annals of Internal Medicine, Lancaster, Pa

9: 115 218 (Aug.) 1935

- *Acute Cor Pulmonale P D White Boston—p 115
- Effect of Vibratory Stimulation on Neutrophilic Index J C Healy Marion H Sweet and F P Chillingworth Boston—p 123
- *Study of One Hundred and Eighteen Readmissions to Oakhurst Sanatorium of Grays Harbor County Washington H L Hull Yakima Wash—p 134
- Myasthenia Gravis Sixth Report W M Boothby Rochester Minn—p 143
- Recent Studies on Antihormones J B Collip Montreal—p 150
- Experimental Air Embolism J B Wolfe and H F Robertson Philadelphia—p 162
- Recent Advances in Carbohydrate Metabolism with Particular Reference to Diabetes Mellitus C N H Long Philadelphia—p 166
- Incidence of the Clinical Types of Syphilis in Males in Pregnant and Nonpregnant Females W C Menninger Topeka, Kan and J E Kemp Chicago—p 175
- Clinical Study of Mild Grades of Hypothyroidism B P Seward Roanoke, Va—p 178
- Pericious Anemia with Normal Blood Picture C H Sanford Memphis Tenn—p 189

Acute Cor Pulmonale—Four cases are cited by White, who believes they illustrate the various features of the acute cor pulmonale dilatation of the pulmonary artery and right heart chambers with or without failure, which results from a

sudden great obstruction to the pulmonary circulation, best exemplified by massive pulmonary embolism. There have been ten other cases in the last two years that have shown some of the features noted in the four cases. In the fourteen cases the diagnosis of pulmonary embolism was confirmed either by necropsy, in five of the six fatal cases, or by adequate clinical evidence, including roentgen examination. Only rarely, however, are all the signs and symptoms that may be said to mark the acute cor pulmonale present in the same case at the time of observation. To encounter a case with just the right amount of pulmonary arterial obstruction at just the right time is rather a fortuitous occasion and yet doubtless not especially rare in the work of any very active practitioner. If the pulmonary arterial obstruction is too overwhelming and complete, death may ensue quickly or a serious state of shock, which depletes the circulation and prevents the overburdening of the right side of the heart. In such cases the signs of the acute cor pulmonale are missing until after the state of shock has subsided. If, on the other hand, the embolus is small or of only moderate size, blocking only one large or small pulmonary arterial branch or several small branches, the obstruction may be too slight to dilate the right ventricle. Experiments on animals have shown that the right side of the heart can stand the strain of the blocking of either one of the two pulmonary arteries without dilating, that is, without the occurrence of the acute cor pulmonale. Finally, the existence of the maximal stage of the acute strain on the right side of the heart may be brief, a matter of hours sometimes rather than days, and then the physician may make his examination only after the acute cor pulmonale has in part or wholly subsided. In the diagnosis of the acute cor pulmonale the author discusses the recent circumstances, onset, early signs (which include increased prominence and pulsation, noted by inspection and palpation, in the region of the second and third intercostal spaces just to the left of the sternum, friction rub, gallop rhythm, dilatation and increased pulsation of the jugular veins and cyanosis), course, and roentgen and electrocardiographic evidence. In the differential diagnosis of the acute cor pulmonale the four conditions that are to be particularly considered are coronary thrombosis, dissecting aortic aneurysm, pulmonary collapse or spontaneous pneumothorax and pulmonary edema from heart disease with or without cardiac asthma. An additional point of importance favoring the diagnosis of coronary thrombosis is a past history of angina pectoris. The absence of any evidence of important heart disease before the attack, in the form of aortic valve disease, hypertensive heart disease, recent coronary thrombosis or marked mitral stenosis, helps to rule out pulmonary edema of cardiac origin and cardiac asthma. The treatment of the acute cor pulmonale is, in part, that of the underlying disease, namely pulmonary embolism, which in very severe cases may necessitate the attempt at pulmonary embolotomy. Before proceeding with this serious operation in somewhat doubtful cases, the diagnosis should be confirmed by the finding of various signs of the acute cor pulmonale. Whether or not digitalis may be helpful in supporting the right ventricle in its strenuous work in these cases, the author does not know, he sees no reason why it should not be given in fairly full but not toxic doses.

Tuberculous Readmissions to Oakhurst Sanatorium.—Hull presents statistics from Oakhurst Sanatorium concerning 118 discharged tuberculous patients, who required readmission once or more than once. Education of the sanatorium patient concerning tuberculosis and his own particular infection must be emphasized, but it is not sufficient to prevent the necessity of readmission (10 per cent in this series). Too short a stay in the sanatorium is a large factor in requiring readmission. The longer the patient remains in the institution, the less likely is the necessity of his readmission because of reactivation of the disease or tuberculous complications. More beds for convalescent or "exercise" cases should be available in each institution and a longer period of observation should be possible, under fairly strenuous living conditions, before discharge. The married woman required readmission more than the single man or woman. The age period between 18 and 32 years is that in which most readmissions are necessary. This corresponds with the mortality curve for tuberculosis. Leaving the

institution against medical advice accounted for 25 per cent of readmissions. In the remaining cases the cause was considered unavoidable. More adequate follow-up work after discharge is necessary.

Archives of Otolaryngology, Chicago

22: 131 276 (Aug.) 1935

- Treatment of Thrombosis of Lateral Sinus. Summary of Results Obtained During Twelve Years at Massachusetts Eye and Ear Infirmary. P. E. Meltzer. Boston—p. 131.
Radical Mastoidectomy in Adults with Aural Tuberculosis and Active Pulmonary Tuberculosis. I. Muskat. Chicago—p. 143.
Osteoma of Frontal Sinus. Review of Literature and Report of Case Presenting Extended Invasion of Orbit. W. L. Gatewood and N. Sattel. New York—p. 154.
Effects of Irradiation on Allergic Nasal Mucosa. Final Report. L. D. Bernheimer. Chicago—p. 165.
Nucleic Acid and Nucleotide Therapy in Nasal Diseases. Contributions to Study of Chemical Aspects of Nasal Diseases. S. L. Ruskin. New York—p. 172.

California and Western Medicine, San Francisco

43: 105 176 (Aug.) 1935

- Problem of Immunization Against Poliomyelitis. E. W. Schultz and L. P. Gebhardt. Stanford University—p. 111.
Blood Cultures in Brucella Infections (A New Method). B. Stewart. B. Eddie. F. Paxton and K. F. Meyer. San Francisco—p. 112.
Development of Psychiatry. H. D. Eaton. Los Angeles—p. 115.
Rapidly Developing Cataracts After Diminophenol. W. W. Boardman. San Francisco—p. 118.
Regulation of Professions by State. Right to Regulate Reasons Therefor. Methods in Use and Attitude of Regulatory Bodies and Courts, with Relation Thereto. L. Browne. San Francisco—p. 119.
Poliomyelitis—The Los Angeles Epidemic of 1934. R. W. Meals. V. F. Hauser and A. G. Bower. Los Angeles—p. 123.
Orthopedic Treatment of Chronic Arthritis. E. Jones. Los Angeles—p. 125.
Dysovulation. S. Hirschfeld. Los Angeles—p. 129.
Brucella Abortus Agglutinins. Study of Their Incidence in Blood of General Population of City and Several Rural Communities in California. C. Emelia Peterson. San Francisco—p. 132.
Comparative Carcinogenic Potency of Common Agents. E. Bogen and R. N. Loomis. Olive View—p. 135.
Pertussis—Its Bacteriologic Diagnosis. J. J. Miller Jr., San Francisco—p. 138.
Strabismus—Present Status of Its Treatment. G. N. Hosford. San Francisco—p. 143.

Blood Cultures in Brucella Infections—As aids in preparing blood cultures in undulant fever Stewart and his associates recommend the following procedures: 1. For citrated and inactivated blood, medium sized pyrex test tubes containing from 0.1 to 0.2 cc. of a sterile 20 per cent solution of sodium citrate or 1 cc. of a 16 per cent solution of sodium citrate in a 0.85 per cent solution of sodium chloride are prepared and kept on hand. The tubes are closed with rubber stoppers. For the blood culture, from 5 to 10 cc. of blood is withdrawn from a vein and mixed thoroughly with the citrate solution. The tube with the citrated blood is transferred for fifteen minutes to a water bath registering 132.8 F. Subsequently, from 0.5 to 1 cc. of the liquid blood is removed and spread over large liver agar slants. Part of the tubes are sealed, part held in jars under 10 per cent carbon dioxide and the remainder left aerobically. All tubes, together with the unused portion of the citrated-heated blood, are held at 98.6 F. At regular intervals, liver agar slants are inoculated by means of a loop from the citrated blood tube. Growth may be noted in from three to forty days. The slants, which reveal growth, are put through the usual tests. It is advisable to incubate the tubes containing the blood for at least two and one-half months. 2. For blood treated with sodium polyanetholsulphonate, pyrex tubes containing 2 cc. of a 1 per cent aqueous solution of sodium polyanetholsulphonate are prepared and kept on hand. In preparing blood cultures, 10 cc. of blood is placed aseptically into the tubes, sealed with a rubber stopper and incubated at 98.6 F. for from ten to thirty days, and transplants are prepared on liver agar as under the first method. During the last ten months these principles were applied to the clinical study of Brucella patients. The results surpassed all expectations. Brucella bovis infections although suspected on account of their history, failed to yield positive blood cultures. In a series of sixteen patients, two furnished typical Brucella abortus type bovis cultures in the citrated and heated blood, and one by spreading the blood on liver agar slants. The unheated blood of the same patients enriched in brain broth remained sterile. Equally conclusive were the

results obtained on the blood specimens secured from slaughterhouse employees and one laboratory worker. Despite a high agglutination titer and high phagocytic index, cultures were obtained as late as the seventy-sixth day after the onset of the disease. In fact, this series of blood cultures on sixteen patients yielded positive results in fourteen, or 87.5 per cent.

Canadian Medical Association Journal, Montreal

33: 125 242 (Aug.) 1935

- General Pathologic Conception of Cancer. J. Ewing. New York—p. 125.
Effects of High Carbohydrate-Low Calory Diet on Carbohydrate Tolerance in Diabetes Mellitus. I. M. Rabinowitch. Montreal—p. 136.
Evidence in Favor of a More Active Puerperium. Study of Five Hundred Cases. H. B. Atlee. Halifax, N. S.—p. 144.
Operative Repair of Cleft Palate. A. B. LeMeaurier. Toronto—p. 150.
Some Cases of Rhinoplasty for Nasal Deformities. J. N. Roy. Montreal—p. 158.
Some Practical Points in Relation to Breast Tumors. J. Miller. Kingston, Ont.—p. 161.
Erythremia Complicated by Ascites. Case. A. E. Wilson and P. H. Sprague. Edmonton. Alta.—p. 167.
Eight Hundred Spinal Anesthetics According to Howard Jones. Method. T. Trempe. Quebec—p. 169.
Eczema. H. Orr. Edmonton. Alta.—p. 173.
Ready Made Remedies. V. E. Henderson. Toronto—p. 176.
Rapid Test for Syphilis. G. F. Laughlen. Toronto—p. 179.

High Carbohydrate-Low Calory Diet in Diabetes—Rabinowitch summarizes his experiences with the high carbohydrate-low calory diet in fifty cases of diabetes in which the patients followed treatment carefully for a period of five years. The data indicate that this diet leads in the majority of cases to marked improvement in carbohydrate tolerance. The dosages of insulin required eventually in these cases were found to be less than with all other diets that have been used heretofore in the treatment of advanced diabetes mellitus. In twelve cases the insulin was discontinued entirely. The diet has the advantage over other diets which are also liberal with respect to carbohydrate in that it is more effective in improving carbohydrate tolerance. Aside from the general well being of patients, in common with other diets liberal with respect to carbohydrate content, it is more economical from the point of view of the cost of insulin. Experiences with this diet in general support the view that undernutrition is still an important principle in the treatment of diabetes, except that the term "undernutrition" has a somewhat different meaning now than in the days before insulin. The care with which the diabetic patient will follow treatment will be directly proportional to the simplicity with which it can be carried out.

Rapid Test for Syphilis—Laughlen secures greater visibility in his agglutination test for syphilis by the addition of a water insoluble stain that colors or adheres to the suspended particles of the antigen but does not color the liquid in which they are suspended, thus affording a good contrast when agglutination occurs. Greater sensitivity and speed have resulted from coarsening the particles in the antigen suspension. Cholesterol, which does this to some extent, is supplemented by the addition of stain particles and balsam. The method employs drops on exposed slides, which results in concentration and faster reactions, and the readings, which are readily made in the gross, can conveniently be confirmed by the microscope. It employs a reagent that is difficult to prepare but is fairly stable and can be secured ready for use without further alteration or addition, thus avoiding any technical procedures that may be considered difficult. It offers advantages over other methods in that (1) it is more rapid and easier to perform, (2) the readings are more distinct because they depend on an agglutination of colored particles in an unstained medium, (3) as it resembles the methods employed in typing blood, hospital interns and others are familiar with the technic, (4) as the reagent is stable for at least several weeks it is ready for use in emergencies, (5) it affords a convenient means of grading the degrees of positivity, (6) accuracy has not been sacrificed to secure speed or simplicity and (7) the test requires only small amounts of materials. The author states that 400 specimens of blood and twenty spinal fluid samples taken for routine examination were tested by the method. They were then forwarded to the provincial and city health departments for routine tests. There was 98 per cent agreement between the agglutination and the Wassermann tests and 99 per cent with the

Kahn Spinal fluids gave about the same percentage of agreement as did the blood samples. Several hundred agglutination tests on known positive blood specimens have also been performed, and thus has demonstrated a close agreement with other methods and also that the time in which a reading can be made by the rapid method remains constant for each specimen, thus affording a ready means of indicating the degree of positivity. The author realizes that the results in less than 1,000 cases are insufficient to draw conclusions and that many similar comparisons must be made. It is apparent, however, that the test gives a high percentage of accurate results. As the readings are very definite and easily made, it may be possible to show a higher percentage of accurate results than is possible with other tests.

Delaware State Medical Journal, Wilmington

7 159 182 (Aug.) 1935

- Delaware in Figures A C Jost, Dover—p 159
Diphtheria Control Program C A Sargent Dover—p 164
Laboratory Comments R D Herdman, Dover—p 166
Community Sanitation and Delaware's Opportunity R C Beckett Dover—p 168
Survey of Results of Artificial Pneumothoraces on One Hundred and Thirty Two Cases L D Phillips Marshallton—p 172
Vaccination Without Compulsion E F Smith Dover—p 173

Florida Medical Association Journal, Jacksonville

22 49 94 (Aug.) 1935

- Obstetric Liabilities S R Norris Jacksonville—p 61
The Nervous Breakdown H M Smith Tampa—p 66
Organized Labor and Railway Medicine V A Lockwood, St Augustine—p 71
Comparison of Disease Incidence in Iowa and Florida with Especial Reference to Effect of Climate on Incidence of Digestive Disease P B Welch Miami—p 72

Iowa State Medical Society Journal, Des Moines

25 427 470 (Aug.) 1935

- Postoperative Pulmonary Complications W S Middleton, Madison, Wis—p 427
Fundamental Pathology in Progressive Tuberculosis: Primary and Reinfection F P McNamara Dubuque—p 433
Amoebiasis: Report of Six Cases A E Feller and J A Greene Iowa City—p 437
The Patient-Physician Relationship Should Be Maintained H J Hartman Waterloo—p 440
Health Insurance Is Not the Remedy J C Hill, Newton—p 442
The Psychiatrist and Internal Medicine C F Obermann, Woodward—p 446
*Valvular Endocarditis with Paradoxical Emboli L J Dimsdale Sioux City—p 448
Acute Methemoglobinemia Following Exposure to Metadinitrobenzene and Metanitroaniline B B Clark and W D Paul Iowa City—p 449

Valvular Endocarditis with Paradoxical Emboli—Dimsdale presents the case of a woman, aged 25, who complained of weakness, feverishness, shortness of breath and sharp stabbing pains in various parts of the body for weeks. She continued her routine duties until she had a miscarriage of a pregnancy of three months. After four days she called a physician. While in the hospital, the patient continued to complain of sudden pains everywhere. She had pain in the left ankle, and several days later fluctuation at this point. An ounce of pus was drained from an abscess opened at this point. The patient lived for twenty-four days, during which time her temperature was septic in type, attaining a height of 108.4 F and usually not less than 105 F. Fever, endocarditis, emboli and bacteremia were present. At necropsy the uterus and lungs as well as the abdominal viscera were studded with infarcts. Examination of the heart showed the valves of the left side to be perfectly normal, but large vegetative masses were noted on the valve flaps of the right side, thus substantiating the belief of the presence of an endocarditis. The latter finding would account for the pulmonic emboli but would not explain the emboli lodged elsewhere. To account for the latter a patent ductus arteriosus acting as a shunt between the pulmonary artery and the systemic aorta (this was not present) or a septal defect should have been present. A patent foramen ovale was found permitting the direct passage of blood from the pulmonary to the systemic side. The case is of interest in demonstrating the mechanism of paradoxical emboli and

also in suggesting the possibility that the miscarriage was due to an infarct of the uterus with consequent separation of the placenta and abortion. The other possible explanation to be considered is that sepsis was the result of an induced abortion, although the patient stated that the abortion was not induced. The infection could then have been lodged and harbored in the heart valves and subsequently caused the picture described. In view of the fact that suggestive symptoms were present previous to the miscarriage, the author believes the former assumption is the more probable.

Johns Hopkins Hospital Bulletin, Baltimore

57: 47 110 (Aug.) 1935

- *Bence-Jones Protein Excretion and Its Effects on Kidney W D Forbus W A Perlzweig I A Parfentjev and J C Burwell Jr Durham N C—p 47
Pathogenesis of Lipoid Nephrosis and Progressive Glomerulonephritis S S Blackman Jr Baltimore—p 70
Effect of Parathyroid Extract on Serum Calcium of Nephrectomized Dogs R Ellsworth and P H Fletcher Baltimore—p 91
Adenoma of Adrenal Cortex Stimulating Pituitary Basophilism (Cushing's Syndrome) R M Calder and F W Porro Durham N C—p 99

Bence-Jones Protein Excretion.—Forbus and his associates studied a case of Bence-Jones proteinuria in man, with especial reference to the effect of the excretion of large quantities of the protein on the kidney. They found that this excretion is accompanied by precipitation of the protein in the tubules in the form of peculiar casts having a fairly constant structure. These casts, being composed of an abnormal protein substance, completely obstruct the tubule and provoke a foreign body reaction, the microscopic picture thus produced apparently being specifically indicative of Bence-Jones proteinuria. The tubular obstruction results in extensive secondary changes in the kidney unit, leading finally to its destruction and its replacement by scar tissue. No evidence was found in support of the experimental idea that Bence-Jones protein is specifically toxic for the tubular epithelium. The injury to the epithelium is more logically viewed as a change secondary to the tubular obstruction. These studies of Bence-Jones proteinuria in man indicate that the excretion of this protein may be expected to produce a significant anatomic injury to the kidney, provided the quantity of protein excreted is relatively large and the duration of the proteinuria is prolonged. It is probable that disturbance in the kidney function will never be serious in any case but that some diminution in function will occur in all cases. The presence of a moderate persistent elevation of blood non protein nitrogen and a mild decrease in urea clearance in the presence of a persistent and relatively pronounced Bence-Jones proteinuria would therefore most likely establish the clinical diagnosis of a specific kidney lesion and make possible the prediction of the state of the kidneys with a fair degree of accuracy.

Journal of Nutrition, Philadelphia

10 117 232 (Aug 10) 1935

- Modification of Sherman Method of Studying Multiple Nature of Vitamins with Application to Vitamin G T S Hamilton and H H Mitchell Urbana Ill—p 117
Influence of Vitamin C Level on Resistance to Diphtheria Toxin I Changes in Body Weight and Duration of Life C G King and Maud L Menten Pittsburgh—p 129
Id II. Production of Diffuse Hyperplastic Arteriosclerosis and Degeneration in Various Organs Maud L Menten and C G King Pittsburgh—p 141
Ascorbic Acid (Vitamin C) in Sprouted Oats R Bogart and J S Hughes Manhattan Kan—p 157
Studies of Crystalline Vitamin B VI. Effect of Graduated Doses on Pigeons R E Waterman and Marion Ammerman, New York—p 161
Relationship of Vitamin D Intake of Hen to Antirachitic Potency of Eggs Produced N B Guerrant Elizabeth Kohler, J E Hunter and R R Murphy State College Pa—p 167
Quantitative Experiments on Occurrence of Vitamin B in Organs. Jessie B Brodie and Florence L MacLeod New York—p 179
Effect of Dinitrophenol on Calcium and Phosphorus Metabolism. C L Robbins New Haven Conn—p 187
Supplementary Values of Animal Protein Concentrates in Chick Rations H J Almqvist E L R Stokstad and E R Halbrook, Berkeley Calif—p 193
New Toxicant Occurring Naturally in Certain Samples of Plant Food stuffs IX Toxic Effects of Orally Ingested Selenium K W Franke and V R Potter Brookings S D—p 213
Id X Effect of Feeding Toxic Foodstuffs in Varying Amounts and for Different Time Periods K W Franke, Brookings S D—p 223

Kansas Medical Society Journal, Topeka

36: 265 308 (July) 1935

- Tumors of the Heart F C Helwig, Kansas City—p 265
Auricular Fibrillation C Maher Chicago—p 272
Skull Fractures and Head Injuries I S Nelson, Salina—p 275

36: 309 352 (Aug.) 1935

- Addison's Disease with Minimal Pigmentation Case H N Tihen Wichita—p 309
Frontal Sinusitis with Osteomyelitis and Frontal Lobe Brain Abscess Following Swimming S E Roberts Kansas City Mo—p 312
Neuralgias and Ear Symptoms Involved in General Diagnosis Due to Mandibular Joint Pathology J B Costen St Louis—p 315
Radium Treatment for Cancer of Cervix P Findley Omaha—p 321
Anaphylactic Shock from Use of Pituitrin in an Obstetric Case F W Amons, Halstead—p 323

New England Journal of Medicine, Boston

213: 195 244 (Aug 1) 1935

- Control of Measles R C Eley Boston—p 195
Whooping Cough with Particular Reference to Prophylaxis and Treatment with Vaccines F C McDonald Boston—p 198
Present Status of Scarlet Fever Prevention G W Anderson, Boston—p 203
Control of Diphtheria E S Robinson Jamaica Plain Mass—p 208
Hyperinsulinism J A Barnes and E L Richmond Worcester Mass—p 225
Brain Abscess as Complication of Septic Pleuropulmonary Disease. D A Nickerson Boston—p 228
Experiences in Ionization of Nasal Mucous Membrane H G Tobey Boston—p 230

213: 245 286 (Aug 8) 1935

- Perforating Inflammation of Vermiform Appendix, with Especial Reference to Its Early Diagnosis and Treatment R Fitz Boston—p 245
Visual Disturbances with Digitalis Medication W H Robey Boston—p 248
Natural History of Some Renal Tumors E R Mintz Boston—p 251
Latent Syphilis E W Karcher—p 257
Myxedema Heart with Congestive Heart Failure and Polyserous Effusions L M Hurxthal Boston—p 264
Cancer Education in Medical Schools R B Greenough Boston—p 267

Whooping Cough—McDonald states that the proponents of vaccine prophylaxis have offered a program that gives promise of preventing whooping cough in the young patient. The question naturally arises whether there are any serious contraindications to the use of the vaccine. Two deaths are reported in Madsen's series in infants vaccinated because there was whooping cough in the immediate family. These deaths occurred in an uncertain age period in which the vaccine may have played no direct part in the fatalities. However, the use of the vaccine, made from organisms grown on mediums enriched with human blood prepared as advocated by Sauer, appears reasonably safe and rational if given after the seventh month of life with the series completed at least four months before exposure. Sauer does not think that immunization should be attempted very soon after recovery from other diseases (measles) or within several months of other immunization (diphtheria, smallpox, scarlet fever). The Bordet-Gengou bacillus does play an important part in the disease picture of whooping cough. While vaccine therapy appears to be of doubtful value, vaccine prophylaxis as outlined by Sauer offers definite promise. However, several years of further use will be necessary for final evaluation.

Northwest Medicine, Seattle

34 281 324 (Aug.) 1935

- Some Aspects of Chronic Nephritis F R Maddison Tacoma Wash—p 281
Ureteral Transplantation Its Present Status C E Teel Bellingham Wash—p 286
Transplantation of Ureter into Lower Large Intestine Delayed Function Until Healing Occurs W J Stater Portland Ore—p 289
Applicability of Certain Surgical Procedures for Duodenal and Gastric Ulcer V C Hunt, Los Angeles—p 291
Early Cancer of Cervix Uteri The Practicability of Its Recognition Before Stage of Ulceration K H Martzloff Portland Ore—p 295
Determination of the Sex of the Unborn Child A Mathieu, Portland Ore, and A. Palmer San Francisco—p 299
Energy Requirements of the Sick Some Conditions Which May Alter It. Leila Wall Hunt, Pullman Wash—p 302
Perineal Testicle Complicated by Acute Epididymitis Case Report. F W Franz Seattle—p 309
Use of Placard in Communicable Disease Control. A Weinzierl Baltimore—p 311
Morphine Addiction Its Treatment by Autogenous Serum Modinos Phlyctenar Method Preliminary Report T D Lee Portland Ore—p 313

Pennsylvania Medical Journal, Harrisburg

38: 835 928 (Aug.) 1935

- Work of the National Institute of Health G W McCoy, Washington, D C—p 835
Preoperative Study of the Cataract Patient H H Turner Pittsburgh—p 840
Erosion of Bone in Neighborhood of Auditory Canal Due to Neoplasms W P Bailey and N Gotten, Philadelphia—p 844
Conservative Treatment of Vascular Spasm in Peripheral Vascular Disease I Starr Jr Philadelphia—p 848
Initial Weight Loss Reduction in New Borns J D Donnelly Ardmore—p 851
Facial Paralysis from Acute Middle Ear Disease H Dintenfuss Philadelphia—p 854
Brain Tumor Report of Two Cases R A Knox and G W Ramsey, Washington—p 857
Etiology of Epileptiform J M Griscom Philadelphia—p 860
The Preeclamptic Woman F B Utley Pittsburgh—p 862
Lymphogranuloma Inguinale S L Grossman Harrisburg—p 866
Etiology and Treatment of Acne Vulgaris End Results in One Hundred and Sixty Nine Cases F Amschel Pittsburgh—p 869

Public Health Reports, Washington, D C

50: 1087 1124 (Aug 16) 1935

- Control of Rabies in New York City R Olesen—p 1087
Height and Weight of Children of Depressed Poor Health and Depression Studies No 2 C E Palmer—p 1106

Science, New York

82: 137 158 (Aug 16) 1935

- Progress in Medical Training and Research in U S S R. A. A. Troyanovsky—p 137
Acuity of Hearing D A Laird Hamilton N Y—p 153
Nomenclature of Corpus Luteum Hormone A Butenandt, K H Slotta W M Allen and G W Corner Rochester, N Y—p 153
Crystalline Progesterone and Inhibition of Uterine Motility in Vivo W M Allen Rochester, N Y, and S R. M Reynolds Brooklyn—p 155
*Colloidal Dye Effective in Treating Pernicious Anemia and Evoking Reticulocytosis in Guinea Pigs Camille Mermod and W Dock San Francisco—p 155
Deuterium as Indicator in Study of Intermediary Metabolism. R. Schoenheimer and D Rittenberg New York—p 156

Colloidal Dye in Treatment of Pernicious Anemia—Mermod and Dock confirmed the observation of Massa and Zolezzi that the intravenous injection of repeated doses of the mono-azo dye congo red produces effects quite similar to those of liver extract in cases of primary anemia. Their observations were made in two cases of untreated but mild addisonian anemia in which intravenous injections of 15 per cent congo red 4B in a 6 per cent solution of dextrose were used. One patient received 60 cc in five days, the other 90 cc. in ten days, both had a rise in reticulocytes and a fall in serum bilirubin comparable to that produced in similar cases by intramuscular injections of liver extract. Congo red injected daily for five days into the peritoneal space of guinea-pigs produced a reticulocyte shower, maximal from five to seven days after beginning treatment with 30 mg of dye daily. The reticulocytosis declined gradually, reaching the control level from ten to fourteen days after the peak. At that time large doses of potent liver extract were injected but caused no further reticulocyte response. Not only does congo red produce the same effect on normal guinea-pigs as potent liver extract, but the treatment, like that with liver, renders the animals refractory to liver therapy for a considerable period. These results can scarcely be accounted for by the widely current theory that pernicious anemia is cured and the reticulocyte response of guinea-pigs evoked by providing a substance needed for the maturation of red corpuscles. While the theory that pernicious anemia results from overactive blood destruction and can be corrected by blocking the reticulo-endothelial system might be satisfactory to account for the blood disturbances of addisonian anemia, it obviously fails to account for the glossitis and spinal cord lesions that often accompany the disease and are arrested by liver therapy. Congo red is notably effective in neutralizing toxic substances and it is more probable that in pernicious anemia and in normal guinea-pigs it assists in detoxification of substances, probably enterogenous in origin, that are hemolytic. These observations make imperative a further exploration of the old theory that pernicious anemia is due to excessive absorption or deficient detoxification of noxious substances derived from the gastro-intestinal tract.

Southern Medical Journal, Birmingham, Ala.

28 679 772 (Aug) 1935

- Nonsuppurative Osteomyelitis Diagnosis and X Ray Treatment J T Murphy Toledo Ohio—p 679
- Arterioles in Malignant Hypertension Report of Case J F Pilcher and E H Schwab Galveston, Texas—p 688
- Transurethral Prostatic Resection Report of Seven Hundred and Forty Eight Cases T M Davis Greenville S C—p 693
- Latent Brain Abscess Secondary to Sphenoid Sinusitis Case Report M A Lischkoff Pensacola, Fla—p 700
- Clinical Importance of Cholesterol C T Stone, Galveston, Texas—p 705
- Pollinosis in the Southwest E D Sellers Abilene, Texas—p 710
- *Leukocyte Blood Pictures in Surgical Types of Infection D A Robnett, Columbia Mo—p 714
- Important Considerations in Prevention of Carcinoma of Cervix W Long Oklahoma City—p 719
- *Endocrines in Gastro-Intestinal Disorders D L Sexton St. Louis—p 724
- Aspergillosis and Moniliosis Case Report with Necropsy Findings J A Reed Washington D C—p 729
- Leprosy Report of Twenty Seven Cases Treated with Anthrax Vaccine J N Roussel, New Orleans—p 730
- Malaria Need for Continued Malaria Research H Hanson, Jacksonville Fla—p 736
- Id Report of the Subcommittee on Malaria Research of the National Malaria Committee. C F Craig New Orleans—p 739
- Id Recent Research on Malaria Plasmodia H E Meloney Nashville Tenn—p 739
- Id Recent Research on Diagnosis of Malaria W Gingrich Galveston Texas—p 742
- Id Recent Research on Therapeutics of Malaria H C Clark Panama Republic of Panama—p 746
- Id Recent Research on Malaria Therapy of Venereal Diseases Review of Progress in New Researches of Malaria Therapy of Venereal Disease B Mayne Columbia S C—p 750
- Id Some Recent Advances in Epidemiology of Malaria G E Riley Jackson Miss E C Faust, New Orleans and S S Cook Washington D C—p 753
- Id Malaria Mortality in the Southern United States for the Year 1933 E C Faust and Celeste Goff Diboll New Orleans—p 757
- Id Review of Malaria Control Activities in the Southern States During 1934 M F Boyd Tallahassee Fla—p 763

Leukocytes in Surgical Types of Infection—Robnett advocates a graphic method of recording total counts and neutrophil percentage for demonstrating by a curve or changing line the degree of resistance as weighed against the infection. This is of incomparable value in diagnosing infections, evaluating resistance, determining the need or the urgency of surgery and arriving at a prognosis based on other than guesswork. For this he uses a modification of the Gibson chart. One may see on this chart at a glance the changes from count to count and interpret the resistance units of disproportion indicated by a rising or falling line. As examples 1 A rising neutrophil end of the line indicates a spreading infection, a new field of infection or an increasing virulence of the infecting agent. 2 A falling neutrophil end of the line indicates that the infection is being overcome or walled off or has been removed. If accompanied by a return of eosinophils or an increase in the percentage of eosinophils, there is no stronger indication that convalescence is established. 3 A rising total cell count end of the line indicates increase in resistance, and when resistance is in keeping with infection a horizontal line exists. 4 A falling total cell count end of the line, if the neutrophil end of the line remains stationary or rises, signifies a break in resistance, and the greater the disproportion between the two ends of the line the more grave the condition. 5 A falling total cell count end of the line, with a sharp rise in the neutrophil end, is an indication of gravity, with a decreasing resistance and an increasing or spreading infection. A blood count is indicative of the condition of the patient only at the time when the specimen of blood was obtained. The blood picture indicates that an infection is or is not present, and, if present, one must find it. In such diseases as pyelitis and cholecystitis, in which there are alternate periods of retention and drainage, the leukocyte count is subject to such changes that it must be interpreted with great caution.

Endocrines in Gastro-Intestinal Disorders—Sexton discusses thyroid, parathyroid, gonadal, pituitary and adrenal disorders and their bearing on gastro-intestinal functions. In considering gastro-intestinal disorders of endocrine origin, such patients should have the benefit of a careful general examination eliminating constitutional disease and its effect on the endocrine and gastro-intestinal systems, ruling out allergic reactions and

finally eliminating the presence of organic disease of the gastro-intestinal tract through special studies. Altered functions of the endocrine system cause disturbances of the gastro-intestinal tract chiefly through an imbalance of the autonomic nervous system. Those gastro-intestinal disorders associated with an insufficient gonadal function are of greater significance and occur more often than in any other endocrine disturbance. The severity of gastro-intestinal symptoms is found to be dependent on the degree of autonomic imbalance and to a considerable extent on the habitus of the patient. Investigations have proved the tendency to subacidity in both hypothyroidism and hyperthyroidism. Gastro-intestinal hyperirritability is the rule in hyperthyroidism, while obstinate constipation is found in myxedema. In patients with gastro-intestinal complaints in whom malnutrition exists, a low basal metabolic rate should be considered with great caution as an indication of thyroid deficiency. Mild disorders of the adrenals and parathyroids are poorly understood, as are also any gastro-intestinal symptoms that may arise from them. The gastro-intestinal disturbances in the well developed adrenal and parathyroid disorders are recognized as playing a prominent part.

Tennessee State Medical Assn Journal, Nashville

28 315 360 (Aug) 1935

- Botulism J L Cochran Jackson—p 338
- Further Report on Surgical Treatment of Retinal Detachment. E. C. Ellett and R O Rychener Memphis—p 348

Western J Surg, Obst. & Gynecology, Portland, Ore.

43 421 476 (Aug) 1935

- Concerning Deficiency and Insufficiency of Urethra L. Fraenkel, Breslau Germany—p 421
- Impedance Angle Test for Thyrotoxicosis M A B Brazier, London England—p 429
- Rupture of Tendons Report of Four Cases of Latent Rupture of Tendon of Extensor Pollicis Longus J H Boyce, San Francisco—p 442
- Pneumothorax Two Cases W D Holden Portland Ore—p 445
- *Simplified One Stage Procedure for Cancer of Rectum (Combined Abdominoperineal) D V Trueblood Seattle—p 447

Simplified Procedure for Cancer of Rectum—The abdominoperineal operation for cancer of the rectum that Trueblood submits requires two operating groups, one to work from above (in the abdomen) and one to work from below (anus and perineum). The patient is placed in the lithotomy position with the table tipped as for the Trendelenburg position. If a man, the penis, containing a catheter, and testicles are placed in a rubber glove, which is secured by a rubber band at its base. If a woman, the bladder is emptied and the vagina is prepared with the perineum. The surgeon opens the abdomen and determines whether or not the lesion is operable. If so, the crew detailed to work on the anus and perineum begins. The anus is cauterized by actual cautery, circumscribed by an incision and inverted with a suture, then the successive steps necessary to free the rectum with its fat from surrounding structures are performed. The author prefers using the radio-cautery rather than the knife for this work. While these operative steps are being performed, the abdominal group has severed the sigmoid, between clamps, with the cautery. The distal end is tied just below the clamp and tied again a little lower. The clamp is then removed and a piece of rubber dam is placed over the intestinal end and tied. The intestinal end is not inverted, thereby saving time and obviating the infection of an intestinal stitch. The rest of the abdominal procedure is as has been described so often by others. It is well, however, to tie off the superior hemorrhoidal artery as soon as possible so as to reduce the amount of bleeding in the operative field below. The two operative fields have been approaching each other and eventually meet, permitting the surgeon below to withdraw the distal sigmoid and rectum. The abdominal surgeon repairs the peritoneal floor of the pelvis, provides for the permanent colostomy, covers raw surfaces and closes the abdomen without drainage. The perineal surgeon places a rubber dam in the wound cavity and fills it with gauze. The two stages of the abdominoperineal operation have been performed simultaneously. The procedure offers the surgeon relief from the difficulties often found at the second opening of the abdomen, that is, adhesions or evidence that the cancer has grown rapidly during the interval.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

8: 467-530 (Aug.) 1935

- Portable Direct Reading X-Ray Dosage Rate Meter G. W. C. Kaye and G. E. Bell—p. 467
- New Instrument for the Measurement of Ionizing Radiations T. A. Chalmers—p. 479
- New Simple and Compact X-Ray Meter C. N. Rocks—p. 481
- Roentgenologic Diagnosis of the Diseased Appendix A. Orley—p. 487
- Reduction in Multiplication of Protozoan (*Nodo Caudatus*) Caused by Exposure to Gamma-Ray Irradiation with Study of Sensitive Period in Life of Cell M. Robertson—p. 502
- Addendum: Radiation Field Near Flat Applicator W. V. Mayneord—p. 527
- Useful Carrier for Wet Films H. Morris—p. 529

British Medical Journal, London

2: 243-286 (Aug. 10) 1935

- Diseases of the Gallbladder C. P. G. Wakeley—p. 243
- Some Immunologic Aspects of Cure and Prevention of Diphtheria J. Menton—p. 246
- *Significance of Pyrexia in Chronic Pulmonary Tuberculosis M. Myers—p. 250
- Cushing's Syndrome Case W. Langdon Brown and C. M. Seward—p. 253
- Peritonsillar Abscess in Infancy with Records of Two Cases A. Maclean—p. 254

Pyrexia in Chronic Pulmonary Tuberculosis—Myers found that the various types of lesions in chronic pulmonary tuberculosis (as defined by Wingfield's classification) give rise, within limits, to characteristic changes in the temperature chart. Spread (activity) of the disease may occur in the absence of pyrexia. Many patients with quiescent pulmonary tuberculosis suffer from frequent bouts of pyrexia, or may even exhibit a constant mild pyrexia, without there being any evidence of spread of the disease. In view of the foregoing, it is possible that pyrexia in chronic pulmonary tuberculosis is often caused by infection of the tuberculous lesions by the organisms of the respiratory tract. Serial roentgenograms are the most reliable guide to the spread or retrogression of the actual tuberculous lesions, but the temperature chart, especially when considered in conjunction with these, gives essential and valuable information.

Glasgow Medical Journal

6: 49-104 (Aug.) 1935

- Developmental Defects of Lens and Their Embryology Ida Mann—p. 49
- Thrombophlebitis Migrans Two Cases A. B. Walker—p. 66

Irish Journal of Medical Science, Dublin

No. 115: 289-336 (July) 1935

- The Mammal Before and After Birth J. Barcroft—p. 289
- Chemical Conditions of Mental Development J. Barcroft—p. 302
- Notes on Ayerza's Disease Report of Case E. T. Freeman—p. 314
- *New Method for Treatment of Fracture of Lower Jaw H. Meade—p. 318
- Calcium and Phosphorus Metabolism in Health and Disease W. A. Gillespie—p. 320

Treatment of Fracture of Lower Jaw—Meade used Kirschner wires to hold the fragments in position in a fracture of the lower jaw, in which the wound on the right side of the face started behind and below the angle of the mouth and extended into the submaxillary region. It was septic and communicated with the lower jaw, which was fractured. The fracture was badly comminuted and extended from the canine to the second molar tooth. He injected the skin with a 1.5 per cent solution of apothesine. As the patient was only semiconscious, he did not consider any further anesthesia necessary. With his fingers in the mouth he pressed the fragments into position as well as he could and then drilled in two wires from the front toward the angle of the jaw, the wires crossing each other. There was no increase in the swelling of the soft tissues subsequent to this intervention. The edema decreased every day, as did the intensity of the head symptoms. Within a week the patient was perfectly conscious. The wound, however, was

very septic and there was a free discharge of pus and saliva for the following three weeks. About a fortnight later a small piece of bone was removed, which was seen to be lying free in the wound. The patient had very little trouble with the wires. When he left the hospital five weeks later the wound was practically healed. The author has used the same method in another case of fracture of the jaw. This case was simpler, being a single fracture of the right side of the mandible, situated just behind the canine tooth. It was not comminuted. In the first case he had used an electric drill to insert the wires. On the second occasion he used a hand drill, so that he was unable to control the fragments with his fingers. He states that, when inserting the wire, one should try to avoid the roots of the teeth and the line of the inferior dental nerve. He recommends the use of an electric drill.

Journal of Anatomy, London

69: 399-542 (July) 1935

- Early Human Embryo (No. 1285 Manchester Collection) with Capsular Attachment of Connecting Stalk J. Florian and J. P. Hill—p. 399
- Formation of Venous Valves Foramen Secundum and Septum Secundum in Human Heart P. N. B. Odgers—p. 412
- Congenital Heart Disease with Single Arterial Trunk Case. G. Davison—p. 423
- Development and Histogenesis of Human Pineal Organ R. J. Gladstone and C. P. G. Wakeley—p. 427
- Terminal Part of Wolffian Duct J. E. Frazer—p. 455
- Anatomy of Major Duodenal Papilla of Man with Especial Reference to Its Musculature. V. J. Dardinski—p. 469
- Paraganglions and Carotid Body A. Celestino Da Costa—p. 479
- Observations on Structure of Uterus Masculinus in Various Primates S. Zuckerman and A. S. Parkes—p. 484
- Sensitivity of New Born Monkey to Oestrin S. Zuckerman and G. van Wagenen—p. 497
- Subcommissural Organ and Mesocelic Recess in Human Brain Together with Note on Reissner's Fiber M. F. L. Keene and E. E. Hewer—p. 501
- Peroneus Tertius Muscle in Chacma Baboon (*Papio Porcarius*) L. H. Wells—p. 508
- Unusual Thyroid Gland in Race of Lizards (*Egernia Kingii*) from Eclipse Island Western Australia G. Bourne—p. 515
- Coronary Blood Supply in Rhesus Monkey D. I. Abramson and H. J. Eisenberg—p. 520

Journal of Tropical Medicine and Hygiene, London

38: 185-196 (Aug. 1) 1935

- Short Note on *Vibrio* *thrix aurantica* Castellani 1929 M. Girolami—p. 185
- Ulcer Syndrome in Tropical Africa. A. A. F. Brown—p. 187

Medical Journal of Australia, Sydney

2: 101-132 (July 27) 1935

- Investigation and Treatment of Vaginal Discharges H. Jacobs—p. 101
- Sedatives in Acute Cerebral Trauma G. Phillips—p. 108
- Practical Method of Dealing with Asthma and Hay Fever R. S. Steel—p. 114

Practitioner, London

135: 129-248 (Aug.) 1935

- The Problems of Tropical Life L. Rogers—p. 129
- Care of European Children in the Tropics H. S. Stannus—p. 138
- Neurasthenia in the Tropics M. Culpin—p. 146
- Diagnosis of Malaria P. Manson Bahr—p. 155
- Tropical Diarrhoeas N. H. Fairley—p. 167
- Favorite Prescriptions VIII Pharmacopoeia of Hospital for Tropical Diseases W. E. Cooke—p. 188
- *Anemia in Infancy and Childhood Helen M. M. Mackay—p. 200
- Vomiting in Infancy and Childhood K. H. Tallerman—p. 211
- Hydatid Cyst of Lung Case Report of Spontaneous Rupture and Recovery W. Lee—p. 223
- Habitual Constipation Especially in Old Age F. P. Weber—p. 229
- Displacements of Uterus Some Facts and Fallacies J. H. Hannan—p. 233
- Solarium for Heliotherapy P. M. Mehta—p. 237

Anemia in Childhood—Mackay states that anemia is diagnosed much too often in children of school age and not nearly often enough in babies. It is not common in the former, whereas it is extremely prevalent among babies. To make sure whether or not one is dealing with a case of anemia a hemoglobin estimation is essential, for only a profound anemia can be diagnosed with certainty from a child's appearance. A child who lives

in a basement and goes outdoors little and who is overtired or suffering from nausea may look pale and yet have a normal hemoglobin level. Conversely, an anemic child may have rosy cheeks from an outdoor life or may be flushed pink from exercise, from crying or from sitting near a fire. Even slight grades of anemia affect the child's general well being and its resistance to diseases adversely, so that it is of importance to know what is the normal hemoglobin level at different ages, in order to recognize departures from the normal. The normal hemoglobin levels in early life, the types of anemia in relation to age periods and the prophylaxis are discussed.

South African Medical Journal, Cape Town

8: 441-472 (July 13) 1935

- *New Pregnancy Test Demonstrating Presence of Histidine in Urine of Pregnant Women H Renton—p 441
- Anemia in South African Domesticated Animals De Kock Fourie, Quin Monnig Graf and Kellermann—p 443
- Agranulocytosis Report of Three Cases M M Suzman—p 449
- Pneumocephalus F D du T van Zyl—p 455
- Leprosy Some Aspects of Modern Research H v R Mostert—p 459
- Administration of Hospitals Under the East India Company P J Venter—p 464
- Height Weight Age Standards as Index of Nutrition of Children Preliminary Report I Freed—p 467
- The ACH Index as Applied to South African Boys C L Leipoldt—p 471
- 8: 473-516 (July 27) 1935
- Harris's Technic in Prostatectomy W H Lloyd Wronsley—p 475
- Preoperative Period in Prostatic Obstruction H J Besselaar—p 479
- Neoplasms in Domestic Animals C Jackson—p 481
- Operative Treatment of Benign Prostatic Enlargements V Vermooten—p 485
- Benign Prostatic Hypertrophy J Z H Rousseau—p 488

New Pregnancy Test, Demonstrating Histidine in Urine—The test that Renton describes depends on the presence of histidine in the urine of pregnant women and is carried out by the technic recently introduced by Kapeller-Adler. This test may readily be performed by any general practitioner. It is not claimed to be as accurate as the Aschheim-Zondek or Friedman tests, but it has the advantage that a result is obtained in about twenty minutes. If the test is used in conjunction with clinical observations, it is of the greatest assistance in the diagnosis of doubtful cases of early pregnancy. Five cubic centimeters of filtered urine is placed in a test tube, and bromine reagent (1 cc. of pure bromine, 100 cc. of glacial acetic acid and 300 cc. of distilled water) is added by means of a pipet until the mixture becomes light yellow. Usually from about 2 to 5 cc. of the reagent is necessary. This is the most intricate part of the test, as it is necessary to have a minute excess of bromine in the urine before proceeding with the next step. The urine "consumes" the bromine, and the excess of bromine is tested for with the iodine starch paper. The best way to do this is to cut a series of small squares of the white paper and place them on a piece of glass. By means of a glass rod, a drop of the mixture is placed on a piece of the paper. Free bromine gives a violet color. If there is too much bromine, the color will be dark violet. The object is to obtain a pale violet reaction, indicating minute excess of bromine. If the color is found to be too dark, a few more drops of urine are added until the correct color is obtained. It is necessary that the color reaction should remain stable for ten minutes. When this color reaction has been settled, i. e., after a lapse of ten minutes, 3 cc. of alkali reagent (10 Gm. of ammonium carbonate, 90 cc. of distilled water and 200 cc. of pure liquid ammonia) is next added and the mixture shaken and then placed in a steaming water bath for three minutes, if the test is positive for histidine and pregnancy, a mauve deepening to reddish purple, depending on the amount of histidine present, will result. This usually becomes more marked on standing for a few minutes. Best results are obtained by using a twenty-four hour specimen of urine, but a morning specimen of good concentration may be used. The author has checked the results of 100 tests by clinical observations or subsequent history. Most of the urines were examined in early pregnancy. One case was positive at three weeks. The best reactions seemed to be obtained at about two to three months. At or near term the intensity of the reaction generally did not appear to be as strong as in earlier cases.

Quart. Bull., Health Org., League of Nations, Geneva

4: 323-496 (June) 1935

- Nutrition and Public Health E Burnett and W R Aykroyd—p 323
- *Tuberculin Standardization and Tuberculin Tests T Madsen and J Holm—p 475
- *Latest Results of Typhoid Serology Their Bearing on Production and Testing of Typhoid Vaccines and Therapeutic Serums as Well as on Typhoid Diagnosis F Kauffmann—p 482

Tuberculin Standardization and Tuberculin Tests.—Madsen and Holm point out that considerable divergences appear in the results of certain of the series of tuberculin tests carried out recently, but, as there was no uniformity in the tuberculin used or the type of test employed, it is hardly possible to compare the results, and valuable material is thus lost for the study of tuberculosis epidemiology. The adoption of the standard tuberculin and of a standardized test would remedy this. The authors state that the sensitivity of the Pirquet and Moro tests corresponds to a Mantoux test performed with 0.01 mg. of standard tuberculin. To determine all the tuberculin positives, the negative reactors must be retested with an intracutaneous injection of 0.1 mg. and eventually with 1 mg. of standard tuberculin. Only a complete intracutaneous test ending with a dose of 1 mg. can be considered a standard method for mass investigations.

Serologic Results in Typhoid—Kauffmann states that the discovery of the new typhoid Vi antigen (virulence antigen) and the detection of the new serologic V-W change of form has introduced vitally important improvements in the experimental basis on which the production and testing of typhoid vaccines and therapeutic serums rests. At the same time, this new knowledge has completely eliminated the difficulties and irregularities formerly encountered in serologic typhoid diagnosis. Therefore, great progress has been made both in the diagnostic and in the therapeutic field. The author gives a general survey of the field. The experience that he has gained so far affords a reliable basis for the following proposals concerning an internationally uniform Widal test. 1 All investigators should use the same strains, which should be supplied from one single center and distributed fresh once a year. 2 The strains should in all cases be reseeded on the same medium, and the emulsions prepared and preserved according to the same method. 3 The Salmonella tests should be performed separately with O and H antigens. 4 Killed emulsions should be used for O and H agglutinations, since these emulsions are in every case specific and easy to read, remain stable for a long time and are safe and cheap. 5 Formaldehyde broth cultures should be used for purposes of H agglutination, alcohol emulsions for O agglutination and living or formal-killed bacilli of the V form for possible Vi agglutination. 6 Specified dilutions of the serum, specified temperatures of incubation, specified periods of incubation and a specified technic of reading and appraisal of results should be used.

Journal of Oriental Medicine, Dairen, South Manchuria

22: 81-102 (June) 1935

- Lower Jaw of Chinese. K. Miyashita—p 81
- Cholera and Cholera like Vibrio Parts VI, VII and VIII Variability of Cholera Vibrio K. Manako—p 85
- Investigations on Amebic Dysentery VII Simple Method for Determination of Degenerated Trophozoite and Cysts of Endamoeba Histolytica in Feces I Sumi and K. Inoue—p 88
- Study of Anaerobic Bacteria Part I Comparative Study of Growth of Anaerobic Bacilli on Aerobic Mediums H. Inoue—p 89
- Id. Part II Simple Method of Cultivating on Slant Agar Mediums H. Inoue—p 90
- Pelvic Arteries of Chinese. K. Miyashita—p 91
- Place of Origin of Large Branches of Abdominal Aorta in Chinese K. Miyashita—p 92
- Experimental and Clinical Study of Urinary Nitrite Reaction K. Okada—p 94
- Biologic Studies of Acid Fast Bacteria Part II Isolation of and Some Biologic Natures of Saprophytic Acid Fast Bacteria K. Urabe—p 96
- Sweating with Heat Stroke K. W. Kuo, K. Takahara, J. Adachi and K. Saito—p 98
- Observations on Discharge of Sweat Drops from Sweat Pores in Man K. Saito—p 100
- Effect of Application of Cold on Metabolism at High Surrounding Temperatures K. Ogata—p 101
- The Effective Sweating S. Ito and T. Yabuki—p 102

Presse Médicale, Paris

43: 1169 1192 (July 24) 1935

- Cancer of Larynx in Aged G Portmann, Mougneau and Barraud —p 1169
- *Treatment of Tuberculous Adenitis P Moure Baude and C Rouault —p 1172
- Thrombophlebitis of Inferior Vena Cava and Portal Vein R Lutembacher —p 1175
- Normal and Pathologic Gastric Villosity T Moutier —p 1178
- Clinical and Roentgenologic Forms of Aerial Cyst of Lung P Pruvost, M Leblanc Delori and Coletsoos —p 1182
- Action on Reaction of Parathyroids in Diffuse Cancerous Osteitis E Bernard J Doyer, J Forge and Mlle Gauthier Villars —p 1186
- Diffuse Subacute Glomerulonephritis H Chabanier C Lobo-Onell and E Lelu —p 1189

Treatment of Tuberculous Adenitis—Moure and his collaborators discuss the use of an etherized solution of formalized chlorophyll in tuberculous adenitis. This solution has the advantage of being penetrating and sclerosing. The adenitis treated were for the most part cervical and of three types: chronic, ganglionic masses formed from agglomerations of ganglions and fistulized adenitis. The technic of injection was simple. In the case of cervical polyadenopathy it is necessary to choose a gland at the lower portion of the superficial subclavicular triangle, to fix it between the thumb and forefinger and to push the needle directly into the center, avoiding the superficial veins. The injection is then made slowly. The pain is relatively slight, owing to the incorporation of an anesthetic in the fluid. The local reaction and the fever of about 39 C. (102.2 F), especially the first, are not to be considered a complication. The amount injected is from 2 to 10 cc. The number and frequency of the injections vary with the case. Some cures have been obtained in two months with four injections, others in six months with ten or twelve. The authors have treated 112 patients in this way. Eleven were lost sight of, forty five recovered and fifty-six are still receiving treatment.

Schweizerische medizinische Wochenschrift, Basel

65: 757 804 (Aug 24) 1935 Partial Index

- *Infection Experiments with Isolated Oxychromatic Inclusion Bodies of Herpes Gertrud Baumgartner —p 759
- Observations on Nonneoplastic Pancreatic Disturbances A Bener —p 760
- Case of Acromegaly with Diabetes Mellitus. Also Contribution to Physiology of Anterior Lobe of Hypophysis E Goldschmidt —p 766
- *Extrarenal Azotemia in Circulatory Insufficiency H Grieshaber —p 768
- Pulmonary Gangrene with Bronchitis Dissecans Marta Herzog —p 770
- Bronchiectasis in Situs Viscerum Inversus M Kargagener and A Horlacher —p 782
- Simultaneous Appearance of Scalds in Horses and of Disturbances Resembling Glandular Fever in Human Beings F Koepplin —p 787

Experiments with Inclusion Bodies of Herpes—Baumgartner reports her studies on the oxychromatic inclusion bodies of herpes. She isolated, washed and inoculated them. The material she investigated consisted of the epithelial cells of the cornea of rabbits with vaccination keratitis. She found three types of formations that are not detectable in the normal cornea. 1 After teasing and smoothing the tissue debris by means of microneedles, she discovered occasionally free cells which enclosed a luminescent body. 2 In enlarged, partly degenerated cells she observed roundish and slightly longish formations that were somewhat larger and less luminescent than the first ones. 3 In the surroundings of the tissue fragments there frequently were a number of roundish and longish formations that had great luminescence. All three types give, under greatest magnification, the impression of globes with many pits. The author is convinced that the bodies mentioned under 1 and 2 are herpes bodies and thinks it probable that those of the third group are too. However, in the experiments with the herpes bodies she used only those that had been extracted from the cells. After the bodies had been isolated and washed, a body was blown by means of a pipet into a scarification on the cornea of a rabbit. In other animals the wash fluid was introduced in the same manner. The author states that she obtained two positive results with herpes bodies and two positive and seven negative results with the bodies and wash fluid combined, but the wash fluid alone always gave negative results. She admits that the number of her experiments was too small to permit definite conclusions, but she points out that with herpes bodies the results are less often positive than in fowl pox. In citing

other investigators of the problem of inclusion bodies, she points out that some suggested the subdural mode of infection. She thinks that comparative studies with several methods of vaccination might throw more light on the problem.

"Extrarenal" Azotemia in Circulatory Insufficiency—Grieshaber points out that, whereas the pathogenesis of renal uremia is fairly clear, the extrarenal factors that may cause azotemia are not so well understood. Some authors believe that azotemia may result from sodium chloride deficiency, while others assume more general causes. The latter group admits a sodium chloride deficiency, but, instead of considering the salt deficiency the cause, they maintain that it is an accompanying symptom. The author reports a case history that corroborates the latter view. A decompensated aortic insufficiency, which developed on the basis of an aneurysm resulting from incomplete rupture of the aorta, led with increasing circulatory weakness and cardiac oliguria to an azotemic condition. The author stresses that the azotemia preceded the hypochloremia, that the increase in the urea content was accompanied by a retention of the aromatic disintegration products of protein, and that there was a discrepancy as regards time and volume between the hypochloremia and the hypochloruria. He shows that in the reported case the hypochloremia cannot have been the cause of either the azotemia or the hypochloruria. Moreover, the cause of the hypochloremia is likewise unknown, for it cannot be explained by external causes, such as vomiting or diarrhea. However, it is possible that the sodium chloride in the edema fluid, that is, in the tissues, could not be mobilized because of the continuous circulatory impairment of the pre-renal function, while as the result of digitalization a flooding out took place by way of the kidneys. This sodium chloride retention in the tissues, that is, at the site where the proteomic metabolic products develop, is, in addition to the aforementioned time factors, a further proof of the fact that the azotemia resulting from circulatory insufficiency is not caused by sodium chloride deficiency.

Pediatrics, Naples

43 993 1104 (Sept. 1) 1935

- *Glycemic Changes in Epidemic Parotitis P Buonocore —p 993
- Sympathetic Nervous System in Exudative Diathesis Through Study of Capillaries S Quadri —p 1004
- Reaction of Feces in Children Determining Causes of Fecal pH R. Pachioli and V Mengoli —p 1025
- Hematologic Research in Vivo on Bone Marrow of Early Infancy F Teclazic —p 1046
- McClure-Aldrich Test in Intoxication E Tatafiore —p 1053

Glycemic Changes in Epidemic Parotitis—Buonocore made dextrose tolerance tests at intervals on ten children who had epidemic parotitis. The patients were given from 20 to 50 Gm of dextrose on a fasting stomach. No less than 25 Gm of dextrose per kilogram of body weight was given. The glycemic curve was read every half hour. All patients showed marked glycemic changes. During the regressive stage of the parotitis (from the fourth to the sixth day) the curve demonstrated intense hyperglycemia of long duration. The author suggests that the disturbance in glycemic metabolism was due to a concomitant pancreatic dysfunction.

Archivos de Medicina, Cirugía y Espec, Madrid

38: 545 576 (Aug 30) 1935

- *Physiologic Importance of Amount of Circulating Blood. Its Study in Cardiovascular Diseases J del Cañizo y Suárez —p 545
- Syphilitic and Arsenical Sensorimotor Polyneuritis Differential Diagnosis W López Albo —p 551
- Creatinuria in Muscular Dystrophy and Cortical Hormone. A Pascual and J A Collazo —p 555
- Malta Fever in Our Neurologic Experience. P Ortiz Ramos and J Ortiz de Villajos —p 558
- *Congo Red in Treatment of Hemoptysis. A Hernández Díaz —p 563

Studies on Circulating Blood—Cañizo y Suárez made studies on the amount of blood in circulation in normal conditions and in cardiovascular diseases. He concludes that the organs that act as physiologic reservoirs of blood are the spleen, liver, lungs, venous system and subpapillary plexus of the skin, as has been proved by other authors. The amount of blood in circulation under normal conditions is about 85 cc. per kilogram of body weight, a value relative to the body weight and the venous pressure. The amount of blood in circulation may vary, because of physiologic or pharmacologic influences. It

increases by muscular exercise, rising of the external temperature and respiration of carbon dioxide and diminishes during sleep or by the respiration of oxygen. The amount of circulating blood ranges between 55 and 75 cc. per kilogram of body weight in persons presenting compensated valvular lesions. The diminution represents a new factor for the compensation of the cardiac lesions. The amount of circulating blood regularly increases in compensated red hypertension (plethora), diminishes in compensated white hypertension (spasm), greatly diminishes in acute circulatory insufficiency (vasomotor collapse) and greatly increases in chronic circulatory insufficiency, in which figures of about 120 cc. per kilogram of body weight, and even more, may be observed. Venous pressure in cases of chronic circulatory insufficiency is extremely high. Wollheim's "minus" decompensation and vasomotor collapse should be considered two stages of one and the same process and not two different forms of circulatory insufficiency.

Congo Red in Treatment of Hemoptysis—Hernández Diaz states that the factors of hemorrhage and spontaneous hemoptysis depend on the reticulo-endothelial system, the stimulation of which, especially by congo red, results in the control of hemorrhages. He reports satisfactory results with intravenous injections of a 1 per cent solution of congo red in distilled water in the amount of 10 cc. per injection. Smaller injections are insufficient. The technic is the same as that used for any intravenous injection. The interval between the injections is twenty-four hours. As a rule the hemorrhage stops after the first or second injection, except in rare cases in which four or five injections are necessary to control it. The treatment is indicated in any type of hemorrhage, but the best results are obtained in those of moderate intensity. The injections of congo red are generally well tolerated. The febrile reaction following the injection shown by a small group of patients seemed to be due to a slight precipitation of the solute in the solvent, owing to the fact that Ringer solution was used instead of distilled water in the preparation of the solution. The injection is a little difficult because of the color of the solution to be injected. Congo red is not a caustic to the cellular tissues, but when it exudes from the vein a red spot appears at the point of injection that may last for several days. In the author's group of sixty-four patients, fifty-eight were suffering from tuberculous and nontuberculous hemoptysis. Of these, the treatment failed in two cases of ulcerous tuberculosis with cavitation, gave mediocre results in seven and succeeded in forty-nine (control of the hemorrhage after one, two or three injections without recurrences). The remaining six cases include three of hematemesis in gastric ulcer, one of melena in cecocolic intestinal tuberculosis, one of hematuria due to renal lithiasis, and one of hemorrhage due to rectal epithelioma. The treatment succeeded in all cases except in that of rectal epithelioma. The phenomena observed in the blood after the injection are monocytosis, increase of the fibrinogen and of the platelets, and shortening of the time of coagulation.

Beiträge zur Klinik der Tuberkulose, Berlin

86: 343-398 (July 27) 1935 Partial Index

- Gold Therapy of Tuberculosis J. Zinkernagel—p. 343
- *Pathogenesis of Bronchiectasis Bronchiectases and Changes in Accessory Nasal Cavities M. Kartagener and K. Ulrich—p. 349
- *Experiments on Prophylactic Vaccination Against Tuberculosis with Different Strains of the Tubercle Bacillus and with Staphylococci J. Weissfeiler and E. N. Morosowa—p. 358
- *Demonstration of Tubercle Bacilli in Adults Culture from Gastric and Duodenal Contents K. Menzel and J. Schramek—p. 371
- Dry Picture of Tuberculin P. Kallós—p. 378

Pathogenesis of Bronchiectasis—Kartagener and Ulrich state that the rhinologic examination of seventy patients with bronchiectasis disclosed in thirty-nine, or 55.7 per cent, a chronic maxillary sinusitis. They think that this frequent concurrence of bronchiectasis and sinusitis is not entirely accidental. Moreover, the cranial roentgenograms of eighty-six patients with bronchiectasis disclosed that a relatively large proportion of these patients had small frontal sinuses and that in some the frontal sinus was entirely absent. Comparative examinations in 100 normal persons made this quite evident. The comparative numbers were 35 compared to 18 per cent, and 20 compared to 3 per cent, respectively. The authors consider these observations a demonstration of developmental inhibitions in the region

of the accessory nasal sinuses in patients with bronchiectasis. This developmental inhibition is of a constitutional rather than an exogenic nature, and the authors conclude that the concurrence of bronchiectasis and sinusitis indicates a coordinated developmental inhibition or a deformity in two different sites of the respiratory tract.

Prophylactic Vaccination Against Tuberculosis—Weissfeiler and Morosowa made their studies on guinea pigs. They admit that other investigators considered guinea pigs unsuitable for such studies, but they are of the opinion that, if all precautions are taken to avoid mistakes, it is possible to obtain valuable results with guinea-pigs. They describe a method of immunization for guinea-pigs which, they think, will produce objective and readily comparable results. They found the BCG strain especially effective in producing immunity in guinea-pigs and think that the efficacy of other immunization methods should be evaluated by comparison with the BCG experiment. The pigment forming tubercle bacillus strain of Weissfeiler and the R and S variants of this strain likewise produced a noticeable immunity, this indicates that the mutation that resulted in the development of these variants did not abolish the immunizing action. The R variant proved more effective than the S variant and the mixture of the two did not produce a greater immunity. The non acid fast forms of the tubercle bacillus increased the resistance only slightly. The immunizing capacity has been largely lost in the changes which these non acid fast forms underwent in their mutation from tubercle bacilli. The authors found also that by treating guinea pigs with staphylococci it was possible to effect an increase in the nonspecific tuberculous infection. They think that hetero-allergic changes explain this increase in the nonspecific resistance.

Demonstration of Tubercle Bacilli—Menzel and Schramek think that the search for tubercle bacilli in adults should include bacterioscopy and culture of specimens of sputum, if there is no spontaneous expectoration, a laryngeal smear should be taken for microscopic examination and culture. In addition to this they recommend the fractional withdrawal of the secretion of the fasting stomach, of the duodenal contents and of the bile. Cultures of the material obtained in this manner should be made on the Petraghani medium. The authors emphasize that for the examination of the gastric and duodenal contents the culture method is better than bacterioscopy and is also simpler, more reliable and less time consuming than the animal experiment. Tests on 120 adults with pulmonary tuberculosis were negative in eighty-four cases in which the sputum or the laryngeal smear had been subjected to bacterioscopy and to cultural examination. In seventeen of these eighty-four patients, however, culture of the gastric and duodenal contents was positive. In view of the fact that the gastric and duodenal cultures had been made only once in each patient and that the examinations of the sputum or the laryngeal smears had been made according to four different methods, it may be concluded that the gastric and duodenal cultures are highly sensitive. The examination of the gastric contents alone is insufficient, because the duodenal contents seem to be more often positive than the gastric secretion. The bile was found positive in only a few cases. The authors reject the hypothesis that considers the presence of tubercle bacilli in the bile indicative of a continuous bacillemia. They maintain that culture of the gastric and duodenal contents is of practical significance, because it succeeds in cases in which all other methods fail.

Dermatologische Zeitschrift, Berlin

72: 1-56 (Aug.) 1935 Partial Index

- Dermatomycoses Caused by Rare Strains of Parasites E. Weiz—p. 1
- *Are There Specific Antibodies in the Urine of Syphilitic Patients? T. Preininger—p. 10
- *Primary Syphilitic Lesion in Urethra Duplex W. Koch—p. 15

Are There Specific Antibodies in Urine of Syphilitic Patients?—Preininger reviews his studies on 211 specimens of urine. Of these, 109 were from patients with syphilis and 102 from patients who were free from it. He found neither the precipitation methods nor the Wassermann test suited for the detection of syphilitic antibodies and that the outcome of these tests does not even permit the assumption of the presence of

antibodies. He concludes that the urine of syphilitic patients either does not contain syphilitic antibodies or that the present methods are not capable of detecting them.

Primary Syphilitic Lesion in Double Urethra—Koch points out that the localization of the primary syphilitic lesion in the urethra is comparatively rare. He recently observed a case in which the primary lesion was localized in the orifice of a double urethra. He describes the history of this patient, a man aged 69 and states that the primary lesion and the infiltration of the double urethra yielded to a combination therapy with bismuth compounds and arsphenamine. Following the introduction of a contrast medium, roentgenoscopy revealed a double urethra, but apparently there was no communication between the double and the normal urethras or the bladder. The anamnesis revealed that up to the age of 15 micturition took place through both urethras, but after that the duplicate urethra became gradually obstructed, the obstruction being complete at the age of 20. According to the author the literature reports sixty cases of double urethras, but he thinks that this is the first report of a primary syphilitic lesion in a double urethra.

Klinische Wochenschrift, Berlin

14: 1201-1232 (Aug. 24) 1935. Partial Index.

Serologic Studies in Tuberculosis. F. Müller and O. Schedtler — p. 1206

*Relations Between Alternation of Cardiac Action and Changes in Coronary Circulation. V. Chini — p. 1208

Influence of Epinephrine on Resorption from Subcutaneous Tissue. J. Falck and E. Lange — p. 1209

Treatment of Paroxysmal Tachycardia. F. Nagel — p. 1211

Castor Oil as Means of Intensification of Serologic Reactions. Particularly of Complement Fixation in Gonorrhea. R. Brandt — p. 1212

Microscopic Demonstration of Vitamin A in Animal Tissue. F. R. von Querner — p. 1213

Alternation of Cardiac Action and Changes in Coronary Circulation—Chini reports observations on three patients in whom the electrocardiogram was characterized by an atypical course of the first phase of the ventricular complex with alternating elevation of the R and S deflections and with alternating course of the ST wave especially in the first and third leads. A few days after the electrocardiogram had been made there appeared symptoms of cardiac infarct followed by death in the three cases. The fact that the ST wave showed an alternating course before the appearance of the clinical symptoms of cardiac infarct and that the rapid development of a new apical infarct following the thrombosis of the distal portion of the anterior descending coronary artery could be proved by the anatomic aspects indicates that there had been previously an insufficient blood supply in the region in which the infarct developed. This was indicated by the alternating coronary changes in the electrocardiogram. The author believes that a temporary disturbance in the apical region, which as such could produce only a temporary alternating asystole, was the beginning of the thrombosis and infarct formation. In one instance there also was pulsus alternans. The author thinks that the alternating course of the ST wave in human subjects can be compared with the cardiac alternation in amphibians, if this alternating course is the result of a partial asystole of a ventricular region.

Castor Oil as Means of Intensification of Serologic Reactions—Brandt says that other investigators suggested the intensification of serologic reactions, particularly the Müller-Oppenheim reaction for gonorrhea, by means of an addition of olive oil. The author concedes that this was a technical advance but considers it a disadvantage that olive oil is not readily soluble in alcohol. To overcome this shortcoming he used castor oil instead of olive oil and found that the castor oil was better in that not only a considerable saving of specific antigen was possible but also the Müller-Oppenheim gonorrhea reaction increased in range.

Microscopic Demonstration of Vitamin A in Animal Tissue—In studies with the fluorescence microscope von Querner observed that in the paraplasmatic fat inclusions of the hepatic parenchyma, of the adrenals and of the hypophysis as well as in the retinal rods and cones, there is a substance that is luminous under the fluorescence microscope. The luminous substance is rapidly destroyed under the influence of ultraviolet rays. The author observed also that the fat droplets of

some animal products and of various synthetic vitamin A preparations have the same luminescence. According to measurements with the spectral ocular and on the basis of their behavior these substances have a close resemblance, the slight deviations are probably the result of carotene admixtures. In the organs of rats deprived of vitamin A for long periods, the luminous substance is either absent or is present in small quantities. The author concludes that the luminous substance is either identical with vitamin A or represents some form of this vitamin.

Zeitschrift f. Geburtshilfe u. Gynäkologie, Stuttgart

111: 137-272 (Aug. 16) 1935

Modification of Weight of Body and of Organs of White Mice During Pregnancy. R. Bruhl and F. Vogel — p. 137

Glycosuria and Diabetes Mellitus During Pregnancy. T. Heynemann — p. 149

*Studies on Porphyrin Metabolism During Pregnancy. R. Fikentscher — p. 164

*Studies on Porphyrin Content of Urine in Pregnancy. Toxicoses, Particularly in Hepatic Disturbances. R. Fikentscher — p. 210

Cenosis of Premature Detachment of Placenta. C. Claiberg — p. 217

*Observations on Old Primiparas. M. Vorlíček Jelinek — p. 229

Superficial Spreading of Cervical Carcinoma to Vagina. H. E. Eichenberg — p. 243

Porphyrin Metabolism During Pregnancy—Fikentscher reports his own studies on porphyrin metabolism during pregnancy. He discusses the elimination of porphyrin in the urine of healthy pregnant women and compares it with that of nonpregnant women. He found increased values much more often in pregnant than in nonpregnant women, and he noticed that the porphyrin content of the urine is most frequently increased during the first and the last third of the gestation period. He points out that the high incidence of increased elimination of porphyrin during pregnancy harmonizes with the fact that in pregnant women the metabolism is taxed higher than ordinarily. He reports his studies on the porphyrin content of the blood of mother and fetus during normal pregnancy. The blood corpuscles and the serum were examined separately. It was found that the porphyrin content of the erythrocytes of pregnant women does not noticeably differ from that of nonpregnant women. Tests on the serums of pregnant women generally revealed no porphyrin. The author states further that, whereas it has been impossible to demonstrate noticeable quantities of porphyrin in the blood of normal human subjects, spectroscopic analysis of the serums of fetuses and of newly born infants discloses the presence of ether-soluble porphyrin with a spectrum quite similar to that of coproporphyrin. He thinks that this indicates that the porphyrins have a special biologic position and function during embryonal life. He reports his studies on the porphyrin content of the amniotic fluid, which revealed that the values were highest between the fifth and the seventh month of pregnancy. Tests on the urines of newly born infants disclosed the highest porphyrin values during the first few days of life (second to fifth days). After that the porphyrin content decreases rapidly.

Porphyrin Content of Urine During Pregnancy Toxicoses—In this report Fikentscher describes his studies on the urinary elimination of porphyrin in women in whom the pregnancy produced a disturbance in the metabolic apparatus, particularly the liver. He observed increased elimination in the toxicoses and he found the highest porphyrin values in the urine of patients with the severest impairment of the metabolic apparatus. Variations in the clinical aspects were accompanied by corresponding alterations in the porphyrin content of the urine. The interrelations were especially noticeable in women with emesis and hyperemesis. Careful studies were made on forty-six women with these disorders and it was observed that in the mild cases the porphyrin content of the urine did not differ noticeably from that of healthy pregnant women. In women with hyperemesis, the degree and the time of appearance of the increase in the porphyrin content of the urine coincided with the degree and the duration of the vomiting. In the severest forms of hyperemesis, the porphyrin content of the urine reached extremely high values and the subsidence of the symptoms was accompanied by a decrease in the porphyrin values. The author thinks that the heightened porphyrin content in hyperemesis is primarily, although not entirely, the result of functional disturbances in the liver. He concludes

that the determination of the porphyrin content of the urine has clinical significance in that its results indicate whether the organism can cope with the requirements of pregnancy. Greater increases in the porphyrin content indicate disturbances in the metabolic equilibrium, particularly the hepatic function.

Observations on Old Primiparas—Vorlíček-Jelinek calls attention to the fact that the number of old primiparas is now considerably larger than during the prewar period and thinks that the present economic and social conditions are responsible for this. But, although there are comparatively more old primiparas now, the incidence of dystocia among them has decreased. Whereas formerly the pelvic anomalies necessitated the majority of obstetric operations, it is now the rigidity of the soft parts that is the chief cause of pathologic deliveries in old primiparas. This rigidity is mainly responsible for premature rupture of the bag of waters and for weaker action of the labor pains with resulting longer duration of the delivery. The majority of old primiparas of the present period have a normal pelvis, for this reason, abnormal positions of the fetus are less frequent among them than they were formerly and the deliveries of primiparas are now as a rule less difficult. The author observed also that in old primiparas there is neither a greater frequency of pregnancy complications nor a greater tendency to premature births than in young mothers. There seems to be a relatively larger number of male as well as of multiple births in old primiparas, but there is as yet no satisfactory explanation for these phenomena.

Superficial Spreading of Cervical Carcinoma to Vagina—Eichenberg shows that the superficial carcinomatous processes of the vagina, which originate in a cervical carcinoma and later appear as recurrences, may cover the entire vagina and may even spread to the vulva. Because of their slow, superficial growth, they are relatively benign. They usually appear red and eroded, and it is difficult to differentiate them from the vaginal changes that frequently develop after irradiation with radium. Since they cannot be felt with the finger, it is necessary to employ a speculum in all gynecologic examinations, particularly after irradiations for carcinoma. In doubtful cases, an exploratory excision should be made. The author points out that the literature brings reports about cases in which the carcinoma spreads to the vagina in the form of a white coating. In three instances a knowledge of these changes led to the discovery of high cervical carcinomas that were neither visible nor palpable. The author thinks that the vaginal radical operation is preferable in cases in which the parametric aspects indicate operability. Radium irradiation of the superficial carcinomatous coatings of the vagina has the disadvantage that the determination of the correct dosage and of the type of application is rather difficult, especially since there is danger of the formation of a fistula. In old women, in whom the spreading of the superficial carcinoma is extremely slow, irradiation is of doubtful value, because it may lead to a more rapid development of the process.

Acta Obstet. et Gynec. Scandinavica, Helsingfors

15:1116 (No. 1) 1935

- Gonadotropic Stimulation Therapy B Zondek—p. 1
 *Diet During Pregnancy, with Particular Regard to Albuminuria Prophylaxis E Jerlov—p. 12
 Therapeutic Uses of Hormone Preparations. E Möller Christensen—p. 28
 Uterine Myoma in Young Girls Aged Less Than Twenty Years S Clason—p. 39
 *Duration of Life of Spermatozoa in Human Uterine Tube C A Ohlin—p. 50
 *Studies on Changes in Uterine Mucosa After Excessive Doses of Estrogenic Hormone P N Damm—p. 58
 Appearance of Decidual Reactions in Tubal Mucosa in Case of Intra Uterine Pregnancy A Sjoval—p. 68
 Stereohystero-graphic Technic S Clason—p. 87

Diet During Pregnancy—Jerlov stresses the importance of sufficient amounts of certain metallic elements in the diet of pregnant women, showing that calcium, phosphorus, magnesium and iron are essential for the development of the fetus. He gave especial attention to the iron requirements of the pregnant organisms. In studies on 1,143 pregnant women he observed that the hemoglobin content frequently became greatly reduced, and he considers this indicative of a negative iron balance in the mother, which is brought about because the

ordinary diet of the mother does not provide sufficient amounts of iron to meet the growing requirements of the fetus. He advises iron medication for women with low hemoglobin values. Further attention is given to the vitamin requirements of pregnant women, and the approximate daily requirements of vitamins A, B and C are indicated. Vitamin D can be procured by the expectant mother by exposure to the sun or by medication. However, while it is important to add some substances to the diet, there is also a need to restrict others. As the pregnancy advances, it is advisable to reduce the nitrogen and the sodium chloride intake so as to prevent albuminuria. The author describes a diet for pregnant women which he has employed since 1926. The regimen prescribes varied foods, but especially plenty of fruits and vegetables. During the last stage of pregnancy a spoonful of cod liver oil should be taken daily. Milk should be provided in amounts of from 0.5 to 1 liter daily. Eggs should be eaten freely, and lemon and orange juice should be taken. Salted foods should be avoided as much as possible and meat should be taken sparingly. Liver, however, should be eaten frequently because it provides large amounts of vitamin A and of iron. The author advises that women be given a special printed form explaining the importance of the dietetic rules.

Duration of Life of Spermatozoa—To determine whether the tubal epithelium and especially its mucus producing factors influence the duration of life of the spermatozoa, Ohlin made experiments in vitro. The duration of life of sperm alone was compared with that of sperm which had been combined with epithelium (ciliated and mucus producing) abraded from fresh normal human tubes. A difference in the duration of life of the sperm under these varying conditions could not be detected. The author concludes from this that the tubal epithelium and its secretion constitute a medium that is indifferent for the vitality and the longevity of the spermatozoa and does not counteract the factors in the female genital tract that exert an unfavorable influence on the spermatozoa. This supports the prevailing opinion of a short duration of the life of the sperm after coitus.

Uterine Mucosa After Excessive Doses of Estrogenic Substance—Damm discusses the theory according to which glandular cystic hyperplasia is caused by the persistence of the follicle with consequent overproduction of folliculin (estrogenic substance) and underproduction of the corpus luteum hormone. He observed that by the administration of 750,000 mouse units of estrogenic substance to a castrated woman, aged 29, changes could be produced in the formerly atrophic mucosa, which corresponded to those that exist in glandular cystic hyperplasia. This observation gives support to the aforementioned theory of pathogenesis and indicates that it is inadvisable to administer to patients with inactive ovaries extremely large doses of estrogenic substance without the subsequent treatment with corpus luteum hormone.

Hospitalstidende, Copenhagen

78 793-820 (July 30) 1935

- Chaulmoogra Oil Treatment of Lupus Erythematoses S Lombolt—p. 793
 *Atropine Treatment of Postencephalitic Parkinsonism O J Nielsen—p. 806
 Determination of Quinine-Resistant Lipases in Exophthalmic Goiter C C Stockholm Borresen—p. 813

Atropine Treatment of Parkinsonism—Nielsen reports the results of this treatment in sixteen cases, six of which have been followed for five years. Modifying Romer's method, he usually begins with from three to five drops of 1:1,000 solution of atropine sulphate three times daily, increasing by one drop from one to three times a day or every other day. When single doses of more than 1 mg have been reached, he gives a fixed dosage of 1 (-2-3) mg three times a day in pills or in a solution and the rest in drops until the optimum is reached. He finds it advantageous, especially at the start of the treatment, to interrupt the treatment for a half or whole day weekly. The optimal doses have been from 4 to 12 mg three times daily. He believes that by this procedure the unpleasant effects of atropine are diminished and the optimal dose with full therapeutic effect is possibly smaller, the distance between optimal and toxic doses increased and the danger of atropine intoxication lessened.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 105, No 16

CHICAGO, ILLINOIS

OCTOBER 19, 1935

THE CLINICAL INVESTIGATION OF FUNCTIONAL STERILITY IN THE FEMALE

P BROOKE BLAND, MD
ARTHUR FIRST, MD
AND
LEOPOLD GOLDSTEIN, MD
PHILADELPHIA

The interpretation of sterility in patients in whom a complete physical examination reveals no anatomic abnormalities in either husband or wife is a complex problem, requiring for satisfactory solution among many things an understanding especially of the inter-relationship of the glands of internal secretion.

Before it has been decided that infertility in a female is of endocrine origin, it is of course essential to eliminate every possible extrinsic causative factor. Of prime importance is the postcoital examination, which reveals the true extent of male responsibility, together with the effect of abnormal or hostile cervical secretion on the spermatozoa.

Parenthetically, so conspicuous is the incidence of male deficiency in our clinic that in more than 50 per cent of the patients the two mates are receiving treatment for the barrenness simultaneously. Equally essential is a transuterine tubal insufflation (Rubin test) and the visualization of the tubes by the intra-uterine injection of an opaque oil to determine the presence of occlusion or patency of the tubal canals.

Besides, it is necessary to exclude general causes, such as acute and chronic infections, since conditions of this character not infrequently simulate endocrinic dysfunction. Similarly, congenital underdevelopment of the genital organs in the form of a rudimentary vagina or uterus, stenosis of the vagina or cervix or an imperforate hymen, and neoplasms of all types, must be eliminated as causative influences. Moreover, it must be borne in mind that an antecedent pelvic inflammation, resulting in a thickened tunica albuginea mechanically preventing thereby maturation and rupture of the graafian follicle, may be the sole basis for the infertility.

In dealing with sterility of assumedly endocrine origin, it is of paramount importance to determine, if possible, which gland is primarily responsible, or, as expressed by Lissner,¹ an attempt must be made to determine the uniglandular origin of the polyglandular syndrome in each individual case. From the angle of investigation, functional sterility may be conveniently divided into clinical and laboratory aspects. The diag-

nosis of endocrine disorders, however, should not be based on laboratory observations alone. For example, a low basal metabolic rate may be due either to pituitary or to thyroid deficiency, and a low blood sugar may be caused by some abnormality in either the adrenals or the pancreas.

The syndromes produced by hypothyroidism and hypoadrenalism are at times similar. Clinically, basophilic adenoma of the pituitary gland closely resembles an adenoma of the adrenal cortex. Addison's disease may simulate Simmonds' disease resulting from pituitary destruction. Hence all clinical, physical and laboratory data must be analyzed before a working diagnosis is established.

Etiologically, cases of functional sterility may be due chiefly to primary pituitary, ovarian or thyroid dysfunction. Much less frequently is the condition the result of adrenal disease.

In table 1 there is outlined the differential diagnosis of the three main types of the endocrinopathies.

A PRIMARY PITUITARY DEFICIENCY

Primary deficiency of the anterior pituitary lobe is by far the most common form of endocrine disturbance encountered in the sterile patients studied in our clinic. Generally speaking, this condition, if not sufficiently severe to suppress totally ovarian function, is usually one of a mild Fröhlich's syndrome (adiposogenital dystrophy). Clinically, these patients are rather short in stature and show distinct stigmas of underactivity of the hypophysis, manifested, first, by a characteristic mammary-mons girdle obesity due to associated involvement of the hypothalamus, secondly, by hypertrichosis with masculine distribution of pubic hair, and, thirdly, by genital hypoplasia with menstrual derangements. Either amenorrhea or menorrhagia is present, the latter indicating a less severe degree of failure on the part of the pituitary gland to stimulate ovarian activity. Stabilization of the autonomic and central nervous systems is especially characteristic of these women, so that dysmenorrhea is rarely a complaint of patients falling in this category.

In severe grades of primary pituitary deficiency there may be characteristic eye changes, namely, a temporal quadrant defect in the red field and relative central or peripheral scotomas of a nonprogressive type. In some patients the laboratory studies disclose impaired kidney function, as evidenced by the presence of albuminuria and a high uric acid content of the blood. Of significant diagnostic importance is an increased sugar tolerance.

The determination of the specific dynamic action of protein has been emphasized by Goldzieher² as being of considerable value in the diagnosis of pituitary dis-

From the Department of Obstetrics Jefferson Medical College.
Read before the Section on Obstetrics, Gynecology and Abdominal
Surgery at the Eighty-Sixth Annual Session of the American Medical
Association Atlantic City, N. J., June 12, 1935.

¹ Lissner, Hans. Lecture before a Meeting of the Convention of the
American College of Physicians, Philadelphia, May 3, 1935.

² Goldzieher, M. A. and Gordon, M. B. Determination of the
Specific Dynamic Action of Protein and Its Value in the Diagnosis of
Pituitary Disease. *Endocrinology* 17: 569-577 (Sept-Oct) 1933.

ease This is the total increase in heat production above the normal of the individual occurring after the ingestion of a protein meal If the whites of three eggs, a slice of toast and a cup of tea without sugar are given after a control basal metabolism test to a normal individual, the increase in two or three hours thereafter is about 16 per cent

In 192 cases of pituitary deficiency the increase was only 38 per cent Four cases of pituitary tumors showed an average increase of 35 per cent, and seven cases of primary hypogonadism showed an average increase of 20 per cent It may be stated, therefore, that the anterior pituitary lobe produces a hormone that accelerates the specific dynamic action of protein, hence the low values in pituitary hypofunction and the high values in pituitary adenoma with hyperfunction

The slight increase in the specific dynamic action of protein above the normal in primary ovarian failure is readily understood when it is remembered that this

TABLE 1—*Differential Diagnosis of Endocrine Hypofunction Associated with Sterility*

| Symptoms and Laboratory Studies | I Pituitary | II Primary Ovarian | III Thyroid |
|--|--|---------------------|-------------------|
| Menstrual disturbance | Amenorrhea or abnormal bleeding | Amenorrhea | Menorrhagia |
| Dysmenorrhea | Absent | Common | Absent |
| Obesity | Common mammary glands type | Underweight | Common uniform |
| Nervous system | Stable | Emotional excess | Stable |
| Hair distribution | Profuse male type | Normal or scanty | Normal |
| Thyroid | Normal | Normal | Enlarged |
| Genital hypoplasia | Marked | Marked | Moderate |
| Kidney function | Albuminuria increased uric acid of blood | Normal | Normal |
| Condition of eyes | Contraction of visual fields | Normal | Normal |
| Dextrose tolerance | Increased | Normal | Normal |
| Basal metabolism | Lowered | Normal | Very low |
| Blood cholesterol | Normal | Normal | High |
| Specific dynamic action of protein | 5% rise | 20% rise | 15% rise (normal) |
| Estrogenic hormone in blood and urine | Low | Low | Low |
| Anterior pituitary gonadotropic hormone in blood and urine | Not demonstrable | Demonstrable in 50% | Not demonstrable |

condition is often associated with a hyperfunction of the anterior pituitary lobe

The hormone studies in anterior pituitary deficiency furnish little additional information In patients with this condition the anterior pituitary gonadotropic hormone is not demonstrable in the blood, as contrasted to its occurrence in about 50 per cent of patients with primary hypogonadism The level of estrogenic substance in the blood is below normal

B PRIMARY OVARIAN FAILURE (PRIMARY HYPOGONADISM)

Primary ovarian failure is due to inherent deficiency of the internal secretory portion of the ovary independent of the secondary effects of the diminution of function of other glands, notably the pituitary and thyroid Clinically, these patients present a marked contrast to those of the hypopituitary type They represent the superlatively feminine type They are emotional to excess, underweight, viscerotrophic and intolerant to food, and experience gastro-intestinal spasticity and irritability of the nervous system

Hypoplasia of the genital organs and irregular menstruation or amenorrhea are constant observations

Hormone studies reveal a uniformly low estrogenic level in the blood premenstrually The most significant finding, however, is a demonstrable quantity of anterior pituitary gonadotropic hormone in the blood and urine in more than 50 per cent of the patients This probably is the result of a compensatory hyperactivity of the hypophysis in an attempt to overcome a failing ovary In ovarian hypofunction the opportunity for fertilization is thus diminished in direct proportion to the diminution of the number of menses annually

C THYROID DERANGEMENT

In thyroid dysfunction either in the form of hypothyroidism or hyperthyroidism there is no palpable evidence of genital atrophy, though not infrequently it is a cause of sterility Menorrhagia as a rule, and not amenorrhea results from hypothyroidism In hypofunction of the thyroid the endometrium is often hyperplastic and as pointed out by Lawrence and Rowe,³ gives rise to prolonged bleeding when menstruation does occur Repeated abortion may in some instances be an expression of thyroid failure

Hyperthyroidism may be differentiated into toxic adenoma and exophthalmic goiter⁴ Toxic adenoma on the one hand is a thyroid condition giving rise to constitutional manifestations while, on the other hand, exophthalmic goiter is a constitutional condition inducing thyroid manifestations In toxic adenoma only about 20 per cent of the patients experience menstrual trouble, chiefly amenorrhea In exophthalmic goiter, however, amenorrhea is much more common, owing to the fact that it is a severe constitutional disorder, seriously offending the generative organs and caused possibly by overactivity of the thyrotropic hormone of the anterior pituitary gland

The diagnosis of the foregoing conditions is relatively easy, provided one resorts to a routine to basal metabolic studies in the investigation of functional sterility

D ADRENAL DERANGEMENT

Adrenal deficiency is a relatively infrequent occurrence Patients with severe adrenal disturbances appear for treatment more because of the general systemic manifestations induced by the glandular disorder than for the sterility itself Of special interest are those patients with asthenia, loss of weight and low blood pressure—symptoms resulting from moderate adrenal cortical hypofunction Lawrence and Rowe⁵ point out that this may be confused with depressed states of non-endocrine origin Menstruation is delayed The sugar tolerance is unusually low and the basal metabolism below normal Only the lack of bronzing of the skin differentiates this condition from true Addison's disease Addison's disease may, however, occur without bronzing and is then difficult to distinguish from pituitary cachexia or Simmonds' disease

Adrenal cortical adenomas may be diagnosed by palpation or by pyelography, revealing a distortion of the upper calices or displacement of the kidney These neoplasms give rise to increased function of the gland, attended notably by virilism with hypoplasia of the internal genitalia, and resemble in many respects pituitary basophilism In contrast, however, the patient with a cortical adenoma shows hypertrophy of the clitoris and often a marked excess of estrogenic substance in

³ Lawrence C. H. and Rowe A. W. *Studies of the Endocrine Glands III The Thyroid* Endocrinology 12: 377-450 (July Aug) 1928

⁴ Bram I. *Toxic Adenoma and Graves Disease* Northwest Med. 28: 210-214 (May) 1929

⁵ Lawrence, C. H. and Rowe A. W. *Studies of the Endocrine Glands V The Adrenals* Endocrinology 13: 1-39 (Jan Feb) 1929

the blood. Furthermore, decalcification of the bones is rare, whereas in pituitary basophilism (Cushing's disease) it is common in the cervical and thoracic vertebrae, owing probably to associated hyperparathyroidism.

INVESTIGATION OF HORMONES

Passing on to further consideration of hormonologic studies in relation to sterility, it may be stated that the determination of ovarian (estrogenic) and pituitary (gonadotropic) hormones in the urine is an extremely valuable laboratory adjunct in the diagnosis and treatment of the underlying condition as well as of related menstrual disorders.

1 Production of Estrogenic Principle—During her active sex life except during pregnancy a woman normally excretes in the urine from 10 to 20 rat units of estrogenic substance per liter. The curve of the hormone concentration in the urine shows two peaks during the normal menstrual cycle.⁶ The first and smaller occurs at about the tenth to the nineteenth day of the cycle and may be correlated with the time of maximum growth of the follicle, ovulation and early corpus luteum formation. A second peak in the urine occurs at about the twenty-first to the twenty-fourth day of the cycle, corresponding to the active phase of the corpus luteum. Thereafter there is a sudden drop in urinary excretion of estrogenic substance followed normally by the onset of menstruation. The normal monthly total output in the urine is about 1,200 to 1,500 mouse units per liter.

The blood cycle for estrogenic substance is likewise characteristic. In the normal menstruating fertile woman 40 cc of blood does not contain a full mouse unit until seven days before the menses. With the onset of bleeding the blood level again decreases.

2 Production of Gonadotropic Principle—In the blood there is also a cycle of the anterior pituitary gonadotropic hormone. According to Frank, between the eighth and the tenth day a full rat unit is present in the 40 cc blood specimen. Before and after this period smaller quantities are found. However, in the usual laboratory procedure 30 cc of blood is withdrawn and 4 cc of serum is injected in demonstrating anterior pituitary gonadotropic hormone. Fluhmann,⁷ in a study of the blood of a large series of women, has divided his patients into four categories. The first two include women with normal menses or with hypovarian conditions characterized by irregular or delayed menses, scanty periods and amenorrhea. In 136 of these patients only one positive reaction was obtained. In the third group are women in whom there is a total absence of ovarian function, namely, castrates, patients in the postclimacteric state and a certain number with prolonged periods of amenorrhea. In seventy-seven of this group a positive reaction was obtained in forty-nine. In the fourth group are patients with conditions referable to an increase in the hormone secretion of certain glands, those in the menopause, or those with polymenorrhea. In fifty-three of these patients eighteen gave a positive blood test for the gonadotropic hormone.

6 Frank, R. T., Goldberger, M. A. and Spielman, Frank. Present Endocrine Diagnosis and Therapy. A Critical Analysis Based on Hormone Studies in the Female. *J. A. M. A.* **103**: 393-402 (Aug. 11) 1934. Gustafson, R. G. and Green, D. F. The Quantitative Determination of the Amount of Estrogenic Substances Excreted Daily in the Urine of the Normal Human Female. *J. Biol. Chem.* **34**: 105 (May) 1934.

7 Fluhmann, C. F. The Significance of Anterior Pituitary Hormone in the Blood of Gynecologic Patients. *Am. J. Obst. & Gynec.* **20**: 115 (July) 1930. Anterior Pituitary Hormone in the Blood of Women. A Preliminary Clinical Classification of Results in Nonpregnant Individuals. *Endocrinology* **15**: 177-183 (May-June) 1931. The Biological and Clinical Importance of Ovary Stimulating Hormones. *Ann. Int. Med.* **6**: 1212-1224 (March) 1933.

Kurzrok and his associates⁹ describe a definite rise in the gonad stimulating hormone in the urine just preceding or at the time of ovulation, that is, at about the tenth to the thirteenth day of the cycle, when 60 cc of urine is employed for the concentration. The sudden excretion of this hormone is considered to be the stimulus for ovulation. Hence the greatest incidence of ovulation occurs between the eleventh and the fourteenth day. Except during this brief period normally menstruating women do not excrete the gonadotropic hormone in the urine in quantities sufficient for detection by Zondek's method in 12 cc of urine.

The estimation of the estrogenic and the gonadotropic hormones in the urine is useful as an index of therapy in menstrual dysfunction. This is based on the fact that normally menstruating women do not excrete demonstrable quantities of gonadotropic hormone in 12 cc of the urine but excrete from 10 to 20 rat units of estrogenic substance per liter of urine. Kurzrok⁹ notes further that four types of excretion are possible when these hormones are considered together.

In type I, estrogenic excretion is positive and anterior pituitary elimination is negative. This indicates a normally functioning anterior pituitary ovarian chain, and these hormones are therefore therapeutically not indicated.

In type II, both hormones are absent.

In type III the estrogenic substance is absent but the anterior pituitary gonadotropic hormone is present. This is the most advanced stage of hypofunction.

In type IV both hormones are present, so that hormone therapy is usually contraindicated.

STUDY OF THE ENDOMETRIUM

In the light of modern knowledge, studies of the endometrium must also be carried out in the investigation of functional sterility. Accordingly, patients with endocrine sterility may be conveniently divided into two groups, depending on the presence or absence of regular menstrual periods.

The endometrium obtained after a diagnostic premenstrual curettage yields valuable information regarding the presence of a suitable nidatory site for the implantation of a fertilized ovum. The absence of a normal secretory premenstrual phase is indicative of failure of ovulation or of a deficient corpus luteum and explains many problem cases of sterility in the regularly menstruating woman. The endometrium is usually obtained easily without anesthesia or cervical dilation with the aid of a small curet, or in accordance with the technic of Klingler and Burch.¹⁰ These investigators designed a small uterine cannula that could readily be passed into the uterus. Suction is made from an attached syringe, and a sufficient amount of tissue is usually obtained to make a diagnosis without the use of the curet. Not only is this procedure of the utmost value from a diagnostic standpoint but it is also sometimes beneficial therapeutically, especially when combined with cervical dilation.¹¹

8 Kurzrok, Raphael, Kirkman, Irene J. and Creelman, Margaret. Studies Relating to the Time of Human Ovulation. *Am. J. Obst. & Gynec.* **28**: 319-333 (Sept.) 1934.

9 Kurzrok, Raphael and Ratner, Sarah. The Relation of Amenorrhea Accompanied by Genital Hypoplasia to the Follicular Hormone in the Urine. *Am. J. Obst. & Gynec.* **23**: 689-694 (May) 1932. Kurzrok, Raphael. The Estimation of Estrin and the Follicle Stimulating Hormone in the Urine as an Index of Therapy in Menstrual Dysfunction. *Endocrinology* **16**: 361-365 (July-Aug.) 1932.

10 Klingler, H. H. and Burch, J. C. Suction in Obtaining Endometrial Biopsies. *J. A. M. A.* **99**: 559-560 (Aug. 13) 1932.

11 Halban, Josef. Gynäkologische Operationslehre, Berlin: Urban & Schwarzenberg, 1932. Cary, W. H. A Clinical Study of 100 Cases of Developmental and Functional Deficiencies in the Female with Analysis of Treatment and Results. *Am. J. Obst. & Gynec.* **25**: 335-350 (March) 1933.

In our study we found it somewhat difficult to ascertain the cause of sterility in those women who menstruated regularly every month and who apparently had no gross abnormality in the generative organs. However, a premenstrual curettage performed on one group of fifty regularly menstruating sterile women revealed that only twenty-three had a normal progesterational endometrium with characteristic secretory changes

TABLE 2—Study of Fifty Regularly Menstruating Sterile Women

| Type of Endometrium Obtained After Premenstrual Curettage | Number of Cases | Results of Treatment | | |
|---|-----------------|----------------------|----------|----------|
| | | Full Term Pregnancy | Abortion | Failure |
| Premenstrual | 23 | | | |
| Interval | 15 | | | |
| Hyperplastic | 9 | | | |
| Atrophic | 3 | | | |
| Estrogenic Substance in 40 Cc of Blood (Premenstrual) | | | | |
| Positive reaction | 13 | | | |
| Subthreshold | 15 | | | |
| Negative | 22 | | | |
| Total | 50 | 8 (16%) | 4 (8%) | 38 (76%) |

evoked by the corpus luteum hormone, progesterin (table 2)

In the remaining twenty-seven patients there was found a hyperplastic, an interval or an atrophic endometrium. In these patients, as emphasized by Novak and by Mazer,¹² sterility may be consequent on failure of ovulation, a condition common in the monkey and occurring probably not infrequently in women. Should fertilization occur, the endometrium is not prepared to retain the embryo, and abortion inevitably results.

RESULTS OF HORMONE STUDIES

In this group of fifty regularly menstruating sterile women, thirty-seven, or 74 per cent, gave no evidence of estrogenic substance in 40 cc of blood obtained just before an expected period, thus indicating deficient uterine stimulation by the gonads.

A second group of 100 irregularly menstruating women studied in our clinic is more easily understood from the standpoint of sterility (table 3). So closely linked are the menstrual disturbances to the failure to conceive that efforts directed to regulate the "periods" appear as the most important measures available in the successful treatment of infertility.

Over two thirds of this group of 100 women (sixty-four) presented definite evidences of pituitary hypofunction. A smaller group of eight women showed a primary ovarian hypofunction as evidenced, in addition to the clinical stigmas, by the presence of a demonstrable quantity of anterior pituitary gonadotropic hormone in the blood by the Fluhmann method, indicating a compensatory hyperactivity of the pituitary gland in an attempt to compromise for a subfunctioning ovary.

TREATMENT

In considering the treatment of functional sterility, it is of course clear that prophylaxis in the adolescent youth is of the utmost importance. A large number of functionally sterile women cite a history suggestive of glandular disturbance in early adolescence. The resultant incomplete development of the genital organs

should therefore be guarded against at this period in order to avoid the possibility of sterility in later life. All endocrine disorders should be treated at once. It is indeed unfortunate if initial complaints referable to a disturbed genital physiology are ignored.

OPTIMAL TIME OF CONCEPTION

Recently, as noted in the literature, renewed interest has been manifested in the age old question as to the most favorable period of impregnation. Generally speaking, one may say that conception is most frequent after coitus following ovulation. Knaus¹³ and Ogino¹⁴ contend that the maximum likelihood of conception in women with a regular twenty-six day cycle (in whom ovulation occurs on the twelfth day) will extend from the ninth to the thirteenth day. In women with a twenty-eight day cycle (in whom ovulation occurs on the fourteenth day) the favorable period extends from the eleventh to the sixteenth day. In women with a thirty day cycle (ovulation on the sixteenth day) the favorable period lasts from the thirteenth to the seventeenth day. Theoretically there is ample support of this assumption when one recalls that the female ovum in all animals can live only a few hours and that the spermatozoa usually lose their power of fertilization after forty-eight hours. This observation is not absolute, since ovulation induced by coitus may possibly occur. Sterility, therefore, may be due in some cases to the fact that coitus occurs only during the period of "physiologic sterility."

ORGANOTHERAPY

Despite the noteworthy advance made in the manifold aspects of endocrinology, organotherapy until quite recently was almost void of accomplishment. However, during the past few years a progressive forward movement all along the line has occurred, so that it has at last acquired a fairly scientific basis. In all instances the correction of menstrual irregularities is of vital importance in the treatment of functional sterility. In the administration of endocrine products the interrelationship of the glands of internal secretion must be constantly borne in mind.

TABLE 3—Study of One Hundred Irregularly Menstruating Sterile Women

| | Number of Cases | Results of Treatment | | |
|------------------------|-----------------|----------------------|----------|---------|
| | | Full Term Pregnancy | Abortion | Failure |
| Pituitary hypofunction | 64 | | | |
| Ovarian hypofunction | 8 | | | |
| Thyroid hypofunction | 3 | | | |
| Hyperthyroidism | 1 | | | |
| Unclassified | 21 | | | |
| Total | 100 | 84% | 7% | 59% |

With regard to the agents employed, the thyroid gland will be considered first.

A Thyroid—This is a most valuable adjuvant in the treatment of functional sterility and may be used even when the basal metabolism is normal or slightly subnormal. The administration of desiccated thyroid tissue, 1½ or 2 grains (0.09 or 0.13 Gm) daily, tends

12 Novak Emil Two Important Biologic Factors in Fertility and Sterility J A M A 102:452-454 (Feb 10) 1934 Mazer, Charles and Goldstein Louis Clinical Endocrinology of the Female Philadelphia W B Saunders Company 1932

13 Knaus Hermann Zur Bestimmung des Ovulationstermines in der menschlichen Gebärmutter in situ Erwiderung auf die Arbeit von G K F Schultze Zentralbl f Gynak 58:710-720 (March 19) 1932

14 Ogino K Ueber den Konzeptionstermin des Weibes und seine Anwendung in der Praxis Zentralbl f Gynak 56 721-732 (March 19) 1932

to increase cellular activity throughout the entire body, including the endocrine glands. In addition, it has been shown by Van Horn¹⁵ that thyroid neutralizes the effects of estrogenic substance on the endometrium, which may explain the temporary beneficial effects of thyroid therapy in functional uterine bleeding when prolonged and unantagonized action of estrogenic substance on the endometrium is the immediate cause of abnormal uterine bleeding. Cessation of bleeding may also result from stimulation of the anterior pituitary lobe with hyperluteinization.

B Estrogenic Substance—The chief use of this product is in amenorrhea. It must be remembered that despite restoration of pituitary function, the marked uterine atrophy either primary or as a result of a preexisting pituitary deficiency, may in itself become the cause of the continued amenorrhea and sterility. Therapy with estrogenic substance evokes an increase in growth and vascularity of the uterus and renders it, therefore, more responsive to improved or normal ovarian stimulation.

Given by mouth, estrogenic substance is quite efficacious because of the marked stability of the hormone to strong bases, acids and artificial digestion. Orally, estrogenic substance is one fifth as potent as when administered subcutaneously.

If, as pointed out by Mazer,¹⁶ 10,000 rat units of estrogenic substance is given hypodermically to a castrated woman, there will be excreted in the urine 180 rat units the first day, and 10 cc of blood will give a positive reaction by the Frank and Goldberger method. Eighty rat units is eliminated the second day and 15 rat units, the normal excretion, on the fourth day, at which time 1 mouse unit is found in 40 cc of blood. Thus it takes four days to obtain the normal equilibrium of estrogenic substance in the urine and blood with this large dose, but, since estrogenic substance inhibits the anterior pituitary lobe in such large dosage, it may actually do harm. One must consider, however, that the estrogenic hormone may have already played an important biologic role before its excretion in the urine.

It has been determined by Mazer¹⁶ that 200 rat units administered hypodermically, or 600 rat units orally, in three divided doses daily, will maintain the normal estrogenic level in the castrated woman. This high dosage, however, is not required in the ordinary case of sterility, because in these patients there is actually some degree of ovarian function. It becomes necessary, therefore, to determine the excretion of estrogenic substance in the urine and blood and, if below normal, to administer an amount sufficient to maintain a normal level of daily urinary excretion. A woman who shows one half of the normal level of estrogenic substance should receive only one half of the full therapeutic dose.

The practical application of estrogenic substance in large dosage would have been impossible were it not for the painstaking chemical study and high commercial yield of ketohydroxyestrin or theelin and the discovery by Schwenk and Hildebrandt¹⁷ in Schoeller's laboratory that the partial hydrogenation of this product into a dihydroxyestrin multiplies the yield by 4, thus providing large doses for therapeutic purposes.

C Progesterin—Theoretically, to imitate nature best, estrogenic substance should be combined in the latter third of the menstrual cycle with progesterin in order to convert the endometrium primed with estrogenic substance into a suitable premenstrual midatory phase. This applies especially to regularly menstruating sterile women who fail to show a normal premenstrual endometrium a few days before the expected flow. These injections are preferably given as one-fifth rabbit unit hypodermically every other day for ten days before menstruation. The success of this combined therapy is best revealed by the remarkable results of Kaufmann¹⁸ and Clauberg,¹⁹ who reported transformation of the atrophic uterine mucosa of castrated women into a functioning secretory premenstrual mucosa by the administration of enormous doses of follicular substance (hydroxyestrin benzoate [Progynon B] 320,000 units) followed by large doses of progesterin totaling 90 rabbit units.

Prolonged uterine bleeding responds quickly to progesterin, although it is only substitutive in effect.

Perhaps the greatest field of usefulness of this product, as pointed out by Krohn, Falls and Lackner,²⁰ is in the treatment of threatened or habitual abortion. From one-fifth to one rabbit unit is employed every other day to maintain the intactness of the endometrium and to allay uterine irritability.

D Anterior Pituitary-Like Gonadotropic Hormone—There are now two commercial preparations containing a gonadotropic fraction obtained from the available anterior pituitary itself. However, little or no information is available as to their therapeutic use. The administration of anterior pituitary-like gonadotropic substances, however, is moderately successful in regularly menstruating women in stimulating luteinization and in creating an endometrium favorable for nidation. This substance, elaborated by the placenta and obtained from the urine of pregnant women, is capable of evoking an ovarian response in the rodent qualitatively identical with that of implants and extracts of anterior lobe tissue. Functional uterine bleeding, except during the menopause, if due to pituitary deficiency, responds favorably to this plan of treatment. Two hundred rat units hypodermically is given daily until the bleeding is controlled and thereafter every other day for a period of two months.

In the treatment of amenorrhea due to pituitary deficiency, however, the use of this product is disappointing. Only 10 per cent of this group respond to the treatment with anterior pituitary-like gonadotropic hormone of the urine of pregnant women when it is employed as the sole agent.

It has been demonstrated, however, that the concurrent administration of a low dosage of anterior lobe extract and of a pregnancy urine extract provokes an ovarian response in rats much greater than would be expected from the sum of the responses of the two substances acting alone. Evans and his associates²¹ designated this hypophyseal substance the synergist. When combined with the gonad stimulating principle of pregnancy urine, normal gonadotropic effects were

15 Van Horn W M. The Relation of the Thyroid to the Hypophysis and Ovary. *Endocrinology* 17: 152-162 (March-April) 1933.
16 Mazer, Charles. Personal communication to the authors.
17 Schwenk E and Hildebrandt F. *Naturwissenschaften* 21: 1933.

18 Kaufmann C. Echte Menstruation bei einer castrierten Frau durch Zufuhr von Ovarialhormonen. *Zentralbl f Gynäk.* 57: 42-46 (Jan 7) 1933.
19 Clauberg Carl. Die Wirksamkeit des Lutealhormons des spezifischen Hormons des Corpus luteum am menschlichen Uterus. *Zentralbl f Gynäk.* 56: 2460-2463 (Oct 8) 1932.
20 Krohn Leon, Falls F H and Lackner J E. On the Use of Luteal Hormone, Progesterin in Threatened and Habitual Abortion. *Am. J. Obst. & Gynec.* 26: 198 (Feb.) 1935.
21 Evans H M, Simpson Miriam E., and Austin P R. Further Studies on the Hypophyseal Substance Giving Increased Gonadotropic Effects when Combined with Prolan. *J. Exper. Med.* 58: 545-559 (Nov) 1933.

secured even in hypophysectomized animals.²² Clinically this was recently employed by Mazer and Katz,²³ who reported a favorable response in thirteen of a group of twenty-four amenorrheic women showing definite stigmas of pituitary deficiency. Hypodermic injections of 3 cc of anterior pituitary lobe extract and from 50 to 100 rat units of anterior pituitary-like gonadotropic hormone given every other day for a period of two months gave far better results than the

TABLE 4—*Estrogenic and Gonadotropic Factors in Urine as Index of Therapy*

| Type | Estrogenic Factor | Gonadotropic Factor | Endocrine Dysfunction | Treatment |
|------|----------------------------------|---------------------|---|--|
| I | 10-20 rat units per liter | Absent | Normal function | Other glands |
| | Less than 10 rat units per liter | | Hypofunction with amenorrhea | Gonadotropic factor alone or gonadotropic factor plus estrogenic factor or gonadotropic plus anterior pituitary lobe extract |
| | More than 20 rat units per liter | | Hypomenorrhea or oligomenorrhea | Gonadotropic factor plus growth hormone |
| | | | Endometrial hyperplasia hypermenorrhea hyperhormonal amenorrhea | Gonadotropic factor thyroid insulin progestin |
| II | Absent | Absent | Marked hypofunction with amenorrhea or oligomenorrhea | Gonadotropic factor plus estrogenic factor gonadotropic factor plus anterior pituitary lobe extract |
| III | Absent | Present | Castration menopause radiation | Huge doses of estrogenic factor |
| IV | Present | Present | Pregnancy genital carcinoma glandular syndromes | |

administration of gonadotropic hormone alone. This is especially valuable in Frohlich's disease.

Nineteen of the entire group of fifty responded to the injections in the form of six or more menstrual flows at regular intervals.

E. Insulin—This preparation employed in a dose of 10 units administered a half hour before breakfast and dinner is chiefly effective in cases of primary ovarian failure. Not only is body weight increased but distinct improvement in genital function is noted.²⁴

ANTI-HORMONES

Recently, organotherapy received somewhat of an adverse blow owing to the discovery by Collip²⁵ of antihormones or specific antagonistic substances in the blood which nullify continuous injections. Hence while the injection into animals of anterior pituitary-like principle from the urine of pregnancy results first in increase in the size of the ovaries, this is followed on repeated injections by regression to normal dimension despite continued administration. An antihormone has been demonstrated for the thyrotropic principle of the anterior pituitary lobe and likewise for the growth factor and for the ketogenic principle.

Loeb²⁶ points out that these antihormones may result from the presence of protein in the extracts employed.

22 Evans, H. M., Penchara, R. I., and Simpson, Miriam E. The Repair of the Reproductive System of Hypophysectomized Female Rats by Combinations of an Hypophyseal Extract (Synergist) with Pregnancy Prolan. *Endocrinology* 18: 601-606 (Sept. Oct.) 1934. Maintenance and Repair of the Reproductive System of Hypophysectomized Male Rats by Hypophyseal Synergist, Pregnancy Prolan and Combinations Thereof. *Ibid.* 18: 607-618 (Sept. Oct.) 1934.

23 Mazer, Charles, and Katz, B. R. Clinical Evaluation of Combined Prolan and Anterior Pituitary Therapy. *Endocrinology* 17: 709-722 (Nov. Dec.) 1933.

24 Williams, G. A., and Williams, R. L. Insulogenic Stimulation of Sexual Development. *J. A. M. A.* 104: 1208-1210 (April 6) 1935.

25 Collip, J. B. Inhibitory Hormones and the Principle of Inverse Response. *Ann. Int. Med.* 8: 10-13 (July) 1934. William Henry Welch Lectures. Some Recent Advances in the Physiology of the Anterior Pituitary. *J. Mount Sinai Hosp.* 1: 28-71 (May/June) 1934.

26 Loeb, Leo. Mechanisms in the Development of an Active Resistance to the Effects of the Substances Stimulating the Thyroid Gland in the Guinea Pig. *Science* 80: 252-253 (Sept. 14) 1934.

from which the active fraction of the molecule has not been separated. This might not be produced by crystalline hormones. Thus, with the administration of estrogenic substance, which is a pure product, Mazer¹⁶ found no antihormones in the serum of women injected with as much as from 100,000 to 500,000 rat units of estrogenic substance.

Although the possibility of the development of anti-hormones during the administration of these preparations emphasizes the necessity for the utmost caution in the clinical use of endocrine products, this should not hinder the proper employment of organotherapy.

IRRADIATION

In low dosage irradiation of the pituitary gland and ovaries, one finds the most potent therapeutic agent for the treatment of menstrual disturbances with functional sterility associated. Strict adherence to all the technic laid down by the roentgenologist is most essential, from 50 to 80 roentgen units or from 7.5 to 12.5 per cent skin erythema dose being given weekly over a period of six weeks.²⁷ The one menstrual disorder that almost invariably fails to respond is hypomenorrhea (scanty flow) in regularly menstruating women. The cause of the menstrual deficiency in these patients is apparently within the uterus itself.

In table 5 it is observed that of a total of seventy-one women with menstrual disturbances, twenty-seven, or 38 per cent, were cured with low dosage irradiation of the pituitary gland and ovaries. In a group of thirty-four women with functional sterility associated with menstrual disturbances, pregnancy followed after irradiation in seventeen, or 50 per cent.

ANALYSIS OF RESULTS

The analysis of our results (tables 2, 3, 5) obtained by various forms of therapy, including hormone administration, dilation and curettage and low dosage irradiation of the pituitary gland and ovaries, reveals that of 150 sterile women fifty-three, or 35 per cent, subsequently became pregnant, though only forty-two carried to full term. Eleven aborted before the sixth month of gestation. Ninety-seven women did not become pregnant although many of these were definitely improved clinically.

TABLE 5—*Value of Low Dosage Irradiation of Pituitary Gland and Ovaries in Menstrual Irregularities*

| Menstrual Disturbance | Cases | Cured | Per Cent |
|--|-------|-------|----------|
| 1 Amenorrhea | | | |
| Primary | 1 | 8 | 30 |
| 1 year | 6 | | |
| 4 months | 19 | | 15 |
| 0-18 weeks | 33 | 15 | 37 |
| 2 Metrorrhagia | 8 | 3 | 37 |
| 3 Menorrhagia | 3 | 1 | 33 |
| 4 Hypomenorrhea | 1 | 0 | 0 |
| Total | 71 | 27 | 38 |
| Functional sterility with menstrual disturbances | 34 | 17 | 50 |

SUMMARY AND CONCLUSIONS

1 In the investigation of functional sterility in women it is essential to remember that the condition is frequently dependent not on a single but on manifold factors and that both partners to a barren marriage must be systematically studied.

2 Hormonologic as well as other investigations should be made as a routine, since in many instances the endocrine structures are etiologically related to the sterility.

27 Edeiken, Louis. Small Doses of X-Ray for Amenorrhea and Sterility. *Am. J. Obst. & Gynec.* 25: 511-516 (April) 1933.

3 Examination of endometrial curettings obtained premenstrually offers an explanation of many otherwise obscure cases of sterility in regularly menstruating women

4 With the aid of modern methods of investigation, very little and in many instances no difficulty at all is encountered in recognizing the various types of endocrine sterility

5 Prophylaxis in adolescence, regulation of the diet, attention to the optimal time of conception and other measures at one's disposal merit careful consideration before organotherapy is instituted

6 Low dosage irradiation of the pituitary gland and ovaries is of value in functional sterility chiefly because of its salutary effect first on these structures and secondly on the menstrual process

7 Of 150 women with functional sterility treated in our clinic, fifty-three, or 35 per cent, conceived

8 In the light of rapid advances being made in the understanding of the relationship of endocrine disharmony to functional sterility, together with the scientific preparation of potent glandular agencies, one may now hold forth some assurance of relief for functionally sterile women

1621 Spruce Street

STERILITY

ANALYSIS OF CAUSES AND TREATMENT

PAUL TITUS, MD

PITTSBURGH

Sterility is to be defined as the inability of a couple to effect or accomplish a pregnancy. This is a better working definition than that which includes women who abort habitually, or those, later in pregnancy, whose fetuses regularly die in utero, because a woman who is able to conceive is not actually sterile. Moreover, this definition shares the responsibility between wife and husband, as is proper, but should be modified by stating that a mating cannot be considered sterile until after one year of unsuccessful attempts at pregnancy.

The term primary sterility is applied to marriages from which no pregnancy has resulted, and secondary sterility to those in which, after one or two pregnancies have occurred, further conception becomes apparently impossible.

Absolute sterility is that condition in which anatomic or genetic faults or pathologic changes make pregnancy impossible, at least for the time being.

In relative sterility, pregnancy is not impossible but is impeded or interfered with by various factors.

These definitions and terms conform with those either suggested or favored by Meaker¹ in his recent monograph on human sterility. For the sake of uniformity in the detailed consideration and treatment of these cases, it is to be hoped that Meaker's classification may soon be generally adopted as standard.

It is interesting to note that there has been a rapid advance within recent years in knowledge of the various causes of sterile marriages. Parallel to this, a simultaneous advance in its effective and successful treatment is now taking place.

It is my purpose to outline as briefly as possible the essential details in the routine investigation of a case of relative sterility, the treatment logically being directed against the faults found. I shall also report an analysis of a total of 113 cases, together with some comments on what has been almost a closed subject, namely, the treatment of absolute sterility.

ROUTINE OF STUDY

Occasionally the physician is consulted by the husband and wife together, but more often it is the wife who comes alone to discover why the marriage has not resulted in children. This is a result of the idea still so prevalent among laymen that sterility is usually due to some fault in the wife rather than in the husband.

The first and most essential step is to explain to the couple the complex nature of sterility and the fact that certain systematic steps must be carried out in complete detail in order to discover as many as possible of the several causes in every case. It should be explained that these are often trivial in themselves until added together, when the total effect of these various factors causes a couple to be sterile. Consequently, unless they understand completely and agree to undergo the necessary study, it is usually best for them not to begin.

The secret of success in the treatment of sterility lies in carrying out in regular sequence every essential step in the study as outlined. If the investigator finds one or two important factors which in themselves might account for the sterility, he must not stop here, satisfied that this is the full answer. If he does, his results will be relatively poor, because every case presents not one or two but a number of faulty factors on both sides. He will find the others if he goes on with the study. It is by removing all instead of merely a few of the faults that really spectacular results may be achieved in the form of a high percentage of pregnancies. Confirmation of this will be noted in the accompanying tables.

The essential steps in a study of sterility should be outlined as follows: (1) history and general physical examination of the wife, including blood count and urinalysis, followed by (2) pelvic examination, (3) history and general physical examination of the husband, including blood count and urinalysis, (4) examination of his genital organs, (5) estimation of basal metabolic rates of husband and wife, (6) examination of spermatic fluid from a condom-to-bottle specimen as well as a later postcoital examination of spermatic fluid recovered from the cervical canal (Huhner test), (7) tests for tubal patency by insufflation (Rubin test), (8) such other measures as may be necessary, including injection of uterus and tubes with opaque mediums for roentgen visualization, and the Frank estimation of circulating estrogenic hormone and follicle-stimulating factor or the excretion of these in the urine as determined by Kurzkro's method, as well as the galactose tolerance test as a gauge of pituitary function.

With the possible exception of the roentgen visualization of the tubes and the laboratory estimations of estrogenic substance, and the galactose tolerance test, the minimum requirements of a sterility study are that all these steps must be carried out. The couple cannot have this too firmly impressed on them.

Meaker has expressed the view that sterility studies cannot be properly conducted except through the medium of an elaborate clinic or group of clinicians and an extended investigation continued over a minimum of a week's time. Such a plan, involving the

From the Department of Obstetrics and Gynecology and the John C. Oliver Memorial Research Foundation of St. Margaret Memorial Hospital. Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.
¹ Meaker, S. R. Human Sterility. Baltimore: Williams and Wilkins Company, 1934.

routine services of a gynecologist, a urologist, an internist and a pathologist or chemist, as well as, frequently, a roentgenologist and others, obtains the best and most rapid individual results, as Meaker has shown. He reports 50 per cent of pregnancies, namely, eighteen occurring in thirty-six instances of relative sterility thus studied and treated.

Nevertheless, such an investigation is economically impossible for average couples, and I have reviewed sixty-seven cases of relative sterility from my own practice studied completely according to my standards but much more simply than his and thus available to a larger number. Among these I am able to report pregnancies occurring in thirty-three, or 49.2 per cent, of the couples.

TABLE 1—Sterility Series

| | | | |
|--|-----|----------------|------------|
| Total cases | 113 | (a) Absolute | 25 (22.1%) |
| | | (b) Relative | 88 (77.5%) |
| Analysis of 88 cases of relative sterility | | | |
| Total pregnancies 38 or 43.1% | | | |
| Cases completely studied | 67 | pregnancies 33 | or 49.2% |
| Cases not completely studied | 21 | pregnancies 5 | or 23.8% |

It is advantageous, whenever possible, to develop a group for special studies, but, with the exception of the gynecologist and the urologist, the consulting specialists in our less formal Pittsburgh group are reasonably reserved for those patients in whom it is apparent that certain specific investigations are required. It is the gynecologist who is usually first to be consulted, and each husband is referred as a routine to the urologist. A minimum course of study can be carried out by these two, as has been outlined. This will usually disclose any more obscure features which need special attention. Obviously, it is more possible economically for a couple to have such an investigation than to require them to undergo in routine sequence a number of highly technical tests of questionable necessity.

In other words, a minimum standard of study should be required of all rather than a maximum standard, which is prohibitive or impossible to many. Meaker recognized this clearly in his monograph and discussed the rational use of "incomplete" methods, giving the impression, nevertheless, that such substandards are inadequate and yield only poor or at best fair results. This is mentioned not to decry the value of the more elaborate studies but rather to encourage others to undertake this work even with less complete facilities, because fair success is better than none at all. There is the assurance that with more skill and practice one's results become better, whereupon one's interest and enthusiasm as well as proficiency increase accordingly.

DISCOVERY OF CAUSES

The history, or the general and special examinations, may disclose many factors, each of which alone may be unimportant. Added together, however, they make the imposing total that causes sterility in this couple.

The history, for example, may show dietetic deficiencies (protein and vitamin E starvation), previous debilitating or damaging diseases (mumps with orchitis, scarlet fever, recurrent tonsillitis, anemia, nephritis or gonorrhea). Excessive use of alcohol, too frequent intercourse, the use of acid lubricating jellies with coitus, coitus interruptus followed by chronic passive congestion of the tubes, and similar factors may be important. The husband in one of our couples was a painter and had mild lead poisoning, and until this was corrected none but inactive spermatozoa could be found.

General physical examination often discloses significant but not at all mysterious conditions. The need for blood counts and urinalyses should be apparent.

Pelvic examinations in the female and examination of the male genitalia have a fixed purpose. Hypospadias or epispadias or undescended testicles in the male are important factors, of which at least the first two are mechanically correctable. To explain this statement, the use of a condom with a hole cut at the proper place will direct the seminal fluid in these cases against the cervical os.

In the female, certain special examinations are required. These include a postcoital examination of the spermatic fluid recovered from the cervical canal and the insufflation (Rubin technic) of the fallopian tubes as a test for patency.

The numbers, the motility and its duration, the morphology of the spermatozoa, including an estimation of percentage of abnormal forms, and the viscosity and amount of the spermatic fluid, are factors of importance and have been discussed at length by Moench² and others. Cary³ has mentioned that the chemicals used in the manufacture of rubber condoms may kill spermatozoa. The precaution should be observed, therefore, of instructing the husband to wash the sheath before using it and to empty the contents immediately into a clean glass bottle, which is to be kept warm by being transported to the laboratory in an inside pocket near the patient's body. It must not be overheated or become too cold. Intra-uterine injection of iodized oil for roentgen visualization of fallopian tubes, and special biochemical examinations may be required in some instances. Details of many of these cannot be outlined here because of lack of space but are entirely familiar to the majority in this specialty.

ANALYSIS OF CASES AND RESULTS

The total series of cases that I have to report at present numbers 113. The accompanying tables outline the observations and results in the original group, which included all patients consulting me up to Nov 1, 1934. This date was chosen in order to allow a minimum of five months to elapse after the last case was completed.

TABLE 2—Duration of Sterility Completely Studied Group
(Thirty Three Pregnancies)

| Years | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | ? |
|----------------------------------|----|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| Number of cases | 11 | 6 | 6 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Primary sterility (nulliparas) | | | | | | | | | | | | | | | 24 |
| Secondary sterility (multiparas) | | | | | | | | | | | | | | | 8 |
| Partly not recorded | | | | | | | | | | | | | | | 1 |

for the effects of treatment to become manifest. The analysis was finished April 1, 1935. About forty additional cases, with some resulting pregnancies, have been registered since November but are not included, because complete results could not be evaluated in any shorter time than that chosen. The study of the majority of the latter cases was still being conducted or had just been completed and treatment was being given when this paper was completed.

The value of adequate study is clearly shown by the difference in results obtained in the two groups. In subsequent reports the percentage of completely studied cases will be higher.

Cases listed in the incompletely studied group were unfinished for various reasons. In some of these

² Moench G D M J & Rec 126 94 (July 20) 1927 Am J
Obst. & Gynec 19 77 (Jan.), 530 (April) 1930
³ Cary W H Personal communication to the author

instances the husband declined to submit to an investigation. It is not unreasonable to conclude that some of these men were absolutely sterile and knew it, but all the cases without positive information have been included in the relatively sterile group. In others, the investigations were begun but the patient failed to complete the routine, so that tubal insufflation, for example, was lacking in some, or basal metabolism estimations or other tests were not done in others.

REVIEW OF FAULTY FACTORS IN SERIES

It should be reemphasized here that unsuccessful attempts at pregnancy for a period of as long as one year may reasonably be taken as evidence of sterility, according to Meaker.

A review of the numerous faulty factors found in relative sterility includes, among the women, tubal obstruction (relative) in thirty-five instances, endocervicitis in twenty-eight, retroflexion of the uterus in twenty-four, hypothyroidism in thirteen, ovarian dysfunction in ten, anemia, ovarian cyst, fibromyomas in five each, cervical atresia following previous deep cauterization in five, chronic adnexitis in four, pituitary dysfunction in three, cervical polyp and infantile uterus in two each, cervical stenosis, the use of alcohol to excess, protein starvation, tuberculosis and diabetes in one each.

TABLE 3—Duration of Sterility Incompletely Studied Group (Five Pregnancies)

| Years | 1 | 2½ | 5 | Exact time not recorded. Includes 2 previous marriages and divorces, nullipara aged 44 |
|-----------------|---|----|---|--|
| Number of cases | 1 | 2 | 1 | 1 |

Tubal insufflation seemed to be responsible for four of these pregnancies.

Some of the male factors found were hypothyroidism in eighteen, inactive spermatozoa with deficient numbers in seven, sluggish spermatozoa with deficient numbers in seven, more than 20 per cent of abnormal forms of spermatozoa in five, anemia in three, excessive frequency of coitus in seven and excessive use of alcohol in one.

As the technic of the male examination has improved to include viscosity tests, counting of spermatozoa, timing the duration of motility, and examination of stained specimens for morphologic defects, information on these matters has been accumulating so rapidly that much of these data from earlier cases are incomplete here. They are to be made the subject of a separate report at a later date.

The endocrinologic phases of this subject have been purposely avoided, as well as mention of the use of glandular extracts for the stimulation of ovulation and spermatogenesis, because this is to be discussed in the other paper of this symposium. I wish merely to state regarding this that some of the most striking results seen by our group are those in the men showing impaired spermatogenesis. The fact that spermatozoa counts may be made at regular intervals while these men are under treatment permits accurate and significant observations regarding improvement in numbers, motility and morphology of their spermatozoa.

A brief citation of six especially interesting cases will show some of the vagaries of this work.

CASE 22—A woman had had one child and then was sterile, secondarily, for nine years. The correction of a severe endocervicitis by cauterization, with tubal insufflation, was followed

by three pregnancies in close succession, the third of which gave her twins. She then applied for contraceptive advice.

CASE 26—A nullipara was sterile for two and one-half years, with a lowered basal metabolic rate and prolonged menstrual intervals. Stimulating dosage of roentgen rays to the pituitary, thyroid and ovarian regions, which I usually use in preference to the more uncertain glandular or endocrine therapy, was followed by two normally spaced periods, after which she became pregnant.

CASE 96 (not included in series)—A physician's wife who had had one child was given about six insufflations at weekly intervals by another physician than myself. She had a normal period after the second and one insufflation a week for the next four weeks following the period, she did not have another period and was delivered at full term by me at a time that dates back to the menstruation in the midst of the insufflations. Apparently, after becoming pregnant, she had at least two insufflations without disturbing the embryo, incredible as this seems.

CASE 95—A woman had recovered from gonorrheal salpingitis with moderate tubal obstruction overcome fairly readily by insufflation, but this was followed by a tubal pregnancy.

CASE 103—A nullipara, married one year, with endocervicitis and cervical stenosis, had never used contraceptives. She and her husband had greatly lowered basal metabolic rates. Appropriate treatment of these several faults was followed by pregnancy after two months.

CASE 112—A nullipara had cystic enlargement of the left ovary, menstrual intervals of from seven to eight weeks, and moderate tubal obstruction. Insufflation was done on or about the ovulation date and she became pregnant at once.

TREATMENT OF ABSOLUTE STERILITY

Having given some of the outstanding points in the causation and treatment of relative sterility, it should also be stated that the majority of instances of absolute sterility in the female, resulting from tubal occlusion, are now correctable by means of certain recent advances in plastic surgical treatment of these conditions. "Clubbed" tubes from perisalpingitis are effectively restored by the "circumcision-cuff" operation, tubes occluded at the cornual ends may have this portion excised and then be implanted into the uterus even more readily than one can implant a severed ureter into the bladder. Sovak has developed the ingenious instruments that he and Holden⁴ have described, as well as a precise but simple technic for these operations. A surprising percentage of pregnancies is being recorded following these operations.

When tubes must be or have been removed, implantation of the ovary in or on an orifice in the uterine wall by the modified technic of Estes⁵ has been followed by a fair percentage of pregnancies.

Absolute sterility in the male from such causes as obstruction of the epididymis following gonorrheal orchitis can now be corrected fairly readily by a plastic operation. Hagner⁶ and others have discussed this in detail.

CONCLUSIONS

1 Relative sterility can be overcome by proper study and appropriate treatment in a ratio nearly of one in every two cases, thirty-three pregnancies, or 49.2 per cent, occurring in sixty-seven couples submitting to complete study and treatment, thirty-eight, or 43.1 per cent, in the entire series of eighty-eight cases of completely and incompletely studied cases.

2 A multiplicity of faulty factors is the rule in these cases, and a systematic routine of study is therefore

⁴ Holden, F. C., and Sovak, F. W. *Am J Obst & Gynec.* 24: 684 (Nov.) 1932.
⁵ Estes, W. L., Jr., and Heitmeyer, P. L. *Am J Surg* 24: 563 (June) 1934.
⁶ Hagner, F. R. *Pennsylvania M J* 37: 795 (July) 1934.

necessary This must include wife and husband and must be complete in certain essential details in order to obtain favorable results

3 Mechanical faults predominate, while more obscure endocrine disturbances are of lesser frequency

4 Absolute sterility in the female due to salpingitis or perisalpingitis is correctable in many instances by appropriate plastic operations

5 Absolute sterility in the male, as from gonorrheal stricture of urethra or occlusion of the epididymis, is usually correctable by comparatively simple plastic operations

6 The entire subject of sterility in the human being is so much more amenable to treatment than is generally believed that every sterile couple deserves an investigation if they wish to have children

1015 Highland Building

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS BLAND FIRST AND GOLDSTEIN
AND DR TITUS

DR NORMAN R. KRETZSCHMAR, Ann Arbor, Mich. Necessity for thoroughness in the study of sterility may well be emphasized. Few problems present such a relationship of variegated cause and effect. A definite routine or plan of procedure is advisable. When possible this should begin with a study of the husband. In this connection Belding reports that spermatozoa retain their motility longer at refrigerator temperature than at body heat. Hence temperature precautions for samples of semen to be studied are relatively unimportant. I can confirm Dr Titus's statement concerning the value of anterior pituitary-like hormone in spermatogenesis. At the University of Michigan Hospital our routine combines all the steps included in the minimal requirements mentioned by Dr Titus. In our studies uterosalpingography plays an important part. With us this procedure has been no more hazardous than uterotubal insufflation. There were no untoward symptoms in seventy-five cases studied by means of opaque mediums. Plastic surgery on the fallopian tubes is still in its infancy. I agree that it is sometimes desirable, but it should be looked on as a serious measure. The patient and her husband should be thoroughly acquainted with the risks and chances for success. Surgery of this sort, if liberally accepted, may prove a profitable field for the unscrupulous operator. The value of thyroid in cases of sterility with low metabolism in either sex has long been known. It is probable that a more accurate evaluation of gland function will contribute to a higher incidence of success in the treatment of nonfertile marriages. It cannot be said, however, that correction of these dysfunctions by administration of gland extract is yet on a satisfactory practical basis. Haphazard or flighty administration of endocrine substances the action or value of which is still insufficiently proved may do no good and may conceivably cause harm. For example, the exact effect of anterior pituitary-like substances is still somewhat questionable. There is no satisfactory evidence to prove that it produces luteinization of primate ova, indeed, evidence to the contrary is found in Hartman's work with monkeys. He found a preponderance of atretic follicles rather than corpora lutea after injection of anterior pituitary-like substance in these animals. Since there is reason to believe that a similar response occurs in the human ovary, the substance is contraindicated in sterility, for ovulation may actually be retarded. Also, it is clear that little is known concerning the remote effects of these substances. Gonadal stimulation by means of low dosage irradiation presents a paradox in that the action of the γ -rays is generally considered to be destructive. Yet it is being recommended more and more frequently in so-called stimulating doses to various glandular structures, including the pituitary and ovary, with apparently good results. As long as this discrepancy exists it would seem wise to be conservative.

DR. EMIL NOVAK, Baltimore. With reference to the results of ovarian therapy I am much less hopeful than Dr Bland and his associates, feeling that the judicious use of the thyroid more often gives results than do the ovarian or the anterior pituitary-

like principle obtained from the urine of pregnant women. Many will think that the rather complicated endocrinologic studies that have been discussed are always essential in studies of sterility and that their omission means a hopeless inadequacy. I do not believe this to be true, and I agree with Dr Titus that a less elaborate plan is sufficient in the great majority of cases. As yet endocrine studies of the blood and urine have yielded no striking therapeutic results and, as a matter of fact, recent studies on the chemistry of the hormones have confused the whole subject of the significance of the estrogenic output. Many different forms of estrogenic substance have been described, with enormously different potency. No one knows how much estrogenic substance is produced or needed by the body and how much or where or in what form it is destroyed. Valuable as the scientific pursuit of this problem is, the clinician need not feel that he is neglecting his patient if he cannot always carry out such investigations. In the present state of our knowledge he will usually learn more from the microscopic study of the endometrium obtained either by the method advocated by Dr Bland or, even better in my opinion, by the technique of aspiration-curettage that I described in *THE JOURNAL*, April 27. As to tubal patency tests, I have always considered the Rubin method simpler and safer than the oil injection technique, while it gives all the information necessary in the vast majority of cases, i. e., whether or not the tubes are open. Finally, a word as to anovulatory menstruation, which certainly explains some cases of sterility, as I have urged for many years. The important desideratum here is to find the factor or factors producing ovulation. I do not believe that either the follicle-ripening or the luteinizing hormone is the ovulating factor but that the essential cause is a delicate quantitative balance of the two. The problem is being intensively studied in various laboratories and the results may be of great value in the treatment of this small but interesting group of cases of sterility.

DR. ISIDOR C. RUBIN, New York. I am glad to note that emphasis is laid on the sterile mating in contradistinction to the sterile male or female. This newer concept has led to more rational investigation of the problem and has proved to be more than merely academic in value. It has helped to improve the results. The results of treatment reported by the readers show the steady progress made in sterility during the past twenty years. The relief of sterility in one of two cases, even in the more favorable groups, is indeed an achievement that was scarcely dreamed of two decades ago. In Dr Titus's series, 66 per cent of the pregnancies occurred in women married from one to three years, nevertheless there were eleven women, or one third, who were married from four to fourteen years. In this group at least the question of coincidence will not be seriously considered. I mention that because in the results, no matter with what measure one is working, the matter of coincidence or accidental results comes up. I believe that, when one third of a series of women who are sterile from four to fourteen years get pregnant as a result of investigation and treatment, the fact cannot be ignored. It may be stated axiomatically that the earlier the investigation of sterility is entered into the more gratifying will be the results. I agree with Dr Titus and Dr Meaker, whom he quotes, that one year of unsuccessful attempts at pregnancy should be considered adequate to judge the fertility of any mating. Much is lost by waiting until three years or more has intervened, when conditions that might have been corrected earlier become more difficult to overcome. In exceptional instances special investigations may be necessary. The use of a clean glass jar for the collection of semen has solved the problem of the spermicidal action of the condom in my experience. Every once in a while the partners in a certain sterile marriage, in either of whom nothing has been found to account for the sterility, have each joined in another marriage that would prove fertile. Apparently the faults were spontaneously corrected or the new partner compensated for the deficiencies. There is no doubt that many of those faults lie in the endocrine field which can now be better appraised and treated. The medical profession is still far removed from the position of assaying relative deficiencies of the inner secretory glands, aside from the thyroid and the pancreas, in spite of the very valuable contributions made in the last ten years in the study of the pituitary, ovary and adrenals. The study of the endometrium by curettage at the

premenstrual period has given much concrete evidence of the function of the ovaries and perhaps of the pituitary also. It gives a biologic assay of that particular woman, but for only one menstrual cycle. One shortcoming of the hormone tests is that they depend on study of one or two samples of blood or urine in a process that is changing from day to day. I think that efforts in reconstructive surgery of the fallopian tubes should continue. I have had eight pregnancies in a series of thirty-three tubal operations, and these results are being duplicated by others.

DR. BENJAMIN R. ALMQUEST, Pittsburgh. As a member of Dr. Titus's group in evaluating prostatovesicular secretions, I am surprised at the number of men falling into the relative infertility and low fertility groups as well as the many borderline cases who objectively and subjectively would seem to be physically fit. Relationships have been reported between the potency of the ejaculate and its hydrogen ion concentration and viscosity. Unpublished preliminary experiments made in the Oliver Memorial Research Laboratory at St. Margaret Hospital, Pittsburgh, under the direction of Mr. Frederick C. Messer, indicate that, unless the specimens of ejaculate studies have been collected and transported entirely out of contact with the air, these two properties undergo marked changes in value as the result of gaseous interchange between the specimen and the atmosphere. This observation casts grave doubt on the value and significance of data previously obtained on specimens less carefully handled. Since it is not practical clinically to obtain samples under such ideal conditions, a study of the biophysical and biochemical properties of prostatovesicular secretions, normal and abnormal, is planned in order to evaluate these factors in terms of others that will be more stable. Incidentally we are planning to carry out hormone assays on male urine in selected low fertility or seemingly absolute sterility cases, and if hormone is absent, it is probable that efforts to correct faults would be futile. I would emphasize one point in our series which Dr. Titus has reported. To avoid the suggestion of figures we have included all men who did not have definite anatomic faults. Many of these had genetic faults that we probably cannot correct. We believe that our figures otherwise would have shown even higher percentages of pregnancies.

DR. A. D. CAMPBELL, Montreal. Rarely, if ever, does pregnancy occur in women with a consistently short cycle of from twenty-one to twenty-five or twenty-six days. If a corpus luteum cannot sustain the endometrium twenty-eight days, it is unreasonable to hope that an impregnated endometrium can be sustained. It is true that certain women with alleged short cycles do become pregnant but on close analysis one finds that such women occasionally have twenty-eight day cycles. As yet the cause of polymenorrhea has not been ascertained, and, until more of the physiology of the short cycle has been learned such women must go childless. I am glad to hear that genetics is taking such an important part in this question of sterility, for I feel that the next generation of scientists will not be one limiting its researches to hormones but will be coupling genetics with hormones. The diagnosis of sterility by laboratory methods is an extremely complicated procedure. Furthermore, it is not a question of the presence or absence of any one hormone but of the presence of antihormones. Dr. Collip has found that many sterile and particularly amenorrheal women not only did not have the gonadotropic substance but did have a corresponding antimaturation substance. I think that treating patients indiscriminately with various preparations of unknown quantity, potency or therapeutic action should be discouraged, for I feel that such patients set up an antihormone and that no treatment will be effective thereafter. The role played by the transporting mechanism in the fallopian tubes is of primary importance. Not only the peristaltic action of the musculature but the action of the ciliated epithelium must be reckoned with. The action of both the musculature and the epithelium is dependent on endocrine balance. Certainly the injection of a foreign substance, a gas or an opaque oil, will not alter disturbed function, and such practices are not infrequently attended with danger. As for myself, I have given my insufflation machine away.

DR. ARTHUR FIRST, Philadelphia. I agree with Dr. Novak that probably all laboratory tests are not always essential in

the management of functional sterility. However, the combination of laboratory and clinical examinations is of paramount importance in classifying the endocrine dysfunction present. As to the value of low dosage irradiation to the pituitary gland and ovaries in functional sterility associated with menstrual disturbances, it doesn't make any difference whether this has a stimulating effect or whether it causes selective inhibition, regardless of the *modus operandi*, it nevertheless does produce satisfactory results, as we found that in thirty-four cases of functional sterility associated with menstrual disturbances 50 per cent became pregnant following irradiation. Strict adherence to all the techniques laid down by the roentgenologist must be carried out in this form of therapy. We agree with the previous speakers in the fact that one should not become unduly enthusiastic concerning the use of glandular therapy in the treatment of sterility of endocrine origin, nor should one revert to therapeutic nihilism and condemn altogether this form of therapy. We believe that the chief reasons for failure in the administration of organotherapy are, first, the fact that non-endocrinopathic causative factors have not been eliminated, second, improper administration of glandular products, and, third, improper or poor dosage. This is not always the fault of the physician but is often the fault of the manufacturer. Only recently a quantity of gonadotropic substance left with us at the sterility clinic for clinical trial, and reputedly stable and supposed to contain from 50 to 100 rat units per cubic centimeter, when analyzed in our laboratory was found to contain only 1 rat unit per cubic centimeter, so that I might say in concluding that although the greatest caution is urged in evaluating results, we feel that the future is very promising indeed in the treatment of sterility associated with endocrine disturbances.

NATURAL CONCEPTION CONTROL

LEO J. LATZ, MD, LL.D.

WITH THE TECHNICAL ASSISTANCE OF E. REINER, C.E.
CHICAGO

Economic conditions or other weighty reasons may put couples in a position in which they need to limit their offspring. Conversely, it is also true that there are a great number of women who desire children and who wish to know the most opportune time for a fertile intercourse. Since most women look to their family physician for guidance in this matter, we feel that an intimate acquaintance with this subject is desirable. Our practical experience in the field of natural conception control enables us to present data and corroborative proof showing that the Ogino-Knaus theory as represented is correct and practical for all normal healthy and regularly menstruating women.

There were several difficulties in the path that prevented scientists from solving this problem during the last few centuries. Nature, so to speak, threw them off their track in their search for the solution by suggesting a similarity between menstruation and heat estrus in animals. In 1883 Cappellmann, following these false hints of nature, set up his theory, which held that women are most fertile during the first fourteen days after the beginning of menstruation and during the three to four days before the next menstruation.

FACTORS GOVERNING THE PERIODICITY IN THE FERTILITY AND STERILITY OF WOMEN

1. The life of the sperm cell within the female genitalia is less than forty-eight hours. The most important factor influencing the length of the fertility of the spermatozoa in a harmful way is the body temperature within the vagina. The scrotum serves as a refrigerating apparatus for the testicles, keeping the spermatozoa at a temperature which is several degrees lower than

necessary. This must include wife and husband and must be complete in certain essential details in order to obtain favorable results.

3 Mechanical faults predominate, while more obscure endocrine disturbances are of lesser frequency.

4 Absolute sterility in the female due to salpingitis or perisalpingitis is correctable in many instances by appropriate plastic operations.

5 Absolute sterility in the male, as from gonorrheal stricture of urethra or occlusion of the epididymis, is usually correctable by comparatively simple plastic operations.

6 The entire subject of sterility in the human being is so much more amenable to treatment than is generally believed that every sterile couple deserves an investigation if they wish to have children.

1015 Highland Building

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BLAND, FIRST AND GOLDSTEIN
AND DR. TITUS

DR. NORMAN R. KRETZSCHMAR, Ann Arbor, Mich. Necessity for thoroughness in the study of sterility may well be emphasized. Few problems present such a relationship of variegated cause and effect. A definite routine or plan of procedure is advisable. When possible this should begin with a study of the husband. In this connection Belding reports that spermatozoa retain their motility longer at refrigerator temperature than at body heat. Hence temperature precautions for samples of semen to be studied are relatively unimportant. I can confirm Dr. Titus's statement concerning the value of anterior pituitary-like hormone in spermatogenesis. At the University of Michigan Hospital our routine combines all the steps included in the minimal requirements mentioned by Dr. Titus. In our studies uterosalpingography plays an important part. With us this procedure has been no more hazardous than uterotubal insufflation. There were no untoward symptoms in seventy-five cases studied by means of opaque mediums. Plastic surgery on the fallopian tubes is still in its infancy. I agree that it is sometimes desirable, but it should be looked on as a serious measure. The patient and her husband should be thoroughly acquainted with the risks and chances for success. Surgery of this sort, if liberally accepted, may prove a profitable field for the unscrupulous operator. The value of thyroid in cases of sterility with low metabolism in either sex has long been known. It is probable that a more accurate evaluation of gland function will contribute to a higher incidence of success in the treatment of nonfertile marriages. It cannot be said, however, that correction of these dysfunctions by administration of gland extract is yet on a satisfactory practical basis. Haphazard or slighty administration of endocrine substances the action or value of which is still insufficiently proved may do no good and may conceivably cause harm. For example, the exact effect of anterior pituitary-like substances is still somewhat questionable. There is no satisfactory evidence to prove that it produces luteinization of primate ova, indeed, evidence to the contrary is found in Hartman's work with monkeys. He found a preponderance of atretic follicles rather than corpora lutea after injection of anterior pituitary-like substance in these animals. Since there is reason to believe that a similar response occurs in the human ovary, the substance is contraindicated in sterility, for ovulation may actually be retarded. Also, it is clear that little is known concerning the remote effects of these substances. Gonadal stimulation by means of low dosage irradiation presents a paradox in that the action of the x-rays is generally considered to be destructive. Yet it is being recommended more and more frequently in so-called stimulating doses to various glandular structures, including the pituitary and ovary, with apparently good results. As long as this discrepancy exists it would seem wise to be conservative.

DR. EMIL NOVAK, Baltimore. With reference to the results of ovarian therapy I am much less hopeful than Dr. Bland and his associates, feeling that the judicious use of the thyroid more often gives results than do the ovarian or the anterior pituitary-

like principle obtained from the urine of pregnant women. Many will think that the rather complicated endocrinologic studies that have been discussed are always essential in studies of sterility and that their omission means a hopeless inadequacy. I do not believe this to be true, and I agree with Dr. Titus that a less elaborate plan is sufficient in the great majority of cases. As yet endocrine studies of the blood and urine have yielded no striking therapeutic results and, as a matter of fact, recent studies on the chemistry of the hormones have confused the whole subject of the significance of the estrogenic output. Many different forms of estrogenic substance have been described, with enormously different potency. No one knows how much estrogenic substance is produced or needed by the body and how much or where or in what form it is destroyed. Valuable as the scientific pursuit of this problem is, the clinician need not feel that he is neglecting his patient if he cannot always carry out such investigations. In the present state of our knowledge he will usually learn more from the microscopic study of the endometrium obtained either by the method advocated by Dr. Bland or, even better in my opinion, by the technique of aspiration-curettage that I described in *THE JOURNAL*, April 27. As to tubal patency tests, I have always considered the Rubin method simpler and safer than the oil injection technique while it gives all the information necessary in the vast majority of cases, i. e., whether or not the tubes are open. Finally, a word as to anovulatory menstruation, which certainly explains some cases of sterility, as I have urged for many years. The important desideratum here is to find the factor or factors producing ovulation. I do not believe that either the follicle-ripening or the luteinizing hormone is the ovulating factor but that the essential cause is a delicate quantitative balance of the two. The problem is being intensively studied in various laboratories and the results may be of great value in the treatment of this small but interesting group of cases of sterility.

DR. ISIDOR C. RUBIN, New York. I am glad to note that emphasis is laid on the sterile mating in contradistinction to the sterile male or female. This newer concept has led to more rational investigation of the problem and has proved to be more than merely academic in value. It has helped to improve the results. The results of treatment reported by the readers show the steady progress made in sterility during the past twenty years. The relief of sterility in one of two cases, even in the more favorable groups, is indeed an achievement that was scarcely dreamed of two decades ago. In Dr. Titus's series, 66 per cent of the pregnancies occurred in women married from one to three years, nevertheless there were eleven women, or one third, who were married from four to fourteen years. In this group at least the question of coincidence will not be seriously considered. I mention that because in the results, no matter with what measure one is working, the matter of coincidence or accidental results comes up. I believe that, when one third of a series of women who are sterile from four to fourteen years get pregnant as a result of investigation and treatment, the fact cannot be ignored. It may be stated axiomatically that the earlier the investigation of sterility is entered into the more gratifying will be the results. I agree with Dr. Titus and Dr. Meaker, whom he quotes, that one year of unsuccessful attempts at pregnancy should be considered adequate to judge the fertility of any mating. Much is lost by waiting until three years or more has intervened, when conditions that might have been corrected earlier become more difficult to overcome. In exceptional instances special investigations may be necessary. The use of a clean glass jar for the collection of semen has solved the problem of the spermicidal action of the condom in my experience. Every once in a while the partners in a certain sterile marriage, in either of whom nothing has been found to account for the sterility, have each joined in another marriage that would prove fertile. Apparently the faults were spontaneously corrected or the new partner compensated for the deficiencies. There is no doubt that many of those faults lie in the endocrine field which can now be better appraised and treated. The medical profession is still far removed from the position of assaying relative deficiencies of the inner secretory glands, aside from the thyroid and the pancreas, in spite of the very valuable contributions made in the last ten years in the study of the pituitary, ovary and adrenals. The study of the endometrium by curettage at the

premenstrual period has given much concrete evidence of the function of the ovaries and perhaps of the pituitary also. It gives a biologic assay of that particular woman, but for only one menstrual cycle. One shortcoming of the hormone tests is that they depend on study of one or two samples of blood or urine in a process that is changing from day to day. I think that efforts in reconstructive surgery of the fallopian tubes should continue. I have had eight pregnancies in a series of thirty-three tubal operations, and these results are being duplicated by others.

DR BENJAMIN R ALMQUEST, Pittsburgh. As a member of Dr Titus's group in evaluating prostatovesicular secretions, I am surprised at the number of men falling into the relative infertility and low fertility groups as well as the many borderline cases who objectively and subjectively would seem to be physically fit. Relationships have been reported between the potency of the ejaculate and its hydrogen ion concentration and viscosity. Unpublished preliminary experiments made in the Oliver Memorial Research Laboratory at St Margaret Hospital, Pittsburgh, under the direction of Mr Frederick C Messer, indicate that, unless the specimens of ejaculate studies have been collected and transported entirely out of contact with the air, these two properties undergo marked changes in value as the result of gaseous interchange between the specimen and the atmosphere. This observation casts grave doubt on the value and significance of data previously obtained on specimens less carefully handled. Since it is not practical clinically to obtain samples under such ideal conditions, a study of the biophysical and biochemical properties of prostatovesicular secretions, normal and abnormal, is planned in order to evaluate these factors in terms of others that will be more stable. Incidentally we are planning to carry out hormone assays on male urine in selected low fertility or seemingly absolute sterility cases, and if hormone is absent, it is probable that efforts to correct faults would be futile. I would emphasize one point in our series which Dr Titus has reported. To avoid the suggestion of figures we have included all men who did not have definite anatomic faults. Many of these had genetic faults that we probably cannot correct. We believe that our figures otherwise would have shown even higher percentages of pregnancies.

DR A D CAMPBELL, Montreal. Rarely, if ever, does pregnancy occur in women with a consistently short cycle of from twenty-one to twenty-five or twenty-six days. If a corpus luteum cannot sustain the endometrium twenty-eight days, it is unreasonable to hope that an impregnated endometrium can be sustained. It is true that certain women with alleged short cycles do become pregnant, but on close analysis one finds that such women occasionally have twenty-eight day cycles. As yet the cause of polymenorrhea has not been ascertained, and, until more of the physiology of the short cycle has been learned such women must go childless. I am glad to hear that genetics is taking such an important part in this question of sterility, for I feel that the next generation of scientists will not be one limiting its researches to hormones but will be coupling genetics with hormones. The diagnosis of sterility by laboratory methods is an extremely complicated procedure. Furthermore, it is not a question of the presence or absence of any one hormone but of the presence of antihormones. Dr Collip has found that many sterile and particularly amenorrheal women not only did not have the gonadotropic substance but did have a corresponding antimaturity substance. I think that treating patients indiscriminately with various preparations of unknown quantity, potency or therapeutic action should be discouraged, for I feel that such patients set up an antihormone and that no treatment will be effective thereafter. The role played by the transporting mechanism in the fallopian tubes is of primary importance. Not only the peristaltic action of the musculature but the action of the ciliated epithelium must be reckoned with. The action of both the musculature and the epithelium is dependent on endocrine balance. Certainly the injection of a foreign substance, a gas or an opaque oil, will not alter disturbed function, and such practices are not infrequently attended with dangers. As for myself, I have given my insufflation machine away.

DR ARTHUR FIRST, Philadelphia. I agree with Dr Novak that probably all laboratory tests are not always essential in

the management of functional sterility. However, the combination of laboratory and clinical examinations is of paramount importance in classifying the endocrine dysfunction present. As to the value of low dosage irradiation to the pituitary gland and ovaries in functional sterility associated with menstrual disturbances, it doesn't make any difference whether this has a stimulating effect or whether it causes selective inhibition, regardless of the *modus operandi*, it nevertheless does produce satisfactory results, as we found that in thirty-four cases of functional sterility associated with menstrual disturbances 50 per cent became pregnant following irradiation. Strict adherence to all the technics laid down by the roentgenologist must be carried out in this form of therapy. We agree with the previous speakers in the fact that one should not become unduly enthusiastic concerning the use of glandular therapy in the treatment of sterility of endocrine origin, nor should one revert to therapeutic nihilism and condemn altogether this form of therapy. We believe that the chief reasons for failure in the administration of organotherapy are, first, the fact that non-endocrinopathic causative factors have not been eliminated, second improper administration of glandular products, and, third, improper or poor dosage. This is not always the fault of the physician but is often the fault of the manufacturer. Only recently a quantity of gonadotropic substance left with us at the sterility clinic for clinical trial, and reputedly stable and supposed to contain from 50 to 100 rat units per cubic centimeter, when analyzed in our laboratory was found to contain only 1 rat unit per cubic centimeter, so that I might say in concluding that although the greatest caution is urged in evaluating results, we feel that the future is very promising indeed in the treatment of sterility associated with endocrine disturbances.

NATURAL CONCEPTION CONTROL

LEO J LATZ, M.D., LL.D.

WITH THE TECHNICAL ASSISTANCE OF E REINER, C.E.
CHICAGO

Economic conditions or other weighty reasons may put couples in a position in which they need to limit their offspring. Conversely, it is also true that there are a great number of women who desire children and who wish to know the most opportune time for a fertile intercourse. Since most women look to their family physician for guidance in this matter, we feel that an intimate acquaintance with this subject is desirable. Our practical experience in the field of natural conception control enables us to present data and corroborative proof showing that the Ogino-Knaus theory as represented is correct and practical for all normal healthy and regularly menstruating women.

There were several difficulties in the path that prevented scientists from solving this problem during the last few centuries. Nature, so to speak, threw them off their track in their search for the solution by suggesting a similarity between menstruation and heat estrus in animals. In 1883 Cappellmann, following these false hints of nature, set up his theory, which held that women are most fertile during the first fourteen days after the beginning of menstruation and during the three to four days before the next menstruation.

FACTORS GOVERNING THE PERIODICITY IN THE FERTILITY AND STERILITY OF WOMEN

1 The life of the sperm cell within the female genitalia is less than forty-eight hours. The most important factor influencing the length of the fertility of the spermatozoa in a harmful way is the body temperature within the vagina. The scrotum serves as a refrigerating apparatus for the testicles, keeping the spermatozoa at a temperature which is several degrees lower than

that of the circulating blood. Added to this, there is the leukocytosis with phagocytosis and the higher hydrogen ion concentration in the vagina, all of which have a limiting effect on the viability of the spermatozoa.

2 The ovum can be fertilized for only a few hours after ovulation. This is due mainly to two biologic factors, each of which alone would bring about this short life span of the egg cell. Shortly before or just during the process of ovulation the first maturation division of the ovum occurs, according to Godlewski and Fischel,¹ the second maturation division occurs only when the ovum is fertilized. The time interval between these two mitotic cell divisions is short, a sperm must therefore be at hand to serve as a life saver to the ovum. Secondly, soon after the last follicle cells have fallen away from the ovum after its rupture, the smooth surface covers itself with a sheath of albumin as it travels through the tube. This albumin sheath protects the ovum, aids in nourishing it until it has embedded itself in the wall of the uterus and last but not least offers a successful resistance to the penetration of the spermatozoa.

3 Ovulation occurs on the fifteenth day before the beginning of the next menstruation, according to Knaus,² and between the twelfth and the sixteenth day

Whereas Knaus of Austria largely employed the biologic-experimental method in his studies on the safe period, Ogino of Japan utilized mostly his clinical material in the evaluation of a period of sterility and fertility in women. In his original report he had material comprising 118 laparotomies. By retaining only those women (eighty-one) whose cycles were regular (out of cycles varying from twenty-three to forty-five days), it was found that if one begins to calculate from the preceding menstruation the date of ovulation rested between the eleventh and the thirty-fourth day. But if one figures by beginning from the following menstruation, the greatest regularity in the date of ovulation prevails, it always took place on the twelfth to the sixteenth day preceding the next menstruation. In these operations Ogino did not find corpora lutea before the sixteenth day, nor did he encounter ruptured follicles up to the twelfth day before menstruation. Ogino stressed the important point that ovulation should be figured from the following menstruation, with which it has a causal relationship.

In a discussion of the date of ovulation, it is well to mention the work of Hartman⁴ on monkeys, Seitz and Wintz's work with castration doses of x-rays, and Newell, Bland, Edgar Allen and Pratt's⁶ observations on human ova during laparotomies and Anderson's⁷ on midmonth pain.

Extraordinary, premature or forced ovulation is mentioned by some authors in order to discourage the use of natural conception control. My practical experience indicates very strongly that there is no extraordinary ovulation in human beings. Spontaneous ovulation is the rule in all mammals, except in three species, the rabbit, the cat and the ferret. Induced ovulation seems to be almost a specific trait of these animals. To my knowl-

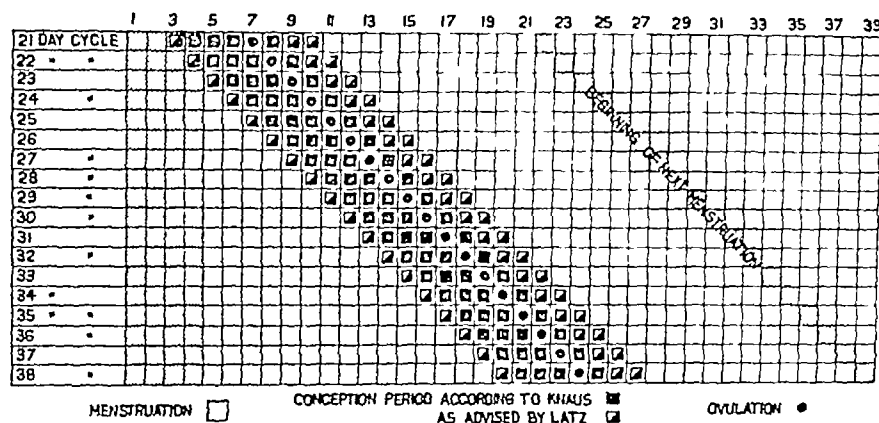


Chart 1—Conception periods for twenty-one to thirty-eight day menstrual cycles

before the commencement of the next menstruation, according to Ogino.³ Knaus proved that the functioning of the corpus luteum exercises a restraining effect on the contractions of uterine muscle, which renders it refractory to the principle of the posterior pituitary lobe. In women with a twenty-eight day cycle, the uterus reacts strongly to injections of solution of pituitary up to the fourteenth day. From the sixteenth day on, the uterus is atonic and no longer responds to pituitary injection. This peculiarity renders it possible to determine the time of ovulation with accuracy. The change in the function of the uterine muscle takes place about twenty-four hours after the bursting of the follicle. It follows that ovulation in women with a regular menstrual history of twenty-eight days must take place during the interval that precedes the time at which the loss of reactivity to principle of the posterior pituitary lobe is observed, that is, on the fifteenth day before the beginning of the next period.

edge there has not as yet been reported in the medical literature one case of extraordinary ovulation provoked by coitus. If this were not true, how could one explain the fact that many virgins who menstruate regularly for from five to ten years before their marriage experience no appreciable change in the regularity of their cycles after the wedding? In the first few weeks of the honeymoon there is certainly enough emotional and nervous stimulus present to bring about an extraordinary ovulation if this were possible.

Chart 1 depicts in a graphic way the fertile period in cycles of from twenty-one to thirty-eight days, according to Knaus and its modification as advised by me.⁵

4 Hartman, C. G. Observations on the Viability of the Mammalian Ovum. *Am J Obst & Gynec.* 7: 40 (Jan.) 1924. Studies in the Reproduction of the Monkey Macacus (*Pithecus*) Rhesus with Special Reference to Menstruation and Pregnancy. Contributions to Embryology. Carnegie Institution of Washington No. 134. 1932. Pelvic (Rectal) Palpation of the Female Monkey with Special Reference to the Ascertainment of Ovulation Time. *Am J Obst & Gynec.* 26: 600-608 (Oct.) 1933.

5 Seitz and Wintz. Ueber die Beziehungen des Corpus luteum zur Menstruation. *Monatsschr f Geburtsh u Gynak.* 49: 1919.

6 Allen, Edgar Pratt, J. P. Newell, Q. U. and Bland, Leland. Human Tubal Ova Related Early Corpora Lutea and Uterine Tubes. Contributions to Embryology, Carnegie Institution of Washington 22: No. 127. 1930. Recovery of Human Ova from the Uterine Tubes. *J A M A* 81: 1018 (Oct. 6) 1928.

7 Anderson, C. W. Natural Avoidance of Conception. *Colorado Med* 30: 223-227 (June) 1933.

8 Latz, L. J. The Rhythm of Sterility and Fertility in Woman. ed. 5. Latz Foundation Chicago 1935.

1 Fischel Alfred. *Lehrbuch der Entwicklung des Menschen*. Berlin Julius Springer, 1929.

2 Knaus Hermann. Periodic Fertility and Sterility in Woman. Vienna, Wilhelm Maudrich 1934.

3 Ogino K. Ovulationstermin und Konzeptionstermin. *Zentralbl f Gynak* 54: 464-478 (Feb. 22) 1930. Ueber den Konzeptionstermin des Weibes und seine Anwendung in der Praxis. *ibid* 56: 721 (March 19) 1932.

For practical reasons in applying the method, when instructing women in its use I have added an additional day before and two days after the fertile period to

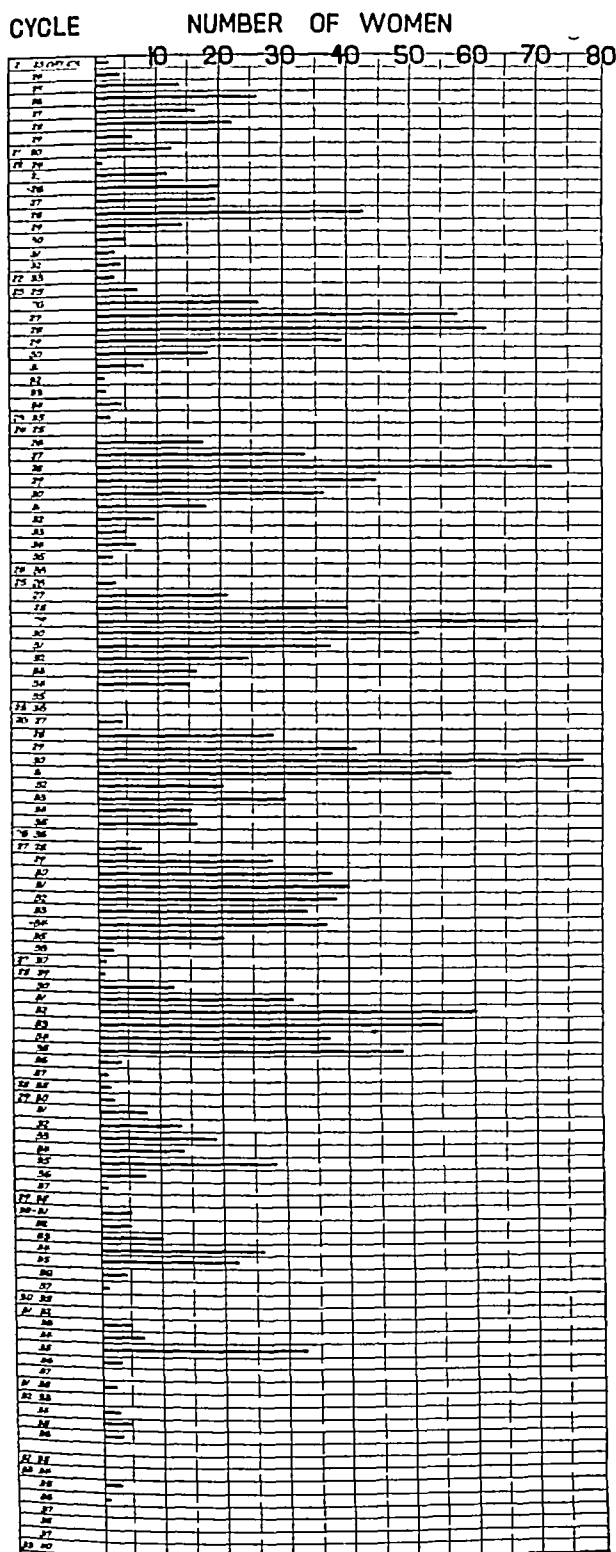


Chart 2—Menstrual cycles of normal adult women. The number of women having cycles as indicated is shown with heavy lines. All cycles recorded here are based on written menstrual records. The time of observation varies from a period of eight months to one of several years.

allow for possible errors in computation. This gives eight days of abstinence, which I advise in regularly menstruating women.

RULES TO BE FOLLOWED IN THE USE OF THE SAFE PERIOD

1 A written record is made of the dates of the beginnings of menstruations covering a period of at least eight months to one year before applying the method. This is necessary to determine the variation between the shortest and the longest cycle. Patients should also be instructed to record disturbing factors that may upset the regularity of menstruation, such as sickness (even colds), mental shocks or upsets, physical strains, and great change of climate or altitude. This will enable the doctor to make an intelligent interpretation of the data given. Data furnished by memory are of no value.

2 There must be no kind of sexual intercourse during the time of possible conception. Couples have told us of using contraceptives during the period of fertility, which, as every one knows, are not 100 per cent safe, and also of practicing retraction during this period.

TABLE SHOWING NUMBER OF INTERCOURSES EXECUTED
DURING THE STERILE DAYS OF LISTED CYCLES

| MOM. | CYCLE | MOM. | DAYS AFTER BEGINNING OF MENSTRUATION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | TOTAL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|-------|------|--------------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 22 | 26 | 14 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Chart 3—Number of intercourses executed during the sterile days of listed cycles

3 A regularity in menstruation must prevail. The menstrual cycle may be either long or short, but the variation should not be more than ten days, a larger variation would make the use of the method impractical. That most women do not vary more, and therefore can use the method, is shown strikingly in chart 2, which shows the menstrual cycles of 2,000 women, the records of which were sent to us by mail in application for a Concip Calendar. These women were not clinic patients, they represented an average of women who were eager to determine their sterile and fertile periods. They represented accurate written records kept over a period of from eight months to several years. The length of the heavy lines indicates the number of women having menstrual cycles as listed, for example, sixty-three women had a menstrual cycle varying between twenty-three and twenty-eight days. Characteristic in this chart are the ten or eleven separate pyramid-like formations of heavy lines, indicating that women will have either short cycles, such as from twenty-two to

twenty-seven days, or long cycles, such as from thirty to thirty-five days. Important also is the fact that about 90 per cent of these women have variations of from two to eight days, regardless of whether their cycles were short or long. In summary it may be said that

| | |
|--------------------------------------|---------|
| 1 per cent of the listed women vary | 2 days |
| 7 per cent of the listed women vary | 3 days |
| 13 per cent of the listed women vary | 4 days |
| 25 per cent of the listed women vary | 5 days |
| 20 per cent of the listed women vary | 6 days |
| 15 per cent of the listed women vary | 7 days |
| 10 per cent of the listed women vary | 8 days |
| 4 per cent of the listed women vary | 9 days |
| 3 per cent of the listed women vary | 10 days |
| 1 per cent of the listed women vary | 11 days |

99 per cent (1 per cent vary more than 11 days)

If one considers that a number of the women whose cycles are listed had possibly one or perhaps two cycles (either long or short) which were due to a disturbance of some kind that was not reported, and therefore were not discarded, the listed cycles do in reality vary not quite as much as is shown on the surface. This chart offers concrete proof that the great majority of women menstruate regularly enough to make use of natural conception control.

4 After these three rules have been satisfied, the woman is told that her fertile period extends from the twelfth to the nineteenth day before her expected menstruation (the expected first day of menstruation being calculated from the longest cycle in the last eight

months), plus the days of variation, between the longest and shortest cycle in the last eight months added to the beginning of the fertile period. For example: Supposing a woman has fluctuated between a twenty-six and thirty day cycle in the last eight months, then her first seven days, counting from the first day of menstruation, are sterile, the next twelve days (eight days of regular fertility plus the four days of variation) are fertile, and the remaining days until her menstruation are sterile. She is then asked to record conscientiously in a calendar the intercourses and first days of menstruation.

WHEN THE SAFE PERIOD SHOULD NOT BE USED

(a) After confinement, miscarriage or abortion until the regularity of the cycle is reestablished (usually from three to six months). About 50 per cent of women menstruate irregularly after childbirth. Cases 134, 133, 148, 180, 185, 193 and 196 in the table can be cited in support of this statement.

(b) After febrile and debilitating diseases or severe physical injuries.

(c) After severe psychic or emotional upsets.

(d) After any drastic alteration in the ordinary routine of life, such as prolonged travel in a strange climate, and strenuous exercises. During and after these unusual happenings the method should not be used until it has been definitely established that the cycle is again regular.

In the accompanying tables are cited many factors causing disturbances in the regularity of menstruation.

TABLE 1—Typical Menstrual Cycles of One Hundred Women Keeping Accurate Records

| Case | Age yrs | No of Children | State of Health | Residence | Individual Cycles Days |
|------|--------------------------------|----------------|--|---------------|---|
| 100 | 30 | 3 | Healthy but somewhat nervous | New Mexico | Birth 27 27 32 33 33 28 31, 32 30 33 |
| 101 | 26 | 2 | Healthy | Illinois | 35 34 32 28 29 30 32, 35 |
| 102 | 36 | 4 | Healthy | Michigan | 29 27 28 29 28 30 28 20 29 |
| 103 | 33 | 2 | Healthy | Indiana | 29 29 34 32 30 31 30 33 31 32 |
| 104 | 37 | 3 | Healthy | New York | Birth 32 32, 31 33 30 31, 32, 32 |
| 105 | 33 | 1 | Healthy | Indiana | 28 29 27 25 27 30 27 25 26 |
| 106 | 26 | 1 | Healthy | Wisconsin | Birth 29 28 29 34 (excitement) 27 |
| 107 | 35 | 1 | (Child 10 yrs), mother mentally deranged for 4 mos after birth | Ohio | 28 27 28 28 28 28, 28 28, 28 27 |
| 108 | 20 | ? | Health delicate | Iowa | Miscarriage 20 31 32, 27 31 32, 30 31 |
| 109 | No personal record (physician) | | Healthy | Illinois | 25 28 26 26 27 30 |
| 110 | 32 | 1 | (Caesarean birth) | New Jersey | Birth 25 26 27 25 29 30 30 |
| 111 | 38 | 5 | Healthy | New York | 32 30, 28 27 28 28 27, 27 31 28 |
| 112 | 32 | 7 | Healthy | Minnesota | 27 28 28, 28 24 27 25 24 28 |
| 113 | 30 | 3 | Healthy | New York | 28 30 28 30 27 26 30 28 |
| 114 | ? | ? | ? | Kansas | 25 25 26 25 27 24 25 25 |
| 115 | 24 | 2 | Healthy | Kentucky | 29 28 24 28 28, 30 28 30 |
| 116 | | | | Massachusetts | 24 28, 30 28 20 29 29 26 27 23, 29 |
| 117 | 43 | 5 | Healthy | Iowa | 28 27 32 27, 29 28 31 29 28 32, 30 31 30 28 31, 28 26 28 28 27 |
| 118 | 42 | None | Healthy | Massachusetts | 25 28, 27 25 27 28 28 25 26 28 25 28 |
| 119 | ? | ? | Healthy | Ontario | 22 22, 22, 24 25 23, 22, 24 |
| 120 | 39 | ? | ? | Illinois | 25 24 26, 26 26 24 25 26 26 25, 25 20 |
| 121 | ? | ? | ? | Ohio | 28 26, 28 28 24 26 25 30 25 27 27 20 |
| 122 | 26 | 2 | Anemic, low blood pressure | Tennessee | 32 30 28 28 36 (hay fever) 32 28 31 35, 33 27 32 37 (whooping cough) 29 28 32 31, 27 |
| 123 | 29 | 2 | (Caesarean birth) healthy | Pennsylvania | 31 32, 27 33 30 28 30 33, 28 32 29 |
| 124 | 35 | None | Insanity in family | Tennessee | 22 26 25 25 25 24 27 33 (abortion) 27 28 28 26 25 |
| 125 | 20 | ? | ? | West Virginia | 23 24 28 23 28 24 26 26 |
| 126 | ? | ? | ? | Massachusetts | 28 29 26 27 23, 27, 27 28, 27 26 28 26 28 29 26 26 29 29 26 |
| 127 | 31 | None | Thyroid disturbance | Michigan | 31 31 46 36 30 32 33 (thyroid operation) 27 29 28 33 30 31 32, 28, 35 28 35 |
| 128 | No other record | | | Pennsylvania | Had a 29 to 35 day cycle calendar for 2 previous years 35, 35 29 32, 31 35 33 33 30 31 |
| 129 | 27 | 2 | Healthy | New York | 29 31, 28 31 30 29, 30 31 28 31 |
| 130 | 36 | 6 | Fallen womb | Illinois | 34 (mental strain) 30 32, (miscarriage) 29 30 31 32, 30 |
| 131 | 30 | 3 | Healthy | Indiana | 26 27 29, 28, 26 26 28 24 27 26 25 26 29 25 26 20, 25 27 26, 23 26 25 25 26 27 26 27 31 31 23, 20 28 25, 25 25 26 29 26 30 28 26 28 (pleurisy) 24 |
| 132 | ? | ? | ? | California | 30 30 29 25 26 27 29 28 28 28 23 26 |
| 133 | 29 | 1 | Healthy | Ohio | Birth 35 29 28, 30 28 29 29, 30 28 |
| 134 | 27 | 1 | Healthy | Saskatchewan | 27 27 30 33 30 31, (marriage) 29 (abortion) 40 34 26 (birth) 44 30, 27 27 29 |
| 135 | 32 | ? | Healthy | Pennsylvania | 28 29 29 28 27 30 29 28 28 23 29 30 27 28 29 29, 30 27 28 |
| 136 | ? | ? | ? | | 28 28, 29 27 28 26, 29 30, 28 27 28 28 |
| 137 | 26 | ? | Healthy | Washington | 27 27 27 27 27, 28 27, 29 |
| 138 | 26 | ? | Healthy | New Jersey | 28 28 28, 28 27 29 29 28 |
| 139 | ? | ? | ? | New York | Birth 30 29 30 27 27, 30 29 34 |
| 140 | ? | 3 | Healthy | Indiana | 24 25 22, 27 25, 24 24 |
| 141 | 30 | 1 | Healthy | Illinois | 25 28 25, 25 24, 25 25, 26 |
| 142 | ? | 2 | Healthy | New York | 32 28 23 27 24, 24 27 24 26 28, 38 (cold) 25 25 20 |
| 143 | 25 | 1 | Leukorrhea | Nova Scotia | 31 25, 28 26 28, 15 (diathermy) 23 (diathermy) 28 28 28, 27 32, 29 25, 30 25, 26 27 29 17 (diathermy) 32 30 29 25 28 25 27, 28 27 25 29 |
| 144 | 39 | 3 | Healthy | Ohio | Birth, 28 30 29 29 23 29 |
| 145 | 38 | 3 | Somewhat anemic | California | 26 24 26 27 24 25 23 (extreme cold) 25 25 27 |
| 146 | 26 | ? | ? | Pennsylvania | 27 26, 26, 26 28 27 |

Table 1—Typical Menstrual Cycles of One Hundred Women Keeping Accurate Record—Continued

| Case | Age yr | No of Children | State of Health (6 ft 4 in 20 lbs) Kidney trouble otherwise good health | Residence | Individual Cycles Days | | | | | | | | | | | |
|------|-----------|-------------------|---|---------------|------------------------|----|----|----|----|----|------------------------|----|----|----|----|-------|
| | | | | | Birth | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 |
| 147 | 35 | 8 | Anemic Ulcerated stomach now well | Indiana | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 148 | 31 | 5 | Healthy | Indiana | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 149 | 31 | None | Healthy | Maryland | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 150 | 25 | ? | Healthy | New Jersey | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 151 | 42 | ? | Healthy | Minnesota | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 152 | 32 | ? | Healthy | Ohio | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 153 | ? | ? | Healthy | Pennsylvania | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 154 | 26 | 1 | Healthy | Wisconsin | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 155 | 27 | ? | Healthy | New York | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 156 | 25 | None | Healthy | Minnesota | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 157 | 45 | 11 | Healthy | Wisconsin | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 158 | 35 | 3 | Healthy | Michigan | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 159 | ? | 3 | Healthy | Indiana | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 160 | 42 | 3 | Healthy | Michigan | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 161 | 27 | ? | Healthy | New York | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 162 | 40 | ? | Healthy | New York | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 163 | 31 | 3 | Healthy | Massachusetts | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 164 | 25 | None | Healthy | New York | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 165 | 33 | 3 | Healthy | Wisconsin | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 166 | 28 | 2 | Healthy | Nebraska | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 167 | 27 | None | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 168 | 20 | None | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 169 | 32 | 5 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 170 | ? | ? | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 171 | ? | ? | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 172 | 25 | None | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 173 | 24 | None | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 174 | 27 | None | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 175 | 35 | 5 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 176 | ? | ? | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 177 | ? | ? | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 178 | ? | ? | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 179 | 27 | 1 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 180 | 30 | 4 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 181 | 34 | 2 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 182 | 20 | None | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 183 | 37 | 2 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 184 | 26 | None | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 185 | 36 | 4 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 186 | 28 | 1 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 187 | 23 | None | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 188 | 34 | 5 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 189 | 28 | None | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 190 | 34 | ? | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 191 | 34 | ? | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 192 | 30 | 1 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 193 | 28 | ? | Very nervous* otherwise healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 194 | 34 | ? | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 195 | 33 | 3 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 196 | 37 | 4 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 197 | 27 | None | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 198 | 34 | 4 | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 199 | ? | ? | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 200 | 27 | None | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |
| 201 | 22 | None | Healthy | Illinois | Birth | 24 | 28 | 20 | 33 | 30 | 28, 25 (mental strain) | 30 | 26 | 30 | 26 | 27 28 |

Patient 168 menstruated regularly between twenty-eight and thirty-three days. The only twenty-five day cycle was caused by a mental shock (engagement broken). Patient 176 shows a regular menstrual cycle varying between thirty and thirty-three days. The thirty-eight day cycle was caused by shock occurring on the twenty-ninth day of the cycle (favorite aunt fell out of window and died). In case 183, a woman with a twenty-four

period of several months to a year or more. This is facilitated by the distribution of a small record calendar for married people and the request to enter the foregoing data.

Chart 3 shows in a graphic way in the form of a summary the record of 114 women who had 4,702 intercourses during a total of 1,128 months without the occurrence of a pregnancy. The conception period for the given cycles is surrounded by heavy lines and is hatched. This chart also shows in a striking way the short conception periods for short variations of cycles and the long conception periods for long variations of cycles. The data presented, which are additional to the cases reported by de Guchteneere,⁹ Holt, Miller,¹⁰ Albrecht¹¹ and others, show incontestably the value of Ogino's and Knaus's observations.

CONCLUSIONS

1 The menstrual cycles of women are individual and about 90 per cent show a variation of from two to eight days.

2 At least 80 per cent of all women menstruate regularly enough to make use of natural conception control.

⁹ de Guchteneere R. Les variations cycliques de la fécondité féminine. Rev franc de gynéc. et d'obst 28 138 157 (March) 1933.

¹⁰ Miller A. G. Schulz C. H., and Anderson D. W. Conception Period in Normal Adult Women. Surg. Gynec. & Obst 56 1020-1025 (June) 1933.

¹¹ Albrecht, Hans. Zur Frage der periodischen Unfruchtbarkeit des Weibes. München med. Wchnschr 80:1682 (Oct 27) 1933.

PROOF THAT THE OGINO-KNAUS METHOD IS CORRECT AND PRACTICAL

We have succeeded up to the present day in having many couples furnish us an exact record of the first days of menstruations and intercourses covering a

3 A record of at least eight months is necessary to determine the variation of the menstrual cycle of a woman

4 The 114 cases quoted with a record of intercourses had in sterile periods are corroborative proof that the Ogino-Knaus method of natural conception is correct

209 South State Street

THE PRINCIPLES OF THE TREATMENT OF SEPTICEMIA

W J MERLE SCOTT, MD
ROCHESTER, N Y

The treatment of infection is one of the major subdivisions of surgery, and among all the systems infection of the blood is one of the most serious in its results. For its treatment, new therapeutic agents and methods are constantly being proposed. They spring up to a period of great popularity and then are usually replaced by the next favorite agent. Partly concealed by this procession of panaceas, however, there are certain principles of treatment that have withstood the test of time and others, grounded on the fundamental pathologic processes, that appear most hopeful for

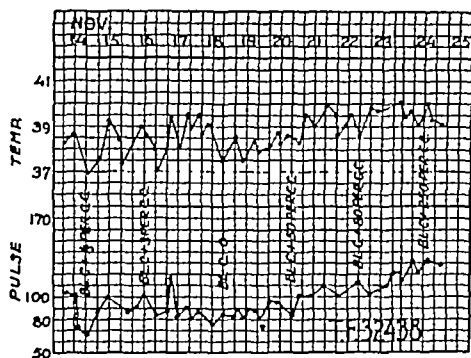


Chart 1—*Streptococcus haemolyticus* septicemia arising from carcinoma of the bladder. There was a variation in the number of colonies per cubic centimeter in the early stages of the blood stream infection although there was a steady progression in the later stages.

future progress. In order to analyze these principles of treatment, the cases diagnosed as septicemia during the last nine years in the Strong Memorial Hospital and the Rochester Municipal Hospital, numbering 351, were studied.

At the beginning of this clinical investigation it was decided to accept as bona fide cases of septicemia only those presenting (1) clinically the symptoms of sepsis together with (2) bacteriologically a positive blood culture or, in a few cases in lieu of the latter, such definite evidence of its presence at some time as is afforded by diffusely scattered multiple abscesses. In forty of the 351 cases, one or the other of these two criteria was lacking. Consequently on this basis these forty were rejected as uncertain in diagnosis, leaving 311 cases for analysis.

TYPES OF CLINICAL COURSE

An outstanding feature of this series, as it is of any group of septicemia cases, is the extreme variation in behavior from one case to another. Certain definite types of clinical course could be identified. In the first

place, there is a rapidly progressive variety. Symptoms may begin explosively or more gradually, but they develop continuously to an alarming condition within a few days. At times they change abruptly for the better and the patient recovers. But frequently, in spite of anything that is done, the patient rapidly succumbs. Many of these patients died within forty eight hours after entering the hospital.

The second type of behavior I designate as the plateau variety. After the period of onset the patients reach a rather stationary level and change but little from day to day. Usually exhibiting a swinging septic temperature curve, they may lose ground slowly, remain practically stationary or show gradual improvement. During this time, metastatic foci may develop slowly one focus after another. Whether the plateau of clinical behavior in this process is level or slopes gradually upward or downward, there is a considerable period of time, often several weeks, during which the forces tend toward recovery on the one hand and toward progression of the infection on the other seem to be nearly balanced. Particularly in this state it seems that a little help given to the natural defenses of the body would decide the issue in favor of recovery.

The third clinical variety is the transient septicemia in which the patient shows the picture of a full blown infection of a sufficient severity or with certain clinical features to suggest septicemia. Culture of the blood is carried out but, before the report of the organism isolated can be returned, the patient's symptoms have abated and the septicemia is at an end. This type of behavior is particularly frequent in blood stream infection from septic abortion. When the patient is admitted she presents a rather alarming picture of infection and has a positive blood culture, but within two or three days, if the progress is favorable, the symptoms of sepsis have abated. Unfortunately one cannot be certain that this is to be the future course of the infection when it is first seen.

The fourth clinical type is the terminal sepsis occurring in the course of some disease that is generally debilitating or specifically impairs the resistance mechanism. This is exemplified by the final invasion of the blood stream in aplastic anemia and agranulocytosis. This type of septicemia is of little concern in this discussion because its treatment is primarily the therapy of the fundamental disease rather than of the terminal infection.

MECHANISM OF BLOOD INFECTION

I have gone into detail in these types of symptomatic behavior because I feel that a correlation between the clinical syndrome and the intensity of the blood stream infection gives an important clue as to the nature of the process involved in the latter, at least in its early stages.

While many cases showing the rapidly progressive type of reaction have also a paralleling progression in the bacterial count of the circulating blood, even these cases early in the blood stream infection show lack of correlation in these two factors (chart 1). In others the culture is repeatedly negative during a period when the clinical picture is distinctly that of general sepsis with the development of numerous metastatic foci. In fact, any hypothesis that attempts to explain the progression of symptoms in septicemia on the basis of growth of bacteria in the circulating blood is faced with many serious inconsistencies (charts 2 and 3). I am convinced that infection of the blood occurs primarily, in the majority of cases, by way of septic thrombophlebitis.

usually in the minute vessels in the infected area but at times located in the large veins. The latter mechanism has long been recognized in involvement of the lateral sinus secondary to mastoiditis. Neuhof¹ has very properly directed attention again to similar infection of the major veins contiguous to abscesses or lymphadenitis of the axilla, groin, neck and other regions. It cannot be categorically stated that infection always reaches the blood stream by involvement of the wall of these lesser or greater vessels. It is my interpretation of the data, however, that this is true in the majority of cases and probably such foci usually continue to pour infection into the blood over a period of several days. The prompt subsidence of symptoms that may follow the sequestration of such a vascular focus from the circulating blood stream is ample evidence of its significance in continuing the septicemia.

PRINCIPLES OF TREATMENT

Consequently, the first principle in the treatment of septicemia is the eradication of all foci of infection at the earliest feasible moment. The adequate drainage of all collections of pus under pressure is usually as good care as is possible for the vascular bed in the area of primary infection. If phlebitis of one of the

septicemia. Colloidal solution of iodine, metaphen, arsphenamine, gentian violet and acriflavine hydrochloride were administered intravenously in this series. They have been the favorites since mercurochrome has been found to be more likely to harm the patient than to do him good. In all, fifteen patients were treated with one or more of these agents. All of the fifteen eventually died. In only one case did it appear from the chart that the chemotherapy had exerted any beneficial effect on the course of the infection (chart 4). Even in this case the symptoms recurred under treatment and the patient succumbed to the infection. I do not believe that the fatal termination in all of this small group means that the chemotherapy was particularly harmful to the patient. There probably is an element of selection of the patient who is progressing unfavorably. But at least in none of these cases did it prove particularly beneficial.

If my conception as given for the mechanism by which infection of the blood arises and is maintained is correct it is easily seen how almost impossible is the task being set for a chemical agent. The organisms that infect the blood stream are sealed away from the generally circulating blood in septic thrombi. To expect the chemical agent to penetrate into such thrombi in sufficient concentration to destroy the bacteria is an extremely rigorous condition. Although I agree with Kolmer² that such an agent would be of great therapeutic value, from this study as well as from his report and others in the literature it seems to me that the greatest hope for progress in the treatment of septicemia lies in the immunologic rather than in the chemical approach to the problem.

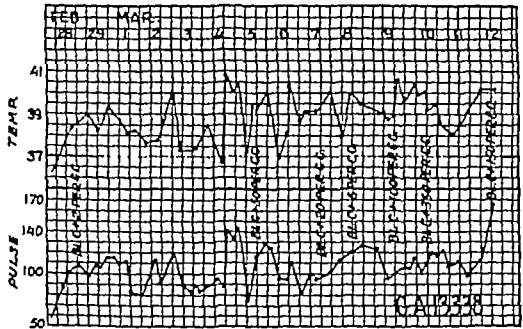


Chart 2—Pneumococcus (type I) septicemia with acute vegetative endocarditis. There was a progressive drop in the colony count of the blood (March 5 to March 8) from 50 per cubic centimeter to 6 per cubic centimeter without any corresponding clinical improvement. Also there was a terminal drop in the last two days from 350 to 150 per cubic centimeter on the day of death, associated with a marked progression in symptoms.

major veins is suspected, exploration should be made and, if found, it must be excluded from the circulation by excision or ligation of the vein.

Another adjunct in the treatment that was found helpful in this series and has stood the test of time is the use of blood transfusion to bolster the condition of the patient and particularly to replace destroyed blood in those cases in which anemia has developed. This is so widely accepted now that little need be said in its favor except to warn against the mechanical overloading of the circulation by blood transfusion in the later stages of septicemia or when the cardiac reserve is seriously impaired. It does no good and often hastens the end to give large blood transfusions to moribund septicemic patients. As a supportive measure, however, blood transfusion is of real value.

CHEMOTHERAPY

Ever since Ehrlich's dream of a universal antiseptic that would kill all bacteria without injuring the host, a succession of drugs, dyes and other chemicals have been tried in the treatment of septicemia. There is no *therapia sterilisans magna* available for the cure of

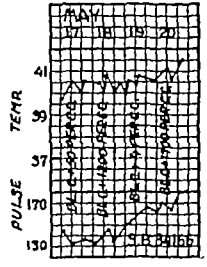


Chart 3—Streptococcus haemolyticus septicemia arising from acute pharyngitis. Note the drop in the colony count to 4 per cubic centimeter on May 19 with the count 1200 on the preceding day and 1700 on the succeeding day (the day of death). The patient was desperately ill on all three days.

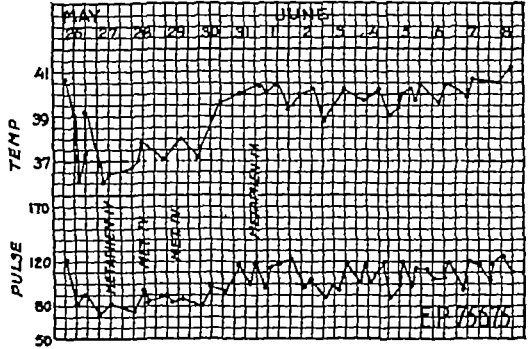


Chart 4—Streptococcus haemolyticus septicemia source undetermined. Remission of symptoms coincident with intravenous administration of metaphen (1:1000). Note, however, that symptoms returned while the chemotherapy was being continued and that the septicemia went on to a fatal termination.

SUBGROUPS

The most important criterion of the effectiveness of a given form of treatment is its gross result, namely, the mortality rate. The mortality rate of the entire series of 311 cases was 74 per cent. However, it is obvious from even a very superficial study of these cases that septicemia is not a unified whole but that certain clinical groups of these cases arising from a common source, with infection by the same organism

1. Neuhof H. Diagnosis and Operative Control of Acute Pyogenic Phlebitis Complicated by General Septic Invasion. Ann Surg 97: 808 (June) 1933.

2. Kolmer J A. Septicemia. Ann Int. Med 8: 612 (Nov) 1934.

must be used as the basis of comparison in discussing the effectiveness of various therapeutic agents

Thus, for example, staphylococic septicemia arising from carbuncle had an extremely serious prognosis with an 86 per cent mortality, while *Streptococcus*

Particularly in the case of immunotransfusion, however, there was a striking clinical improvement coincident with the administration of the immune blood in patients having previously had several simple transfusions (charts 5 and 6)

Another advantage of this method is that the immune bodies are present in blood that would be given the patient anyway for its supportive effect. Many reports of individual cases and of short series of patients with septicemia treated by immunotransfusion have appeared in the literature since Wright's⁴ original application of this term to a method of in vitro vaccination of the blood with nonspecific organisms, which he proposed in 1919. Subsequently the use of specifically immunized donors has been advocated, Vivian⁵ and Unger⁶ being among the earliest in this country to practice this method. My associates and I have not used the non-specific type of immune body response but have felt that the passive transfer of specific protective sub-

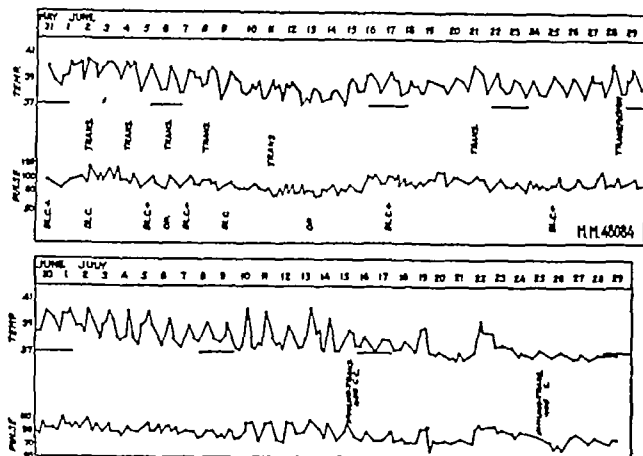


Chart 5—*Streptococcus haemolyticus* septicemia arising from axillary cellulitis. Seven weeks after admission with the clinical course an established and uniform septic one immunotransfusion was followed by a spectacular improvement not only in the vital signs but fully as strikingly in the patient's symptoms and feeling

haemolyticus septicemia of otic origin resulted in more survivals than fatalities. The mortality rate in this group was 49 per cent, though a rate as low as 35 per cent has been reported in the literature. For purposes of comparison, then, in order to evaluate the treatment it is necessary to know the origin of the infection and the type of organism. Tables 1 and 2 give these data for the cases in this series.

IMMUNE TREATMENT

Table 3 shows the agents used in an attempt to influence the infecting organisms with immune or lytic bodies and their results. A total of seventy-one patients

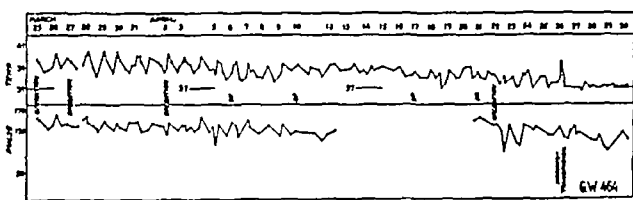


Chart 6—*Streptococcus haemolyticus* septicemia with multiple metastatic foci. Immunotransfusion is followed by a drop in the temperature by crisis to normal. Abscesses that were coming regularly before the immunotransfusion ceased developing and one focus that was already beginning receded without suppuration.

had one or more of these methods applied in their treatment, twenty-two survived and forty-nine died, a mortality rate of 69 per cent. However, even in this relatively small group two procedures bear out somewhat the optimism of their sponsors in the literature and suggest their trial in future cases. The administration of bacteriophage³ was associated with a mortality of 50 per cent in eight cases, most of them of *Staphylococcus aureus*. The use of immunotransfusion was associated with a fatal termination in only one of five instances. With both of these methods the series of cases are much too small to be significant statisti-

cally. Particularly in the case of immunotransfusion, however, there was a striking clinical improvement coincident with the administration of the immune blood in patients having previously had several simple transfusions (charts 5 and 6).

stances should theoretically be of much more value. In our cases the donor was injected daily with increasing amounts of vaccine, made from the organism isolated from the patient's blood stream. The immunotrans-

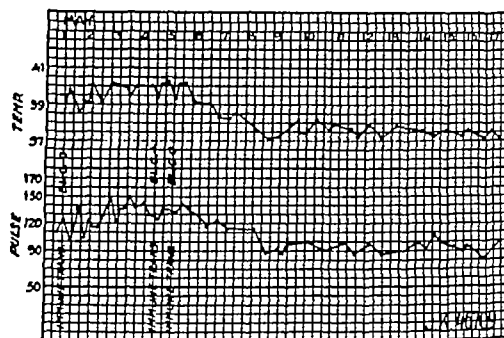


Chart 7—*Streptococic* septicemia following scarlet fever and mastoiditis. Innumerable colonies per cubic centimeter were present on May 4 and the patient was in a desperate condition. Blood from a convalescent scarlet fever patient was given to the patient on that day and the next. This was followed by a striking improvement in the patient's condition, with eventual recovery.

TABLE 1—Causes of Septicemia

| | Total 811 | Died 231 | Well 58-56% |
|---|--------------|-------------|----------------|
| Pneumonia | 45 | 28 | 7 |
| Other lung infections | 3 | 2 | 1 |
| Infections of upper respiratory tract | 3 | 21 | 14 |
| Infections of genito-urinary tract | 37 | 21 | 16 |
| Uterine infections | 22 | 12 | 10 |
| Peritonitis | 4 | 4 | 0 |
| Carbuncle | 22 | 19 | 3 |
| Skin infections, burns gangrene and infected wounds | 13 | 11 | 2 |
| Cellulitis | 18 | 11 | 2 |
| Septic arthritis | 9 | 5 | 4 |
| Osteomyelitis | 12 | 7 | 5 |
| Scarlet fever | 29 | 22 | 7 |
| Measles | 11 | 8 | 3 |
| Erysipelas | 6 | 6 | 1 |
| Chickenpox | 2 | 1 | 0 |
| Heart disease and bacterial endocarditis | 16 | 16 | 0 |
| Aplastic anemia leukemia and agranulocytosis | 10 | 10 | 0 |
| Gastro-intestinal and biliary infection | 6 | 5 | 1 |
| Meningococcus | 4 | 4 | 0 |
| Miscellaneous | 3 | 2 | 1 |
| Sources unknown | 7 | 6 | 1 |

fusion was 400 or 500 cc of blood first given about eight days after immunization of the donor was started. The chief objection to the method is that it requires at

3 MacNeal, W. J. Specific Treatment of Septicemia Particularly with Aid of Bacteriophages. *Am J M Sc.* 187:623 (May) 1934.
MacNeal, W. J., and Friess, Frances C. Bacteriophage as Therapeutic Agent in Staphylococcus Bacteremia. *J A M A* 99:1150 (Oct 1) 1932.

4 Wright, A. E. New Prospects in the Field of Therapeutic Immunization, *Lancet* 1:489 (March 29) 1919.
5 Vivian, C. S. Treatment of Streptococcus Septicemia Complicated by Wound Diphtheria. Making Use of Transfusion of Blood Immune to Streptococcus, *Ann Surg* 69:437 (April) 1919.
6 Unger, L. J. Transfusion from Immunized Donors. *Laryngoscope* 33:145 (Feb) 1923.

least ten to fourteen days to develop immune bodies in this manner in the donor. This time factor is a serious limitation, as the issue is often decided in the early days. We have started to immunize donors in a number of instances only to have the patient die before a specific immunotransfusion could be given.

In certain situations, such as in desperate septicemia complicating scarlet fever, we have employed transfusion from a recovered patient in the hope that

TABLE 2—Organisms Causing Septicemia

| | Total | Dead | Well |
|-------------------------------------|-------|------|------|
| <i>Streptococcus haemolyticus</i> | 114 | 72 | 42 |
| <i>Streptococcus nonhemolyticus</i> | 10 | 7 | 3 |
| <i>Staphylococcus aureus</i> | 60 | 49 | 11 |
| <i>Staphylococcus albus</i> | 19 | 14 | 5 |
| <i>Pneumococcus</i> | 54 | 48 | 6 |
| <i>Bacillus coli</i> | 10 | 0 | 10 |
| <i>Bacillus proteus</i> | 6 | 3 | 3 |
| <i>Bacillus influenzae</i> | 2 | 1 | 1 |
| <i>Meningococcus</i> | 4 | 4 | 0 |
| Miscellaneous | 3 | 2 | 1 |

immune bodies in the convalescent serum might be of benefit. Chart 7 shows an apparently striking result with this method. In other cases it failed to save critically ill patients. It is worth a trial, however. Our experience with the commercially prepared antibacterial serums for the pyogenic group has been disappointing. Probably not enough strains of the septicemia-producing organisms are used. Also it should be shown by test that immune bodies are present in the serum for the organism isolated from the patient's blood.

Cadham⁷ has developed a method that combines the giving of specific immune bodies with nonspecific agents, such as the complement found in normal serum. He has available a colony of rabbits immunized against about fifty strains of streptococci and staphylococci isolated from the blood of patients with septicemia. As quickly as the organism can be isolated from the patient's blood in a new case of septicemia a vaccine is made from it, which is then injected intravenously into the rabbits. This is presumed to cause an outpouring into the blood stream of immune bodies previously attached to the cells in the fixed tissue and consequently to give a very high titer in the serum for the specific organism.

TABLE 3—Serum Therapy

| | Total | Dead | Well |
|------------------------------------|-------|------|--------|
| | 71 | 40 | 22-31% |
| <i>Pneumococcus</i> serum | 7 | 0 | 1 |
| Convalescent pneumonia transfusion | 1 | 1 | 0 |
| <i>Diphtheria</i> antitoxin | 2 | 1 | 1 |
| <i>Anti</i> meningococcus serum | 1 | 1 | 0 |
| <i>Anti</i> streptococcus serum | 18 | 13 | 5 |
| <i>Anti</i> staphylococcus serum | 7 | 6 | 1 |
| <i>Anti</i> scarlet fever serum | 8 | 7 | 1 |
| Convalescent scarlet fever blood | 5 | 4 | 1 |
| <i>Erysipelas</i> antitoxin | 7 | 4 | 3 |
| Convalescent erysipelas blood | 1 | 1 | 0 |
| Convalescent chickenpox serum | 1 | 0 | 1 |
| Bacteriophage | 8 | 4 | 4 |
| Immunotransfusion | 5 | 1 | 4 |

used. In order to make these immune bodies effective complement is given the patient in the form of normal human serum. In this way the patient receives specific antibodies within three to five days from the time when septicemia was suspected. Undoubtedly this relatively early administration of a specific immune serum contributes largely to the excellent results reported, a total mortality of 15 per cent in a series of 100 consecutive cases of streptococcal and staphylococcal septicemia.

SUMMARY

The most important principle in the treatment of septicemia is the eradication or exclusion from the circulation of all foci that are reinfecting the blood. Transfusion as a supporting measure is also useful. None of the chemotherapeutic agents in common use have been found of great value. The development of immune serums specific for the patient's organism and available early in the course of the septicemia is the most hopeful line of progress at present. I would suggest that a committee from the American Medical Association and the Canadian Medical Association be appointed to study this complicated problem.

Strong Memorial Hospital

ABSTRACT OF DISCUSSION

DR. GEORGE A. RAMSAY, London, Ont. In the case of chronic staphylococcal osteomyelitis and also of blood stream infection that has become less acute, it is at that point that the value of the toxoid predominates. In the surgical division of Western University and at the Children's Hospital we ran into some difficulties if we used it until we were perfectly certain that we had a reasonably clear blood stream. We have found that the toxoid has been of value in improving the caliber of donors for blood transfusion. That is to say, we agree with Dr. Scott that it is not possible to treat rapidly the blood stream of the ordinary donor to make an "immune" transfusion. We have a number of donors who have had osteomyelitis, been treated by toxoid and returned to the hospital as donors. As yet there is no standard by which to estimate their value.

DEPRESSION AS A PART OF A
LIFE EXPERIENCE

A STUDY OF FORTY CONSECUTIVE CASES

NIELS L. ANTHONISEN, M.D.

WAVERLY, MASS.

The older, rigid formulation of the manic depressive psychosis as being an exclusively constitutionally determined mental disease has, in the course of time, changed into a more plastic one. Room has been given for consideration of the importance of life experiences, and the psychotic episodes, the milder types at least, are no longer regarded as accidental occurrences, independent of situational circumstances. It was my endeavor in the present investigation based on hospital material to find out to what extent psychologic conditioning as well as precipitating factors could be traced through the psychoses. Forty consecutive patients with depressions, thirteen men and twenty-seven women, all under the age of 50, were studied. Several of the patients had had attacks before, and an attempt was made to bring those attacks also inside the sphere of the investigation. Some had had manic attacks and some had them afterward. Those episodes were not included, though at times they shed interesting light on the depressive episode.

The study fell naturally into three parts: (1) a study of the prepsychotic personality, (2) the etiology of the depression in terms of more topical predisposing factors and (3) the course of the illness.

The information given concerning the prepsychotic personality of the patients indicated that thirty-one had had difficulties in socialization due to sensitiveness, shyness and awkwardness, at times coupled with

⁷ Cadham F. T. Some Immunological Problems in Septicemia. *Canad. M. A. J.* 24: 219 (Feb.) 1931. *Septicemia—Method of Treatment*. Report of 100 Cases. *Am. J. M. Sc.* 188: 542 (Oct.) 1934.

From the McLean Hospital.
Read before the Section on Nervous and Mental Diseases at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.

irritability, intolerance and aggressiveness. The latter characteristics might be so outstanding that the fundamental sensitiveness was hardly noticeable. As a consequence of the mentioned reaction tendencies, relatively few had close friends and some had practically no associates outside the narrow family circle. Some were said to be good mixers but were nevertheless inclined to feel lonely and unpopular and were very much dependent on favorable circumstances.

One patient was sociable but overanxious to please all people, and two other patients were regarded as sociable but extremely egotistical and indulged.

The difficulties of these thirty-four patients were reflected in their activities. More than a third were tied to the narrowest environment, though some of them made more or less erratic attempts at gaining a foothold in work or a hobby. The rest of the patients made sincere attempts at creating and maintaining a position for themselves. A number of these gave evidence of being under considerable strain, and changes of circumstances brought out promptly their feeling of frustration and their lack of self reliance. Only relatively few seemed to have entered into and maintained themselves in their occupation with a show of ease and security. In one case a never satiated appetite for broader fields finally overwhelmed the patient.

It is traditional to consider "spontaneous" mood swings as being characteristic of the manic depressive psychosis. In only one case was it stated by one of the relatives that the patient had been happy or depressed "without reason." The subsequent history from the patient himself tended to disqualify the statement, as he felt that his mood swings had been dependent on events of encouraging or discouraging nature. Four patients showed a tendency to protracted depressed moods. One who was said to have "a tendency to gloominess" showed a normally hopeful and happy mood when he was relieved of certain responsibilities during his hospital stay. Another was said to be depressed "normally" yet "was happy when some one made love to her." About the third patient, it was said that "he was seldom cheerful and became depressed when the crops failed." The fourth patient, of whom it was said that she had shown trends of gloominess in childhood, gave objective and subjective evidence that success was accompanied by happy feelings, though she easily became depressed again.

It seems more correct to regard such types of patients as extraordinarily susceptible to depressive reactions, so much so that life only occasionally holds encouraging and hopeful experiences, rather than to consider them constitutionally and unconditionally depressed.

In nineteen more cases, information was given pointing to depressive tendencies ranging from "inclination to be dissatisfied" or to "feel inferior" or to "worry" to more definite alternations of happiness and depression according to changing circumstances. In some cases these alternations were of a rather violent nature.

The depressive tendencies were all found in patients who had shown difficulties in socialization.

The question arises then: What connection is there between the frequent occurrence of anxiety (sensitiveness) and the depressive tendencies? In the milder cases ("feeling of inferiority, tendency to worry") the feeling tone is so pervaded by the fear quality that the depressive quality escapes immediate recognition. It seems, however, that the depressive mood has its inception with the anxiety and tends to protract and empha-

size it. In the group in which the mood of depression is more evident and sets in more acutely, the sentiment has changed into one of more finality, namely, toward the fulfillment of what was feared.

It may be said that, of the forty cases, thirty-four had shown more or less definite evidence of poor social adjustment, though only a relatively small number could be regarded as borderline.

The information received concerning the six remaining patients indicated that in their setting of life they had enjoyed a satisfactory adjustment. It was only their psychoses that brought out their narrow margin of adjustment and dependence on certain conditions. With these changed, a few of them had difficulties in regaining even a tolerable adjustment.

While I have thus given a sketch of certain handicapping traits of the patients, little knowledge was gained as to the influences that had helped to bring out these traits. The description of the parents in a crude way gives a suggestion of some influences of importance. Ten of the patients had one parent who had shown definite depressive features. In seventeen more cases, one or both parents were characterized as nervous, high strung, intolerant, domineering or easily hurt. In the rest of the cases the characterizations of the parents frequently indicated that there may have been more hardships to put up with than were stated to the examiner.

In studying the more immediate factors with a bearing on the depression partly preparing the ground for it, partly precipitating it, some might be listed as accidental. Far more frequently could it be seen, however, that the traumatic circumstances would not have developed if the personality had not invited the development. A woman, aged 32, may serve as a simple illustration. She had always been concerned about her "background." Her parents were immigrant peasants who had the characteristics found in this group of people. She married into a snobbish and arrogant, but poor family, a relative of which was titled. One sees here the conditioning setting in which the depression developed.

In only two cases out of forty was it not possible to point to significant etiologic factors of the depression, besides the personality factor. One of these patients simply refused to give information. The other patient was vague and hesitant and in both cases objective information was lacking. In some cases the attack could be considered the climax of a long standing maladjustment in which the precipitating factor represented the drop that made the water overflow and necessitated the hospitalization. In others in which the patients had seemed relatively well adjusted, the cause seemed obscure and unreal. Thus, in one case the depression occurred after the death of an aunt to whom the patient, a woman, aged 39, had not been particularly close. Further study showed, however, that the patient had not carried out her deceased mother's will with regard to this aunt, which brought to her consciousness other "sinful" and "immoral" episodes in her earlier life. In the greater number of cases the situational factors were of more dramatic nature, such as impending financial disaster, frustrated love affairs, fear of being dishonored, pregnancy and childbirth. It is of special interest that in none of the seven cases of "puerperal psychoses" could the depression be primarily attributed to the physiologic changes but rather to psychologic circumstances such as increased strain in the family or guilt feeling for harboring hatred toward the infant.

In a considerable number of cases, excluding the puerperal cases, physical illness entered in as a complication. In some the etiologic connection with the depression was entirely remote, in others it seems that the illness aggravated the strain under which the patients were laboring. In two cases the physical illness seems to have been only of symbolic significance.

The "motifs" of the precipitating factors represented in the main complaints could be followed more or less clearly through the illness in twenty-seven of the forty cases. In the remaining thirteen cases the meaning of the complaints was less understandable, apparently arising largely out of the poor rapport that had been established with the patients. From a symptomatologic point of view and with regard to the outcome, they do not differ from the group of twenty-seven. It is only the latter group that will be considered in the following.

The complaint would give itself direct expression, or indirect, by substitution. For instance, one patient presented hypochondriacal complaints, which disappeared rapidly when her difficult home situation was discussed. In three cases the immediate complaint presented might be metaphorical or symbolic and delusional. In the course of the interview the distortions might be dropped and resumed again after the interview until a definite improvement had set in.

Of particular interest was the study of the frequently occurring self depreciation and self condemnation. In all the cases in which they occurred (twenty-four) it could be ascertained that they referred to realities of the patients' lives and represented a formulation of the patients' official and at times sincere evaluation of the inefficiencies or "depravities" that had been in part conducive to their miserable situations. In a few cases the self accusations could just as well be applied to another person of importance to the patient. And the self accusations and self condemnations were regularly balanced by condemnations of others. This might come out directly, but at times in such a subtle form that the patient was hardly aware of it himself, or it would be revealed only after deeper rapport had been established with the physician. In certain cases it was just this hatred against which the self condemnation was directed.

The complaints were accordingly an estimation of the situation in which the patients found themselves with regard to their relations to other people, their capacities and worthiness, their failures and outlook. The variety of complaints thus not only gave expression to depressed moods but also indicated the resourcefulness of the various patients. The latter was given its test in the way the patients dealt with their difficulties.

In a few cases their problems were actually solved with the hospitalization, as burdensome responsibility was thereby removed automatically. These patients, finding themselves in a more favorable position, recovered almost immediately. Some patients recovered relatively promptly from the depression and made a more or less satisfactory adjustment to the hospital, though they were unable to cope with the outside situation and therefore continued their hospital stay unless a radical change took place in the environment. Others remained in a gloomy or agitated mood for months or even years until the outside circumstances changed or until the patients, supported by the physician, were able to change their attitudes. A few patients of this group were unable to reconcile themselves to their fate,

though a measure of relief was gained in the course of time. One patient took her problems entirely in her own hands and found a solution, though of a rather illusory nature, as later events showed. Another gave an interesting demonstration of different healing processes at work. After having gone through a severe orgy of self punishment, during the time of which she also discussed her problems at some length with her physician, she suddenly "repressed" all that had taken place and accepted the assistance of a social worker.

In all the cases, twenty-three in number, in which considerable improvement, a comfortable hospital adjustment or recovery occurred, important changes took place in the relationship between the patient and the environment. In none of these cases was there a "spontaneous" improvement, if by "spontaneity" one means an improvement without fulfillment of a certain need of the patient, that is, without a new outlook. A new outlook was brought about either by change in the situation or by an alteration of the patient's own attitude, compared with his prepsychotic attitude. The former was demonstrated time and again by the improvement following such changes as reconciliation between husband and wife or reformulation of future plans, partly instigated by the physician, or a financial rescue by a friend. The latter was shown in cases in which the patient recovered after having gained insight into and reconciled himself to his primitive drives.

In the four unimproved cases and in part in those who made a hospital adjustment there was an incapacity to utilize the opportunities of environmental changes or to change their attitudes to the unchanged environment. This was not due to the depressed mood as such but to the personality makeup of the individual.

There was thus a correspondence between prepsychotic personality, the nature of the precipitating factors of the psychosis and the outcome. Character traits, such as flexibility or rigidity, docility or demanding aggressiveness, insecurity or relative self-sufficiency, were reflected in the psychosis and determined, in conjunction with the therapeutic resources, the duration and final outcome.

CONCLUSION

It can thus be said that the study gave no evidence on the basis of which one could differentiate between depressions that occurred on a physiologic basis and depressions that occurred on a psychologic basis. It could be demonstrated in practically all of them that they occurred as response to psychologic events. In the twenty-seven of the forty patients who lent themselves to a relatively conclusive study, the course and the outcome of the depression were primarily dependent on the resourcefulness of the personality and the therapeutic possibilities. The depression might consequently be considered an attitude to a certain set of events and circumstances rather than an expression of a physiologic occurrence. There was no symptomatologic characteristic of the remaining thirteen cases which would indicate that they were of a principally different nature.

ABSTRACT OF DISCUSSION

DR. EARL D. BOND, Philadelphia. Dr. Anthonisen described recovery following improvement in outside circumstances in many of his cases. Dr. Hunt describes the same thing in cases midway between manic-depressive and schizophrenic psychoses. Evidence to this effect makes for more systematic and enthusiastic therapeutic attempts. On the other hand, there is much

experience to show that most depressions run their courses as self-limiting diseases, and there is much reason to suspect that it is difficult to get together a series of depressions that everybody would agree were manic-depressive. Having just examined 600 patients, I find examples on both sides of this proposition. Some patients have broken down when everything seemed in their favor, others have recovered when everything seemed against them. I suppose the easiest explanation for some of these apparent inconsistencies is to suppose that there are multiple instead of single causes at work. I will give two illustrations which support Dr Anthonisen's conclusions. One was a woman who had been in a severe depression for eleven years. She recovered promptly after the death of a much older and extremely cantankerous husband. A man, seclusive and conscientious, married at 19 a wife who was pleasant and uncritical and kept him in a good social setting. Even though he had a depression at 39 he was able to keep on at work, and he recovered with his wife's help. At 48 the wife died, and at 49 he married again. The second wife expected her husband to dance attendance on her. She had an operation which brought her to the hospital. She leaned on him with considerable criticism. The patient broke down again into a depression, and this time he has remained in it for five years without any sign of recovery.

DR. LLOYD H. ZIFGLER, Albany, N. Y. There are numerous disharmonies in nature that render an organism more or less functionless in the full biologic sense. The mule is sterile and not self-perpetuating, a victim of a biologic pitfall. The sensitive person, unable to socialize, fosters the creation for himself of restricted environment that engenders a lack of flexibility. Sooner or later this combination must confront a new situation, the modification of which is dependent not so much on how the environment can be changed as on a deep and often unpleasant experience in the individual. The modifiability of such disharmonies is itself the very basis of prognosis and treatment. Dr Anthonisen's contention that environmental factors have more etiologic significance in the production of depressions than older formulations postulated is substantiated in the history of a married woman, aged 49, one of identical or monozygotic twins, who at 39 had a severe depression, with exhaustion lasting a year, after the death of her only child, a daughter of 19. On recovery she was her normal, cheerful, energetic self. At 48 she suffered a similar attack after a shock less tragic than that of the death of her daughter. On the other hand, her twin sister, with whom she often visits, has remained well despite the loss of her only child a week after delivery. A schizophrenic brother has been in a state hospital many years. A younger sister is entirely well. Such histories emphasize particularly the need for a broad view of human life as a growth, not entirely predetermined by heritage but affording elements that may be disorganized or disharmonized by some of the less friendly circumstances of time and place. Dr Anthonisen's paper deserves careful study by those who wish to immerse themselves in some of the life problems of patients suffering from depression.

DR. NIELS L. ANTHONISEN, Belmont, Mass. I have for years been much interested in the problem of manic-depressive psychosis as a spontaneous and a self-limiting disease. The more experience I have gained the more I have become convinced of the significance of situational circumstances in the chain of the causal events, but, of course, I cannot say that all cases of manic-depressive psychosis are precipitated by psychologic factors. Many times patients are admitted to the hospital about whom the relatives have no information to offer, and it also happens frequently that one may study a case for a considerable length of time before one is able to find out what the psychologic factors are. Little by little the facts may come out, and as a result the patient may get an entirely new attitude toward life. That kind of case does not disprove what Dr Bond said, but it does indicate at least that one should not be satisfied with negative information from the side of the relatives or even with the information that the patients might be able to give on one's immediate inquiry, but that a very thorough study is necessary before one is justified in drawing conclusions.

CONGENITAL ATROPHY OF THE SKIN, WITH RETICULAR PIGMENTATION

REPORT OF TWO CASES

M. F. ENGMAN JR., MD
ST. LOUIS

In 1926 M. F. Engman Sr.¹ presented before the Chicago Dermatological Society a case of reticular pigmentation of the skin with atrophy. In his description of the case he remarked that the brother of this patient also suffered, but to a lesser degree, from the same condition. These patients have continued under our observation and have submitted to certain studies, which are reported here.

REPORT OF CASES

CASE 1—History.—C. L. is a white man now 32 years of age. His parents are fair-skinned Americans of Anglo-Saxon descent. As a baby the patient was frail and weak. At 3 months he had attained his birth weight. As a child he was delicate, of sallow complexion, and a poor eater. Otherwise, however, he was normal.

At the age of 8 years there appeared on the tongue and buccal mucosa small ulcerations and leukoplakia like lesions which would not heal. They seemed to have appeared as a result of sharp teeth cutting the tongue and cheek. Some of the ulcers were five years in healing.

When the patient was 12 years old the family first noticed that his skin was darkening especially over the face, neck, forearms and legs. The darkening process became general and the color gradually deeper up to 18 years of age, at which time it had reached about its present appearance.

The nails of the fingers and toes also began to show changes at about the same time the dark color began to appear. The nails of the fingers became rough and dry. Large pieces would break off. At the same time there was inflammation or infection under the toe nails from time to time, and the same dystrophic changes occurred. In the course of the next few years he lost all his nails permanently.

There is no history of any similar condition in any other member of his family except in his younger brother (case 2).

Dr Engman Sr. first saw this patient in 1913, when the boy was 10 years old. He did not see him again until he was 22, at which time his present condition had fully developed. The patient entered Barnes Hospital, where he was carefully studied. Every phase of his general health was investigated, but nothing especially abnormal was found other than very marked dental caries. Melanin was not found spectroscopically in either his blood serum or his urine.

Examination.—The appearance of the patient at present is striking (fig. 1). In general there seems to be nothing abnormal about him except what is referable to the skin and its appendages. The man is of medium height, slender but not emaciated. His hair is thin and lusterless. The scalp is dry and slightly coated with a branny scale. His face is somewhat sharp and "pinched" such as one sees in certain forms of scleroderma. There are no eyelashes. The eyelids are slightly everted giving an inflamed appearance to the eyes, which otherwise seem to be normal. The lips are dry and scaly.

The mouth itself shows much change. The mucous membrane is slightly bluish from an increase in pigmentation. There are areas of leukoplakia like lesions on the buccal mucous membrane, the gums and the tongue. Small whitish ulcerated areas appear from time to time and disappear slowly. He has lost all his teeth.

The skin of the face and neck is pigmented in the same manner as the rest of his body, but, being exposed parts, light and weather have produced some difference in appearance. Here the reticular formation is hardly apparent. The skin is dry, slightly scaly, very dark and rather reddish. The forearms and backs of the hands have the same appearance.

Read before the Section on Dermatology and Syphilology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.
1. Engman, M. F. A Unique Case of Reticular Pigmentation of the Skin with Atrophy. Arch. Dermat. & Syph. 13: 685 (May) 1926.

The nails have disappeared from the fingers and toes. Except for the skin changes the extremities are normal.

Over the entire body, especially over the covered portions, there is a lacework distribution of pigment, forming millimeter octagons of white skin surrounded by narrow bands of gum metal blue-black. Scattered over the entire body are larger white areas a centimeter or so in diameter that seem as if a number of these tiny white octagons have coalesced. These white spots have been gradually increasing in number and size as the years go by (fig 2).

Dr. John R. Calk examined the urethra and bladder cystoscopically in November 1933. He reported that the mucous membrane of the urinary tract was entirely normal except that at the mucocutaneous junction of the meatus there was an erosion similar to the lesions in the mouth.

Mentally this patient is alert and above the average in intelligence.

Mentally this patient is alert and above the average in intelligence.

Microscopic Study—A small area of skin for biopsy was taken from the side of the back. Several of the small white octagons surrounded by the lacework bands of pigment were included. The biopsy was performed by Dr. Louis H. Jorstad, who remarked on the toughness of the skin and the difficulty of cutting through it. Part of the biopsy was immediately prepared for the dopa reaction part for special staining and part for serial sections stained with hematoxylin and eosin.

Routine Sections The epithelium (fig 3) in general was quite thinned and flat under low power. There was no papillary configuration. Under high power the epithelium was from three to five cells in thickness and there seemed to be just a suggestion of rete pegs here and there. The

cornified layer was relatively increased in thickness. Otherwise the epithelium showed nothing remarkable. The cutis was noteworthy in that there was a marked increase in the collagen. The papillae were obliterated and there was a general hypertrophy and hyperplasia of the fibrous elements.

The sweat glands seemed to be slightly atrophic. No sebaceous glands were seen in any of the sections studied. No edema or inflammatory infiltration was observed. The elastic tissue was decreased in amount and considerably broken up and shredded.

Pigment was present in the basal layer of the epithelium but not to any marked degree in the hematoxylin eosin stained sections. In the upper cutis just below the epithelium there were very large clumps of pigment with smaller deposits of pigment intervening. In serial sections these clumps continued through many sections and appeared to be the bands seen clinically.

Serial sections showed no apparent relation of these bands with any normal skin structures. The follicles were sometimes included in the pigment clumps and sometimes not. This pigment was shown to be non-iron bearing by the potassium ferrocyanide reaction. We believe it to be melanin. In these hematoxylin eosin stained serial sections the pigment appeared as large, well defined groups of coarse brown granules, apparently contained within mature fibrous cells.

Dopa Reaction Frozen sections were prepared according to Blackberg's² technique for the dopa reaction except that after

the completion of the reaction the sections were passed rapidly through 95 per cent alcohol and absolute alcohol, cleared in xylene and mounted in gum dammar for permanent sections (figs 4 and 5).

There was a marked increase in widely branching dendritic cells all through the basal layer. This was especially true in areas in which the rete was thicker. Intervening areas of this epithelium showed some dendritic cells, but they were not as numerous. There seemed to be no relation between the clumps of dermal pigment and the areas of more numerous dopa positive dendritic cells. In fact, the dermal pigment more often appeared when there were fewer dendritic cells.

Silver nitrate sections showed fine granular pigment present in the basal layer to a very marked degree. The phenomenon of capping in which the pigment granules are collected in a semicircle distal to the nucleus, was the usual finding. There were large clumps of subepithelial pigment, which usually did not underlie the most heavily pigmented basal cells.

Neither the dopa nor the silver nitrate sections seemed to throw any light on the anatomy of the clinical lacework pattern. Well marked bands with intervening unpigmented areas were not strikingly noticeable enough to imply that the bands observed clinically were in the basal layer.

CASE 2—J. L., a white man aged 26, is the brother of C. L. (case 1). This patient was not as cooperative as his brother and for that reason was not as thoroughly studied. The case is reported because the condition is in every way identical to that in case 1 except to a lesser degree.

At the age of about 7 years it was noticed that his finger nails and toe nails began to undergo the same sort of atrophic process that his brother's had done at about the same age. Shortly before this as in his brother's case leukoplakia-like lesions and small ulcerations developed on the tongue and buccal mucous membrane and were slow in healing.



Fig 1 (case 1)—Distribution of lesions

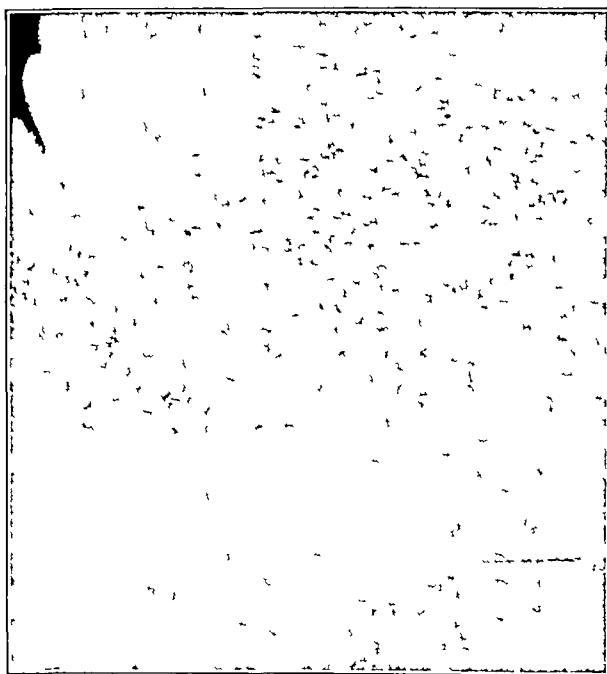


Fig 2 (case 1)—Close-up showing pigment lacework

The darkening of the skin began slowly and indefinitely sometime during early puberty and gradually deepened over a period of years. It has never become blue-black like his brother's nor has it become so generalized. Otherwise it is the same. There is the same reticular, lacework pattern of pigment bands giving a dark fawn color to the skin. The color is most marked around the neck from the clavicle up over the lower part of the face. There are large colorless areas as in the brother. The forearms, cubital spaces, lower part of the legs, scrotum and penis are pigmented to a mild degree.

² Blackberg, S. A. A Simple Technique for the Dioxypyrenylalanine Reaction. Arch. Path. 1:4 121-123 (July) 1932.

The nails have gone. The skin over the knees and elbows is somewhat dry, scaly and atrophic. The hair is fairly normal. The teeth are carious.

When the patient was 16 years old he entered Barnes Hospital for detailed study, in the service of Dr. M. F. Engman Sr. No abnormalities were found other than those already mentioned. Spectroscopic examination showed no melanin in the blood serum or in the urine.

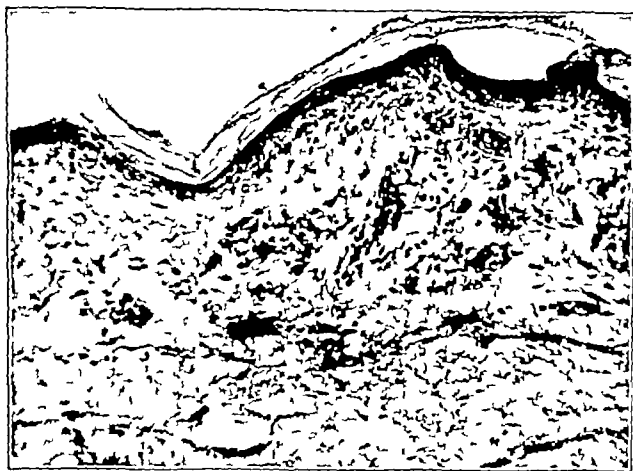


Fig. 3 (case 1)—Routine hematoxylin-eosin stained section of pigment area under low power.

At the age of 21 the patient acquired gonorrhea. A chronic epididymitis developed, which required incision on two occasions.

It was noted at this time that the skin over the body seemed dry and slightly atrophic in appearance.

Two years later the patient was readmitted to Barnes Hospital for a cystitis which was believed to be tuberculous.

No biopsy of this patient's skin could be obtained so it can only be assumed that the pathologic picture would be similar to that of his brother's, as are his clinical picture and his history, except that in this case the atrophic and pigmentary process did not progress as far.

COMMENT

Cole, Rauschkolb and Toomey³ in 1926 reported a case of congenital dyskeratosis with dystrophy of the nails and leukoplakia of the mouth. Their patient showed some mild pigmentary change mainly about the neck, where there was a peculiar pinhead sized papular eruption. Cole and his collaborators went carefully



Fig. 4 (case 1)—Dopa section under low power.

into the literature of all conditions reported resembling their case in any way and fully discussed the possibilities of diagnosis. It was their opinion that the patient presented by Engman Sr. at the Chicago Dermatological Society (case 1) was similar to theirs. This is apparently true. However, there are as many

differences as there are similarities. Our cases are similar to theirs in that all three present atrophy of epithelial structures—mouth and nails. Atrophic and pigmentary changes in the skin were generalized in one of our cases, less so in our second case, and quite localized in Cole, Rauschkolb and Toomey's case. The pathologic pictures were similar. Clinically the cases seem to be different in the pigment distribution. We were greatly impressed with the netlike character of the pattern in our patient. It is so uniform and so pronounced that we are inclined to consider it as fundamental. Furthermore, the atrophy in case 1 is so generalized as to include all external ectodermal structures except the eyes themselves. There is so little known about such a condition that one cannot afford to be very dogmatic about similarities and differences.

There are a good many different types of atrophic conditions of the skin and of pigmentary changes, some of which are congenital, described in the textbooks and reported in the literature. Cole and his collaborators discussed a good many of these conditions, but since none of them are at all like those presented in our cases it does not seem pertinent to discuss them here.

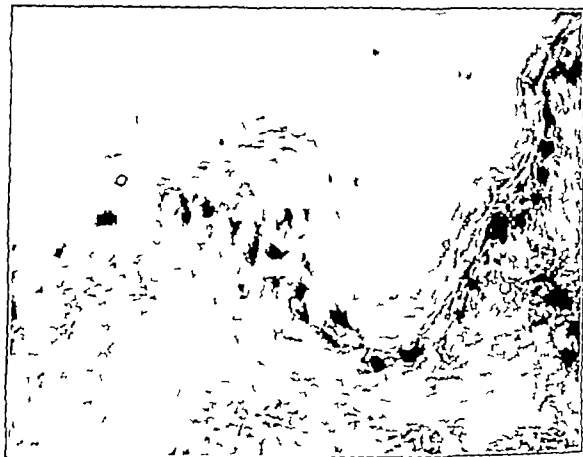


Fig. 5 (case 1)—Dopa section under high power.

A careful search of the literature has revealed the report of only one other case which resembles ours very closely. This one is more like ours than is Cole's case. Wende and Baukus,⁴ in 1919, reported the case of a girl, aged 10 years, who began to become pigmented at 1 year of age. The entire skin became dark, varying in color from bronze to Negro black. There were innumerable white areas varying in size from a millet seed to a lentil. On the anterior aspect of the thighs, groin and lower part of the abdomen there were white macules, some of which were made up of single minute macules while others, the authors state, were the result of the coalescence of several macules. In excising a small piece of skin for biopsy it was noted that in entering the corium there was a remarkable resistance. This was true also in our case. The histopathologic picture in this case was quite similar to ours, except that epithelial atrophy was not so marked. Wende and Baukus further described in the same article the younger brother of the patient, who suffered from a similar pigmentary disturbance, but to a much less degree. In both of these cases, however, the intensity of pigmentation responded very markedly and in

³ Cole H. N., Rauschkolb J. E., and Toomey, John. Dyskeratosis Congenita with Pigmentation, Dystrophia Unguibus and Leukokeratosis Oris. Arch. Dermat. & Syph. 21: 71-95 (Jan.) 1930.

⁴ Wende G. W. and Baukus H. H. A Hitherto Undescribed Generalized Pigmentation of the Skin Appearing in Infancy in Brother and Sister. J. Cutan. Dis. 37: 685-701 (Oct.) 1919.

reverse fashion, as it were, to light (sunlight and artificial light) The more intense the light and the longer the exposure, the less the pigmentation Such a phenomenon was not present at all in our cases Careful light tests, even with ultraviolet, were made in case 1 Furthermore, in the cases of Wendt and Baukus, there were no clinical atrophic changes in the nails, teeth or mouth

Thus, I may say of our cases that they belong to a group to which may be added Cole's case and the cases of Wendt and Baukus The group has in common congenital pigmentary changes which may be due to some fundamental ectodermal defect, the etiology and the mechanism of which is not understood Atrophic tendencies may predominate the picture, as in Cole, Rauschkolb and Toomey's case Pigmentary disturbance may be present, as in the case of Wendt and Baukus, or both may be present to a greater or less degree, as in our cases

The clinical and histopathologic studies of these cases naturally suggest as a descriptive name for this group congenital atrophy of the skin with reticular pigmentation

Beaumont Medical Building

ABSTRACT OF DISCUSSION

DR H A DIXON, Toronto I think that in the two brothers the condition comes within the group of nevi and possibly within the ichthyosis group In poikiloderma atrophicum vasculare telangiectasis is found, later capillary hemorrhage and leukoplakia are common, and not uncommonly rather generalized pruritus In the early stages there may be edema or eczema of the eyelids In the melanoderma of Civatte or of Riehl there is pigmentation on the exposed parts and probably on the exposed parts only The pigmentation is in the form of a reticulum surrounding rather clear areas the clear areas correspond to the follicular openings The changes of the mucous membrane in the melanoderma of Civatte are rather uncommon, and if telangiectasis or atrophy is present it is slight I think that the patient described by Drs Cole, Rauschkolb and Toomey is similar to Dr Engman's patient and, as they have pointed out, there is a direct relation between the nevi and ichthyosis and all the transitions from a simple hyperkeratosis to a rather extensive papillary hypertrophy may be seen What the cause of congenital dyskeratosis may be is a difficult question Bettman reports one instance in which the father and three sons were affected In a report from the Jadassohn clinic, there is the history of intermarriage Many of these cases are familial and it is possible that intermarriage plays an important part

DR S WILLIAM BECKER Chicago It is possible at the present stage of pigment study to determine the process by a combination of the dopa method especially the new paraffin modification that was developed in the laboratory where I work, and Masson's trichrome stains One can state just what is going on in the skin This does not mean that one can make any decision relative to the causative factors The fact that in these sections the dopa reaction was most marked in the areas with the smallest amount of dermal pigmentation may simply mean that this must be visualized as a process and not as a series of static pictures I think that in the regions with the greatest dermal pigmentation the dopa reaction was most positive a few months ago Although no inflammatory reaction was observed in these patients, I cannot help but think that the condition, as far as the pigmentation is concerned, is due to a subthreshold inflammatory reaction that has been rather irregular and has resulted in retiform pigmentation

DR HAROLD N COLE Cleveland After Rauschkolb Toomey and I showed our case at the October 1925 meeting of the Cleveland Dermatological Society Dr Martin F Engman Sr presented his case at a meeting of the Chicago Dermatological Society Drs Mitchell Oliver and Senear saw our patient

and noticed the close resemblance to the patient of Dr Engman Dr Engman's case would rather make one believe that this is a familial disease, moreover, there have been cases reported in the German literature that would lead to this surmise Recently Kumer and Loos reported twenty-three cases of this disease in a family of five generations Some of the cases showed thickening of the fingernails and toenails, symmetrical island form types of thickening over the soles of the feet, follicular keratoses on other parts of the body and leukokeratoses in the mouth, with formation of white spots on the back of the tongue and inside the corners of the mouth, and even hoarseness due to involvement of the larynx The disease is a dominant process The proportion of normal to sick patients is 52 to 23, and of males to females 13 to 10 It seems that this disease is not uncommon in Austria, and it is quite possible that, like other conditions, once it is called to our attention we shall find that it is somewhat more frequently found in our country It seems to be distinguished by certain characteristics the cutaneous changes consisting of this peculiar retiform pigmentation a dyskeratosis, and eventually a certain amount of atrophy On the mucous membrane there are changes of leukokeratosis, or leukoplakia, and there may be, at times, open lesions that would possibly throw a person off and make him think of moist papules if he were not practiced in dermatology The nails are much thickened and often assume a more or less conelike shape, and in certain of the cases there is a dystrophy of the nails with even complete absence of certain of the nails Likewise, the hair and the cornea may be affected It apparently comes under the heading of ectodermal defects It is undoubtedly a familial disease, and I believe that it is characteristic enough to be looked on as a distinct entity and since Riehl has apparently described this condition before the other designations were given it, it looks to me as though dermatologists should accept the designation of "pachyonychia congenita, typhus Riehl"

DR FREDERICK D WEIDMAN, Philadelphia Our concept of the melanins is changing every day Many years ago, when I was teaching general pathology, one of the things emphasized about melanin was its insolubility I think that there is today some chance for question on that point A number of years ago I reported a case (necropsy) of transverse hyperpigmented lines of the skin of a new-born baby Now, the application that this experience has to the case here reported is what I take to be on the part of the reporter some discrepancy between the pigmentation which he saw clinically and that which he studied tinctorially and could not quite reconcile with what he saw clinically, that is a distribution of pigment in the epidermis that he could not quite understand In the ordinary paraffin sections from my necropsy case I did not find any excess pigment so I turned to frozen sections and found that it was possible to demonstrate a large amount of pigment in the transverse lines, compared to that present in the normal skin of the baby I suggest that, whenever these discrepancies in pigmentation between what one sees clinically and what is found in histologic sections, one should check up by employing frozen sections as well as paraffin sections In that way one avoids the possibility of dissolving out some of the various members of this heterogeneous group of the melanins

DR CHARLES F PABST Brooklyn Pigmentation is playing an important role in the causes of dermatoses In a visit to the Bahamas General Hospital at Nassau I talked with Dr Cruikshank and I was surprised to learn that in a population of 65,000 they had only seven deaths from cancer in the entire year, and pigmentation seemed to be an important factor in this low cancer death rate Dr Engman has mentioned a disease that is undoubtedly familial Then the question arises Is it not racial? If it is racial what is the reason that certain cells cannot manufacture melanin? No matter how one tries, one cannot make some skin cells manufacture melanin I am conducting a test with guinea-pigs to represent the different races and families albinos, blonds and brunettes Up to the present time the albinos and the so-called blond races represented by these guinea-pigs have been exposed eight hours a day to the intense natural rays of the sun So far there have been several deaths among the albino and blond guinea-pigs that have little or no pigmentation The necropsy showed in all these cases a simple acute nephritis The black pigmented

guinea-pig representing the Negro or the deeply pigmented brunette is living on, although exposed eight hours a day. To augment this effect and to find out whether the pigment was a protection to the organism or not, I rubbed on tar preparations, after shaving the skin of the abdomen, the back and the ears of the black guinea-pig, and, in spite of the application of tar which usually is followed by cancer this guinea-pig is still living, has no cancer, and shows no ill effects. I should like to ask Dr. Engman whether in his extensive study of pigmentation he has decided that there is any one factor in the cell itself that is responsible for the inability of the cell to manufacture melanin.

DR. M. F. ENGMAN JR., St. Louis. These cases were a difficult study. In preparing this paper I had invaluable help from the various departments of Washington University Medical School and Barnard Free Skin and Cancer Hospital. The questions that arose in our discussions were largely the questions that have arisen here. We did not pretend to understand why in one area pigment would not be manufactured but would in another area. We felt from the clinical and pathologic picture that, as Dr. Becker suggested, there had been pigment manufactured in areas where now there is atrophy and very few dendritic cells. The lines of reticular pigmentation we could not be certain about but we believed that the pigment was in the upper part of the cutis. The paraffin hematoxylin-cosin stained serial sections were probably twisted and warped sufficiently so that graphs constructed to show the straight lines were useless. I think that was the reason for the discrepancy Dr. Weidman mentioned. It is also quite possible that some of the pigment was dissolved out in fixation. As Dr. Cole mentioned these cases are similar to the ones he reported. We are still unable to classify this group. The cases reported in the German literature show marked inflammatory changes in the skin which were not present in our cases. We had no evidence of inflammation anywhere except in the nails, which are by now all gone, and in the mouth.

NONOPERATIVE TREATMENT OF INADEQUATE PERIPHERAL DISTRIBUTION OF BLOOD

PASSIVE VASCULAR EXERCISES AND LOCAL HYPERTHERMIA

LOUIS G. HERRMANN, M.D.
CINCINNATI

The seriousness of the sequelae which usually follow the sudden abstraction of the required amount of arterial blood from the tissues of an extremity places the majority of such disturbances in the realm of surgical emergencies. In the past, the sudden occlusion of the major artery of an extremity by embolism, thrombosis or trauma frequently necessitated some major surgical intervention at the site of injury to the artery or more often some radical or mutilating surgical operation.

For those patients whose major or secondary arterial pathways were slowly but progressively becoming narrowed, causing a marked deficiency in the peripheral distribution of arterial blood, only the usual palliative measures were employed. There is no doubt that the accepted methods of chemotherapy, physical therapy and surgery have contributed greatly to the comfort of the patients, but the increase in arterial circulation was insufficient in the majority to prevent the appearance of some trophic lesion or influence the severe pain

Clinical experience has shown that there are many major factors which influence the peripheral circulation of arterial blood, especially in the distal parts of an extremity, yet in final analysis the pathologic physiology of the peripheral arterial circulation is relatively the same for many of these factors. In general, the peripheral distribution of arterial blood is influenced by

- A Physical state of the intravascular fluid
 - 1 Quantity
 - 2 Pressure
 - 3 Viscosity
- B Physical state of the peripheral arteries
 - 1 Abnormal spasm
 - 2 Rigidity
 - 3 Compression
 - 4 Obliteration
- C Physical factors in the environment
 - 1 Atmospheric pressure
 - 2 Temperature
 - 3 Radiation (light)

In clinical practice, therefore, my associates and I have considered that all deficiencies of peripheral arterial circulation can be explained on the basis of some combination of the four major disturbances affecting the physiology of peripheral arteries, namely, major arterial spasm, arteriolar spasm, major arterial occlusion or arteriolar occlusion. Differentiation between these types can be made under controlled conditions of temperature and humidity by oscillometric and calorimetric studies before and after complete vasomotor relaxation (fig. 1).

After an accurate diagnosis of the type of arterial disturbance has been made, the problem of proper therapy becomes paramount. It should be apparent from the foregoing list of factors responsible for the deficiency of peripheral circulation that the vast majority of the disturbances do not present vasospasm as a factor of major importance. For this reason operations on the sympathetic nervous system have a relatively limited field of application in this great group of disturbances.

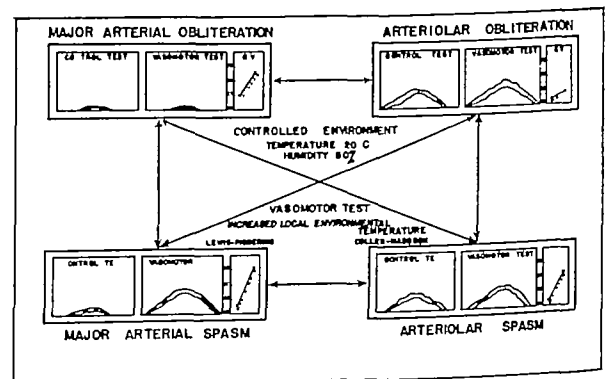


Fig. 1—Changes in oscillometric and calorimetric readings which characterize the four main types of arterial disturbances responsible for deficiencies of the peripheral distribution of arterial blood. Any combination of these types may be seen in clinical practice.

of peripheral circulation of arterial blood. Paralysis of the vasoconstrictor mechanism with the resulting vasodilatation only favors the formation of a collateral circulation in the same manner as does heat or other forms of radiant energy when applied to an affected extremity.

The treatment of deficiencies of peripheral circulation is extremely difficult and may tax to the utmost the

Read before the Section on Surgery General and Abdominal at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.

From the Department of Surgery, College of Medicine of the University of Cincinnati and the Vascular Disease Services of the Cincinnati General Hospital and the Christian R. Holmes Hospital of the University of Cincinnati.

ingenuity of the physician or the surgeon. In general, it may be said that all therapy for these disturbances should be directed toward

- 1 Prevention of infection of the poorly nourished tissues
- 2 Reestablishment of an adequate collateral arterial circulation
- 3 The relief of pain

The local hygiene of the feet and the prevention of mechanical, chemical and thermal trauma to the parts will aid materially in preventing infection from gaining entrance into the tissues of the affected extremity.

It was the search for a more physiologic means of preventing the serious sequelae of obliterative arterial diseases of the extremities that led me to attempt to stimulate the development of an adequate circulation through the collateral arterial pathways by rhythmically decreasing and increasing the air pressure about the

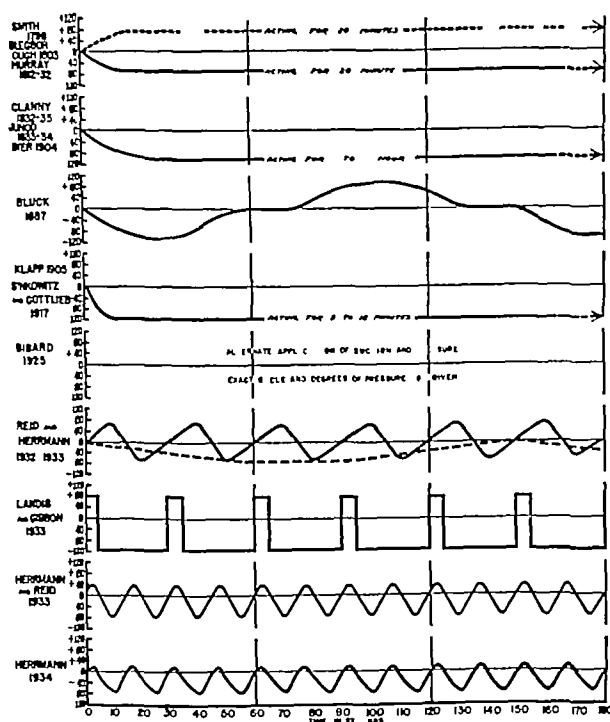


Fig 2—Historical review in chronological order of the more important types of alterations of environmental pressure used to improve the arterial circulation in an extremity.

affected extremity. The physiologic effect of diminished or increased environmental pressure has been known for centuries and was applied clinically as a means of increasing the circulation in an extremity as long ago as 1803 by Ralph Blegborough¹ of England.

In August 1932 my associates and I began to apply the principle, expounded by Bluck² in 1887 and rediscovered by Bibard³ in 1924, that the alternation of negative and positive pressure about an extremity increased markedly the peripheral circulation of arterial blood. We were interested in using this means for the sole purpose of developing an adequate collateral arterial circulation around diseased or injured arteries.

¹ Blegborough, Ralph. Facts and Observations Respecting the Air Pump Vapour Bath. London: Laclington Allen & Co. 1803.

² Bluck, Edgar. Improved Means or Appliances for Promoting or Modifying the Circulation of the Blood in a Living Body. London: Darling and Sons. 1888.

³ Bibard, Rene Auguste. Appareil ventouseur à effets alternants de dépression et de compression. Imprimerie nationale. Paris. April 17, 1925.

Our original treatment unit⁴ was so constructed that the change of pressure was brought about slowly, the complete cycle of the variation, from atmospheric pressure to 70 mm of mercury negative pressure, then to 70 mm of mercury positive pressure and finally back to atmospheric pressure again, took about thirty seconds. Large amounts of positive pressure were occasionally found to cause secondary thrombosis, con-

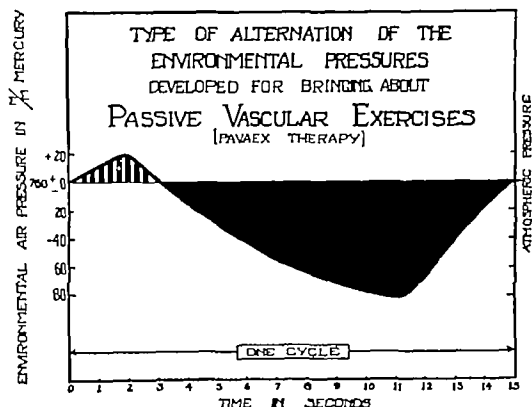


Fig 3—Kymographic record of pressure changes characteristic of passive vascular exercise. Note the gradual rise and fall in cyclic sequence with the pressure predominantly in the phase below the existing atmospheric pressure.

sequently, the alternation of pressure was kept largely in the phase below the existing atmospheric pressure. It is the intermittent negative pressure environment that actually causes the increase in the arterial circulation in an extremity. In order to prevent venous stasis, it is important that the negative pressure be completely neutralized at the end of each cycle. Consequently, after much experimentation we came to the conclusion that from two to four cycles of alternating pressure

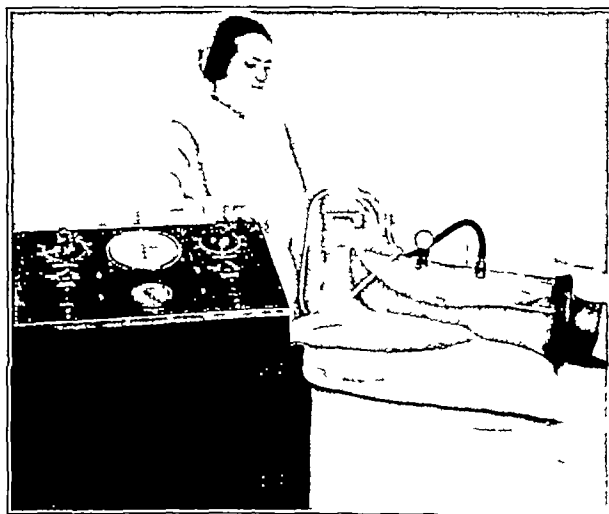


Fig 4—The Experimental Pavaex Treatment Unit. The pyrex treatment boot has been elevated several inches above the level of the patient's heart to facilitate the return of venous blood.

from about 80 mm of mercury negative pressure to 20 mm of mercury positive pressure will bring about the greatest increase in the arterial circulation. There seems to be no limit to the length of time the treatment can be carried out without discomfort or untoward

⁴ Herrmann, L. G. and Reid, M. R. Passive Vascular Exercises. Treatment of Peripheral Obliterative Arterial Diseases by Rhythmic Alternation of Environmental Pressures. Arch Surg 29: 697-704 (Nov.) 1934. The Pavaex (Passive Vascular Exercise) Treatment of Obliterative Arterial Diseases of the Extremities. J Med 14: 524 (Dec.) 1933.

effects The frequency or length of treatment should depend on the urgency of the condition being treated, as, for instance acute arterial occlusion by operation, trauma, thrombosis or embolism must be considered as a surgical emergency and treated intensively until adequate circulation has been permanently reestablished For patients who are hospitalized, the number of hours of actual treatment vary from five to seven each day, while the less urgent and ambulatory patients receive from twelve to twenty hours each week

In February 1933 Landis and Gibbon⁵ suggested still another modification of the original methods of applying suction and pressure to the human extremity to modify the circulation They suggested on purely physiologic grounds the sudden exchange of extreme degrees of suction and pressure as a means of increasing the flow of blood temporarily through rigid or diseased arteries, in accordance with Poiseuille's law They confirmed the practical observations of Bluck² and Bibard³ that the circulation was increased by alternate application of suction and pressure to an extremity Their subject had apparently normal peripheral arteries, consequently their observations in those physiologic experiments cannot be interpreted as applying directly to patients with extensive organic disease of the peripheral arteries

It is quite apparent from figure 2, which shows in chronological order the development of this type of therapy during the past hundred and thirty-seven years, that the idea is a very old one, and still more important is the fact that the beneficial effects of changes in the environmental pressure were recognized and applied clinically many years ago The problem, therefore, resolved itself into one of determining the most efficient cycle for the alternation of these pressures and the optimum amounts of negative and positive pressure which, when applied to patients with diseased arteries of the extremities, would bring about the greatest increase in the circulation with the least damage to the delicate tissues of the affected extremity

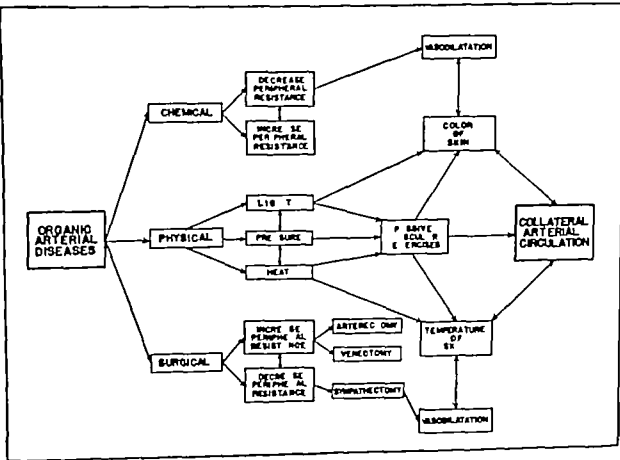


Fig 5—Various methods of overcoming the deficiency of arterial circulation in patients with organic diseases of the arteries of the extremities

In order to conform to the generally accepted principle of dilating or stretching muscular tissue, it appeared from the very beginning quite necessary to cause the pressure to change gradually rather than suddenly Since this physical method of dilating col-

lateral arterial pathways was essentially passive exercise of the vascular system, the expression passive vascular exercises was coined and the contraction Pavaex was used to designate this method of gradual exchange of pressures about an extremity, with the pressure predominantly in the phase below the existing atmospheric pressure (fig 3) The experimental Pavaex Treatment Units (fig 4) were built in order that this method of treatment might be applied to a

| EFFICIENCY OF THE COLLATERAL ARTERIAL CIRCULATION IN EXTREMITIES BEFORE AND AFTER INTENSIVE PASSIVE VASCULAR EXERCISES (PAVAEX THERAPY) | | | | | |
|---|------------------------|--|---|---|--|
| PART OF CIRCULATORY SYSTEM AFFECTED | TYPE | PREDOMINANTLY MAJOR ARTERIES | PREDOMINANTLY SECONDARY ARTERIES | PREDOMINANTLY ARTERIOLES | PREDOMINANTLY CAPILLARIES |
| PATHOLOGIC PROCESS | NORMAL ADULT (CONTROL) | TRAUMATIC OCCLUSION / SCLEROSIS / ACUTE THROMBOSIS | ARTERIOLECTOSIS / OCCLUSIVE SCLEROSIS / SCLEROTIC SCLEROSIS / SCLEROTIC SCLEROSIS | ARTERIOLECTOSIS / SCLEROTIC SCLEROSIS / SCLEROTIC SCLEROSIS / SCLEROTIC SCLEROSIS | STASIS DUE TO INTERDIE COLD (PROLONGED FETTER) |
| BEFORE PASSIVE VASCULAR EXERCISES (PAVAEX THERAPY) | | | | | |
| DIAGRAM OF THE ARTERIAL PATHWAYS AND THEIR ANASTOMOSES | | | | | |
| EFFICIENCY OF COLLATERAL ARTERIAL CIRCULATION | + | 0 | ++ | + | 0 |
| EFFICIENCY OF ENTIRE ARTERIAL CIRCULATION | ++++ | + | ++ | + | + |
| AFTER PASSIVE VASCULAR EXERCISES (PAVAEX THERAPY) | | | | | |
| DIAGRAM OF THE ARTERIAL PATHWAYS AND THEIR ANASTOMOSES | | | | | |
| EFFICIENCY OF COLLATERAL ARTERIAL CIRCULATION | ++ | ++++ | +++ | + | ++ |
| EFFICIENCY OF ENTIRE ARTERIAL CIRCULATION | ++++ | ++++ | +++ | +(+) | ++++ |

Fig 6—Estimate of the efficiency of the arterial circulation by oscillometric and calorimetric studies under controlled conditions of temperature and humidity in patients with normal and with diseased arteries These results are based on data obtained from the application of 50 000 hours of passive vascular exercise treatment

large series of patients, with obliterative arterial diseases of the extremities, who had been carefully studied so that the results of the treatment might be properly evaluated This report is based on clinical data obtained from two and three-fourths years' experience

Arteriographic studies on patients treated by passive vascular exercises show an enormous increase in the size and number of useful collateral arteries in the distal parts of the extremity which have been treated intensively Pulses became palpable in the genicular arteries of those patients whose circulatory insufficiency was due to obliteration of the major arteries of the lower leg Repeated calorimetric and oscillometric studies have demonstrated conclusively that the collateral circulation brought about by this mechanical means remains active and in many patients it continues to become more active for many months after the Pavaex treatments have been discontinued Experience has shown that approximately 100 hours of passive vascular exercises given at the rate of at least five hours each day, is sufficient

5 Landis, E M and Gibbon J H, Jr Effects of Alternate Suction and Pressure on Circulation in the Lower Extremities Proc Soc Exper Biol & Med 30 593 595 (Feb) 1933

to stimulate the development of an adequate collateral arterial circulation in most patients with obliteration of the major or secondary arteries of an extremity when the arteriolar network is relatively normal.

The various methods of overcoming the deficiency of the peripheral circulation of blood in patients with organic arterial diseases of the extremities is shown in figure 5. All the therapy is directed toward the development of an adequate collateral arterial circulation. The physical agents of light, pressure and heat are most important from the therapeutic standpoint. Experimental studies have shown that variations of the environmental pressure produce the greatest effect on the circulation of blood while variations in environmental temperature and radiation influence more definitely the local metabolism of the tissues. The beneficial effects of hyperthermia during the reconstructive phase after injury to tissues, when the arterial blood supply is ample, have been observed repeatedly. It is a common clinical observation that the application of radiant heat to the extremities of patients suffering from extensive organic arterial diseases frequently causes the gangrene to spread more rapidly or to appear in patients who showed no gangrene at the time such therapy was started. Freeman⁶ has recently shown in experimental studies that local application of heat frequently increases the deficiency of circulation by increasing the local metabolism of tissues with the consequent increased demand for arterial blood.

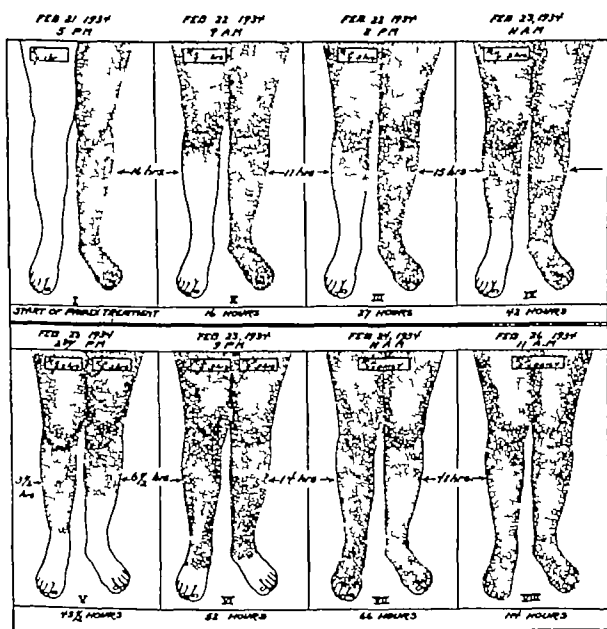


Fig 7—Major arterial embolism. Complete occlusion of the right common iliac artery by a clot from the diseased heart. Excruciating pain of five hours duration relieved in fifteen minutes by passive vascular exercise therapy. Adequate collateral arterial circulation was sustained after seventy-nine hours of treatment to right leg. On the second day after admission to the hospital a second embolus was liberated and lodged at the bifurcation of the popliteal artery. Arterial circulation was restored within a few minutes and remained adequate after thirty-one hours of passive vascular exercise treatment. Schematic drawing shows the level of sustained arterial circulation at various periods during the hospital course. No further treatment has been given and the patient has remained free from circulatory disturbances in the extremities since February 1934.

On the contrary, if the arterial circulation can be increased in proportion to the increase in the demand for blood, the reconstructive processes will take place

6 Freeman N E Effect of Local Temperature on Blood Flow in Extremities read before the American College of Surgeons Boston 1934 Am J Physiol to be published

more quickly. During the past year we have been combining the effects of passive vascular exercises with various degrees of local hyperthermia with encouraging clinical results, especially in patients with moist gangrene of one or more toes or some large indolent ulcer on the extremity. The degree of local hyperthermia that we have employed varies according to the local disturbance, the average being 104 F. Simpson⁷ suggested the combination of these physical agents several years ago and we have followed his suggestion of using preheated dry air to bring about the local hyperthermia.

More than 50,000 hours of passive vascular exercise treatment have been given to several hundred patients, with serious and extensive arterial diseases of the extremities. The degree to which the collateral arterial circulation can be developed by this mechanical means depends largely on the actual number of arteriolar and small arterial pathways that are patent and unaffected by the disease process (fig 6).

Obviously the most striking clinical benefits will be observed in patients with sudden obliteration of the major arterial pathways by trauma or disease, and the least striking effects are to be expected in patients with extensive arteriolar obliteration in the distal parts of the extremities.

The influence of the sympathetic nervous system on the physical state of the collateral arteries must be kept in mind at all times. When the deficiency of peripheral distribution of arterial blood is due to high grade angiospasm, which is of central origin, it would be stupid to expect any permanent benefits from a local application to the extremities of some mechanical means of stimulating circulation. On the other hand, Thomas Lewis and his associates have shown that there are varieties of vasospasm due to local derangement in the periphery. It is now well established by the work of Lewis and Pickering⁸ and of Collier and Maddock⁹ that increased environmental temperature brings about vasomotor relaxation. The use of local hyperthermia in conjunction with passive vascular exercises overcomes the peripheral vasospasm that accompanies the active types of obliterative arterial diseases of the extremities and thus helps to surmount one of the



Fig 8—Reproduction of photograph of extremities shown in figure 7 one year after passive vascular exercise treatments had been given. No pulses were palpable in the femoral popliteal posterior tibial or dorsalis pedis arteries. There were strong pulses in the genicular arteries about both knees and a good pulse in the circumflex iliac artery on the right.

7 Simpson W M Personal communication to the author March 3 1933

8 Lewis Thomas, and Pickering G W Vasodilation in the Limbs in Response to Warming the Body with Evidence for Sympathetic Vasodilator Nerves in Man Heart 16 33 (Oct.) 1931

9 Collier F A and Maddock, W G The Differentiation of Spastic from Organic Peripheral Vascular Occlusion by the Skin Temperature Response to High Environmental Temperature Ann Surg 96 719 732 (Oct.) 1932

important obstacles to the formation of a sustained collateral arterial circulation

Passive vascular exercises have been shown to be an effective means of overcoming the vascular insufficiency in the distal portions of an extremity after acute occlusion of the major arterial pathways has resulted from arterial embolism (fig 7), arterial thrombosis, ligation of major arteries, or surgical incision of aneurysmal

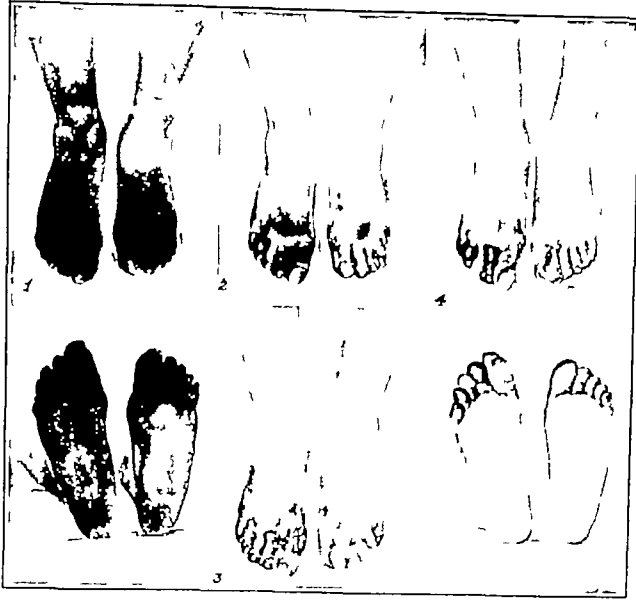


Fig 9—Frozen feet. Exposure of fourteen hours to cold of 14 F. Complete loss of sensation, muscular activity and gross stagnation of circulation. Deep purple discoloration of both feet, lower legs and all the toes. (1) a uniform deep purple discoloration of both feet. (2) the appearance after five hours of passive vascular exercise treatment to each lower extremity. (3) appearance of both feet twelve hours after admission to hospital. (4) both feet after twenty-eight hours of passive vascular exercise treatment.

(syphilitic) sacs with ligation of the incoming and the outgoing artery. Frozen feet (figs 9 and 10) of all degrees have responded promptly and the serious sequelae of extensive thermal trauma have been prevented in all cases treated by this method in our clinics.

Arteriosclerosis obliterans with or without gangrene and with or without the association of diabetes mellitus has proved to be amenable to passive vascular exercises

since the ischemia of the extremity can be quickly overcome and the gangrene made to demarcate. The presence of moist gangrene adds materially to the seriousness of the disturbance and hinders the development of an adequate collateral arterial circulation due to the widespread destruction, by inflammation, of the smaller arterial and arteriolar path-



Fig 10—Actual condition of feet shown in figure 9 three weeks after admission to hospital. Only tips of two toes were lost. The patient has been entirely free from symptoms referable to the feet since November 1933.

ways in the extremity. It is especially in this type of patient that the combination of local hyperthermia and passive vascular exercises finds its greatest use.

In the treatment of gangrene, clinical judgment must be exercised in all cases, and a conservative method of

treatment is never to be recommended when only heroic surgical procedures are indicated. Passive vascular exercise has been suggested primarily as a means of preventing the serious complications of organic arterial diseases and not as a cure for extensive gangrene. In selected cases, especially in the fourth and fifth decades of life, the method offers a real aid to those who prefer to do the more conservative types of amputations through the foot or lower leg (fig 11).

In true thrombo-angitis obliterans there is usually an extensive obliteration of the arteriolar and small arterial beds, consequently the reestablishment of an adequate arterial circulation can be accomplished only with considerable difficulty. I believe this form of therapy offers only temporary relief from the circulatory disturbances characterizing this disease entity.

Visceral pain, which results from the lack of arterial blood to the tissues of an extremity, can be quickly relieved by passive vascular exercises. The excruciating pain associated with acute occlusion of a major artery of the extremity can be quickly and permanently relieved. The intermittent claudication associated with



Fig 11—Arteriosclerosis obliterans with moist gangrene. A white man aged 57 with severe diabetes mellitus had lost the right leg eighteen months before because of gangrene. A condition of left foot at time of admission to hospital, major amputation was refused. B, condition of foot two weeks later after diabetes had been controlled and usual palliative methods employed. C, six weeks after admission to hospital, showing considerable extension of the gangrenous process. D, three weeks after a Lisfranc amputation had been performed. At the time of the amputation not a single bleeding vessel was encountered. After forty-two hours of passive vascular exercise therapy the stump was covered with healthy granulation tissue. This amount of treatment was given over a period of ten days. Small pinch grafts of skin were applied and the surface was almost completely epithelialized when D was taken. The stump has remained healed and has been useful for weight bearing without pain for more than two years.

extensive arteriolar obliteration is usually only moderately improved, while the type associated with major arterial disease has been benefited to a satisfactory degree in the majority of patients. Local hyperthermia enhances greatly the effect of passive vascular exercise in such cases.

Acute or subacute thrombophlebitis must be considered a definite contraindication to passive vascular exercises. Extensive obliteration of the arteriolar bed due either to the late stages of thrombo-angitis obliterans or to extensive arteriolar sclerosis should be considered a contraindication, since little or no lasting benefit has been obtained from this therapy. Varicose veins are not affected by passive vascular exercises.

With the addition of local hyperthermia, the passive vascular exercise method of treatment has been used in our clinics with good results in the less malignant forms of cellulitis of the foot associated with trophic lesions of the extremities due to arterial insufficiency (fig 12). Such problems require judgment, and no definite rules can be laid down for the application of any one method of treatment for all varieties of such disturbances.

of the results obtained by any method of treatment. As Dr Herrmann pointed out, there are many possible combinations of major arterial and arteriolar occlusion, and added to these are the various spastic phenomena. The family of vasospastic diseases is a large one and is all too frequently covered by the generic term Raynaud's disease. It is undoubtedly true that in the majority of the so-called chronic occlusive diseases, omitting those caused by emboli, there is a certain element of spasm present, and it is not always easy without careful investigation to determine which is the major factor in the causation of

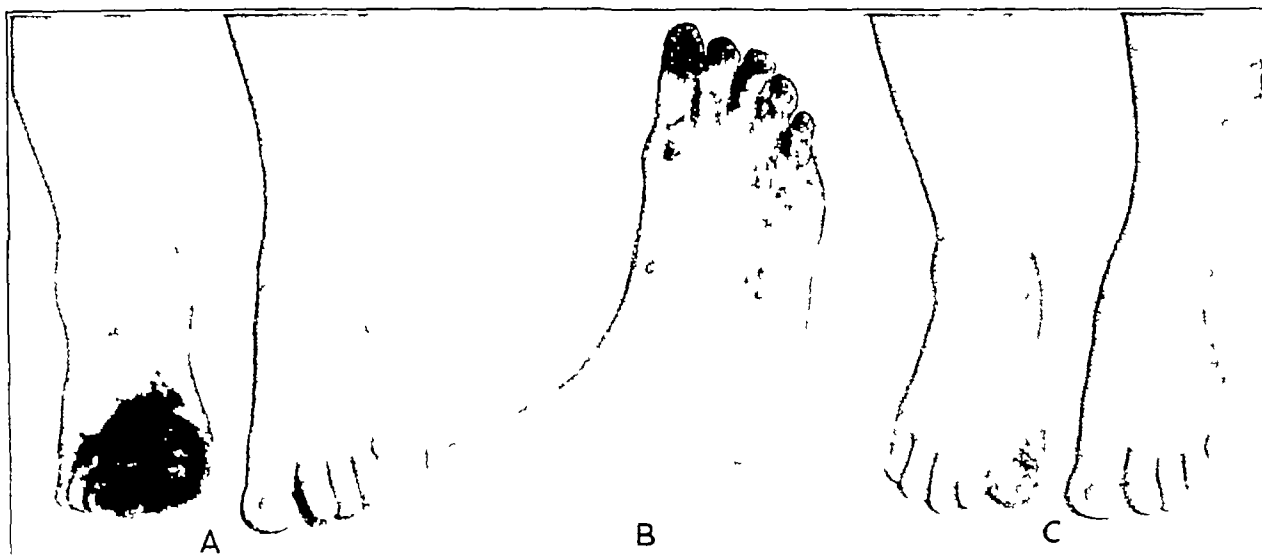


Fig 12—Gangrene of the foot with acute cellulitis and lymphangitis of the foot and leg treated with local hyperthermia in conjunction with passive vascular exercise. A condition of the foot at the time of admission to hospital. Patient had been unable to lie flat for three months with gangrene extending pain constant and excruciating. Acute pain relieved after four hours of passive vascular exercise treatment and local hyperthermia. Patient was then able to lie flat in bed and sleep without drugs. B Condition of foot after two weeks of hyperthermia plus passive vascular exercise. C Condition of the foot six weeks after admission to hospital. Patient was entirely free from pain and walked without discomfort and only a small granulating surface at the tip of the great toe remained. This was epithelizing slowly.

From the benefits that we have brought about by intensive application of this method of treatment to a large series of patients with obliterative arterial diseases, we¹⁰ are confident that it offers a logical and efficient means of artificially stimulating the development of collateral circulation by enlarging the existing collateral arterial pathways in the extremities when the deficiency of the peripheral distribution of blood is due to organic obliteration of the major or secondary arteries.

ABSTRACT OF DISCUSSION

DR. H. M. ELDER, Montreal. I should like to express appreciation of Dr Herrmann's avoidance of the use of proper names. All are familiar with the passion of the public for labels 'Doctor, just what is wrong?' is a very common query and the temptation to cut short discussion that the patient could not possibly understand by answering, 'You have Buerger's disease' or 'You have Raynaud's disease' or something of that sort is one to which a great many physicians are prone to yield. The difficulty from a scientific point of view is that there aren't nearly enough names to go round. All physicians are accustomed to seeing many cases of a mixed occlusive and spastic type that cannot be catalogued, and a classification of cases as done by Dr Herrmann is a great step forward in permitting an accurate comparison and evaluation.

¹⁰ Reid, M. R. and Herrmann, L. G. Treatment of Obliterative Vascular Diseases by Means of an Intermittent Negative Pressure Environment. *J. Med.* 14: 200 (June) 1933. Herrmann, L. G. Syphilitic Peripheral Vascular Diseases. Treatment by Means of an Intermittent Negative Pressure Environment. *Am. J. Syph.* 17: 305 (July) 1933. Herrmann, L. G. and Reid, M. R. El tratamiento pavaex (ejercicio vascular pasivo) en las enfermedades debidas a obliteración arterial de las extremidades. *Rev. méd. veracruzana* 14: 1122-1127 (April) 1934. Reid, M. R. Diagnosis and Treatment of Peripheral Vascular Diseases. *Am. J. Surg.* 24: 11 (April) 1934. Herrmann, L. G. and Reid, M. R. The Conservative Treatment of Arteriosclerotic Peripheral Vascular Diseases. Passive Vascular Exercises (Pavaex Therapy). *Ann. Surg.* 100: 750-760 (Oct) 1934.

symptoms. Whether one believes in the central origin of vasospastic stimuli or agrees with Sir Thomas Lewis in his contention that these purely spastic types of arterial insufficiency are phenomena resulting from peripheral stimuli makes little or no difference since it is obvious that in order to relieve the condition the circle must be broken somewhere, and ganglionectomy appears to offer the best means of accomplishing this. Dr Herrmann has shown that, in the occlusive vascular cases, success lies in the development of an adequate collateral circulation and not in an attempt to force more blood through already diseased vessels. Passive vascular exercise has been demonstrated to be efficient. Ganglionectomy will permit full dilatation of all the vessels of an extremity but does not greatly increase collateral circulation. So far surgery has been limited to cases that were essentially spastic in origin. Dr Herrmann has shown a method of coping with those of an occlusive nature. Possibly the next step should be the combination of the two as an ideal means of treatment in cases not amenable to treatment by either one alone.

DR. NORMAN E. FREEMAN, Boston. Passive vascular exercise may be the only means by which the circulation can be rendered adequate in the presence of severe obliterative arterial disease. In the peripheral circulatory service at the Massachusetts General Hospital in Boston we have been interested in some of the mechanisms that regulate and control the flow of blood in the periphery. Studies on the rate of circulation in the hand at different temperatures have demonstrated a dual control. Through the sympathetic vasomotor nerves the blood flow to the hand is modified in accordance with the needs of the body. After the central control has been removed by sympathectomy the blood flow is found to be regulated by the metabolic requirements of the tissues. The circulation in the normal hand increases as the local temperature is raised. However, when the central vasomotor control is removed by sympathectomy, after the vasomotor tone has been regained we still find that the circulation is dependent on the local temperature. This observation puzzled us until it was realized that the tem-

perature of the hand determined the metabolism of the tissues. As the local needs increased with a rising temperature, the blood supply was raised to meet the demands. Gangrene may be defined as the result of a discrepancy between the metabolism of the tissues and the supply of blood available to meet these nutritional needs. In an extremity affected by organic obliteration of the vessels, application of heat locally will serve only to increase the disproportionality because the vessels are already unable to supply an adequate amount of blood. Raising the temperature may increase the flow slightly, but it is sure to increase the needs. Many of us have experienced the excruciating pain that is produced when we have incautiously immersed our hands or feet when numbed with cold into hot water. If, however, we first restore the circulation by rubbing and massage, we suffer no pain. In the treatment of obliterative vascular disease the application of heat locally is dangerous. Pain will be increased, and even gangrene may be produced by the injudicious application of heat. In other experiments it has been shown that the reflex vasodilatation from the application of heat to the body is of no avail. Up to the present time we know of no physiologic agency that is capable of increasing the flow of blood to the extremities of these patients. Passive vascular exercises offer a physical method for supplying blood to the extremities when the physiologic mechanisms of the body have failed.

DR LOUIS G. HERRMANN, Cincinnati. It was through the suggestion of Dr. Freeman that heat was combined with passive vascular exercise in order not only to increase the demand for blood but also to increase the local metabolism of the tissues. Dr. Elder brought out the important fact that the use of vasodilating substances enhances the effect of passive vascular exercises. For a long time I have been using the oral administration of alcohol in the form of whisky regularly during the course of passive vascular exercise therapy and have found that it aids in bringing about a much greater increase in the arterial circulation and a quicker establishment of a collateral arterial circulation.

THE SO-CALLED MOSAIC FUNGUS AS AN INTERCELLULAR DEPOSIT OF CHOLESTEROL CRYSTALS

A. M. DAVIDSON, M.B., Ch.B. (Edin.), M.D. (Man.),
M.R.C.P. (Edin.), F.R.C.P. (Can.)

AND

P. H. GREGORY, Ph.D. (Lond.)

Lecturer in Dermatology and Research Worker on Dermatophytes
Respectively University of Manitoba Faculty of Medicine
WINNIPEG, MANIT.

When scrapings from the feet mounted by the usual method in potash are examined microscopically for the presence of ringworm fungi, two kinds of fungus-like structures are commonly observed. One kind consists of long, more or less sinuous, sparingly branched threads, which are universally recognized as true hyphae belonging to a dermatophyte (fig 1). Attempted isolations from such material yield a high proportion of cultures. The other kind of fungus-like structure consists of irregular discrete branching threads, which follow the contours of the epithelial cells (fig 2). It has been named "mosaic fungus" by Weidman and is still the subject of controversy, as its supposed status as a fungus has not hitherto been clearly proved or refuted. Isolations of dermatophytes have seldom been reported from material that contained only the "mosaic fungus."

Weidman,¹ who in 1927 drew attention to these bodies by his original description, suggested that if

This work was made possible by a grant from the Banting Research Foundation, Toronto.
Read before the Section on Dermatology and Syphilology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.
¹ Weidman, F. D. Laboratory Aspects of Epidermatophytosis. Arch. Dermat. & Syph. 15: 415 (April) 1927.

they are fungi they must be in a degenerate state. Other workers have regarded them as pathogenic fungi which have been incompletely destroyed by the immunity reactions of the body. Others again have regarded them as consisting of air or potash between the cells, or as collections of intercellular organic debris.



Fig. 1.—Scale from feet in potash showing the true hyphae of a dermatophyte. Magnification 460 diameters.

At Winnipeg during the past four years, in the course of routine laboratory examinations, the "mosaic fungus" has frequently been observed. Oct. 18, 1934, specimens were prepared by placing scales on a slide in a drop of 20 per cent potash under a cover glass and leaving for an hour or more without heating. The cover glass was then pressed gently to flatten out the macerated scale. The mosaic was located with the low power of the microscope and then examined with the oil immersion objective and the 10× oculars of a Leitz binocular microscope giving a magnification of about 930 diameters. The elements of the mosaic were immediately seen to consist of piled masses of the flat rhombic crystals of cholesterol. Some of the crystals showed the reentrant angle often seen in crystals of this substance.

Since our original discovery that the mosaic can be resolved into an aggregation of cholesterol crystals, scales from a number of other patients have been examined and the crystalline nature of the "mosaic fungus" has been amply confirmed. After the scale has been pressed out under the cover glass, most of the crystals are seen in surface view, but in unflattened preparations a number are seen edgewise and the crystalline nature of the elements is then obscured. The crystals are small, seldom larger than 10 microns in length, and transparent. The masses in which they are arranged constitute the irregular angular segments of the mosaic (figs 3 and 4). Cold potash gives the best specimens, but the crystalline structure can also be demonstrated after heating.

Mosaics from different patients show considerable variation in the regularity of the crystalline form. While some mosaics are composed of well formed crystals, similar to those illustrated in figures 3 and 4

others have the constituent elements irregularly disposed. The platelike structure of the so-called mosaic elements is, however, usually discernible on careful focusing.

The crystals must not be regarded as an artefact incidental to the action of the potash, as by the following method they can be demonstrated in the dry scales without the use of that reagent. Dry scales are soaked in xylene to dissolve out the cholesterol. The xylene is then allowed to evaporate whereupon the spaces formerly occupied by the crystals become filled with air. The scales are mounted in Gurr's "neutral mounting medium." Between the dry epithelial cells is then seen an almost perfect mold of the crystals.

The mosaic consists of flat rhombic crystals, sometimes with a reentrant angle, resembling cholesterol, it is insoluble in water, slowly disappearing on prolonged contact with strong potash, it is soluble in xylene and other fat solvents, it is found between the cells of the stratum corneum in certain cases of dermatitis of the hands and feet. The so-called mosaic fungus therefore consists principally, if not entirely, of crystals of cholesterol. It is proposed that the structures should be renamed the *cholesterol mosaic*.

Whether the deposition of the crystals of cholesterol in the skin bears any relation to infection by ringworm fungi, or whether two distinct processes are involved, is not yet known. It is, however, obvious that in the present state of our knowledge the presence of the

mosaic fungus has few supporters. Cholesterol is a logical finding. It is not like fatty acids, easily saponified by the addition of alkalis. It comprises about one sixth of the normal skin fat and is increased in the pathologic skin as shown by Chorazol, who found an increase of cholesterol in the affected skin of forty patients with fourteen types of dermatitis. Becker and Ritchie concluded that the so-called mosaic fungus was a collec-



Fig. 3—Elements of the mosaic in scale cleared in potash mounted in glycerin. Crystals to left of center seen edgewise. Magnification 1000 diameters.



Fig. 2—Scale from feet in potash showing the so-called mosaic fungus. Magnification 460 diameters.

cholesterol mosaic can no longer be regarded as evidence of infection by a dermatophyte.

6 Medical Arts Building

ABSTRACT OF DISCUSSION

DR. JOHN GODWIN DOWNING, Boston. The paper of Drs. Davidson and Gregory confirms the work of those of us who have been unable to culture mosaic forms found in the skin and dispels what Whitfield termed the ghosts of mycology which have been haunting dermatologists for so many years. The confusion, in part, has been due to the diversified conceptions of mosaic forms by different authors; however, today the

tion of organic material resulting from inflammatory changes in the epidermis. I have found these mosaic forms in persistent industrial dermatoses without mycelia, and cultures grew only bacteria, molds and yeasts. The characteristic crystals with notched corners are seen in pictures and I should like to ask the authors if they have used polarized light or microchemical tests for cholesterol on structures that were not so apparent. After I read this article, skin scales, treated with 10 per cent potassium hydroxide gently heated, showing mosaic forms were washed in water and a cholesterol test was done which consisted of placing them in a drop of five parts of sulphuric acid and one part of water on a slide and examining them under the microscope. The mosaic forms stained red and then violet, and after fifteen minutes a drop of dilute iodine solution was applied under the cover glass and the mosaic forms took on a green-blue with the tissue remaining unstained. Later scales showing mosaic figures and mycelia were treated similarly, and the mosaic figures reacted as before, but the mycelia showed only their outline. It is interesting that with sulphuric acid and iodine, cellulose turns blue. However, in the case of cellulose, sulphuric acid forms a gummy precipitate which stains blue with the addition of iodine, but the mosaic figures do not appear to undergo any change with sulphuric acid—they show a carmine red and then on the addition of iodine produce the blue. These microchemical studies need further study before an opinion can be formed for they are merely suggestive and not the clear cut observations that are given in the authors' report.

DR. SAMUEL W. BECKER, Chicago. Several years ago Ritchie and I studied mosaic fungi and decided that they are not fungi, air or potassium hydroxide but particulate matter between the cells which accounts for their mosaic contour. Weidman also has called attention to their particulate nature. We noted that they were more frequent in inflammatory lesions, especially the tops of vesicles, and thought the substance might result from inflammation. We allowed epidermis containing mosaic fungus to disintegrate in potassium hydroxide in the moist chamber and noted that the particles forming the mosaic assumed an ovoid or spherical shape and were surrounded by

a highly refractile ring. This material was similar to other artefacts to which we called attention. We endeavored without success to reproduce the artefacts by combinations of olive oil, blood serum and potassium hydroxide. Since Stumpf's article stating that the material forming mosaic fungus is free fatty acid, Thatcher and I have made further studies. We succeeded in producing artefacts similar to those resulting from the disintegration of mosaic fungi by injecting oleic acid into the



Fig. 4—Elements of the mosaic in the same preparation as in figure 3 seen in surface view showing reentrant angles of cholesterol crystals. Magnification 1 650 diameters

epidermis. This did not result in the formation of typical mosaic fungi. It is probable that mosaic fungus is composed at least in part of saponified lipid material possibly cholesterol, but more probably oleic acid, which is the fatty acid most apt to be found at the periphery of the body.

DR. MARTIN F. ENGMAN JR., St. Louis. Engman Sr and Kooyman have made careful studies of normal skin fats which they reported in the *Archives of Dermatology and Syphilology* in the last two years. Their studies suggest confirmation of the idea that the mosaic fungus may be cholesterol deposit. Kooyman found in the basal layer and lower portions of the epithelium considerable amounts of phospholipin present with a relatively small amount of cholesterol but in the cornified layer the opposite obtained. There was very little phospholipin and a great deal of cholesterol. The skin used for these studies contained no sebaceous glands. Skin from the soles of the feet and palms of the hands was used.

DR. A. M. DAVIDSON, Winnipeg, Man. In regard to Dr. Downing's discussion of the color test, we did the color tests or rather, I had a biochemist do them for me, but I thought I would stick to my observations and make sure that the substance might be identified by the reentrant angle of the cholesterol crystal. I hope to do further color tests later. Since making that lantern slide I enlarged it to 1,870 diameters simply by enlarging the photograph and the crystalline structure is still more evident.

Perhaps the Three Greatest Advances—In our understanding of the processes of life perhaps the three greatest advances of the past hundred years have been first, the establishment of the general principle of evolution with the subsequent working out of something of its genetic mechanism; second, the discovery of the widespread existence of activities of bacteria and the development of the theory of infectious disease and the science and techniques of sanitation; third and latest the development which for convenience we refer to as the newer knowledge of nutrition and of the nutritional characteristics of foods—Sherman H. C. Food and Health New York: Macmillan Company, 1934.

Clinical Notes, Suggestions and New Instruments

PEDUNCULATED THROMBUS OF THE LEFT AURICLE SIMULATING MITRAL STENOSIS

DAVID KAPLAN, M.D. AND EDWARD W. HOLLINGSWORTH, M.D.
HINES, ILL.

The number of thrombi, ball or pedunculated, of the left auricle reported has been small, and Abramson¹ states that thrombi which form before death are a relatively uncommon postmortem finding. Welch² in 1899 collected twenty-five instances of "pedunculated polyps" in the left auricle. Covey, Crook and Rogers³ found twenty-one cases of ball thrombi reported in the literature up to 1928 and added two of their own. Scott and Saphir⁴ reported a pedunculated thrombus in 1928 and Schwartz and Biloon⁵ added three cases in 1931. In all these cases, auricular fibrillation and mitral stenosis were present except in one of hypertension of Schwartz and Biloon. Von Ziemssen⁶ was the first to conclude that mitral stenosis was necessary for the formation of auricular thrombi, but this was disproved by the case of Schwartz and Biloon and now by ours, in which there was an unusually large mitral valve. The authors who suspected the presence of auricular thrombi ante mortem state that the diagnosis should be made or suspected in all cases of mitral stenosis in which temporary or permanent occlusion of peripheral vessels develops.

REPORT OF CASE

A white man, aged 38, married, a journeyman plumber admitted to Edward Hines Jr. Hospital March 10, 1934, complained chiefly of weakness and a fast pulse.

He had had influenza on numerous occasions since 1918, typhoid and diphtheria as a child, poor teeth ever since 1918, and a tonsillectomy in February 1928. He stated that he had not had any venereal disease. He had been working regularly until March 8.

In the fall of 1929 he started to "feel rotten" and was nervous and irritable. He was told that his "heart nerves" were diseased and that he had a "leaky heart." He stayed home but not in bed for three months and then returned to work. In December 1933 he had a sore throat of one week's duration at which time he was told that his heart was all right but a week later the pulse became fast and he felt weak. He was then told to stay in bed for a week after which he returned to work until March 8, 1934, save for occasional "days off." March 10 he felt very weak and nauseated. He stated that there was no swelling of the legs but that he had had a slight cough.



Fig. 1—The chest March 14, 1934

On physical examination the patient was dyspneic and bedridden. He was 72½ inches (189 cm.) tall and weighed 162½

From the Edward Hines Jr. Hospital.
Published with the permission of the medical director of the Veterans Administration, who assumes no responsibility for the opinions expressed or the conclusions drawn by the authors.

1. Abramson, J. L. *Ann. Clin. Med.* 3: 327 (Oct.) 1924.
2. Welch, W. H. in Allbutt, T. C. *System of Medicine*. London: Macmillan & Co. 6: 185, 1899.
3. Covey, G. W., Crook, Roy and Rogers, F. L. *Am. J. M. Sc.* 175: 60 (Jan.) 1928.
4. Scott, R. W. and Saphir, Otto. *Am. J. M. Sc.* 175: 66 (Jan.) 1928.
5. Schwartz, S. P. and Biloon, Sol. *Am. Heart J.* 7: 84 (Oct.) 1931.
6. von Ziemssen. *Zur Pathologie und Diagnose der Gestielten und Kugelthromben des Herzens*. Congress Intern. Med. 9: 281, 1890.
7. Welch², Covey, Crook and Rogers³.

pounds (74 Kg) Inspiration was slightly harsh at the bases posteriorly, there were no rales. The point of maximum impulse of the heart was visible and palpable in the fifth intercostal space at the midaxillary line. There was an apparently definite presystolic thrill at the apex. The left border was percussed about 14 cm from the midsternal line, the right border about 4 cm, basal dullness was normal. The first sound was very sharp at the apex. The pulmonic second was about



Fig 2—The thrombus in the left auricle covering the mitral valve

normal but louder than the aortic second which was soft. There was a rumbling presystolic murmur at the apex, immediately followed by a blowing systolic murmur, which was transmitted to the left. The arteries were soft and compressible. The pulses were small, equal and absolutely irregular. The pulse rate in a recumbent position was 84, the heart rate 144 and the blood pressure 134 systolic, 90 diastolic. There was moderate dyspnea, slight cyanosis and moderate engorgement of the cervical vessels. The liver was palpated four finger breadths below the right costal border. There were no signs of ascites although there was edema of the extremities.

The electrocardiogram showed auricular fibrillation with a ventricular rate of 130 and slurring of the QRS complex in leads 2 and 3. The T wave was inverted in lead 1 and upright in leads 2 and 3.

Urinalysis showed the presence of albumin, a few white blood cells, epithelial cells, cylindroids and granular casts. The Wassermann and Kahn tests of the blood were negative. The blood count was: red blood cells 4,200,000; white blood cells, 12,000; polymorphonuclear leukocytes 70 per cent; small mononuclears, 20 per cent; large mononuclears, 10 per cent; hemoglobin 80 per cent.

Roentgen examination of the chest at a distance of 2 meters showed the greatest transverse diameter of the heart to be 18 cm, the greatest internal chest diameter 31.5 cm and the aortic arch 5.5 cm. There was a generalized fuzziness throughout all the lobes of the lungs.

The clinical diagnosis at that time was rheumatic valvular disease, mitral stenosis and regurgitation, myocarditis with hypertrophy and dilatation, auricular fibrillation and congestive heart failure.

The patient was put to bed and given large doses of digitalis. The next three days he vomited greenish material after breakfast. March 17 he complained of pains in the chest and expectorated large quantities of bright red blood, which was assumed to be caused by pulmonary infarction. March 19 he became jaundiced and showed evidences of fluid in the left side of the chest. On the 20th the jaundice had decreased but the sputum was again streaked with blood. On the 22d he became cyanosed and irrational, and there were signs of fluid in both sides of the chest. On the 23d he became stuporous and deeply

jaundiced with hiccups. March 28 the blood count showed red blood cells 5,580,000, white blood cells, 45,100, polymorphonuclear leukocytes, 92 per cent. The van den Bergh test gave a prompt direct reaction, the icterus index was 24. He grew gradually worse and died March 29, markedly cyanosed and jaundiced. Fibrillation persisted throughout his hospital stay.

Autopsy was performed by Dr W. L. McNamara, pathologist.

The body was fairly well developed and fairly well nourished. There was a severe degree of jaundice involving the skin and sclerae; the vessels of the neck were engorged, with some cyanosis of the face and slight edema of the ankles.

About 200 cc of fluid was noted in the abdominal cavity. The liver was enlarged and rather hard; the spleen was slightly enlarged and firm and the glands were not enlarged.

There were no adhesions to the chest plate, both lungs being partially collapsed. There was about 1,000 cc of fluid in each side with an icteric tinge. The pericardial sac was enormous and measured 19 cm at the cardiophrenic angle; it contained about 150 cc of fluid. The right side of the heart was markedly dilated.

The heart weighed 870 Gm. The right side comprised about two thirds of the anterior surface. When the left auricle was opened, a large thrombus was noted, measuring 7 by 9 by 5.5 cm, which was attached to the lateral wall over an area measuring 2.5 by 1.2 mm, covering the region of the foramen ovale as seen on the right side of the intra-auricular septum. This mass was well organized and the surface was very shiny, of a gelatinous like appearance and almost filled the mitral orifice. In the fixed specimen the walls of the auricle could not be drawn together around the mass. A mild atheromatous change was noted in the ascending part of the aorta, the coronary orifices being somewhat smaller than normal. The aortic leaflets were somewhat thickened at the attached edges, and the mitrals were thickened and ballooned. The coronary vessels themselves showed mild intimal thickening. The wall of the left auricle was definitely hypertrophied; that of the left ven-



Fig 3—The thrombus of the left auricle lifted upward, exposing the large mitral orifice (15 cm)

tricle measured between 12 and 16 mm and of the right ventricle 11 mm. The endocardium of the left ventricle was somewhat thickened and there was a slight atheromatous change of the descending aorta just above the bifurcation. The peripheral vessels were mildly thickened. The mitral valve measured 15 cm.

The lungs together weighed 1,350 Gm, both were partially collapsed, and there was some deposit of fibrin. There was

a hemorrhagic infarct in the upper portion of the right mid axillary line of the lower lobe measuring about 2 cm in diameter. Marked congestion was found at both bases. On section of the lungs there was noted quite marked atheromatosis of the pulmonary vessels, extending to the finer ramifications, and a moderate pneumoconiosis.

The liver weighed 1,450 Gm, it was rather firm and the capsule was smooth. On section the nutmeg markings of chronic passive congestion were seen.

The spleen weighed 150 Gm and was a grayish blue. The capsule was not thickened but was rather firm. On section quite a marked chronic passive congestion was seen with some fibrosis.

The anatomic diagnosis was mural thrombus in the left auricle with partial obstruction of the mitral valve orifice, bilateral pleural effusion, bilateral collapse of the lungs, hemorrhagic infarct of the right lung, pulmonary arteriosclerosis, chronic passive congestion of the liver and spleen, icterus, and mild fibrosis of the spleen.

MICROSCOPIC EXAMINATION

According to Dr. H. C. Fortner, pathologist of this facility, a section of the heart showed some hypertrophy of the muscle fibers, section of the thrombus showed a rather thick layer of well organized fibrous tissue covering a thrombus with much young fibrous tissue.

SUMMARY

In a case of pedunculated thrombus of the left auricle with clinical changes simulating mitral stenosis, no peripheral vessel disturbances were found, auricular fibrillation was present and there was no stenosis of the mitral valve. We have been unable to find a report of a similar case.

UNUSUAL CASE OF ACTINOMYCOSIS OF THE HAND

R. S. HOLLINGSWORTH, M.D., CLINTON, MO.

This unusual condition of actinomycosis is presented to remind physicians that the ray fungus infection is not an infection of only the jaw and neck but may occur on any part of the body following an injury with a foreign body and subsequent exposure to the ray fungus.

REPORT OF CASE

F. H. T., a man aged 65, seen at my office Nov. 14, 1934, complained of a painful sore on the left hand which he said

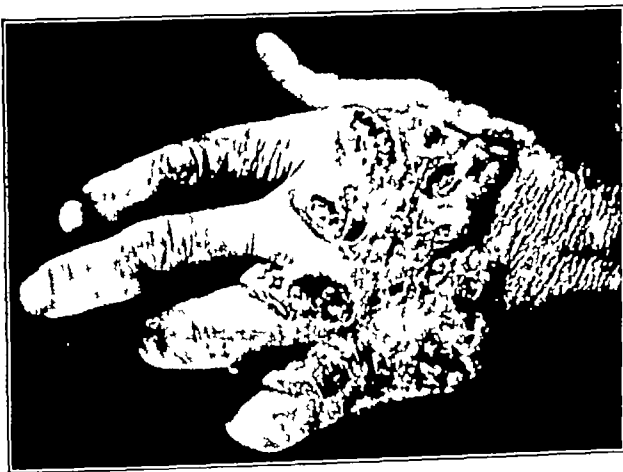


Fig. 1—Actinomycosis of hand before treatment

had been diagnosed as cancer by several physicians. He said that he had been advised to have his arm amputated.

Two and one-half years before the patient was cutting a hedge and ran a hedge thorn into the back of his left hand. About a week later this place began to swell. He went to a physician who opened the swelling but on finding no pus he cauterized the swelling, since that time the sore had spread over the entire back of the hand as shown in figure 1, and around on the palm.

When I examined the hand my first impression was that the condition was malignant, however, the length of time that it had been developing with no loss of weight or enlargement of the adjacent lymph nodes led me to believe that it was not malignant.

When one of the nodules was opened several small white and yellow bodies were squeezed out, which made me feel that I was dealing with one of the parasitic diseases.

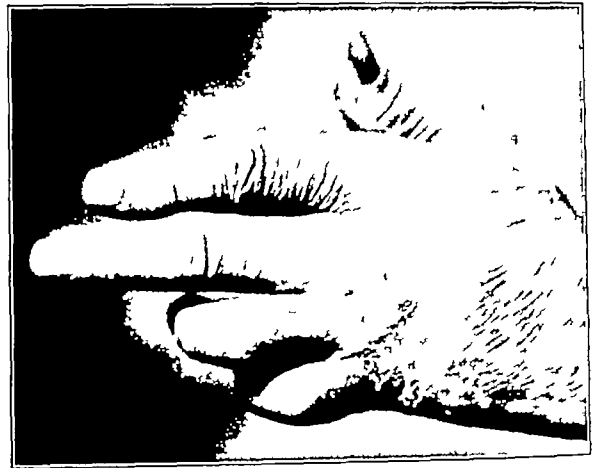


Fig. 2—Healed lesion six months after operation

I asked the patient if he had treated a cow with lumpy jaw during or about the time that he ran the thorn in his hand, and he stated positively that he had not. Realizing, however, that in all parasitic diseases one gets a history of the foreign body injury, I was not satisfied with his story and sent him home, telling him to return in a few days since I wanted to remove a piece of the lesion for tissue section. He returned the next day, however, to correct his statement of the day before, for on his way home he had told his wife what I had asked him and she reminded him that he had treated two cows with lumpy jaw at that time, and the head of one had come in contact with his hand, smearing a quantity of pus over the back of it.

The lesion consisted of numerous raised ulcerated, pinkish nodules, these nodules contained a foul smelling purulent material. Considerable scar tissue was present over the back of the hand. At the base of the fourth finger was a large ulcerated area, which was the site of the initial lesion. The growth had extended between the fourth and fifth fingers and around on the palm of the hand. The fourth and fifth fingers were fairly stiff and it was impossible to extend them fully.

From the history and appearance of the lesion I made a tentative diagnosis of actinomycosis. December 4, assisted by Dr. J. O. Smith, I excised the entire lesion, beginning my incision in the normal tissue. The lesion was dissected down to the tendons of the fingers. The raw area was painted with tincture of iodine and dressings of compound solution of iodine alternated with dressings of 1 per cent copper sulphate were used. For three weeks the patient was given biweekly intravenous injections of 20 cc. of sodium iodide and daily doses of dipropyl iodine protenate by mouth. After operation the pain promptly ceased and a healthy granulating surface was obtained.

The specimen obtained at operation was sent to Dr. F. C. Helwig, pathologist at St. Luke's Hospital in Kansas City, Mo., and the completed slides were also examined by Dr. R. L. Sutton, Jr. of Kansas City. Pathologic examination revealed well differentiated, early, squamous cell epithelioma, type 1, not highly malignant. In a personal interview they stated that the tissue was very unusual and not typical in many respects of an epithelioma, though since no mycotic colonies were found the diagnosis of epithelioma was the only feasible one from the tissue at hand.

At operation some of the yellow granules were obtained and squeezed between glass slides. After staining with Gram's stain the material showed that it consisted mostly of keratinized

cells. In one slide I felt that I found definite evidence of branching mycelia.

COMMENT

Figure 2 shows the healed lesion shown in figure 1, April 26 1935. The entire area was almost completely healed, no raw areas remaining. The fourth and fifth fingers were still rather stiff and drawn but more movable than they had been at first.

In my opinion the reason the pathologic report did not agree with the medical diagnosis was that the chronic irritation of the parasitic disease over such a long period resulted in the formation of a slow growing epithelioma.

Poague Building

A NEW DIAGNOSTIC PROCEDURE FOR DIAPHRAGMATIC HERNIA: THE SEIDLITZ POWDER TEST

DAVID BALL, M.D., NEW YORK

Diaphragmatic hernia probably occurs more frequently than published case reports indicate. This is evidenced by the frequent accidental finding of the condition on the postmortem table and in my own experience.



Fig. 1—Linear shadow to left of cardiac border



Fig. 2—Appearance of shadow with increased air space caused by seidlitz powder



Fig. 3—Outlines of stomach filled with barium sulphate traced over for purpose of better photographic contrast

Over a period of two years in private office practice in association with Dr. Marcus A. Rothschild, I have detected and observed seven cases of diaphragmatic hernia by the method to be described. All the cases were referred for diagnosis because of symptoms that were thought to be cardiac or gastric in origin or because of weakness due to a secondary anemia. In the course of fluoroscopy during the routine physical examination in all the cases an extracardiac shadow was seen. The shadow is either linear or curved and does not conform to the usual lung markings or resemble any well known pathologic condition in the lung. It occurred to me during fluoroscopy that if these shadows were due to a diaphragmatic hernia with a portion of the stomach in the chest, rapid distention of the stomach with gas under fluoroscopic observation by the use of a Seidlitz powder (compound effervescent powder, U.S.P.) might prove or disprove this.

REPORT OF CASE WITH DESCRIPTION OF THE METHOD

B. Y. A woman aged 55 under treatment for mild diabetes, began to complain of marked weakness. She appeared paler than formerly and her hemoglobin was 70 per cent. Physical examination revealed no definite abnormality. On fluoroscopy of the chest a linear shadow was seen just to the left of the left cardiac border and seemed to be separated from the heart by a narrow air space (fig. 1). Diaphragmatic hernia with a portion of the stomach behind and to the left of the heart was considered a possible explanation for this peculiar shadow. It was felt that if gas could quickly be introduced into the stomach under fluoroscopic observation the diagnosis of diaphragmatic hernia might be made. The simplest way of doing this was thought to be by the ingestion of an ordinary Seidlitz powder. A Seidlitz powder was mixed in the usual fashion and the patient was asked to swallow it quickly. Rather

dramatically the "linear" shadow was seen to move up and to the left owing to a marked increase in the air space between it and the heart (fig. 2). Roentgenograms with a contrast meal (fig. 3) later absolutely confirmed the diagnosis and revealed the upper two thirds of the stomach to be in the chest.

COMMENT

Diaphragmatic hernia in adults exhibits a clinical picture closely resembling organic disease of the stomach, gallbladder, heart, lungs and unexplained anemia, and unless kept in mind by the examiner it will be overlooked many times.

The successful application of the method described depends on the fact that in the majority of cases of diaphragmatic hernia a portion of the stomach protrudes through the diaphragm and into the chest.

It is hoped that by the use of the simple method described, diaphragmatic hernia will be more frequently recognized. A careful search of the literature fails to reveal any reference to a similar procedure.

Better contrast may at times be obtained by having the patient swallow a portion of each dissolved powder (blue and white) separately so that all the "gas" is generated in the stomach and

not lost during "fizzing" of the mixed solution. This should be done only if the described method does not distend the stomach sufficiently since there is supposed to be a certain element of danger in distending the stomach too rapidly.

975 Park Avenue

SUBPHRENIC ABSCESS FOLLOWING TRAUMA

FRED R. HARPER, M.D., AND CHARLES A. THOMAS, M.D.
TUCSON, ARIZONA

Ochsner and Graves¹ gathered 3,373 cases of subphrenic abscess from the world literature. Seventy-four (2.2 per cent) were attributed to trauma. The case we are reporting gave a definite clear-cut history of trauma resulting from an automobile accident. The injury occurred six weeks before the diagnosis of subphrenic abscess was made.

REPORT OF CASE

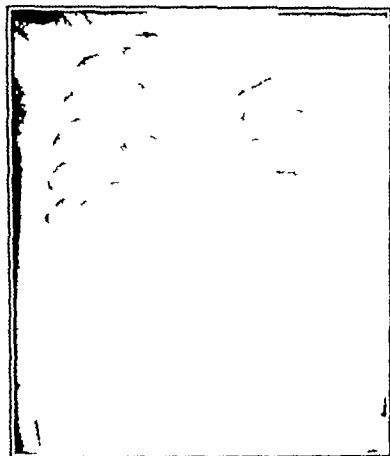
A man aged 28, Mexican, a laborer, was well until he was injured in an automobile accident. At the time of the accident he was thrown from the car, striking the right side of his chest against the curbing. He was unconscious for about thirty minutes following the injury. The next day he went to work but had chills and fever, dyspnea, dizziness, and weakness accompanied by pain in his right side. He continued working for five days during which time the symptoms persisted. For the next three weeks he remained at home in bed. His symptoms increased and an intense pain developed in the right upper quadrant. Except for a nonproductive cough and loss of appetite, he had no other significant symptoms.

From the Thomas Davis Clinic,
1 Ochsner-Alton and Graves, A. M. Subphrenic Abscess. Ann Surg 98:961-990 (Dec) 1933.

Examination on admittance to the hospital revealed definite tenderness along the twelfth rib. Expansion of the right side of the chest was limited. There was impaired resonance and absence of breath sounds from the fifth rib to the base anteriorly and the ninth rib to the base posteriorly. The breath sounds at the right apex were increased. The left side of the chest was apparently normal. The patient's temperature was 103 F, pulse 100, and the respiration rate 30. The leukocyte count was 14,000. Roentgenograms of the chest revealed a dense opaque shadow in the right side of the chest extending to the level of the eighth rib. Aspiration at the level of the ninth rib was done and 270 cc of straw-colored fluid obtained. Following the aspiration, the temperature went down to 99 for twelve hours and then returned to 104. Aspiration was again attempted and 85 cc of fluid was withdrawn and 70 cc of air introduced into the pleural cavity.

Roentgenograms taken following the introduction of air showed the right diaphragm to be definitely elevated to the level of the eighth rib. The diagnosis of subphrenic abscess was made, and the following dry retroperitoneal exploration according to the technique described by Ochsner and Graves was done. Under local anesthesia the twelfth rib on the right side was removed and an incision 3 inches long made at right angles

to the first lumbar vertebra. The peritoneum was separated from the diaphragm by blunt dissection. When the dome of the liver was reached a large abscess cavity was encountered. The cavity was filled with thick pus and was so large that the dissector's whole hand seemed to drop down into an excavation of the liver. Two large rubber tube drains were placed in the abscess cavity and the ends brought out through the original incisions where they were sutured in place.



Elevation of diaphragm resulting from subphrenic abscess

The third day following the operation the patient's temperature dropped to a maximum of 101. By the tenth day it was normal. The tubes were gradually removed over a period of five weeks during which time the patient's temperature was normal. Culture of the fluid was sterile. No amebas were found although careful search was made.

A NEW INSTRUMENT FOR THE INJECTION OF HEMORRHOIDS

T. B. QUIGLEY, M.D., BOSTON

Harvey Cushing Fellow in Surgery, Peter Bent Brigham Hospital

The treatment of hemorrhoids by the injection of a sclerosing solution has finally achieved respectability and has proved its worth in the alleviation of one of mankind's commonest and most annoying maladies. Experience has proved that injections will be successful only if made accurately and systematically after careful evaluation of the number, size and shape of the hemorrhoids and thorough examination of the rectal ampulla for other disease processes. Further, it is now agreed by most authorities that the optimal site of injection is at the apex of the hemorrhoid.¹ With most of the ordinary rectal speculums accurate injection and adequate inspection of the rectal mucosa

is awkward and uncertain. To minimize these difficulties a new instrument was devised.²

A standard proctoscope was cut down to a length of 7.5 cm. and its end slightly beveled. Opposite the incandescent bulb a U-shaped slot was cut, 1.5 cm. in depth. At the base alongside the bulb terminals a piece of 0.6 mm. steel tubing was welded,

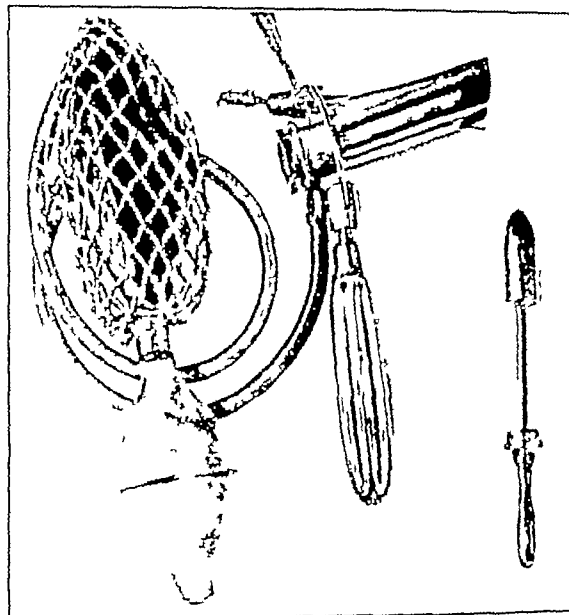


Fig. 1—Instrument with the needle in place.

pointing in the direction of the U-shaped notch. A rubber cystoscope nipple was fitted to the projecting end of this tube.

With the patient in the Sims position the instrument, well lubricated, is inserted to its full length into the rectum. The obturator is withdrawn and the nipple, previously sterilized by

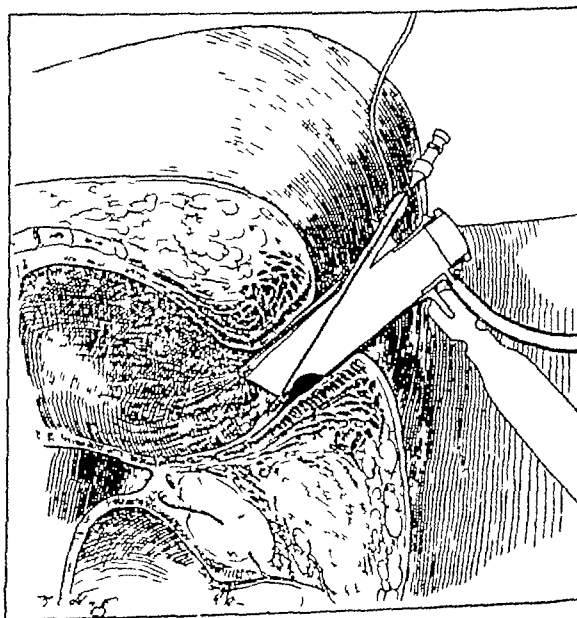


Fig. 2—Diagram of the instrument in place. A bleb of injection fluid has been raised beneath the mucosa above a hemorrhoid.

soaking in alcohol is fitted to the projecting 0.6 mm. tube. The window is adjusted and the rectal ampulla distended with air and carefully inspected. The instrument is slowly withdrawn to the sphincter and the number and character of the hemorrhoids ascertained. The upper portion of the hemorrhoid

From the Surgical Clinic, Peter Bent Brigham Hospital.
1. Kilbourne, N. J. Internal Hemorrhoids: Comparative Value of Treatment by Operative and Injection Methods. A Survey of 62,910 Cases. *Ann. Surg.* 99: 600-608 (April) 1934. Blanchard, C. E. A Text Book of Ambulant Proctology. Youngstown, Ohio: Medical Success Press, 1928. Gabriel, W. B. The Treatment of Hemorrhoids. *Practitioner* 126: 114 (Jan.) 1931.

2. The original model was made by J. H. Emerson, 22 Cottage Park Ave., Cambridge, Mass. The instrument is manufactured by the George P. Pilling and Son Company, Philadelphia.

chosen for injection is allowed to slip into the U-shaped notch at the end of the instrument. The degree of projection of the hemorrhoid into the lumen of the instrument can be controlled by varying the amount of air in the rectum. A 12 cm 22 gage needle is inserted through the nipple. The injection is then made accurately under direct vision either into or about the apex of the hemorrhoid, as the operator chooses.

This instrument has been in use for the last six months in the outdoor department of the Peter Bent Brigham Hospital. A solution of 5 per cent phenol in olive oil has been found satisfactory. From 2 to 4 cc is injected beneath the mucosa above each hemorrhoid (fig. 1) and not more than three hemorrhoids are injected at one time.

SUMMARY

By means of a new instrument, accurate injection of internal hemorrhoids can be made at their apexes and examination of the anorectal mucosa can be carried out under direct vision.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING STATEMENT
PAUL NICHOLAS LEECH, Secretary

STANDARDIZATION AND LABELING OF LIVER AND STOMACH PREPARA- TIONS FOR USE IN THE TREATMENT OF PER- NICIOUS ANEMIA

A Statement by the Council on Pharmacy and Chemistry

For some time it has been felt that the provisions for standardization and labeling of accepted liver and stomach preparations were inadequate. After extensive consideration the Council has arrived at the following statement, which sets forth the principles to govern its action in the consideration and acceptance of such preparations.

Investigation has demonstrated striking therapeutic effects from the feeding of liver or certain preparations of liver or of a preparation of stomach tissue in pernicious anemia and sprue when the bone marrow is not exhausted also in certain cases of obscure anemia.

Preparations obtained from liver have also been used experimentally as a means of controlling essential hypertension and in certain eclamptic conditions. Thus far the Council has accepted only those preparations of liver primarily intended for the treatment of pernicious anemia.

Convincing evidence is now at hand that the daily ingestion of from 200 to 400 Gm of fresh liver will induce and maintain a remission in pernicious anemia. It has also been shown that concentrates may be made from such amounts of liver, but these possess usually not more than two thirds of the original activity of the liver from which they are derived. Similar effects can be produced by 30 to 40 Gm of desiccated stomach and by combinations of stomach tissue and liver. Extracts suitable for parenteral administration may be prepared from 10 to 15 Gm of liver and will possess a therapeutic effect equal to that of the large amounts of liver given above.

Standardization of preparations depends on the reticulocyte response following the uniform daily administration of the product to a patient with pernicious anemia. The test patient should preferably have no complicating infection, diarrhea, marked arteriosclerosis or extensive neurologic changes. The red blood cell count should be between 1,000,000 and 3,000,000 per cubic millimeter and the patient should not be in a spontaneous or induced remission, nor should transfusion have been performed recently. The patient should not have received potent antianemic material or arsenic within a month. Daily reticulocyte counts for one day before and for ten days after the test has been started should be made. During days of marked rise of reticulocytes, two counts a day may be necessary to determine

the maximal value. The acceptable standard response is set forth in the accompanying table.

| Initial Red Blood Count Million per Cu Mm | Minimum Reticulocyte Response Per Cent |
|---|--|
| 10 | 30 |
| 15 | 18 |
| 20 | 12 |
| 25 | 7 |
| 30 | 4 |

The figures given have been obtained by the daily oral administration of material derived from 300 to 400 Gm of liver, or of 30 to 40 Gm of desiccated stomach, or by the daily parenteral injection of material derived from 10 to 15 Gm of liver.

The test should be conducted by uniform daily administration for ten days of the least amount of material expected to yield the standard reticulocyte response. Should there be no reticulocyte response or a lesser response than the required minimum, within the ten day period, that amount of a preparation of established potency known to correspond to the foregoing standards should be administered in uniform dosage for ten days. The purpose of this control is to establish the reactivity of the patient to known amounts of active principle. In assaying an orally administered product an orally administered standard should be used, and with a product for parenteral use a parenterally administered standard should be employed. The principles underlying the determination of potency of autolyzed liver preparations, stomach tissue extracts or combinations of liver and stomach tissue or extracts are the same. In each case the least daily amount of the preparation administered that is necessary to produce the standard reticulocyte response within the ten-day period should be determined. Satisfactory responses to similar tests should be obtained in at least three patients.

The Council will require that all preparations designed for use in the treatment of pernicious anemia be manufactured by a satisfactory method and that they be labeled with the amount of the contained material which will produce the standard rise of reticulocytes when assayed in the manner defined. The manufacturers will be given ample opportunity to bring their products into conformity with the new standards.

SUGGESTIONS FOR LABELS

1 The daily oral administration of — Gm of the material prepared by the method employed in producing the contents of this bottle (or vial) has been demonstrated to produce satisfactory hematopoietic response in pernicious anemia according to standards of the Council on Pharmacy and Chemistry.

2 The daily parenteral injection of — cc of the contents of these ampules containing material prepared by the method employed in producing these contents has been demonstrated to produce satisfactory hematopoietic response in pernicious anemia according to standards of the Council on Pharmacy and Chemistry.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary

DIPHTHERIA TOXOID, ALUM PRECIPITATED (REFINED) (See New and Nonofficial Remedies, 1935, p. 395)

Lederle Laboratories, Inc. Pearl River, N. Y.
Refined Diphtheria Toxoid (Alum Precipitated) Lederle—Also marketed in packages of one 0.5 cc vial (one immunization) ten 0.5 cc vials (ten immunizations) and one 5 cc vial (ten immunizations).

SCARLET FEVER STREPTOCOCCUS ANTI- TOXIN (See New and Nonofficial Remedies, 1935, p. 373)

Lederle Laboratories, Inc. Pearl River, N. Y.
Scarlet Fever Streptococcus Antitoxin Globulin Lederle Modified—It is prepared by the method of Drs. Dick, under U. S. patent 1,547,369 (July 28, 1925, expires 1942) by license of the Scarlet Fever Committee, Inc. The process of refinement is based chiefly on a controlled method of selective digestion of the proteins of the immune horse blood with pepsin. As a result of this process as much as 90 per cent of the coagulable protein may be digested; a smaller portion is precipitated and the remainder a pseudoglobulin fraction is purified first by ordinary filtration and then by ultrafiltration and dialysis. Marketed in packages of one syringe containing 2,000 units (prophylactic dose) and in packages of one syringe containing 6,000 units (therapeutic dose).

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING
REPORTS

RAYMOND HERTWIG Secretary

NOT ACCEPTABLE**HOYT'S GLUTEN SPECIAL FLOUR**

Manufacturer—The Pure Gluten Food Company, New York

Description—Ground gluten prepared from wheat flour by almost complete removal of starch, containing not more than 10 per cent of moisture and, calculated on the water-free basis, not less than 14.2 per cent of nitrogen, not more than 15 per cent of nitrogen-free extract (the protein factor 5.7 being used) and not more than 5.5 per cent of starch (as determined by the diastase method)

Uselessness as a Special Purpose Food—Hoyt's Gluten Special Flour is manufactured specially for use in diets restricted in dextrose formers. To be eligible for acceptance, such type of flour shall contain dextrose formers yielding dextrose in an amount not greater than 33 Gm per hundred cubic centimeters (the dextrose equivalence being computed as the carbohydrate, plus 58 per cent of the protein, plus 10 per cent of the fat content of the food). Dextrose formers of Hoyt's Gluten Special Flour, on the other hand, yield approximately 60 Gm of dextrose per hundred cubic centimeters.

There is authoritative evidence that commercially prepared special diabetic foods are of limited usefulness to the diabetic patient and that the availability of insulin makes them no longer necessary. Artificial substitutes for ordinary foods are not to be favored. It is much better for the diabetic patient to learn how to plan his diet with foods in common use and readily available. The diet should be exactly prescribed in carbohydrate, protein and fat, and total calories.

The designation of a food as a 'diabetic food' merely because it is low in carbohydrates is now unwarranted and misleading and gives the erroneous impression either that the food taken in unrestricted quantities in diabetes is harmless or that it has remedial action. Except for the necessity of restricting foods to avoid overstepping the food tolerance, there are no special diabetic nutritional requirements. The exploitation of starch-free or low carbohydrate foods containing an excess of protein for use by diabetic patients is unwarranted. Protein may be tolerated almost as poorly, if not quite as poorly, as starch in diabetes.

Because Hoyt's Gluten Special Flour is adjudged without usefulness or special adaptability for inclusion in diets restricted in dextrose formers it will not be listed among the accepted foods of the Committee on Foods.

Gluten flours of other manufacturers, for the reasons stated, are not eligible for acceptance.

NOT ACCEPTABLE**LION BRAND VITAMIN D CREAM CHEESE**

The Columbia Cheese Company, Newark, N. J., submitted to the Committee on Foods a cream cheese containing added vitamin D derived from cod liver oil, 400 U. S. P. vitamin D units per pound.

Discussion of Fortification with Vitamin D—There is no convincing evidence from the standpoint of public health or the improved nutrition of the public of a need for the fortification of cream cheese or any type of cheese with vitamin D. It is nutritionally unreasonable to add vitamin D to foods consumed sporadically, such as cheese. An important requisite in the choice of food for incorporating vitamin D is that it be consumed regularly and in considerable quantity in the usual diet throughout the year. Cheese is an example of foods not warranting fortification with vitamin D.

The company was advised of the Committee's decision but has not demonstrated willingness to comply with its recommendations. This vitamin D fortified cream cheese will therefore not be listed among the accepted foods of the Committee.

NOT ACCEPTABLE**MALTCOA**

The Mercens Chocolate Company, Inc., of Buffalo submitted to the Committee on Foods the product "Maltco" prepared from sucrose, cocoa, dried malt extract and buttermilk, certain iron and calcium compounds derived from the "steepwater" of corn, and sodium chloride.

Analysis (submitted by manufacturer) —

| | per cent |
|--|----------|
| Moisture | 4.9 |
| Ash | 3.7 |
| Sodium chloride | 0.5 |
| Fat (ether extract) | 4.6 |
| Protein (noncaffeine and nontheobromine N X 6.25) | 8.9 |
| Crude fiber | 1.2 |
| Carbohydrates other than crude fiber (by difference) | 76.2 |
| Theobromine (Wadsworth method) | 0.37 |
| Caffeine (Decker method) | 0.13 |
| Calcium (Ca) | 0.41 |
| Phosphorus (P) | 0.64 |
| Iron (Fe) | 0.14 |

Discussion of Label and Advertising—The label carries the statements "Builds for the years ahead" concentrated food drink rich in vital elements. In pleasant organic combination it supplies three necessary and body building ingredients: iron, calcium, and phosphate. Maltco aids the digestion of starchy foods. Maltco for breakfast fits you for a busy, energetic day, and as a hot drink before retiring has a soothing, restful effect, especially recommended for nursing mothers, growing children, convalescents and the aged. Maltco contains added organic compounds of calcium and iron, which are easily assimilated. Made from pure sugar, malt, cocoa partially defatted milk and organic iron and calcium salts.

This product does not "build for the years ahead" any more than many other common foods of the diet. The statement "concentrated food drink rich in vital elements," because of vagueness, falsely implies unusual food values. Elements in which the product is "rich" should be specified. The emphasis on the "organic combination" of the iron, calcium and phosphorus incorrectly connotes that these elements in organic combination are more valuable than in inorganic combination. Inorganic calcium, iron and phosphorus compounds may be just as easily assimilated as the respective organic compounds of this product. There is no acceptable evidence that Maltco will significantly aid in the "digestion of starchy foods." Saliva swallowed in eating is many times more potent for digesting starch than is the diastase of the malt extract ingredient. The statement "Specially recommended for nursing mothers, growing children, convalescents and the aged," because of vagueness, implies unusual nutritional or therapeutic values not possessed. Such claims, to be correctly informative, should specifically state the particular usefulness of the food for the classes of individuals named. The statement of ingredients is partly incorrect: malt extract, not malt, as stated is an ingredient.

The advertising, in addition to the quoted label claims, contains such statements as: "With health-building iron, calcium and phosphates. This scientifically prepared health food

contains liberal quantities of organic phosphates of calcium and iron in the same form as nature produces these salts in small quantities in grains and vegetables. Maltco is therefore a near perfect food.

The health giving value is great because Maltco supplements the calcium, iron and phosphate requirements of young and old. In order to get lasting benefits from the use of Maltco it is advisable to drink it regularly. "Maltco is no more a health food" as stated and implied than many common foods of the usual diet. No food specifically can give or assure health. A complete, well balanced diet is but one of the many essentials necessary for health. The nutritional values of the calcium and iron are misrepresented by implication. It has not been shown that the calcium of Maltco is more important nutritionally than the calcium of milk, or the iron than that of the common food wheat.

The label and advertising are misinformative and misleading. The company was advised of the Committee's criticisms but has not demonstrated, after approximately a one year interval, that action has been taken to revise the label and advertising that they may correctly and properly inform the public. This product will therefore not be listed among the accepted foods of the Committee.

NOT ACCEPTABLE

DRY PEPTONIDS (SOLUBLE) BEEF, MILK
AND WHEAT PREDIGESTED

Manufacturer—The Arlington Chemical Company, Yonkers, N Y

Description—Dried extract of partially digested beef, skim milk and wheat bran admixed with malt extract and milk sugar

Manufacture—Beef, trimmed of excess fat, is chopped, heated to boiling in dilute hydrochloric acid solution, cooled and digested with pepsin. Wheat bran is cooked in boiling water, cooled, and malt extract is added. After inversion of the starch, the wheat bran mixture is added to the meat mixture, and the acid pepsin digestion continued.

In a separate tank, the dry skim milk powder is suspended in water, soda is added to adjust the solution to the desired pH, the temperature is adjusted and pancreatin is added. After a definite digestion period, this mixture is added to the meat wheat bran mixture. During the mixing the pH is altered and the digestion of the combined mixtures with pancreatin continued.

After the digestion period, the mixture is acidified, heated to boiling, and filtered. The press cake is washed and the filtrate and washings are concentrated in vacuum. The washed press cake is returned to the digestion tank and subjected to a second digestion with pancreatin. The second filtrate is treated as the first, concentrated in vacuum and added to the first concentrate. The mixture is tested for nitrogen and total solids, and the necessary quantity of milk sugar is added so that the finished product contains 40 per cent of protein ($N \times 6.25$). The syrupy mass is spread on trays and dried in vacuum, sieved and packed in glass containers.

| Analysis (submitted by manufacturer) — | per cent |
|---|----------|
| Moisture | 6.1 |
| Ash | 8.4 |
| Fat (ether extract) | 0.03 |
| Protein ($N \times 6.25$) | 40.2 |
| Average nitrogen content | 6.4 |
| Amino nitrogen (Van Slyke method) | 0.5 |
| Carbohydrates (lactose, dextrose and maltose) (by difference) | 45.3 |

Discussion of Name and Label—The name 'Peptonoids' is inappropriate for this product containing a larger percentage of carbohydrates than what may be regarded as 'peptonoids'. The main panel legend 'Beef, Milk and Wheat Predigested' is incorrect. The product is not "predigested". Skim milk and not milk and only part of the wheat (apparently commercial wheat bran) are used. A more appropriate descriptive statement would be 'Dried extract of partially digested skim milk, beef and wheat bran admixed with malt extract and lactose'. Evidence has not been furnished that the product is 'sterilized' as claimed. The article does not contain 'all of the nutritive principles of beef, milk and wheat, except the fat' as claimed.

Uselessness as a Special Purpose Food—The label and advertising present Dry Peptonoids as a "Special Purpose Food," as indicated by such statements as "Predigested" a concentrated food of decided nutritive value containing 40 per cent protein in partially digested, freely soluble and readily assimilable form, obtained from the flesh-forming nitrogenous principles of beef, milk and wheat, together with their completely converted, promptly absorbable carbohydrates and nutritive salts contains all of the nutritive principles of beef, milk and wheat, except the fat predigested by pepsin and pancreatin absolutely free from unconverted starch or indigestible material. It is peculiarly valuable and acceptable in all conditions requiring nutritive reinforcement. It has no cane sugar clinical advantages. It offers practical freedom from creatin, creatinin, purin bodies. Dry Peptonoids (Soluble) is indicated in those cases where a maximum amount of nutrition is required in a minimum amount of bulk. It will be found useful in cases of gastric ulcer, cancer, vomiting during pregnancy, nervous dyspepsia, gastritis during period of lactation or whenever the presence of ordinary food in the stomach, even water, causes irritation or nausea. Rectal feeding—Dry Peptonoids (Soluble) is of especial value for rectal feeding because it is concentrated, nutritious and is rapidly absorbed without causing irritation.

Dry Peptonoids formerly was considered useful for persons who because of disease are unable to eat regular foods without

distress. At this time, however, the food seems to have no field of usefulness, either as a regular food or as a special purpose food. Therefore Dry Peptonoids will not be listed among the accepted foods of the Committee on Foods.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary

McCORMICK'S BEE BRAND PUMPKIN
PIE SPICE

Manufacturer—McCormick & Company, Inc., Baltimore.

Description—Ground mixture of allspice, saigon cinnamon, ginger, cloves and nutmeg.

Manufacture—Ingredients, prepared as described for McCormick's Bee Brand Allspice (THE JOURNAL, Oct 28, 1933 p 1393) are mixed in formula proportions and automatically packed.

| Analysis (submitted by manufacturer) — | per cent |
|--|----------|
| Moisture | 8.1 |
| Total ash | 4.5 |
| Ash insoluble in hydrochloric acid | 0.2 |
| Volatile ether extract | 5.2 |
| Nonvolatile ether extract | 8.0 |
| Protein ($N \times 6.25$) | 6.3 |
| Starch | 13.4 |
| Crude fiber | 16.1 |
| Carbohydrates other than crude fiber (by difference) | 51.8 |

BOB WHITE BRAND FANCY TABLE
SYRUP CRYSTAL WHITE

Manufacturer—The Torbitt & Castleman Company, Inc., Louisville, Ky.

Description—Table syrup, a blend of corn syrup (90 per cent) and sucrose syrup (10 per cent), flavored with vanilla.

Manufacture—The corn syrup ingredient is manufactured by essentially the same procedure as described in THE JOURNAL, March 5, 1932, page 817. Sucrose syrup and corn syrup in the stated proportions are heated to 70 C, imitation vanilla flavor is added, and the mix is automatically packed hot in cans.

| Analysis (submitted by manufacturer) — | per cent |
|--|----------|
| Moisture | 25.3 |
| Ash | 0.2 |
| Fat (ether extract) | 0.0 |
| Protein ($N \times 6.25$) | 0.1 |
| Reducing sugars as dextrose | 30.4 |
| Sucrose | 10.2 |
| Dextrins (by difference) | 33.3 |
| Titrateable acidity as HCl | 0.01 |
| Sulphur dioxide as SO ₂ | 0.001 |
| pH | 5.1 |

(No methods are available for accurately determining the composition of syrups of this nature, therefore the foregoing analysis is roughly approximate.)

Calories—3.0 per gram 85 per ounce

Claims of Manufacturer—Recommended for use as an easily digestible and readily assimilable carbohydrate supplement to milk in infant feeding and as a syrup for cooking, baking and the table.

FAIRWAY BRAND FREE RUNNING SALT

Distributor—Twin City Wholesale Grocer Company, St. Paul

Manufacturer—The Ohio Salt Company, Wadsworth, Ohio

Description—Table salt containing added magnesium carbonate (1 per cent) for preserving free-running properties, the same as Chippewa Free Running Salt (THE JOURNAL, Sept. 7, 1935, p 800).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO, ILL.

Cable Address 'Medic, Chicago

Subscription price Seven dollars per annum in advance

Please send in promptly notice of change of address giving both old and new always state whether the change is temporary or permanent Such notice should mention all journals received from this office Important information regarding contributions will be found on second advertising page following reading matter

SATURDAY, OCTOBER 19, 1935

YELLOW FEVER STUDIES

A series of studies¹ emanating from the Cooperative Yellow Fever Service maintained by the National Department of Health of Brazil and the International Health Division of the Rockefeller Foundation has developed several new observations and problems connected with yellow fever control In studying the distribution of immunity to yellow fever in Brazil^{1a} by means of complement fixation tests on blood samples, a significant difference was found between the percentage of positive reactions in postepidemic samples and in samples from a nonendemic area This difference was indicated further by the results of interval tests on the same persons, and by the combined results of complement fixation and protection tests At the time of known outbreaks of yellow fever, relatively large percentages of the local population were apparently acquiring a specific immunity to the yellow fever virus without apparent attacks of the disease

The study of a strictly rural epidemic of yellow fever occurring in the Valle do Chanaan, Esperito Santo, Brazil,² showed that *Aedes aegypti* could be definitely ruled out as the vector This changes many ideas previously held This valley, or series of valleys, is formed by the Rio Santa Maria do Rio Doce and its tributaries, where a mountain range falls away from Santa Thereza toward the Rio Doce It is a heavily populated rural area without any villages or towns of importance This region, whose name is as picturesque as its geography,

had been considered an unlikely yellow fever area. On March 3, 1932, however, a suspected case was reported which proved to be fatal and was followed by necropsy confirmation of the diagnosis Immediate investigation allowed the collection of information regarding eighty three suspected cases with nine fatalities between January 15 and April 15, scattered over an area of some 50 square kilometers The epidemic was apparently on the decline when it was discovered, and only twenty-one cases, with three deaths, were observed after the appearance of the first suspected case The apparent low mortality of yellow fever in a population, predominantly white and largely composed of European stocks, recently established in this area, emphasizes the fact that other factors than race are important in determining susceptibility to yellow fever Added evidence of this situation was adduced from the occurrence of a fatal case in a man, aged 72, a resident in the Valle do Chanaan for fifty-five years Further more, the results of mouse protection tests in the valley showed a surprisingly low percentage of immune persons, considering the wide geographic distribution of immunity and the fact that the disease apparently disappeared spontaneously The situation suggests a transmission by some insect vector having high laboratory but low natural efficiency, perhaps because of less contact with the human host than *Aedes aegypti* has

Inspectors failed to find *Aedes aegypti* breeding in the Valle do Chanaan or in the town of Santa Thereza. Several factors are probably responsible for this absence Many other insects were, however, found in this district Of these, *Aedes fluviatilis*, *A. scapularis*, *A. serratus*, *A. terreus*, *Mansonia* (all species), *Psorophora* (all species) and *Phlebotomus* (all species) were held for further consideration as possible vectors While the guilty vector or vectors of this epidemic have not been established, the epidemiologic evidence indicates that they are not house limited mosquitoes It points rather to infections occurring in the field, and to the possible transfer of infections from one house to another by the vector as well as by the human host

These observations, combined with other exceptions to preconceived ideas of the action of yellow fever, led to further investigations³ The possibility of determining, through the examination of necropsy material from a large number of fatal febrile cases, the location of those silent foci of yellow fever responsible for maintaining the endemicity of the disease in the northern part of Brazil was discussed during 1928 and 1929 but no serious attempt was made at the routine collection of specimens previous to April 1930 The collection of such specimens was simplified by the use of a special viscerotome with which sufficient liver tissue for diagnostic purposes is readily obtained Of the seventy-five diagnoses of yellow fever made by the Bahia laboratory on routine liver specimens collected

1 These studies include

- (a) Soper F L, Frohisher M. Jr, Kerr J A, and Davis N C Studies of the Distribution of Immunity to Yellow Fever in Brazil *J Prev Med* 6:341 (Sept.) 1932
- (b) Soper F L, Penna H, Cardoso E, Serafim J Jr, Frohisher M Jr, and Pinheiro J Yellow Fever Without *Aedes Aegypti*: Study of a Rural Epidemic in the Valle do Chanaan, Esperito Santo, Brazil 1932, *Am J Hyg* 18:555 (Nov.) 1933
- (c) Soper F L Some Notes on the Epidemiology of Yellow Fever in Brazil *Rev de hyg e saude pub* 8:37 (Feb.) 1934
- (d) Soper F L, Rickard E R, and Crawford P J The Routine Postmortem Removal of Liver Tissue from Rapidly Fatal Fever Cases for the Discovery of Silent Yellow Fever Foci *Am J Hyg* 19:549 (May) 1934
- (e) Davis N C The Microscopical Examination of 29,593 Human Livers from Central and Northern Brazil with Special Reference to the Occurrence of Malaria and Schistosomiasis *Am J Hyg* 19:567 (May) 1934
- (f) Soper F L Rural and Jungle Yellow Fever a New Public Health Problem in Colombia *Rev de hig* 4 (May and June) 1935
- 2 Soper Penna Cardoso Serafim Frohisher and Pinheiro ^{1a} Soper ^{1a}

3 Soper Rickard and Crawford ^{1a} Davis ^{1a}

in this way, only twenty-one were made on tissues from cases clinically suspected of yellow fever. Fifty-four occurred from forty-three places in which yellow fever was not known to be present, thus amply confirming the hoped for value of the procedure.

It was not wholly surprising that the liver specimens gave additional information. Thus of the 29,593 specimens, 2,298 showed malarial pigmentation. Lesions caused by *Schistosoma Mansoni* were recognized in 1,594 livers. Lesions of typhoid and focal necroses of doubtful etiology were especially prevalent among specimens from one region (Ceara).

In the light of present knowledge yellow fever must be recognized as an international problem. Soper^{1c} advances a five-point program of study. There should be antilarval services in all principal cities and in all ports in tropical America. Protection test surveys should be made to outline the recent distribution of yellow fever. There should be routine collection and examination of liver specimens in rapidly fatal febrile cases from all parts of possibly epidemic areas. A careful study is advisable of all places shown to be infected by the examination of liver tissue, with especial reference to the possibility of vectors other than *Aedes aegypti* and of vertebrate hosts other than man. Finally, antilarval services should be introduced in all towns and villages in and about known infected areas.

THE DEBATE ON STATE MEDICINE

This year the extension divisions and departments of speech of a considerable number of universities and colleges as well as the debating associations of the high schools and similar institutions in many states have chosen as their topic "Resolved, That the several states should enact legislation providing for a system of complete medical service available to all citizens at public expense." Since the announcement of this subject, the headquarters office of the American Medical Association and the offices of many state medical associations have been almost overwhelmed with requests for material, particularly on the negative side of this subject. The Bureau of Medical Economics of the American Medical Association has prepared a large number of pamphlets, which are available without cost to those who require them in these discussions. A tremendous number of these pamphlets have already been sent to many parts of the United States. In addition, debaters' handbooks have been prepared by several organizations, presumably with a view to presenting both sides of the subject adequately and thus being useful to the debaters on both the affirmative and the negative side. The headquarters office and the officials of the American Medical Association have cooperated with those preparing these handbooks, making available for the debaters the point of view of organized medicine.

An analysis of these debaters' manuals brings out some interesting facts. The one prepared by Julia E.

Johnsen¹ on "Socialization of Medicine," circulated by the H. W. Wilson Company, provides good outlines on both the affirmative and the negative side and then presents a general discussion and affirmative and negative references. The general discussion, which occupies 177 pages, is entirely devoted to articles by persons who are known to be proponents of compulsory health insurance. The negative references include articles by John A. Kingsbury and Rufus Rorem, who certainly would not be considered favorable to the point of view of the medical profession.

The Ninth Annual Debate Handbook,² edited by Bower Aly, includes two volumes. In volume I, 112 pages are devoted to the affirmative and fifty-eight pages to the negative, twenty-one pages are presumably impartial. In volume II, ninety-seven pages are devoted to the affirmative and sixty-two to the negative, with sixteen apparently impartial. Incidentally, this volume and all the others indicate that the American College of Surgeons favors compulsory sickness insurance, notwithstanding the fact that the governors of the college have specifically denied this allegation.

The third volume available for the debaters is entitled "Free Medical Care,"³ and is compiled and edited by E. C. Buehler. This volume also would seem to make available far more material on the affirmative than on the negative side, including much the same material that is contained in the Aly handbook. This volume, however, would seem to have developed a better bibliography and a better selection of material than is found in the others mentioned.

On November 12, at 2 o'clock eastern time, a trial debate is to be held over the network of the National Broadcasting Company. For the affirmative the speakers are William T. Foster and Bower Aly. Mr. Aly, it will be remembered, is the man who prepared the handbook already mentioned. For the negative the speakers are Dr. R. G. Leland, director of the Bureau of Medical Economics of the American Medical Association, and Dr. Morris Fishbein, editor of *THE JOURNAL*.

Physicians should recognize the exceeding significance of these debates and their effect on the American public. President Roosevelt has said, at least so Mr. Moley affirms, that there will be no attempt at a program of compulsory health insurance until public sentiment has crystallized in that direction. In the crystallization of public sentiment much will depend on this nation-wide series of debates, which will influence not only the minds of the adults of the next generation but those of hundreds of thousands of persons who will listen to the debates as they are publicly presented in innumerable villages, towns and cities. Physicians will

¹ Johnsen, Julia E. *Socialization of Medicine* (The Reference Shelf vol. 10 number 5). New York: H. W. Wilson Company, 1935. 90 cents.

² *Socialized Medicine. The Ninth Annual Debate Handbook—1935-1936*, vols. I and II, Edited by Bower Aly. Columbia Mo.: Lucas Brothers, 1935.

³ Buehler, E. C. *Free Medical Care* (Debater's Help Book vol. II), New York, Noble & Noble, 1935.

do well to give all the aid they possibly can give to young men and women who are participating in these debates and who come to them for help and advice. The American Medical Association will gladly send to any physician, on request, pamphlets and other material listed below, which may be used by the physician for his own information and which may be given to the debaters to aid them in the preparation of their discussions.⁴

TRANSPORT OF CARBON DIOXIDE BY THE BLOOD

According to the theory that has prevailed since 1928, carbon dioxide is transported by the blood chiefly in the form of bicarbonate in the cells and plasma and is released in the lungs largely as a result of the chemical decomposition of this compound. However, as pointed out in a recent review,¹ further experimental work conducted during the last few years has shown that not all the facts are satisfactorily explained by this hypothesis. First, the liberation of carbon dioxide in the lungs is far too rapid to be attributed to a simple release of the gas from bicarbonate; this process would involve the dehydration of the intermediary product, carbonic acid, a reaction known to proceed too slowly to occur in the short interval of time, probably one second or less, required for the erythrocyte to traverse the length of the pulmonary capillary. Furthermore, the "1928 theory" does not take into consideration the presence and possible physiologic significance of bound carbon dioxide in forms other than carbonic acid and bicarbonate.

Critical consideration of these points has developed chiefly as a result of the observation in 1928 that the release of carbon dioxide from serum alone was extremely slow, whereas, on the addition of erythrocytes, the process was rapid.² Two possible explanations of the phenomenon were suggested that some substance was present in the red cells which catalyzed the dehydration of carbonic acid and hence the libera-

tion of carbon dioxide from bicarbonate, or that some rapidly dissociable compound of carbon dioxide, probably with hemoglobin itself, was present in the erythrocyte. Subsequent investigations, chiefly those of a group of English physiologists,¹ have supported both these explanations. Indeed, an active catalyst for the dehydration of carbonic acid has been obtained from erythrocytes and has been purified to 2,000 times its original activity. The purest preparations³ exhibited certain physical and chemical properties characteristic of the group of organic catalysts, the enzymes. They gave the usual protein tests and were thermolabile, non-dialyzable, sensitive to p_H changes, and inactivated by the salts of heavy metals and by cyanide. Because of its action in removing water from carbonic acid to yield carbon dioxide, this enzyme has been named "carbonic anhydrase." It has been estimated that this enzyme speeds up the rate of liberation of carbon dioxide in the lungs at least 150 times.

The second explanation suggested by Henriques, that some readily dissociable compound of carbon dioxide, probably with hemoglobin, exists in the erythrocyte, received definite support by the observation⁴ that carbon dioxide is liberated at a considerably faster rate from whole blood treated with cyanide, to abolish the effect of carbon anhydrase, than from serum alone. The fact that the carbon dioxide was bound to hemoglobin was suggested by the observation that the compound was affected reversibly by oxygenation and reduction. Further experiments with purified hemoglobin equilibrated against carbon dioxide under physiologic conditions of temperature and p_H substantiated this belief. The amounts of carbon dioxide bound were affected by oxygenation and reduction as before and varied directly with the concentration of hemoglobin in the solution. Additional work indicated that the carbon dioxide was bound to hemoglobin by a carbamino type of linkage. This compound has been named "carbhemoglobin," a term suggested by Bohr in 1909. According to the calculations of the English investigators,¹ although only 5 to 10 per cent of the total carbon dioxide of the blood is bound to hemoglobin, carbhemoglobin is responsible for approximately 20 per cent of the gas actually freed in the lungs because of the completeness and rapidity with which this compound releases carbon dioxide. Recent preliminary data¹ have indicated that some carbon dioxide also may be bound to hemoglobin as bicarbonate.

If the active participation of the enzyme carbonic anhydrase and the compound carbhemoglobin in the transport and exchange of carbon dioxide as herein described is adequately confirmed, a new concept of

4 Material for distribution to students on the socialization of medicine
For free distribution

- 1 Some Defects in Insurance Propaganda
 - 2 A Critical Analysis of Sickness Insurance
 - 3 Sickness Insurance Not the Remedy
 - 4 Sickness Insurance Catechism
- Obtainable from the American Medical Association
- 1 An Introduction to Medical Economics 15 cents
 - 2 A Handbook of Sickness Insurance State Medicine and the Costs of Medical Care 40 cents
 - 3 Collecting Medical Fees 10 cents
 - 4 Contract Practice 10 cents
 - 5 The Cost of a Medical Education 10 cents
 - 6 Income from Medical Practice (with supplement) 15 cents
 - 7 Some Phases of Contract Practice 10 cents
 - 8 Medical Relations Under Workmen's Compensation 75 cents
 - 9 Group Practice 15 cents
 - 10 New Forms of Medical Practice 15 cents
 - 11 Health Insurance in England and Medical Society Plans in the United States 5 cents
 - 12 Prepayment Plans for Hospital Care 5 cents
 - 13 Group Hospitalization Contracts are Insurance Contracts 10 cents
 - 14 Care of the Indigent Sick 50 cents
 - 15 Distribution of Physicians in the United States 50 cents
- 1 Roughton F J W Recent Work on Carbon Dioxide Transport by the Blood, *Physiol Rev* 15: 241 (April) 1935
- 2 Henriques O N Die Bindungsweise des Kohlendioxyds im Blute *Biochem Ztschr* 200 1 (Sept 30) 1928

- 3 Meldrum N U and Roughton F J W Carbonic Anhydrase Its Preparation and Properties *J Physiol* 80: 113 (Dec) 1933
- 4 Meldrum N U and Roughton F J W The State of Carbon Dioxide in Blood *J Physiol* 80 143 (Dec.) 1933
- Ferguson J K W and Roughton F J W The Direct Chemical Estimation of Carbamino Compounds of Carbon Dioxide with Hemoglobin *ibid* 83 68 (Dec) 1934
- The Chemical Relationships and Physiological Importance of Carbamino Compounds of Carbon Dioxide with Hemoglobin *ibid* p 87

this mechanism, similar to that recently suggested,¹ must be drawn. Perhaps the recent developments in this field will serve to initiate "a revolution in the chemistry of carbon dioxide transport."

Current Comment

INFANTILE PARALYSIS VACCINES

The most sensational feature of the scientific discussions at the meeting of the American Public Health Association, held in Milwaukee last week, was the presentation of papers and discussions of these papers on vaccines used for immunization against poliomyelitis. The vaccines now before the medical profession include those of Kolmer and of Brodie. Significant contributions on the development of these vaccines by these investigators have appeared from time to time in *THE JOURNAL*. After the investigators had presented the results of their observations, the value of these preparations was strongly deprecated in discussions in which Rivers of the Rockefeller Institute and Leake of the United States Public Health Service participated. Thus Rivers asserted, and in his contention Leake participated, that the Kolmer vaccine was dangerous because of the presence of free virus and that the Brodie vaccine was without demonstrated value and theoretically could not be of value. It must be remembered that monkeys have previously been injected with subinfective amounts of living virulent virus and yet not immunized against a fatal dose of virus. Moreover, it has been contended that, in some of the patients who developed infantile paralysis following the use of the Kolmer method, the paralysis was due to the free virus in the vaccine. To this Kolmer replies that the time of inoculation was too long after the exposure to permit any one to know whether or not the infantile paralysis was primary or associated in any way with the injection of the vaccine. Certainly more experimentation and clinical evidence must be made available before any one can say whether or not either of these preparations has real value in the prevention of infantile paralysis.

THE TREND IN DEVELOPMENT OF PUBLIC HEALTH SERVICE

In view of the lavish appropriations of money to be expended by and distributed among public health officials, recently authorized by our federal government, the trend toward acceptance of state control of medical care among these officials is not surprising. For years both physicians and public health officials have urged greater appropriations for public health. They now find themselves in the position of a starving man suddenly seated at a ten-course banquet. There is too much food for possible digestion and the end result is certain to be a "stomach ache." It is no secret that health officers in high positions are in a dilemma as to the disposition of the money now to be showered on them. Neither the personnel nor the projects have been developed for suitable spending of these appro-

priations. The announcement has been made that a survey of 750,000 families is to be conducted by the United States Public Health Service to determine the status of their health and the care given to them in disease. Yet the opinion has already been ventured by the assistant secretary of the treasury in charge of the United States Public Health Service that the answer to this survey is apparent. It is said that evidence is available to indicate that a large number of the population are not receiving adequate medical care and that great numbers of those on relief were also given inadequate medical service. This statement coming from the official responsible for the survey and in advance of the time when the survey is to be conducted offers at least the suspicion that the project is not wholly a scientific venture. Is it perhaps a means of giving employment to 30,000 unemployed that makes it appeal primarily to federal officials or is it intended as propaganda leading toward bureaucratic and state medicine? The medical profession will view the progress of the survey somewhat warily. Such an experiment should certainly be analyzed as to its significance and its control.

Medical Economics

THREE CENTS A DAY FOR HOSPITAL INSURANCE IN NEW YORK CITY

WALTER T. DANNREUTHER, M.D.

Vice President and Director, Associated Hospital Service of New York
NEW YORK

At the 1933 meeting of the Medical Society of the State of New York, a special committee on the costs of medical care of which Dr. Arthur W. Booth was chairman, presented a report to the house of delegates recommending the adoption of seven specific propositions. This report was unanimously accepted and has been the responsible factor for several constructive efforts on the part of the local medical profession to lessen the costs of medical care for patients of moderate means, as well as to provide for adequate compensation for the physician under all circumstances. Proposition 3 of the Booth report read as follows:

There is in every community a group of people below the comfort level on whom the costs of medical care impose a heavy burden. These are self-respecting people of the salaried class in most instances whose living expenses are met from their weekly earnings. For them the greater part of medical costs comprise charges for hospital and nursing care.

To lessen the burden of hospital and nursing care for this wage-earning group, your committee recommends the adoption generally of a plan of hospital insurance whose principles may be stated as follows:

(a) Members of employed groups may receive for the payment of a small annual sum hospital care in semiprivate accommodations for a period of twenty-one days in any one year, such care to include bed and board, general nursing service, x-ray and laboratory examinations.

(b) All reputable voluntary hospitals and some proprietary hospitals shall be entitled to participate in this plan.

(c) Except in emergencies, all admissions of patients cared for under this plan must be made through the patient's personal physician.

(d) Certificates of membership issued to subscribers shall state specifically that the service does not cover the fee of the patient's physician.

(e) In each community under the supervision of its organized medical group there shall be developed the details of this plan so as to meet local conditions and make it workable.

The United Hospital Fund of New York, which includes in its membership fifty-five of the largest voluntary hospitals in Greater New York, thereupon assumed the responsibility of creating the necessary corporation to provide for the practical application of these principles but found that it could not do so without the enactment of special legislation, because of existing insurance laws. A bill, known as the O'Brien bill,

Assembly Introductory No 1710, to amend the insurance law and the membership corporation law, in relation to nonprofit hospital service plans, was introduced and quickly passed during the 1934 session of the New York State Legislature. Two important provisions of this bill are

At least a majority of the directors of such corporation must be at all times directors or trustees of hospitals designated in section four hundred and fifty-two of this article which have contracted or may contract with such corporation to render to its subscribers hospital service.

Any corporation subject to the provisions of this article may enter into contracts for the rendering of hospital service to any of its subscribers only with hospitals maintained by the state or any of its political subdivisions or maintained by a corporation organized for hospital purposes under the laws of this state or such other hospitals as shall be designated by the state department of social welfare for such purpose.

Immediately after the enactment of the O'Brien bill the United Hospital Fund sponsored the incorporation of the Associated Hospital Service of New York, which includes in its voting membership

All the trustees of the United Hospital Fund of New York
President of the Hospital Conference of the City of New York
President of the Medical Society of the State of New York
President of the Medical Society of the County of New York
President of the Medical Society of the County of Kings
President of the Medical Society of the County of Queens
President of the Bronx County Medical Society
President of the Medical Society of the County of Richmond
President of the New York Academy of Medicine
President of the Brooklyn Hospital Council

In October 1934 the Coordinating Council of the Five County Medical Societies of Greater New York, which is composed of three officers from each county society, including its president, was requested to designate one of its members to represent organized medicine on the board of directors of the new corporation. The writer, then president of the Medical Society of the County of New York, was elected to this position and is the only physician on the board of eleven directors. While the plans for the details of the contracts with both hospitals and patients were being formulated, I insisted first that the recommendations of the Booth report be rigidly followed; secondly, that the existing relationship between physician and patient remain undisturbed; thirdly, that none of the provisions of the contracts should alter the relationship of the physician to his hospital, and, fourthly, that all proprietary hospitals in the city that could conform with certain standards for private institutions set up by the commissioner of hospitals, and then secure the endorsement of the state department of social welfare, be invited to participate in the operation of the plan. Some safeguard, such as the last, is essential in a large city in which many hospitals are 'closed'—otherwise, physicians who are not staff members of the larger institutions would suffer an injustice and would find themselves tremendously handicapped in hospitalizing insured people. It is a pleasure to record the sympathetic attitude of the other members of the board of directors to these principles throughout all the preliminary negotiations, as well as the fact that the contracts in their final form do not violate any of the objectives of organized medicine in a single particular.

The insurance plan of the Associated Hospital Service of New York is quite similar to those of other organizations which have been functioning successfully in various cities in Texas, in Newark, N. J., and elsewhere. The cost to the subscriber is \$10 a year or 90 cents a month. Reducing the premium rate to its per diem cost suggested the slogan "hospital service when you need it for three cents a day." This hospital plan is an application of the group insurance principle. A minimum of ten persons constitute a group, and at least five of them must have been employed for the previous thirty days. Each one must subscribe to a statement that he or she is in normal health and is less than 65 years of age. There are no occupational restrictions or salary limitations. Within the first six months the Associated Hospital Service of New York has insured 20,000 persons.

The insurance policy offers hospital care for twenty-one days in semiprivate accommodations, in one or more admissions, general nursing care, routine laboratory examinations, ordinary roentgenograms, use of operating room, use of delivery room (only after ten months' membership), routine medications and dressings, and general anesthesia (when such service is supplied by salaried employees of the hospital). If the patient wishes to occupy a private room, he may do so only with the consent of the physician or surgeon. The plan provides for a discount of 25 per cent off regular hospital charges beyond the period of twenty-one days and allows a credit of \$4.50 a day on the price of a private room, if one is preferred to the semiprivate accommodations. The benefits are available immediately in cases of accident or emergency illness, and after ten days from the date of the first subscription payment for other illness, except pulmonary tuberculosis, venereal diseases, hospital care provided for under workmen's compensation laws, quarantinable diseases and mental disorders. When on vacation or other travel outside a fifty mile radius of New York, the insured individuals are entitled to benefits in case of accident or emergency illness. The benefits do not include hospital admission of ambulatory patients for laboratory or roentgen examinations, solely for diagnostic purposes.

The charges made by the patient's physician or surgeon or by special private nurses are not included. Although a patient can be admitted to a hospital only when referred to it by a physician, the plan does not confer staff privileges on any physician which he does not already enjoy.

Up to the present time about 146 hospitals in the New York area, including twenty proprietary institutions, have agreed to accept patients insured by the Associated Hospital Service. As it is a nonprofit organization, all the funds received from premiums are available for hospital distribution, except for modest office expenses, a small pay-roll, and the setting up of reasonable reserves. The hospitals agree to accept patients at a minimum rate of \$6 a day, but there are good prospects of this being increased to \$7 or \$8 in the near future. Either the hospital or the Associated Hospital Service may cancel the contract on thirty days' notice.

Experience with a similar plan in Newark, N. J., has demonstrated that 7 per cent of the insured individuals enter hospitals each year, that 21 per cent of these occupy private rooms, that 16 per cent have roentgen examinations and that 72 per cent are surgical, 22 per cent medical and 6 per cent accident cases. The plan has paid for one hospital day for every sixteen member months since it has been in operation.

The subscription agreement with any individual may be terminated by either party by giving twenty days' prior notice, provided a subscriber shall not then be applying or receiving hospital care.

There are two reasons for not fixing a low or upper salary limit of eligibility. First, because a subscriber might lose his employment or be promoted to a more remunerative position during an insurance year, thus changing his financial status, and secondly because it allows persons on different wage levels to organize a group. The omission of the physician's fee from the hospital insurance plan is really of advantage, as its inclusion would necessarily complicate matters and involve the adoption of a fee schedule. Since no fee schedule is applicable, the earning capacity of the subscriber can be the sole guide in making charges for professional services.

No patient is admitted to a hospital unless referred to it by a physician, and no hospital can select a physician for a subscriber. In fact, there is no special reason why a physician or surgeon should be aware of his patient's hospital insurance until after he has advised him or her to enter the hospital and made his private financial arrangements for his professional fees. A physician is of course under no obligation to render service to a patient who cannot afford to pay for it. The

patient selects the physician and the physician chooses the participating member hospital. There can be no interference from the employer.

The Associated Hospital Insurance plan has apparently won the approval of the local medical profession. The only complaint against the provisions of the contracts have come from the roentgenologists, who contend that it is impossible to define ordinary roentgenograms and who have been fearful that a few institutions may attempt to deprive the roentgenologist of his just due for his services rendered to insured patients. The inclusion of roentgen examinations conforms with the dictum of organized medicine as expressed in the Booth report. It must be remembered that the Associated Hospital Service can terminate the agreement with any hospital after thirty days notice, and the corporation realizes its obligation to the roentgenologist as well as to the institution. Should any hospital violate the good faith of the agreement at the expense of a physician, roentgenologist or otherwise the board of directors can strike it from the list of participating member hospitals.

A voluntary hospital insurance plan for people of moderate means which functions successfully should eliminate the demand for compulsory health insurance and stop the reintroduction of vicious sociological bills in the state legislature year after year. It should minimize the tendency of the low wage earner to pauperism and make the collection of doctors' bills from employed persons much easier.

580 Park Avenue

Association News

RADIO BROADCASTS

The American Medical Association broadcasts over the Blue network of the National Broadcasting Company at 5 p. m. eastern standard time (4 o'clock central standard time, 3 o'clock mountain time) each Tuesday, presenting a dramatized program with incidental music under the general theme of Medical Emergencies and How They Are Met. The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers a toast "Ladies and gentlemen, your health!" The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

The next three programs are as follows:

| | | |
|------------|------------------------------|-----------------------|
| October 22 | Asphyxiation | W. W. Bauer, M.D. |
| October 29 | Poisonous Plants and Insects | W. W. Bauer, M.D. |
| November 5 | Hemorrhage | Morris Fishbein, M.D. |

This program is broadcast also on the short waves through KDKA, Pittsburgh, over station W8AK, 11,870 and 15,210 kilocycles.

The Purpose of Menstruation—From this standpoint the endometrium is a very optimistic tissue indeed preparing month after month in every woman whether single or married for a possible pregnancy, with most frequently frustration of this hope and the occurrence of menstruation. This after all, is the underlying concept as to the significance of menstruation, i. e., that all the changes preceding the actual menstrual period are in the nature of a preparation for a fertilized egg, with casting off of the uterine surface and menstrual bleeding when fertilization does not occur. How different this concept from the still prevalent lay view that the purpose of menstruation is to rid the body of poisons and harmful materials!—Novak, Emil. *The Woman Asks the Doctor*. Baltimore, Williams and Wilkins Company, 1935.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

University News—The twenty-fifth anniversary of the inauguration of graduate studies will be celebrated by the University of Southern California with a three day conference beginning November 21. Group conferences will include the fields of social sciences, languages and literature, education, psychology, physical sciences, mathematics, biology and medical sciences, philosophy, history and international relations.

Dr. Leake Appointed Librarian—Chauncey D. Leake, Ph.D., professor of pharmacology, University of California Medical School, has been appointed librarian of the medical school to succeed Dr. Sanford V. Larkey, who was named director of the Welch Medical Library, Johns Hopkins University School of Medicine, Baltimore. For the present Drs. Leake, Langley Porter and Salvatore P. Lucia are continuing the work of the department under the chairmanship of Dr. Porter. Dr. Larkey, who was also chief premedical adviser, was succeeded in this position by Dr. Charles A. Noble, Jr.

Symposium on Heart Disease—The sixth annual graduate symposium on heart disease, under the auspices of the heart committee of the San Francisco County Medical Society, will be held November 20-21. There will be morning, afternoon and evening sessions at the University of California, San Francisco and Stanford University hospitals and at the department of public health. The course will cover diagnosis, prognosis and treatment. Advances in cardiology will be evaluated, and clinics with practical demonstrations will be held. Further information may be obtained from the secretary, Dr. John P. Strickler, 490 Post Street, San Francisco.

DISTRICT OF COLUMBIA

Hospital News—The Gallinger Municipal Hospital formally dedicated a new isolation pavilion, September 3. The new addition cost about \$500,000. Dr. Hugh S. Cumming, surgeon general, U. S. Public Health Service, gave the dedicatory address.

Tuberculosis Survey—Plans are being drawn up for a survey on tuberculosis in the District of Columbia, according to the *Bulletin* of the National Tuberculosis Association. The survey has been made possible by an appropriation of \$101,000 by the Works Progress Administration. The program will include physical examination, tuberculin tests and x-ray examination by the rapid paper film method.

Davidson Lecture—Dr. George C. Ruhland, health officer of the District of Columbia, will deliver the Davidson lecture of the Medical Society of the District of Columbia, November 13, on "The Newer Public Health." The lecture was established by the medical society as a tribute to Dr. Edward Young Davidson for initiating and guiding to a successful completion the project of building and owning its own home.

Society News—Drs. Charles Armstrong and Ralph D. Lillie addressed the Washington Society of Pathologists, October 5, on "Human and Experimental Aspects of Lymphocytic Choriomeningitis, a New Disease in Man." Bone tumors will be discussed by Drs. Charles F. Geschickter, Baltimore, and Claude Moore, at the meeting November 2.—The Louis Mackall Medical Society was addressed October 14, by Drs. Hill Carter on headache and Richard W. Wilkinson, peroral endoscopy.

GEORGIA

Dr. Rivers to Give Anderson Lecture—Dr. Thomas M. Rivers of the Rockefeller Institute for Medical Research, New York, will deliver the annual Lilly Heard Anderson Lecture in Pediatrics at the Academy of Medicine in Atlanta, November 14. His subject will be "Virus Diseases of the Central Nervous System."

Personal—Dr. Thomas F. Abercrombie, Atlanta director of the state department of public health, was reelected, September 18, to serve his fourth term.—Dr. Charles S. Jernigan, Sparta, has been appointed by the U. S. War Department to take charge of the medical service for the Civilian Conservation Corps in South Carolina.

Society News—The second clinical conference of the Georgia section of the Southeastern Surgical Congress was held in Royston, October 16—Dr Louis Smith, Lakeland, addressed the Lowndes County Medical Society, August 13, on "Pernicious Nausea and Vomiting"—Dr Leonard R Masengale read a paper before the Randolph County Medical Society in Cuthbert, September 5, on "Sickle Cell Anemia"—A symposium on tuberculosis was presented before the Fulton County Medical Society, Atlanta, October 3, by Drs Paul P. McCain, Sanatorium, N. C., George F. Klugh Sr., Albert Worth Hobby, Launcelot Minor Blackford, Joseph C. Massee, Benjamin H. Clifton and Champneys H. Holmes—At the annual meeting of the Fifth District Medical Society in Atlanta, October 17, speakers included Drs George H. Bunch, Columbia, S. C., on "Suppurative Pericarditis", Leland G. Baggett, Atlanta, "Transplantation of the Ureters into the Sigmoid," and Warren T. Vaughan, Richmond, Va., "Diagnosis and Treatment of Food Allergy"

IDAHO

State Medical Election.—Dr Dailey C. Ray, Pocatello, was chosen president-elect of the Idaho State Medical Association at its annual meeting in Boise, September 13. Dr Joseph H. Crampton Lewiston, as president, succeeding Dr Charles R. Scott, Twin Falls, will take office in January. Dr Harold W. Stone, Boise, was reelected secretary. Dr Ray graduated from the Hospital College of Medicine, Louisville, in 1902. He is 58 years of age. In 1933 he was a member of the state legislature.

ILLINOIS

Society News—The St. Clair County Medical Society was addressed, October 2, in Belleville by Dr T. Wistar White, St. Louis, on "Prevention and Treatment of Certain Communicable Diseases," and in East St. Louis, October 3, by Dr Charles B. Reed, Chicago, on "Questions Facing Medicine Today"—Dr Wendell D. Little, Indianapolis, discussed "Surgical Conditions of the Abdomen" before the Vermilion County Medical Society, Danville, October 1.

"Liberty Ball" Racket—Solicitation of funds for beneficiaries of the Veterans' Administration through 'liberty balls' and similar affairs has not been authorized according to a statement from Dr Thomas Hugh Scott, manager of the veterans' facility at Hines. This announcement was made so that the public may not be misled and induced by false representation to respond to telephone solicitation for the sale of tickets to affairs purporting to be for the benefit of "crippled soldiers" who are patients in the Hines institution.

Chicago

Dr Tatum to Lecture—Dr Arthur L. Tatum, professor of pharmacology, University of Wisconsin Medical School, Madison, will deliver an illustrated lecture on "Some Studies in Specific Arsenical Chemotherapy" at Thorne Hall, Northwestern University, October 25, at a joint meeting of the Institute of Medicine of Chicago and the Chicago Society of Internal Medicine.

The Belfield Lecture—Fred Conrad Koch, Ph.D., professor of physiological chemistry and chairman of the department of physiological chemistry and pharmacology, University of Chicago, will deliver the seventh annual William T. Belfield Lecture before the Chicago Urological Society at the Palmer House, October 24. Dr Koch's subject will be "The Biochemistry and Physiological Significance of the Male Sex Hormones."

Cancer Talks for Lay Persons—The Chicago Woman's Club, through its cancer research committee, will offer a series of talks on cancer on five consecutive Thursday mornings, beginning October 24. The course is intended particularly for lay women, it was stated. Dr Frank L. Rector, Evanston, Ill., field representative, American Society for the Control of Cancer, will present the first lecture on "The Story of Cancer." Other speakers will be

Dr James P. Simonds, professor of pathology, Northwestern University School of Medicine, October 31. Scientific Aspects of Cancer.
Maud Slye, director, cancer laboratory, Ohio S. A. Sprague Memorial Institute, University of Chicago, November 7. Transmission of Cancer Through Inheritance.

Dr Fred L. Adair, professor and chairman of the department of obstetrics and gynecology, University of Chicago, Cancer of Female Structures.
Dr Max Cutler, director, tumor clinic, Michael Reese Hospital, Cancer of the Breast.

Course on Psychogenic Organic Disturbances—The Chicago Institute for Psychoanalysis announces a special course for physicians engaged in research work on psychogenic organic disturbances. The course opened, October 1, with a lecture by Dr Walter L. Palmer of the University of Chicago on

"Physiology and Clinical Pathology of Peptic Ulcer, Ulcerative Colitis, and Functional Bowel Disturbances." Dr Palmer spoke October 8 and October 15. Other lecturers in the series are

Dr Ralph W. Gerard, University of Chicago, October 15. 22. 29. Recent Progress in the Physiology of the Nervous System (Action Potentials, Thalamus and Vegetative System).
Dr Ben Z. Rappaport, University of Illinois, October 22. 29. November 5. Allergy and Bronchial Asthma.
Dr Roy R. Grinker, University of Chicago, November 5. 12. 19. Clinical Pathology and Theory of the Epilepsies.
Broda O. Barnes, Ph.D., University of Chicago, November 26. December 3. Physiology of the Endocrine Glands.
Dr Solomon Strouse, Rush Medical College, December 10. 17. Clinical Pathology of Endocrine Disturbances.
Dr M. Herbert Barker, Passavant Hospital, January 7. 14. Physiology and Clinical Pathology of Essential Hypertension.
Dr Erwin P. Zeisler, Northwestern University, January 21. 28. Clinical Pathology of Eczema and Urticaria.

Society News—The Chicago Medical Society will be addressed, October 23, by Drs Frank J. Jirka, state health officer of Illinois, on "What the Medical Profession Can Do to Reduce Automobile Accidents", injuries to the head, spine, pelvis, chest and abdomen will be considered by Drs Adrien H. P. E. Verbrugghen, George G. Davis, William R. Cubbins and Roger T. Vaughan. A symposium on the eye will be presented before the society, October 30, by Drs Thomas D. Allen, Richard C. Gamble, Harry S. Gradle, Sanford R. Gifford, Frank E. Brawley, Samuel J. Meyer and G. Henry Mundt—Dr Ernst A. Pohle, Madison, Wis., discussed "Roentgen Therapy in Leukemia, Hodgkin's and Allied Diseases with Special Consideration of General Body Exposure" before the Chicago Roentgen Society, October 10. Dr Richard H. Jaffe spoke on "Bone Changes in Leukemia"—Speakers before the Chicago Tuberculosis Society, October 11 were Drs Frederick Tice and Allan J. Hruby on "Progress in Collapse Therapy"—The Chicago Pathological Society was addressed, October 14, among others, by Dr Percival Bailey on "Relationships of the Pathologist to the Clinic."—Economics was discussed at a meeting of the Chicago Society of Industrial Medicine and Surgery, October 16, by Drs Felix M. Jansey, Thomas P. Foley and John G. Frost.

KANSAS

Health at Kansas City—Telegraphic reports to the U. S. Department of Commerce from eighty-five cities with a total population of 37 million, for the week ended October 5, indicate that the highest mortality rate (18) appears for Kansas City and the rate for the group of cities as a whole, 10. The mortality rate for Kansas City for the corresponding week last year was 11.3 and for the group of cities, 9.9. The annual rate for eighty-five cities for the forty weeks of 1935 was 11.4, and the same rate appears for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

KENTUCKY

Society News—A symposium on treatment of syphilis was presented at a meeting of the Jefferson County Medical Society, Louisville, October 7, by Drs Adolph B. Loveman, Armistead M. Leigh and Winston U. Rutledge.—Dr Edward C. Rose, now Rochester, Minn., addressed the Third District Medical Society at a special meeting in Bowling Green, August 30, on infantile paralysis.

State Medical Election—Dr Joseph D. Northcutt, Covington, was chosen president-elect of the Kentucky State Medical Association at its annual session in Louisville, October 3. Dr Joshua B. Lukins, Louisville, was installed as president and the following were elected vice presidents: Drs Emmet F. Horine, Louisville, Gathiel L. Simpson, Greenville, and William H. Smith, Danville. Dr Northcutt is 51 years old and a graduate of the University of Louisville School of Medicine, class of 1908.

MICHIGAN

State Medical Election—Dr Henry E. Perry, Newberry, was chosen president-elect of the Michigan State Medical Society at its annual meeting in Sault Ste. Marie, September 25, and Dr Grover C. Penberthy, Detroit, was installed as president. Dr Clifford T. Ekelund, Pontiac, is the secretary. The next annual session will be held in Detroit in September. At this meeting, three physicians were made members emeritus: Drs John A. Wessinger, Ann Arbor, Alvin H. Rockwell and Edward Ames, Kalamazoo. It was voted to expand facilities for graduate study to Bay City and at some place in the

western part of the upper peninsula. Centers have been established at Grand Rapids, Kalamazoo and Flint. Dr. Perry graduated from the Michigan College of Medicine and Surgery in 1898 and from Northwestern University School of Medicine in 1904. He served a term in the state legislature and as president of the Upper Peninsula Medical Society.

MISSOURI

County Society Adopts "Washington Plan"—The St. Louis County Medical Society at a meeting, September 11, adopted a plan adapted from the "Washington (D.C.) Plan." It has been unanimously endorsed by the St. Louis medical and dental societies and plans are under way to organize the "Medical-Dental Service Bureau, Inc." A more comprehensive plan has been functioning for several months in the District of Columbia, with the approval of the Medical Society of the District of Columbia. Mr. Ross Garrett, coordinator of the medical economic security plans in Washington, who surveyed the conditions in St. Louis, will supervise the organization of the bureau.

Society News—The Kansas City Pediatric Society was addressed, September 12, by Drs. John Aull, Kansas City and Harold E. Petersen, St. Joseph, on "Fresh Cow's Milk in Infant Feeding" and "Nephrosis," respectively. Dr. Robert Lee Hoffmann was elected president of the Kansas City Urological Society, September 4, Dr. Arthur L. Osborn, vice president, and Dr. Tony G. Dillon, secretary. The Jackson County Medical Society was addressed, September 24, by Dr. Carroll P. Hungate, Kansas City, on "Infections of the Hand." Dr. Dayton Rusby Seabrough, Jackson, among others discussed spinal anesthesia before the Cape Girardeau County Medical Society in Jackson, September 9. At a meeting of the Randolph Monroe County Medical Society in Moberly, September 10, Drs. George H. Hoxie and Everett R. DeWeese, Kansas City, spoke on "Clinical Aspect of Early Tuberculosis" and "Roentgenologic Aspect of Early Tuberculosis," respectively.

NEBRASKA

Clinical Conference at Omaha—The third annual assembly of the Omaha Mid-West Clinical Society will be held in Omaha at the Hotel Paxton, October 28-November 1. The plans include general assemblies for morning and evening, lectures in the middle of the day and clinics in the afternoon and on the last day, ward walks and clinics at the Douglas County, St. Joseph's and University of Nebraska hospitals. Guest speakers who will address the general assemblies and conduct clinics will be:

- Dr. Joseph Brennemann, Chicago, Acute Conditions in the Abdomen in Childhood, Treatment of Empyema
- Dr. Jay Arthur Myers, Minneapolis, Research Advances in the Diagnosis and Treatment of Tuberculosis, Controlling Tuberculosis
- Dr. William B. Carrell, Dallas, Texas, Use of Cow Horn and of Internal Removal Fixation Devices in Treatment of Fractures of the Knee
- Dr. James R. Goodall, Montreal, Quebec, Toxemia of Pregnancy, Obstetric Emergencies and Sequelae
- Dr. Roy R. Grinker, Chicago, Problems of Meningitis, Central Regulatory Mechanisms
- Dr. Arthur C. Christie, Washington, D.C., Diagnosis and Treatment of Bronchiectasis, Cancer of the Mouth and Lip
- Dr. Russell L. Cecil, New York, Present Status of Pneumonia Therapy, Fever Therapy in Rheumatoid Arthritis
- Dr. Andrew C. Ivy, Chicago, Enterogastrolith—An Internal Secretion That Inhibits Gastric Secretion and Motility, The Therapy of Biliary Tract Disease from the Viewpoint of Applied Physiology
- Dr. Udo J. Wile, Ann Arbor, Common Pathologic Conditions of the Lips and Oral Cavity
- Dr. Vernon C. David, Chicago, Intestinal Obstruction Due to Lesions of the Large Bowel, Ulcerative Colitis from a Surgical Standpoint
- Dr. Arthur B. Cecil, Los Angeles, Genital Tuberculosis, Successful Operations in Hypospadias and Epispadias
- Dr. Edward C. Sewall, San Francisco, Sinusitis, Allergy and the Common Cold, Operative Technique in Sinusitis, External Approach

NEW YORK

Society News—Drs. Temple S. Fay and Walter I. Lillie, Philadelphia, addressed the Broome County Medical Society, October 1, in Binghamton, on "Common Cerebral Symptoms in Medicine and Surgery" and "Ophthalmological Signs and Symptoms in Cerebral Disease," respectively. At the quarterly meeting of the Ontario County Medical Society, October 8, speakers were Drs. Frederick S. Wetherell, Syracuse, on "Treatment of Persistent Nonbloody Vaginal Discharge," and Noah Stanley Lincoln, superintendent of Mount Morris Tuberculosis Hospital on the work of the hospital. Philip P. Jacobs, Ph.D., director of publications and extension, National Tuberculosis Association, New York, conducted an institute on tuberculosis at Jamestown, September 16-17, under the auspices of the Chautauqua County Tuberculosis and Health Association. Dr. Henry G. Bugbee, New York, addressed

the Onondaga Medical Society, Syracuse, October 8, on "Cancer of the Prostate." Dr. Oswald S. Lowsley, New York, addressed the Medical Society of the County of Westchester, Valhalla, October 15, on "Some Modern Phases of Urological Surgery and Diagnosis." The Western New York-Ontario Urological Society, a division of the American Urological Association, is holding its annual meeting in Geneva, October 19. Speakers include Drs. Charles C. Higgins, Cleveland, on "Further Observations on Experimental Production and Solution of Kidney and Bladder Stones," James C. McClelland, Toronto, "X-Ray Studies in the Diagnosis of the Kidney," and Stafford L. Warren, Rochester, "Heat Therapy in Urology." Drs. John Francis McGarrahan, Cohoes, and Harold P. McGan addressed the Albany County Medical Society, Albany, September 25, on "Significance of Dyspepsia" and "Treatment of Ambulatory Diabetes," respectively. The midyear meeting of the New York State Association of Public Health Laboratories will be held November 1 at the state laboratory in Albany.

New York City

District Medical Meeting—The First District Branch of the Medical Society of the State of New York held a meeting at the Hotel Pennsylvania, October 8, with the following speakers: Drs. John J. Moorhead on "Traumatic Surgery," Hugh Auchincloss, "Hand Destruction and Construction," George M. MacKee, "Some Dermatoses, Their Origin and Treatment," and Byron P. Stookey, "Vertebral and Associated Spinal Cord Injuries."

Personal—Dr. Currier McEwen, assistant dean, secretary and assistant professor of medicine of New York University College of Medicine, has been appointed to the medical board of the New York City Employees' Retirement System. Dr. Gerard L. Moench will address the German Gynecological Society at a meeting in Munich, October 23-26, on human fertility. Dr. Charles F. McCarty, formerly director of physical therapy in the New York City Department of Hospitals, has been appointed director of the medical and nursing service of the Emergency Relief Bureau. Drs. Charles Ward G. Crampton and Moses Keschnr were appointed by the Medical Society of the State of New York as delegates to a state conference on crime called by Governor Lehman, September 30-October 3.

Columbia University News—At the opening of the academic year at Columbia University, the following appointments to the faculty of the College of Physicians and Surgeons were announced:

- Dr. Harold Alexander Abramson, assistant professor of physiology
- Dr. Cornelius G. Dyke, assistant professor of radiology
- Dr. Albert Victor Hardy, assistant professor of epidemiology
- Dr. Charles Wadsworth Schwartz, associate professor of radiology

At the Neurological Institute it was announced that Dr. Nolan D. C. Lewis, director of laboratories at St. Elizabeth's Hospital, Washington, D.C., has been appointed assistant medical director of the institute in charge of clinical and clinicopathologic research and professor of neuropathology in the College of Physicians and Surgeons.

Public Lectures at the Academy—Dr. Howard W. Haggard, associate professor of applied physiology, Yale University, New Haven, Conn., will give the second public lecture in the new series sponsored by the New York Academy of Medicine, November 14, on "Medicine in the Days of the Great Monarch." Future lecturers in the series will be:

- Dr. Alexis Carrel, Rockefeller Institute for Medical Research, The Mystery of Death, December 12
- Dr. Harlow Brooks, Medicine of the American Indian, January 9
- Dr. Benjamin P. Watson, How We Learned About the Human Body, February 13
- Dr. Foster Kennedy, The Organic Background of Mind, March 12
- Elmer V. McCollum, Sc.D., Baltimore, The Story of Vitamins, April 9
- Dr. George Draper, Man—The Common Denominator of Disease, May 14

The first lecture in this series was given by Dr. Walter B. Cannon, Boston, October 3, on "The Wisdom of the Body."

NORTH CAROLINA

Society News—Drs. Byrd C. Willis, Rocky Mount, and Duncan R. McEachern, Wilmington, addressed the Third District Medical Society at Wilmington, September 6, on "Gunshot Wounds in the Abdomen" and "Gas Bacillus Infection," respectively. Dr. Thomas C. Bost, Charlotte, addressed the Mecklenburg County Medical Society, Charlotte, September 3, on "Intestinal Polypsis." The Eighth District Medical Society met at Greensboro, September 24, with the following speakers, among others: Drs. James Asa Shield, Richmond, Va., on "Causes and Treatment of Vertigo," James P. Leake of the U.S. Public Health Service, Washington, D.C., "Summary of the Poliomyelitis Situation," and Edward J. G.

Beardsley, Philadelphia, "A Physician's Opportunities and Responsibilities"—Dr Walter R Johnson, Asheville, addressed the Forsyth County Medical Society, Winston-Salem, September 10, on peptic ulcer—Dr Beverly Douglas, Nashville, Tenn., addressed the Buncombe County Medical Society, Asheville, September 16, on "Plastic Surgery of the Face."

OHIO

Toledo Postgraduate Day—The Medical Institute of the University of Toledo announces its second annual Postgraduate Day, to be held November 8, in Doermann Auditorium. The subject will be cardiovascular renal disease, discussed by Drs Paul Dudley White, assistant professor of medicine, Harvard University Medical School, Boston, and Alfred Stengel, professor of medicine, University of Pennsylvania School of Medicine, Philadelphia.

PENNSYLVANIA

State Medical Election—Dr Maxwell J Lick, Erie, was chosen president-elect of the Medical Society of the State of Pennsylvania at the annual meeting in Harrisburg, September 30-October 3, and Dr Alexander H Colwell, Pittsburgh, was installed as president. Vice presidents elected were Drs Harvey F Smith, Harrisburg, Frank A. Lorenzo, Punxsutawney, Walter J Stein, Ardmore, and Francis A Faught, Philadelphia. Dr Walter F Donaldson, Pittsburgh, was elected secretary for his eighteen-month term. The next meeting will be held in Pittsburgh, Sept. 28-Oct 1, 1936.

Philadelphia

Seminars on Anesthesia—A series of graduate seminars on anesthesia presented under the auspices of the Philadelphia County Dental Society in collaboration with the Philadelphia County Medical Society was begun October 18 with a clinic in the afternoon by Dr Charles L Brown and an address in the evening by Dr Edward Lodholz, on "The Biological Nature of Anesthesia." Coming events in the series are:

- October 25 Dr Carl F Schmidt Physiologic and Pharmacologic Aspects of Anesthesia Clinic by Dr Henry K Mohler
- November 1 Dr Ralph M Waters Madison Wis Inhalation Anesthetic Agents Clinic by Drs John H Gunter and Edward W Beach
- November 8 Dr Philip D Woodbridge Boston Signs and Symptoms of General Anesthesia Clinic by Drs John D Reese John A Stiles and Henry S Ruth
- November 15, Dr Emery A Rovenstine New York, Inhalation Anesthetic Methods Clinic by James R Cameron DDS and Dr Frederick W Clement Toledo Ohio
- November 22, Dr John S Lund Rochester Minn Regional Anesthetic Agents and Methods Clinic by L Wallace Ohl DDS, Pittsburgh

Pittsburgh

University Appointments—Dr Stanley S Smith, associate professor of ophthalmology, University of Pittsburgh School of Medicine, has been appointed professor to succeed Dr William W Blair. Dr George J Wright has been made professor of neurology to succeed the late Dr Thomas M T McKennan.

Society News—The first fall meeting of the Allegheny County Medical Society, October 15, was devoted to a discussion of intestinal obstruction, with Dr John W Stinson as the essayist.—Speakers at a meeting of the Pittsburgh Academy of Medicine, October 8, were Drs Ralph H Harrison, on "Misconception and Mismanagement in Cancer of the Breast," and James M Strang, "Use of Dimitrophenol in Obesity."

WASHINGTON

Hospital News—The John Bruining Memorial Hospital was recently dedicated at Dayton, it has twenty beds.—Dr Philip Narodick, Seattle, has been appointed medical director of the King County Tuberculosis Hospital.

Personal—Dr Lynne A Fullerton has recently been appointed medical inspector in the Indian Medical Service with headquarters in Spokane.—Dr George A LeCompte, Shelton, has been appointed health officer of Mason County, succeeding Dr William M Beach, Shelton.

Society News—Drs Kenneth K. Sherwood, Kirkland, and Otis F Lamson, Seattle, addressed the King County Medical Society, Seattle, September 16, on "Practical Value of the Sedimentation Test, Especially in Arthritis" and "Sarcoma of the Stomach," respectively.—A regional meeting of the American Academy of Pediatrics was held in Seattle, August 9-10. Papers were presented by Drs Arthur E Wade, Herbert E Coe and Edward A. LeCocq, Seattle, Lendon Howard Smith and Winfred H Bueermann, Portland, Ore., Edwin J Barnett, Spokane, Alfred Howard Spohn, Vancouver, B C, and Franklin P Gengenbach, Denver.

WEST VIRGINIA

Society News—Dr James Lewis Blanton, Fairmont, addressed the Harrison County Medical Society, September 5 at Clarksburg, on "The Use of Vaccines and Serums in the Prevention of Infectious Diseases"—Dr Cecil Striker, Cincinnati, addressed the Cabell County Medical Society, Huntington, September 12, on "Clinical Management of Diabetes Mellitus and Some of Its Complications"—Dr Edgar F Heiskell, Morgantown, was elected president of the Hospital Association of West Virginia at its annual meeting in Parkersburg, September 5-6.—The Society of Industrial Physicians and Surgeons of West Virginia held its annual meeting in Charleston, October 4, speakers included Drs Walter G Stern, Cleveland, who conducted a symposium on fractures and presented a paper on "The Estimation of Disability from an Orthopedic Standpoint," and Moritz F Petersen, Charleston, "The Allergy Problem in Industry"—Dr George Ralph Maxwell, Morgantown, was reelected president of the West Virginia Tuberculosis Association at the annual session in Morgantown, September 5-6. Among other speakers, Dr David Salkin, Hopemont, discussed therapeutic value of social and vocational guidance for sanatorium patients.—Dr Joseph Earle Moore, Baltimore, addressed the Ohio County Medical Society, at the first fall meeting at the Ohio Valley General Hospital, Wheeling, September 27, on "Treatment of Early Syphilis in Relation to Public Health Control"—Dr William R Counts, Kyle, addressed the McDowell County Medical Society, Welch, September 11, on treatment of gonorrhea.—Dr Charles C. Higgins, Cleveland, addressed the Kanawha Medical Society, Charleston, September 10, on "Production, Prevention and Treatment of Urinary Calculi."

WISCONSIN

State Medical Election—Dr Stephen E Gavin, Fond du Lac was named president elect of the State Medical Society of Wisconsin at the annual meeting in Milwaukee, September 19, and Dr Ralph M Carter, Green Bay, was installed as president. The next annual meeting will be held in Madison. Dr Gavin was graduated from Rush Medical College, Chicago, in 1899.

GENERAL

Results of Examinations in Otolaryngology—Fifty-seven candidates took the examination of the American Board of Otolaryngology in Cincinnati, September 15. Of this number forty-two were certified and the remainder conditioned. The board will hold an examination in Kansas City, Mo., May 9, 1936, before the annual session of the American Medical Association and in New York in October 1936 before the meeting of the American Academy of Ophthalmology and Otolaryngology. Prospective applicants for certification should address the secretary of the board, Dr William P Wherry, 1500 Medical Arts Building, Omaha, for application blanks.

Fund to Study Dementia Praecox—A special committee of the National Committee for Mental Hygiene, at a meeting in New York, October 4, allocated for the study of dementia praecox a fund of \$40,000, which was donated by the Scottish Rite Masons, the New York Times reports. Laboratories, hospitals and clinics in the following cities were selected to receive parts of the grant to be used during the coming year: New York, Philadelphia, Baltimore, Boston, Albany, Providence, Chicago, Ann Arbor, Mich, Waverly, Mass, and Howard, R I. Plans for the campaign were laid a year ago when, at the request of the Scottish Rite Masons, the National Committee for Mental Hygiene undertook to investigate the possibilities for a frontal attack on the problem, the Times continues.

Neuropsychiatric Meeting in Topeka—The fourteenth annual convention of the Central Neuropsychiatric Association will be held in Topeka, Kan., October 25-26, under the presidency of Dr George W Hall, Chicago. Meetings will be at the Menninger Clinic and Sanitarium. Among speakers listed on the program are:

- Dr Benjamin Landis Elliott Kansas City Myasthenia Gravis
- Dr Samuel D Ingham Los Angeles Word Blindness and Associated Symptoms
- Dr Edward T Gibson Kansas City Automatic Writing of Verse Case Report
- Dr Robert P Knight Topeka The Psychodynamics of Chronic Alcoholism
- Dr Walter F Schaller San Francisco Evaluation of Character and Temperament in the Post Traumatic Psychoneuroses

At a luncheon Friday, at the Hotel Kansas, Gov Alfred M Landon will speak, and at a banquet Friday evening Drs Hall and Smith Ely Jelliffe, New York, will be the speakers.

Society News—Dr Elva A Wright, Houston, Texas, was elected president of the Southern Tuberculosis Conference at its annual meeting in Houston, September 16-18. Among

speakers at the conference were Drs Cameron St Clair Guild, New York, on "Tuberculosis in the Negro" and Martha M. Hot, Washington, D C, 'The Social Security Act and Its Relation to the Control of Tuberculosis in Children'—The fifth International Congress of Radiology will be held in Chicago, Sept 13-17, 1937 Dr Benjamin H Orndoff, 2561 North Clark Street, Chicago, is the general secretary—Dr Thomas Parran Jr, health commissioner of the state of New York was elected president of the American Public Health Association at the meeting in Milwaukee, October 9 Next year's meeting will be held in New Orleans—Dr Charles F Geschickter, Baltimore, was elected president of the American Association for the Study of Neoplastic Diseases at its regular fall meeting in Washington, D C, September 5-7 Dr Samuel W Budd, Richmond, Va, was named vice president The next meeting will be in Baltimore December 19 21

Bequests and Donations—The following bequests and donations to medical institutions have recently been announced

Presbyterian Hospital New York \$162 192 from the estate of Mary B Tollfree

St Agnes' Hospital for Crippled Children White Plains N Y \$18 000 by the will of Walter G Butler

Beth David Hospital New York \$1 000 under the will of the late Julius Nelson

Presbyterian Hospital Philadelphia \$1 000 by the will of Miss Eliza Beth Wright

Shriners Hospital for Crippled Children \$12 000 Rush Hospital for Consumption and Allied Diseases, \$2 000 Philadelphia by the will of the late Marie Redifer, Atlantic City

Orthopedic Hospital and Dispensary New York \$10 000 by the will of Mrs Harriet Crocker Alexander

St Luke's Hospital New York \$7 500 by the will of the late John Cunningham

Northern Westchester Hospital Mount Kisco N Y \$4 000 from the estate of the late Charles A Halstead, Mount Kisco

Yonkers (N Y) General Hospital \$2 000 by the will of William Heatherington

Woman's Hospital of Philadelphia \$3 000 from the estate of the late Dr Emma V Boone

Lankenau Hospital, Philadelphia will receive \$5 000 from the estate of Mrs Besse L Diedel after the death of an immediate legatee \$1 000 from the estate of Pauline Burges

Woman's Hospital Philadelphia the bulk of the \$12 000 estate of Miss Mary A Spain to endow a room to be occupied by public school teachers

Children's Medical Division of Bellevue Hospital New York, will ultimately receive most of the estate of Mrs Anna Phipps Tinker widow of the late Dr Horace H Tinker The estate was appraised at about \$250 000

Long Island College Hospital Brooklyn \$10 000 by the will of Mary Moore Orr

Episcopal Hospital Philadelphia \$30 000 to endow six free beds by the will of the late Mrs Annie B Moore

Pennsylvania Hospital Philadelphia \$12 000 by the will of the late Rebecca A Hough

The following Philadelphia hospitals received bequests in the will of the late Jacob Dreifus Jewish Hospital, \$30 000, Mount Sinai Hospital \$10 000 Jefferson Pennsylvania Friends University and Fred erick Douglass Memorial hospitals \$5 000 each Other beneficiaries were Misericordia and St Joseph's hospitals Atlantic City \$2 500 each Eagleville Sanatorium for Consumptives Eagleville Pa \$10 000

St Luke's and Children's hospitals Philadelphia \$10 000 by the will of the late Mrs Elizabeth Powell

American Oncologic Hospital Philadelphia \$5 000 by the will of Miss Mary E Hebard and about \$15 000 from the estate of Mary Ward Graham

CANADA

Personal—Dr Wallace W Cross, Hanna, has been appointed minister of health of Alberta—The division of hospitals and the department of health of Ontario at Toronto have been merged under the minister of health, Dr James A Faulkner, the former director of hospitals, Dr Bernard T McGhie, is acting deputy minister of health succeeding Dr William J Bell, retired Dr John W S McCullough chief inspector of health, retired after twenty-five years' service

Memorial Medal—In memory of the late Dr Frederick N G Starr, for many years professor of clinical surgery at the University of Toronto Faculty of Medicine, Mrs Starr has arranged for a gold medal to be awarded by the Canadian Medical Association to any member of the association who adds distinction to the profession by his attainment in science, art or literature. It will be awarded annually or when in the judgment of a committee the occasion arises for the distinction. Dr Starr was for several years general secretary of the association and president in 1927 He died in April 1934

CORRECTION

The Genesis and Control of Epidemics—In the editorial on "The Genesis and Control of Epidemics" (THE JOURNAL, September 21, page 968) the name "Topley" should be corrected to read "Webster" beginning on page 969, second column, twenty-sixth line, through the remainder of the paragraph Moreover quotation marks should surround portions of the material beginning on line twenty-six with the word "breeds", page 969 and continuing to the end of line ten, of column one, on page 970

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept 21, 1935

The Most Barbarous Perversion of Science

This country is much exercised about protecting the civilian population against air attacks At a meeting of the National Peace Council, which was attended by eminent scientists such as Sir F Gowland Hopkins, P R S, Earl Russell, F R S, Professor Soddy and Julian Huxley, the precautions taken by the government were criticized The council has issued a statement in which it views with apprehension the growing tendency in official quarters of this and other countries to accept the use of aircraft for unrestricted bomb and gas attacks on civil populations It considers this the most barbarous perversion of science and industry of human history and is sure that it would in a short time lead to the breakdown of civilized life Nothing short of abolition of aerial bombing can prevent this result The method (implicit in the British government's program) of countering air attacks by reprisals carries, in the view of the council, its own condemnation Our government's acceptance of this principle has already increased the apprehension of air attacks in western Europe Active defense by interceptive aircraft and antiaircraft guns can only produce casualties in the attacking force without preventing more than a small fraction of the possible damage The measures of passive defense proposed by the government—adaptation of rooms to render them gas tight, while they are unprotected against explosive or incendiary bombs, the purchase of cheap gas masks and the organization of casualty services—are pronounced grossly inadequate and calculated to produce a dangerous illusion of security Only some slight mitigation of casualties can thus be achieved The only passive defense likely to be efficacious technically is the construction of armored gas-proof shelters and the provision of closed-circuit oxygen gas masks and complete vesicant-proof suits for the whole population 'Not only would this be impossible because of the enormous cost involved but it would be an intolerable burden on the population and destroy all the possibilities for a better life which science rightly applied can offer

Not every one will completely accept these pessimistic conclusions, even though uttered by scientists of the highest eminence, who it may be remarked, produce nothing constructive. Such a practical people as the English always prefer action to theorizing The government is proceeding with its precautions Addressing a conference of the Institute of Fire Engineers on the morrow of the meeting described, Wing Commander E J Hodson, assistant undersecretary in charge of the air raids precautions department of the home office, stated that the measures which the government proposes to take to protect the civil population against air attacks will include the establishment of first aid and decontamination posts, casualty clearing stations, base hospitals, an intelligence service, and a school for training instructors in antigas measures Fire brigades are to be supplied with respirators and protective clothing The British Red Cross Society and kindred organizations will organize and staff first aid posts and decontamination posts The first aid posts will be located close enough together to enable persons to reach one quickly on foot. The base hospitals will be located as far as possible outside the danger zone and will be fed by the clearing stations Fire brigades will be trained in antigas measures, including decontamination of clothing and equipment For this purpose men will be trained as instructors at the gas school shortly to be established. Mr Hodson said that the authorities were confident that these measures would materially minimize the effects of air attacks

Improved Conditions of Service for Army Surgeons

There is a serious shortage of candidates for the Royal Army Medical Corps because of inadequacy of pay and restriction of professional opportunities. The subject was therefore investigated by a departmental committee, which has recommended a number of reforms, which have been accepted. It is proposed to increase the length of the career, to lower the age at which promotions take place and to increase the proportion of officers promoted to the higher ranks. All entrants will receive short-service commissions. After five years a surgeon will have the choice of retiring with a gratuity of \$5,000 or applying for a permanent commission. By substantial up-grading a surgeon will spend a larger part of his career in the higher ranks than formerly. If he joins at 25 and is granted a permanent commission, it is guaranteed that he will be a captain at 26 and a major at 35. Promotion to lieutenant colonel and colonel will be by selection, on an average of seventeen and twenty-five years respectively after joining. The career of the average officer will normally extend to the age of 57. If he joins at 25 his pay will be \$1,810 as lieutenant, at 26, \$2,235 as captain, at 35, \$3,105 as major, at 42, \$4,745 as lieutenant colonel, at 45, \$5,155 as lieutenant colonel, at 50, \$5,780 as colonel. This up-grading means improved pension rates. An officer who shows aptitude in any particular branch of his profession will have an opportunity of qualifying as a specialist and thereafter be employed in that branch for the greater part of his career.

A Six Months Baby

What is called "the smallest baby in the world" is to be seen at the Infants Hospital, Westminster. It is a six months baby which weighed at birth only 13 ounces, an ounce less than the previous record holder, a girl born in Surrey six years ago. The present baby is the son of a Newcastle plasterer and at the time of the report was 11 weeks old and weighed 3 pounds (instead of the 12 pounds normal for that age). He is growing rapidly and is expected to be of normal weight at the age of 18 months. Only about one six months baby in twenty survives. His cot is in a private room with the window open and he is kept at the normal temperature of 98.4 by means of an electric blanket. He is fed from a special bottle seven times a day and three times at night. His diet includes thyroid extract, calcium, extract of bone and vitamins. Most of his time is passed in sleep and he is under constant supervision. As a common cold would probably kill him, those who enter his room must wear a mask and gown. He is not bathed but his body is kept oiled. He has to be handled with extreme care.

Firewalking

A demonstration of firewalking, which is still practiced by natives of India at religious ceremonies, was given at Carshalton (near London) in the presence of members of the University of London Council for Psychical Research and some well known physicians. The firewalker was a young Indian, Kuda Bux, a Kashmiri Mohammedan, 30 years of age and weighing 8½ stone (54 Kg). He said that he first practiced firewalking at the age of 14 and that the fire did not harm him because of his faith. The fire was contained in two trenches 12 feet long, 6 feet wide and 8 inches deep. The materials used in preparing the fire included 7 tons of oak logs, a ton of firewood, a load of forest-burnt charcoal and 10 gallons of paraffin. When the demonstration was given the fire trenches had been burning for eight hours and the charcoal, which had been placed on the top, was fanned by a high wind to an intense heat, which was measured by a thermometer and found to be 800 F on the surface. Bare footed, Kuda Bux walked twice along these fire trenches, his feet making contact with the burning embers for some five seconds each time. After both walks his feet were examined by Professor Pannet, director of the surgical unit at St Mary's Hospital, who found no scorching or other trace of injury. Under the arch of the right foot he previously

placed a piece of court plaster, which was not even scorched. The temperature of the feet immediately after passing over the fire was found to be the same as before starting. Kuda Bux declared that he was not conscious of the heat as he walked over the fire, although he appeared to be as susceptible to the heat as other persons when standing near it. Professor Pannet said that there was no unusual toughness or thickening of the soles of the feet. Kuda Bux was invited to do the firewalk a third time, the full length of both trenches, but he asked to be excused. He appeared to be disturbed by the scientific tests and apparatus and the critical curiosity of the audience. His explanation was that "the faith" had gone out of him. Attempts to firewalk were then made by two young men but after a couple of steps on the embers they jumped off with their feet blistered. One was the editor of *St Bartholomew's Hospital Journal*. A physician present, who had seen the ceremony of firewalking in India, said that the test was made under unusually severe conditions, which would have deterred most firewalkers. The trench was shallower than was customary and with the high wind increasing combustion and blowing away the ash the heat was more intense and transmitted without any insulation. Though Kuda Bux boldly did the walk twice, he eventually seemed to realize that the conditions were too severe for him to do the firewalking properly. There was no question of any fake about what he did do. The circumstances of the performance rendered this impossible. But it is unsatisfactory that we are left with no explanation of the phenomenon within the sphere of physics or of physiology. Only that of "faith," given by Kuda Bux himself, is forthcoming. Perhaps something on the subject will be published by Professor Pannet or by other medical witnesses present.

Proposed National Oxygen Tent Service

The oxygen tent is regarded in this country as the most efficient means devised for the administration of oxygen, but it is not generally available. A number of leading teachers of the London hospitals have therefore sent a joint memorandum to the British Red Cross Society asking for help in rendering the tent more readily available in hospitals and in patients' homes. The society has responded by cooperating in the establishment of a national oxygen tent service. But before embarking on a complete scheme, which would involve much expense, the society wants to collect more data than are at present available on the value of the oxygen tent in various conditions. To obtain this it has placed an order for the construction of twelve sets of apparatus, which will soon be available. One tent will then be placed at the disposal of each of the principal London hospitals. The hospitals have been asked to make a trial of the tent over a period of not less than two months by keeping comprehensive records of the cases for which the tent has been used and reporting on the value of a national service. At the end of the trial the hospitals can acquire the tent by refunding the cost to the society. In its most modern form the tent is built on an adaptable frame and can be raised or lowered by means of a handle behind the bed. The patient is kept under observation through noninflammable celluloid windows.

The Treatment of Mental Disease

The annual report of the board of control, the body appointed by the government to control the administration of mental hospitals, records an increase in the number of voluntary admissions, which is reflected in a marked decrease of admissions under a certificate of insanity. The board expresses regret that the employment of whole-time resident chaplains in mental hospitals is now the exception, as these did valuable work by sympathy and encouragement. The report points out that occupational therapy is valuable not only as a method of treatment but also as a means of employing the so-called unemployables and so lessening their turbulence and destructiveness. But it must be under an occupational therapist who has made

a special study of the problem. A proposal to provide a huddling room for women patients at one hospital is noted with pleasure, as one of the first objects of treatment is to restore the patient's self respect, and few things are more fatal to a woman's self confidence than the consciousness that her hair is untidy. Comment is made also on the great progress in recent years in improving the dress of women patients. The need for increased provision for outdoor amusements for the younger patients and the value of drill and simple gymnastics for those incapable of organized games are mentioned. The total number of mentally defective patients in England and Wales who were in institutions and under guardianship, Jan 1, 1935, was 41,314, in addition, 33,377 patients were under statutory supervision.

PARIS

(From Our Regular Correspondent)

Sept 16, 1935

Vaccination Against Plague with a Living Virus

The results of vaccination against plague having been unsuccessful among the natives of the French colony in Madagascar, with a virus in which the organisms had been killed, an attempt has been made to use a living vaccine with the aid of the EV strain of bacilli. G. Girard reported his experience at the July 2 meeting of the Academy of Medicine of Paris. In a district of Madagascar in which there is a recrudescence of plague every year, 46,900 natives applied to be vaccinated between Oct. 10 and Dec. 20, 1934. No accident due to the vaccine was observed and the local reactions have never interfered with the daily occupations of the natives. Up to May 10, 1935, twenty-two deaths due to the plague were reported as occurring among those who had been vaccinated, and the general mortality was 225. Among the nonvaccinated (about 60,000 natives) there were 100 deaths from plague (1.66 per cent) and a total of 581 deaths (97 per cent). There were other deaths among the nonvaccinated that could not be determined bacteriologically because they occurred in remote districts.

The number of deaths among the vaccinated has been one-fourth that of the nonvaccinated. No case of the primary or secondary pulmonary form has been observed in the vaccinated. Septicemia is also less marked and the "buboes" contain so few visible organisms that it was necessary to make cultures to find them. Vaccination has been a marked step in advance. Its application depends on maintaining unaltered the characters of the EV strain, which up to the present time has not shown any variations.

Culture of the Bacillus of Leprosy

Since 1928, Vaudremer and Brun have been successful in cultures of the bacillus of leprosy. Some of these cultures have been reinoculated over a period of six years. At the June 25 meeting of the Academy of Medicine, the authors reported their results. The bacillus passes through the same stages of evolution as that of tuberculosis, viz., an initial granular form and bacillary nonacidoresistant and acidoresistant forms. These different forms depend on the culture medium and on the age of the cultures. In order that the leprosy bacillus may pass through such a developmental cycle, it is essential to employ the Raulin medium which has previously been utilized for the culture of *Aspergillus fumigatus* but in which the elements of the latter have been removed by filtration. The leprosy bacillus, taken from leprosy lesions, begins to develop in such a medium. One can then reinoculate it on various mediums and can obtain the characteristic acidoresistant form by inoculation on a 4 per cent glycerin-potato medium.

After two years study, Vaudremer and Brun found spore formation. The bacillus is agglutinated by the serum of lepers, which kill it in twenty-four hours. A vaccine prepared from

the bacillus has given satisfactory results in several clinics (Sezary, Touraine, Milhan). Bezançon in the discussion stated that he had been able to obtain some microcultures on a blood-gelose medium but could not obtain a growth on reinoculation.

Duodenal Diverticula and Chronic Pancreatitis

Two cases were reported at the June 19 meeting of the Société de chirurgie by Moure and Mialaret in which the etiologic role of diverticula of the second portion of the duodenum on the development of a chronic pancreatitis appears to be proved. The majority of such diverticula are observed on the concave aspect of this part of the duodenum and thus can exert pressure on the common bile and pancreatic ducts and produce a chronic inflammation of the head of the pancreas.

In the first case, a man of 48 had attacks of severe pain during six years at irregular intervals and without any relation to meals. The pain was localized in the epigastric region and radiated transversely. There was temporary relief following the use of belladonna. Radiography revealed a dilated duodenum with gastric stasis. Gastro-enterostomy was performed, as the condition found in the first portion of the duodenum led to the diagnosis of duodenal ulcer. Temporary relief followed, but a second intervention became necessary. At this operation a diverticulum 1 cm long and the thickness of the adult index finger was freed, followed by a duodeno-pylorotomy. The head of the pancreas was found enlarged and indurated. Complete cessation of all symptoms followed the operation.

In the second case, radiography revealed a diverticulum of the concave aspect of the second portion of the duodenum in a woman of 31 suffering from recurrent pain in the epigastric region. The diverticulum was freed and inverted, and this was followed by a duodenojejunostomy. There was no recurrence of the attacks of pain.

In the discussion, Baumgartner reported a case of chronic pancreatitis with icterus in a patient with a duodenal diverticulum. At operation the common duct was found dilated and was drained. The relief that was given by that simple drainage led him to believe that there is no relation between the pancreatic and biliary changes and the presence of a duodenal diverticulum.

Biliary Peritonitis Without Visible Perforation of Gallbladder

At the June 26 meeting of the Société de chirurgie, Salmon of Marseilles reported the case of a girl, aged 11 years, who had typhoid of four weeks' duration. The Widal reaction was positive. During her convalescence, sudden severe pain was felt in the right upper quadrant of the abdomen. Appendectomy had been performed when she was 6 years of age and there was a history of recurrent pain in the gallbladder region for a year preceding the attack of typhoid. On admission a diagnosis was made of acute typhoidal cholecystitis accompanied by typical symptoms of peritonitis.

When the abdomen was opened in the gallbladder region (under local anesthesia), bile stained fluid escaped and all the viscera of the upper part of the abdomen were seen to be covered with bile. There was no demonstrable perforation of the gallbladder, and only cholecystostomy was done. Cultures made from the contents of the gallbladder revealed the presence of large numbers of typhoid bacilli. The peritoneal fluid contained only *B. coli*. Recovery was uneventful. It is probable that the typhoid bacilli in the peritoneal fluid were killed by *B. coli*, according to the author. Biliary peritonitis without perforation is rare in children. Peritonitis as a complication of a typhoidal cholecystitis is not as rare. The passage of bacilli across the wall of an infected gallbladder is facilitated by the presence of intramural ecchymotic areas such as were found on the surface of the gallbladder in Salmon's case.

BERLIN

(From Our Regular Correspondent)

Aug. 19, 1935

Meeting of the German Phthisiologists

The annual session of the German phthisiologists brought a number of papers of general interest (It may be mentioned parenthetically that the combating of tuberculosis was referred to as now constituting a political duty.) Interest attaches to the experiences with the compulsory isolation station located in Thuringia, central Germany. A law of Thuringia, enacted in 1931, provides the application of certain compulsory measures, including restriction of personal liberty, in carrying on its crusade against tuberculosis. This law made it possible to compel tuberculous persons and also suspects to submit to an examination and, if desirable, to force them to accept isolation. As a detention home, in which patients may be kept even against their will, the government of Thuringia equipped a special department of a sanatorium (used otherwise for mental patients) in which, however, the treatment is confined to symptomatic and psychic measures. Since the institution was first opened, seven months ago, seventy-one patients have been admitted, forty-two being involuntary and twenty-nine voluntary inmates. The reasons assigned for such internment were asocial behavior, incorrigibility, homelessness, vagabondage, inadequate home surroundings, lack of domiciliary care, and in all cases the impossibility of segregating these patients other than in a "closed" institution in a manner that would not be a menace to their entourage. The number of tuberculous persons, who constitute a menace to the general welfare and who cannot be handled without compulsory isolation was estimated by Dr. Heisig of Weimar, the official representative of Thuringia, at from three to four to each 100,000 of population. The application of compulsory isolation is said to have increased the influence of the welfare organizations. In other provinces, or *länder* to be exact, from fifteen to thirty isolation beds per hundred thousand of population are considered necessary.

Kayser-Petersen of Jena discussed the "Importance of Superinfection in Tuberculous Disorders in Man." The effects of superinfection were described by reference to observations within the family (tuberculous infection in spouses being especially important), in the schools, in caring for tuberculous persons, in industrial plants and in health resorts for lung patients. The effects of superinfection on married couples are revealed by the statement that in about 10 per cent of married persons active tuberculosis occurs. Superinfection acts in marriage relationship commonly in the direction of an accentuation rather than a breakdown of resistance. Among the care-taking personnel the action of superinfection is confined to an increase of the tuberculin skin reaction. A lowering of the hygienic conditions leads to an increased morbidity. Superinfection is an important factor in tuberculous disorders. In some respects it has a favorable, protective, immunizing action, but in some cases, particularly in young children, it may in an especially contaminated environment, have an injurious effect.

Among the special topics that were discussed mention may be made of "Pregnancy in Relation to Tuberculosis," which was presented by Professor Hansen of Lubeck. His extensive research on the course of tuberculosis in women furnished no proof for the commonly accepted view that pregnancy exerts an unfavorable influence on the course of tuberculosis. He found that the course of tuberculosis can undergo a favorable or an unfavorable change during pregnancy. The treatment for pregnant tuberculous persons is the same as for the non-pregnant. Hansen is of the opinion that as a rule, the interruption of pregnancy on account of tuberculosis should be refused. Only in rare cases it might be indicated, when, in case the pregnancy was not interrupted, the application of a rational tuberculosis therapy would be impossible. The children of tuberculous mothers are biologically equal to the chil-

dren of healthy mothers of the same milieu. The intra uterine infection does not play an important part.

In the discussion, Lydtin of Munich reported that in a series of nineteen pregnant tuberculous women thirteen died within a year. Braeuning of Stettin, who has had wide experience as a phthisiologist, called attention to the grave struggles of conscience that face the physician called on to decide as to the need of an interruption of pregnancy. According to his observations, an exacerbation of the tuberculosis occurs, after completion of a pregnancy, in about 6 per cent of the women.

Average Duration of Hospitalization

As reported by Dr. Ernst Meier of the federal bureau of health there were 3,961,734 patients cared for in the hospitals of Germany in 1932 according to the hospital statistics for the German reich. The total number of days of hospitalization was 155,731,207. The total number of beds at the beginning and at the end of 1932 was 592,805. If that number is multiplied by 366 the number of days in the year, one gets 216,966,630 as the number of available days of hospitalization. Subtracting the number of actual days of hospitalization, it will be seen that 61,235,423 potential days of hospitalization were unused.

From the three units the number of patients cared for, the number of days of hospitalization, and the number of sick beds a survey of the relative utilization of the hospitals can be secured. In reality, however, the utilization of the hospital is subject to many irregularities. From computations made as accurate as possible, the following values for the hospitals of Germany in 1932 have been secured:

| | |
|---|-------------|
| Days of hospitalization | 155 731 207 |
| Vacant days | 61 235 423 |
| Number of patients admitted | 3 574 022 |
| Number of patients dismissed | 3 573 242 |
| Patient turnover (average of admissions and dismissals) | 3 573 632 |
| Average duration of hospital stay | 44 days |
| Vacant days per patient on basis of patient turnover | 17 days |

These computations are only a rough estimate, since they are based on the supposition that the flow of patients through the hospitals is always uniform. They furnish, however, a basis for the important question of the potential utilization of the beds with a given average number of days of hospitalization per patient. Since bed vacancies arise chiefly when there is a change of patients, the beds are better utilized, the longer the average hospital stay of the patients is. An institution that, from the nature of its function, must count on short hospitalization periods will always find it impossible to keep all its beds occupied, for all the fluctuations in the admissions due to the seasons and to changing epidemiologic and economic conditions affect the percentage of occupancy. On the other hand institutions with long hospitalization periods, in which the annual admissions in comparison with the total number of patients are small in number are much less affected by such fluctuations. Recently published hospital statistics for the German reich classify the hospitals according to their fields of endeavor. For the year 1932 the report contains statistics on 4,958 independent institutions (administrative units), which, however, are classified, according to their fields of activity, under 6,662 "institutions and departments." The institutions for the weakminded are far in the lead numerically. The average period of hospitalization for a weakminded person is five and one-half years. The average number of days that a sick-bed remains vacant, when a weakminded patient is dismissed, is eight months, but there are wide variations. Aside from the institutions for the feeble-minded, the only institutions whose patients have an average hospitalization period of more than one year are the psychopathic hospitals and the departments for mental patients.

A high number of vacant days for a change of patient is recorded for the institutions for alcohol addicts (seventy nine

days) and for tuberculous children (seventy-five days). The smallest number of vacant days following a change of patient, and at the same time one of the highest numbers of vacant days to a sick bed were recorded for the maternity departments. This is explained by the fact that parturients constitute the group having the shortest period of hospitalization of any individual patients. An obstacle to a more complete utilization of sick beds arises if an institution must be prepared in an emergency to accommodate temporarily a much larger number of patients than normally. Hence among the institutions having a high number of vacant days per sick bed are many that are compelled to have available a large number of beds in isolation wards for the benefit of contagious patients. The largest proportion of beds in isolation wards are found in the institutions and departments for cutaneous and venereal diseases (16 per cent of such beds, as of Dec 31, 1932). The next highest figures are found in the institutions for tuberculous adults and for sick infants and children (each group 13 per cent), the institutions and departments for tuberculous children and the sick wards in the prisons (each group 9 per cent), and the general hospitals (7 per cent). The total number of beds in isolation wards for contagious patients was 21,121, 12,333 of which were in general hospitals.

Many types of institutions must be ready to serve independent of the nature of the permanent need since no other institutions are available to the community, for example, the smaller general hospitals in the rural districts. Their low percentage of occupancy may have contributed in no slight degree to the fact that for the totality of general hospitals, in 1932, 135 vacant days (four and one-half months not in service) per bed were recorded. Similarly the sick-wards in prisons are necessary, although the percentage of occupancy is low. For these sick-wards the maximal figure of 190 vacant days per sick-bed is recorded, or a higher percentage of vacant days than of occupied days.

ITALY

(From Our Regular Correspondent)

Aug 15, 1935

The Sanitary Service in a Future War

Prof Filippo Caccia, "generale medico" in the army medical corps, discussed recently "The Sanitary Service in a Future War," at a conference of medical and military officers. The speaker held that the technical improvements and motorization will result generally in a "war of movement" in which aerobatics, chemical attacks and possibly bacteriologic attacks will be highly developed. It is desirable, during peace time, to develop the prophylactic and therapeutic agents best adapted to conserve the fighting forces. Prophylactic vaccinations, which were tried successfully in the World War, will be certain to become more highly developed in future wars. The better hygienic organization of the armies in the field has reversed the relationship of the number of persons killed in action and dying of wounds, on the one hand, and the number of persons dying from disease. In the Crimean War for example five soldiers died from disease for each one killed in action or dying from wounds. In the World War, eight died in action or from wounds for each one who died from disease.

The organization of therapeutic facilities in time of war is a complex task and comprises three distinct functions: preparation, transportation and hospitalization. Chemical warfare, used in aviation not only at the front but also far in advance of the front, imposes new problems of a sanitary nature. According to General Caccia, all physicians should be compelled to take at the university such courses as will fit them to meet the needs of the new situation that has arisen. Warfare at the front necessitates light motorized hospital units, easy to rig up and to unrig, and with standardized parts, so

that if one part is destroyed a corresponding part of another unit can be substituted. In proximity to the front, light motor ambulances will be needed, but better still would be screened motor litters, thereby reducing to a minimum transportation by man power only. In mountain warfare, sledges and a telephage system are indispensable.

The time factor is of paramount interest in connection with a rational mode of treatment. Some lesions (abdominal, thoracic grave wounds of the lower limbs) require a very comfortable and relatively short transportation period—not longer than eight or ten hours. Patients with cranial, osteo-articular or spinal lesions can endure a longer transportation period—from twenty-four to thirty hours from the time of the trauma. General Caccia emphasizes the need of adequate preparation on the part of physicians in the type of medical service encountered in war. At present only about one fourth of the physicians pass through the Scuola di sanità militare, after leaving the university.

The Gastro-Enterologic Society

The Società di gastroenterologia held recently its second session in Rome, under the chairmanship of Prof Cesare Frugoni, director of the Clinica medica in that city. Lucherini of Rome reported the results of his cholecystographic research on the mechanism of the contraction of the gallbladder. He found that sodium chloride (10 cc. of a 10 per cent solution) introduced from ten to fifteen minutes after an injection of 3 Gm of tethiothalein sodium enables the examiner to procure roentgenograms of the gallbladder in from fifteen to twenty minutes after the injection. He tested the cholecystokinetic action of calcium chloride and found that, following the intravenous injection of that salt, the gallbladder, after from fifteen to twenty minutes, shrinks evidently but resumes its size, form and former opacity when the action of the drug has passed. The mechanism of rapid cholecystography is based chiefly on the stimulus exerted by the various drugs introduced with the tethiothalein sodium on the functional activity of the liver cells.

Bonadies of Rome presented a paper on syphilitic gastritis. He emphasized the advisability of examining patients for syphilis in the presence of gastritis that does not respond to ordinary treatment.

Sebastianelli of Rome reported the results of research on the bactericidal potency of the gastric and the duodenal juices in gastro-intestinal disorders. The bactericidal potency of the duodenal juice is often distinctly different from that of the gastric juice and is always absent in diabetic patients and in 95 per cent of persons with gallbladder disorders.

Crosetti and Bajardi of Siena, on the basis of experiments on the albino rat, conclude that the injection of gastric juice of healthy persons or, commonly, of persons not affected with pernicious anemia causes a reticulocytic reaction in most of the rats. The phenomenon is absent in the majority of rats into which is injected the gastric juice of patients with pernicious anemia.

Alessandrini of Rome described the behavior of gastric acidity following the introduction of solutions of hydrochloric acid of various concentrations. He found that in employing concentrations up to twenty times that of the physiologic solution an autoregulation of the gastric acidity occurs which corresponds to that obtained by other stimuli. If the degree of acidity goes beyond a certain point, vomiting is produced.

The same speaker carried on research on factors that effect an evacuation of the stomach, the gallbladder and the ileum. The evacuation is determined in part by stimuli applied directly to the pilorus ventriculi, which constitutes, to a certain extent, the regulatory center of the motility of the digestive apparatus.

Attili and Bonadies discussed the radiologic aspect of the gastric folds. Gastroscopy supplies evidence on the color and opacity of the gastric mucosa, and on the presence of endog-

enous mucus and small ulcerations, which radioscopy cannot demonstrate. Radioscopy, on the other hand, allows complete exploration of the whole organ, including those parts that the instrument cannot explore. If one desires to make a precise diagnosis of stomach disease, it is necessary to combine the two methods

MOSCOW

(From Our Regular Correspondent)

Sept. 15, 1935

The Fifteenth International Congress of Physiology

A series of interesting reports were read at the plenary and sectional meetings of the fifteenth International Congress of Physiology

PLENARY SESSIONS

The first plenary session was held in Leningrad August 9. After salutatory addresses made by government representatives and scientific organizations, the president, academician Ivan P. Pavlov, opened the congress. Professor Walter W. Cannon (Harvard Medical School, Boston) read the first introductory paper, on chemical transmission of nervous impulses. After a review of the principal investigations of chemical transmission of excitability, Professor Cannon showed that the irritation may lead to inactivity of the nerve, the inhibition being due to humoral transmitters, particularly sympathin.

At the second plenary session, August 11 the addresses of academician Leon A. Orbeli (Leningrad) and Prof. Joseph Barcroft (Cambridge) were read.

Professor Orbeli's address was devoted to the subject of pain. He cut the sciatic nerves of animals and observed how sensitivity was restored.

At first the ancient phylogenetic sensitivity of pain was reestablished, somewhat higher than usual. Later tactile sensitivity was restored. Pain is attended by changes in the excitability of corresponding tissues. The vegetative functions depend not only on reflexes but also on hormone influences particularly on the hormone of the posterior lobe of the hypophysis.

Sir Joseph Barcroft presented an address on the velocity of some physiologic processes. He studied the time factor in the reaction between oxygen and respiratory ferments. The separation of carbon monoxide from hemoglobin is some hundred times faster than the restoration of oxygen to hemoglobin. The hemoglobin in the muscular tissue of the heart reacts much faster than blood hemoglobin. The time required for its oxidation is 0.001 of a second and for its restoration only 0.0001 of a second. The oxidative processes occur with great rapidity in mice and canaries, owing to the cytochrome ferment.

The last plenary session was held in Moscow August 17. The first paper "Some Factors in Physiologic Processes" was delivered by Prof. Louis Lapicque, of the Institut de France, Sorbonne, Paris. He stated that chronaxia (the coefficient which represents the relation of tissues to the combined effect of intensity and duration of electrical stimuli) is not equal for different muscles. In the case of men the processes that regulate the flexor motions pass with greater velocity than the extensor ones. When this distinction is abolished there is a supplementary loss of coordination, which is found when lesions of the cerebral cortex are present.

The last address at the Moscow plenary session, made by academician A. A. Ukhtomsky of Leningrad was devoted to physiologic lability and inhibition. He established the dominant theory, i. e., the principal tendency of excitation inhibits other processes in the organism, or the dominant suppresses a less vigorous excitation.

SECTION ON NERVOUS HUMORAL REGULATION

Prof. Walter W. Cannon spoke on the comparative effect of epinephrine and sympathin on the pupil.

Leon Binet and B. Minz (chair of physiology, Faculté de médecine de Paris) discussed changes in the nerve after elec-

trical irritation. In the trunk of the vagus nerve of a dog acetylcholine is present. An extract from a reflexly irritated vagus of a dog has the properties characteristic of an extract of a nerve directly stimulated by electric current. Prof. K. M. Bicov (Leningrad) discussed chemical transmission of excitability in the central nervous system. A depressive effect is obtained when blood flowing from the cerebrum during irritation of the depressor nerve is collected and afterward injected into the carotid artery. This effect is not present when blood collected without the irritation is injected because it does not contain acetylcholine-like substances.

A. V. Kibijakov from Kazan reported on the humoral transmission of excitability in the sympathetic ganglion. The extract obtained after the ganglion had been excited, when tested on the heart, was similar to acetylcholine. Simultaneously a epinephrine-like effect was seen.

Prof. J. N. Chukichev (Moscow) spoke on the oligodynamic action of albumin on different systems. Products of intensive acid hydrolysis of albumin are highly active. They reestablish the activity of a tired muscle, produce a hypersecretion of maxillary glands, change the secretion of gastric glands, depress the tonus of the intestine and change the excitability of the cortex. Chukichev supposes that sympathin is a product of albumin metabolism.

SECTION ON THE CENTRAL NERVOUS SYSTEM

Prof. G. Kato, Z. Kaku and J. Tasaki from Keio Gijuku University Medical College, Tokyo, Japan, spoke on the excitation and inhibition of reflexes by the same afferent fiber. On a cerebrospinal preparation of a cat, a single fiber beginning in the sole provokes the flexor reflex on the same side and inhibits the extensor reflex in the vastus, soleus and gastrocnemius muscles of the opposite side, if adequate excitation is used.

In addition Kato and his nine assistants demonstrated, on toads brought from Japan experiments on the activity of nerve fibers. He isolated a single sciatic nerve fiber, which gave after excitation a muscular contraction. Bowditch's law "all or nothing" was brilliantly confirmed by these experiments demonstrated at the congress. Prof. J. F. Fulton of Yale University School of Medicine, New Haven, Conn., removed different parts of the premotor zone of the cortex in monkeys and observed the effects. He concluded that motor somatic and autonomic symptoms cannot be connected with any definitely localized area of the cortex. Dozent N. J. Propper (Moscow) reported an experimental study on the pathogenesis of epilepsy. He concludes that epileptic attacks are accompanied by complete disorganization in the cortex of the processes of stimulation and inhibition.

Prof. Mario Gozzano of Naples, Italy, presented supplementary data on this question. He showed that during strychnine saturation of motor areas the bio-electrical waves are attended by clonic convulsions. At the moment of attack the balance between separate processes is disturbed and sharp variations in the electrical phenomena are seen. It is possible to induce epilepsy of reflex origin as a result of afferent impulses.

SECTION ON THE ENDOCRINES

Prof. K. J. Anselmino of the Frauenklinik der Universität, Düsseldorf, Germany, discussed the hormones of the hypophysis that influence fat and carbohydrate metabolism and their increased amounts in the blood and urine of diabetic patients. The carbohydrate hormone reduces the quantity of glycogen and nonsaturated fatty acids in the liver of the rat. These two hormones can be obtained from urine of diabetic patients.

Benjamin Harrow, J. M. Chamelin and A. Mazur from the College of the City of New York came to the same conclusions. Their report was entitled "The Hormones of Fat Metabolism and Hyperglycemia." They obtained a substance from male urine which produced hyperglycemia in rabbits. It con-

tains two factors one which diminishes the blood sugar and a second which augments it

Hans Selye read a paper by J B Collip of McGill University, Montreal, on antihormones, substances with antagonistic effect which appear after injection of one of the hypophyseal hormones. Antihormone has not been obtained in pure form. Collip finds that endocrine disturbances must be explained not only by insufficiency of certain hormones but by an excess of antihormones.

Prof N B Medvedeva, Kiev, spoke on the specific hormone of the adrenal cortex which calls forth a marked hyperglycemia (by parenteral administration).

Donald G Marguis and Ernest R Hilgard of Yale University reported on conditioned visual reflexes of dogs and monkeys after removal of the optical region of the cortex. They obtained a conditioned reflex by closing the eyelids under the influence of weak light, after removal of both occipital parts of the cortex. The reflex could be produced after the operation as easily as before it. The paper called forth a lively discussion.

A Chauchard, B Chauchard and W Drabovich of Paris made quantitative examinations of the excitability of peripheral neurons during conditioned reflexes. Chauchard's experiments show the influence of cerebral activity on the peripheral excitability.

SECTION OF BIOCHEMISTRY

Prof Emil Abderhalden of Halle, Germany, reported on the role of protective proteins in the differentiation of albumins. After the injection of different albumins, protective ferments appear in the blood. If known groups, such as iodine, are introduced in the albumin, the organism reacts to them specifically. By parenteral administration of polypeptides, it becomes possible to form protective substances that can cause the destruction of an administered substratum.

Prof Felix Haurowitz of Prague spoke on the blood pigment.

Prof Ettore Biocca of Rome spoke about crystallization of carboxyhemoglobin. Crystals of restored hemoglobin may be obtained even from blood shed as long as ten days before. If after dissolution and mixture with carbon monoxide the blood does not form carboxyhemoglobin, it does not belong to the human type.

OTHER SECTIONS

Prof V J Skvorzov addressed the section on pharmacology on the principles of antitoxic action. A dog that is given a lethal dose of hydrocyanic acid will survive if within three to four minutes he receives an injection of 30 per cent dextrose or of 8 to 10 per cent sodium bicarbonate solution. Similar results were obtained in the treatment of alcohol, arsenic and other intoxications.

The section on pharmacology passed a resolution to form an organization to be called the International Pharmacologic Society.

C M McCay and his collaborators of Cornell University, Ithaca N Y, at the meeting of the section on cellular physiology spoke about the influence of retarded growth on longevity. Rats with retarded growth live much longer than control animals and their hearts are larger and their livers smaller than are those of the control rats.

Prof Klaus Hansen of Oslo tested the biologic properties of heavy water. It has a sweetish and metallic taste. A big dose taken once is innocuous to men and animals. The continued use of heavy water leads to paralysis and death.

Sir Joseph Barcroft and D H Barron of England spoke on the beginning of respiration at birth. The cause of the first respiration is oxygen insufficiency. It can be produced artificially by the change of hemoglobin into methemoglobin by the introduction of hydroxylamine into the umbilical vessels. This experiment, made by Sir Joseph on a gravid sow, made a great impression on the congress.

About 1,500 physiologists from all over the world were present at the congress. An exposition demonstrating the

progress of soviet physiology was organized for the congress. A silver medal of the Russian physiologist Schenov was presented to every delegate. A trip to Coltuchi, which is not far from Leningrad, where Pavlov's laboratories are located, was organized.

About twenty-two scientific films were shown, many of which were prepared in Pavlov's laboratories.

A reception for the delegates was given by V M Molotov, the president of the Soviet of People's Commissars.

At the close of the congress most of the delegates went on trips throughout the Soviet Union.

Prof Alexander Hill of London proposed that the sixteenth International Congress of Physiology be held in 1938 in Zurich in connection with the fiftieth anniversary of the first congress of physiology held in 1888 in that city.

Street Noises

Research on noise began in Leningrad and Moscow in 1934. The greatest noise heard at Leningrad measured 80 and the least 45 decibels and was equal to that of the noisiest streets of New York.

The research demonstrated that in Leningrad the principal noises are due to street cars, motor car signals, loud speakers in the streets and bad pavements. Trees are very effective in diminishing street noises.

The measurement of noise in Leningrad street cars demonstrated that the average noise in the motor part of the car measured 67 decibels at full speed and 60 at slow speed.

The constant increase in traffic in this country makes the problem of street noise very acute.

Special regulations for combating unnecessary noise will be made soon and measures will be taken for the absorption of sounds such as trees planted along the streets, and paving with wood blocks and asphalt, and the prohibition of the use of horns at night.

Marriages

JOHN ALARGO ALEXANDER Murfreesboro Tenn to Miss Bessie Lois Ward of Cleveland, in Shelbyville, Tenn, August 6

MERVYN HENRY LITTLE, Willimantic, Conn, to DR. OLGA ALEXANDREUNA GAVRILUK of Lawrence, Mass June 8

WYCLIFFE CHARLES JACKSON, Jenkinsones, W Va, to Miss Mary Stuart McCallum, Rowland, N C, June 1

JOHN H PINHOLSTER Savannah, Ga, to Miss Kathryn Shurmpert White of Jacksonville, Fla, June 30

JEFFERSON NEAFIE RICHARDSON, Atlantic City, N J, to Miss Margaret Allen Pole of Philadelphia, July 24

EDGAR H MACKINLAY, McConnellsburg, Pa to Miss Helene Davis Brown of Altoona, July 8

CHARLES W STRAUB Middleburg, Pa, to Miss Dorothy Showalter of Mifflinburg, June 19

RICHARD L SUTTON JR. to Miss Serena Anne Neel both of Kansas City, Mo, September 28

DONALD F MARION, Harrisburg, Pa, to Miss Mabel Floyd of Fairmont N C August 28

THOMAS P BRINN, Hertford N C, to Miss Mary Emfry Glasson of Durham, August 20

BYRON I MUELLER, St. Charles, Iowa, to Miss Flora Estelle Otto of Carroll, August 12

VIRGIL LEONIDAS KELLY, Charlottesville, Va., to Miss Alberta Worrell of Otey, June 11

VICTOR E. BURN to Miss Eloise Conner Roe, both of Newton, N J., September 4

LEON EDWARD BRAWNER to Miss Thelma Clements both of Atlanta Ga, July 25

CLYDE J BIBB, Portage, Pa, to Miss Katharine Vogel of Scalp Level, recently

RALPH D CRESSMAN to Miss Bernice M Klein, both of San Francisco August 14

HERBERT L BRUMBAUGH, Dayton, Ohio to Miss Sara Isabelle Ross, September 27

Deaths

William Francis Honan ☉ New York, New York, Homeopathic Medical College and Hospital, 1889, professor of surgery at his alma mater, fellow of the American College of Surgeons, served during the World War, attending surgeon to the Flower Hospital, attending surgeon and director of the department of thoracic surgery, Metropolitan Hospital and Sea View Hospital, consulting surgeon to the Carson C. Peck Hospital, Brooklyn, and the Fifth Avenue Hospital, aged 68, died, October 6, of heart disease, while playing golf at Huntington, N. Y.

Herbert Phalon Cole ☉ Mobile, Ala., Johns Hopkins University School of Medicine, Baltimore, 1906, member of the Southern Surgical Association, fellow of the American College of Surgeons, formerly associate professor of gynecology, University of Alabama School of Medicine, past president of the Mobile County Medical Society, aged 55, died, September 27, in the Victoria Hospital, Miami, Fla., of sepsis, following an infection under his finger nail.

George Frederick Stericker ☉ Springfield, Ill., University of Leeds School of Medicine, and M.R.C.S. England, 1883, L.M.S.S.A., London, 1884, past president and secretary of the Sangamon County Hospital, for many years president of the Springfield Tuberculosis Association, on the staffs of St. John's Hospital and the Springfield Hospital, aged 73, died, September 14, of subacute bacterial endocarditis.

William James Hickson ☉ Chicago, University of Pennsylvania Department of Medicine, Philadelphia, 1900, director of the medical research department, Training School, Vineland, N. J., 1912-1915, psychopathologist to the psychopathic laboratory of the Municipal Court of Chicago, 1914-1929, aged 61, died, October 4, of heart disease, while at his summer home in Gloucester, Mass.

Byron Webster Beatty ☉ Dayton, Ohio, Ohio Medical University, Columbus, 1905, member of the Clinical Orthopedic Society for many years on the staff of St. Elizabeth's Hospital, aged 52, one of the founders and first chief of staff of the Good Samaritan Hospital, where he died, September 15, of disease of the gallbladder.

Theodore Senseman ☉ Margate City, N. J., University of Pennsylvania Department of Medicine, Philadelphia, 1897, fellow of the American College of Surgeons, served during the World War, aged 60, medical director of the Atlantic City Hospital, where he died, September 8, of chronic pulmonary tuberculosis.

Ezra Z. Derr ☉ Medical Director, Captain U. S. Navy, retired, Frederick, Md., University of Virginia Department of Medicine, Charlottesville, 1870, University of the City of New York Medical Department, 1872, entered the navy in 1873 and retired in 1910, aged 84, died, August 24, of coronary occlusion.

Lefferts Hutton, New York, Columbia University College of Physicians and Surgeons, New York, 1905, assistant medical director of the Mutual Life Insurance Company of New York, served during the World War, aged 55, died suddenly, August 14, of coronary embolism, at his home in Millburn, N. J.

Everell Vern Chadwick, Eldred, Pa., George Washington University School of Medicine, Washington, D. C., 1917, served during the World War, formerly connected with the U. S. Public Health Service and the U. S. Veterans' Bureau, aged 43, died, August 18, at Camptown, Pa.

George Mitchell Eckel ☉ Hot Springs National Park, Ark., University of Texas School of Medicine, Galveston, 1908, member of the American Psychiatric Association and the Association for Research in Nervous and Mental Diseases, aged 50, died, September 17, of angina pectoris.

Clarence Edward Lum, Nisswa, Minn., Minnesota Hospital College, Minneapolis, 1885, an Affiliate Fellow of the American Medical Association, fellow of the American College of Surgeons, aged 73, died, September 7, in St. Joseph's Hospital, Brainerd, of coronary thrombosis.

Daniel Carr Main, Pomona, Fla., Hahnemann Medical College and Hospital, Chicago, 1902, veteran of the Spanish-American and World Wars, formerly on the staff of St. Elizabeth's Hospital, Washington, D. C., aged 59, was killed, September 2, in the hurricane.

David James King, Williamsburg, Va., University of Buffalo School of Medicine, 1900, member of the Medical

Society of Virginia, for many years physician to the William and Mary College, aged 71, died, August 18, of cerebral hemorrhage and hypertension.

William Hubley Herr ☉ Lancaster, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1897, served during the World War, on the staff of the Lancaster General Hospital, aged 62, died, August 25, of chronic valvular heart disease.

Werner Lothar Benishek ☉ Aurora, Ill., Albert Ludwigs-Universität Medizinische Fakultät, Freiburg, Baden, Germany, 1926, director of the x-ray department of the Copley Hospital, aged 33, was found dead, September 30, of poison, self-administered.

George Simonton Means, Jacksonville, Fla., Southern Medical College, Atlanta, Ga., 1895, Tulane University of Louisiana School of Medicine, New Orleans, 1902, aged 65, died, August 14, of hemiplegia, arteriosclerosis and hypertension.

Irvin Pope Sr., Tyler, Texas, Tulane University of Louisiana Medical Department, New Orleans, 1887, member of the State Medical Association of Texas, fellow of the American College of Surgeons, aged 73, died, August 20.

Charles Henry Miller, Washington, Kan., St. Louis University School of Medicine, 1913, aged 46, on the staff of the Veterans Administration Facility, Lincoln, Neb., where he died, August 15, of cerebral hemorrhage and arteriosclerosis.

James Charles Holdsworth, Chicago, College of Physicians and Surgeons, Baltimore, 1896, served during the World War, aged 64, died, August 17, in the Veterans Administration Facility, Hines, Ill., of subacute bacterial endocarditis.

Bertram Gottlieb, Huntington, N. Y., Tufts College Medical School, Boston, 1924, member of the Medical Society of the State of New York, aged 37, died, September 19, in the New York Hospital, following an infection of the nose.

Lee Herbert Smith, Buffalo, University of Buffalo School of Medicine, 1877, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1881, aged 79, died, September 18, of angina pectoris.

Homer Powers ☉ Rankin, Texas, American Medical College, St. Louis, 1877, past president of the Crane-Upton Reagan Counties Medical Society, aged 79, died recently, of chronic nephritis and hypertrophy of the prostate.

James Patterson Ziegler, Elizabethtown, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1880, member of the Medical Society of the State of Pennsylvania, aged 86, died, August 14, of senility.

William Henry Tassell, Coudersport, Pa., College of Physicians and Surgeons, Baltimore, 1883, member of the Medical Society of the State of Pennsylvania, aged 79, died, September 5, of intestinal obstruction.

Benjamin Azum Caudle, Hopkinsville, Ky., Vanderbilt University School of Medicine, Nashville, Tenn., 1892, member of the Kentucky State Medical Association, aged 66, died, August 30, of cerebral hemorrhage.

Raymond Robinson Hume, Minco, Okla., University Medical College of Kansas City, Mo., 1906, member of the Oklahoma State Medical Association, aged 55, died, August 11, of cirrhosis of the liver.

Ephraim Weston Morgan, Memphis, Tenn., Bellevue Hospital Medical College, New York, 1871, Confederate veteran, aged 88, died, August 18, of arteriosclerosis and hypertrophy of the prostate.

Carl Mindlin ☉ Haverhill, Mass., Long Island College Hospital, Brooklyn, 1912, aged 50, died, August 20, at McKinley Hospital, Trenton, N. J., of sarcoma of the left axilla, lungs and brain.

Joseph Machesney Spang, Pittsburgh, Hahnemann Medical College and Hospital of Philadelphia, 1908, aged 55, died suddenly, August 15, in the Homeopathic Medical and Surgical Hospital.

David Oral Beal, Afton, Wyo., College of Physicians and Surgeons, Baltimore, 1912, served in the British army during the World War, aged 47, died, August 16, in Montpelier, Idaho, of pneumonia.

John Bruff Boothe, Philadelphia, Howard University College of Medicine, Washington, D. C., 1935, intern at the Mercy Hospital, aged 34, died, September 26, of malignant hypertension.

Merritt William T. Negus, Rochester, N. Y., University of the City of New York Medical Department, 1879, aged 80, died, August 3, of a skull fracture received when hit by an automobile.

Harvey Louis Langlois ♂ Kankakee, Ill., University of Illinois College of Medicine, Chicago, 1917, aged 44, on the staff of St Mary Hospital, where he died, August 22, of pneumonia

Bigelow Putnam Blackstone, Houston, Texas, State University of Iowa College of Homeopathic Medicine, Iowa City, 1899, veteran of the World War, aged 64, was found dead, August 30

William Drake Hamilton, Columbus, Ohio, Columbus Medical College, 1883, fellow of the American College of Surgeons, aged 76, died, August 23, in Cape Cod, Mass., of heart disease.

William Young Fowler, Llano Texas Memphis (Tenn.) Hospital Medical College, 1895, aged 75, died in August at a hospital in Austin, as the result of injuries received in a fall

William Penn Fawcett, Alderson, W. Va., Hospital College of Medicine, Louisville, 1902, member of the West Virginia State Medical Association, aged 74, died, September 4

Ray Ferguson, Escatawpa, Miss., Kansas City (Mo.) Medical College, 1899, aged 67, died August 5, in the Jackson County Hospital, Pascagoula, of estivo autumnal malaria

Charles William Stramberg, Trenton, N. S., Canada Halifax Medical College 1910, aged 55, died May 18, in the Aberdeen Hospital, New Glasgow, of pernicious anemia

T Howard Knight, Los Angeles, University of the South Medical Department, Sewanee, Tenn. 1895, aged 76, died, August 23, of coronary thrombosis and angina pectoris

Samuel P. Reser, Hartford, Kan., College of Physicians and Surgeons, Keokuk, Iowa, 1880, member of the Kansas Medical Society, aged 84, died, August 6, of senility

Edward W. D. Abner, Denver, Meharry Medical College, Nashville, Tenn., 1893, aged 68, died, August 27, in the Denver General Hospital, of an accidental gunshot wound

Harvey Milton Fults, Carter K., Kentucky University Medical Department, Louisville, 1901, aged 64, was found dead in bed, August 29, of chronic valvular heart disease

Max Darius Wilson ♂ Chicago, Bennett Medical College Chicago, 1912, aged 62, died, October 6, in the Jackson Park Hospital, of carcinoma of the colon with metastasis

John Theodore Hulskamp ♂ Louisville, Ky. University of Louisville Medical Department, 1909, aged 53, died August 24, in St. Joseph Infirmary, of chronic nephritis

John F. Burleson, Grand Rapids, Mich., University of Michigan Department of Medicine and Surgery, 1906, aged 57, died, September 8, of chronic myocarditis

James Davis Moorhead, Columbia, S. C. Medical College of the State of South Carolina, Charleston, 1913, aged 43, died suddenly, August 21, of cerebral hemorrhage

Allen G. Thurman Childers ♂ Mulhall, Okla. Ensworth Medical College, St. Joseph, Mo., 1890, aged 71, died, August 21, of sarcoma of the neck

Duncan George Cameron, Windsor, Ont., Canada, Trinity Medical College, Toronto 1904, died, August 18, of injuries received in an automobile accident

Franklin Timothy Knox, St. Louis Homeopathic Medical College of Missouri, St. Louis, 1873, aged 88, died, August 19, in Ferguson, of arteriosclerosis

Jesse Malcolm Henry, Sadieville Ky., Medical College of Ohio, Cincinnati, 1886, aged 73, died, August 24, of arteriosclerosis and diabetes mellitus

M. P. Lyla Harker, Oak Park Ill., Loyola University School of Medicine, Chicago, 1923, aged 48, died suddenly, July 27, of cerebral hemorrhage.

William Jarman Hughes, Moscow, Ohio, Kentucky School of Medicine, Louisville, 1890, aged 74, died, August 11, of coronary thrombosis

Ivar Leif Lefsrud, Viking, Alta, Canada, University of Alberta Faculty of Medicine, Edmonton, 1931, aged 34, died, July 16, at Sterco

George Frederic Floyd, Birdsnest, Va. College of Physicians and Surgeons, Baltimore, 1883, aged 77, died, August 29, of myocarditis

Alexander Vertes, Louisville, Ky., St. Louis College of Physicians and Surgeons, 1902, aged 65, was found dead August 2

William Hamilton Ehlen, Seattle, University of Oregon Medical School Portland, 1890, aged 69, died, August 22

Silas S. Burns, Bethel Pa., Jefferson Medical College of Philadelphia, 1885, aged 86, died, August 13

Bureau of Investigation

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE The abstracts that follow are given in the briefest possible form (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the composition (4) the type of nostrum, (5) the reason for the charge of misbranding and (6) the date of issuance of the Notice of Judgment—which may be considerably later than the date of the seizure of the product]

Griscom's Family Liniment—Steelman & Archer Inc. successors to Criscom Mfg Co. Philadelphia Composition Essentially an emulsion of ammonia fatty acids soap turpentine oil volatile oils including camphor and water. Fraudulent therapeutic claims—[N J 22583 February 1935]

Vagltone—Vincent Laboratories Texarkana, Texas Composition Glycerin boric acid phenols small amounts of zinc oxide quinine sulphate thymol and oxyquinoline sulphate and water dyed green. For female disorders etc. Fraudulent therapeutic claims—[N J 22597 February 1935]

Bits To Sol—Bits To Sol Co. Fitzgerald Ga. Composition Essentially salicylic acid boric acid alcohol (61 per cent by volume) acetone wintergreen glycerin and water with a yellow dye. For skin disorders piles etc. Fraudulent therapeutic claims—[N J 22600 February 1935]

Kelfood—Protective Diet League, Hollywood Calif. Composition Tablets containing seaweed a small amount of fatty oil and yeast. For infectious sterility goiter asthma glandular disorders rheumatism etc. Fraudulent therapeutic claims—[N J 22601 February 1935]

Jo Lova Tea—Paraguay Tea Inc. Miami Fla. Composition Yerba mate (ordinary Paraguay tea) For anemia stomach disorders rheumatism alcoholism etc. Fraudulent therapeutic claims—[N J 22602 February 1935]

Martin's Herb Tablets—Martin Herb Co. Pittsburgh Composition Ground plant material. For stomach kidney liver, blood skin and respiratory disorders rheumatism female complaints etc. Fraudulent therapeutic claims—[N J 22603 February 1935]

East India Injection—East India Medicine Co., St. Louis Composition Small amount of berberine alkaloid dissolved in water. For venereal diseases. Fraudulent therapeutic claims—[N J 22605 February 1935]

Cholerine—East India Medicine Co. St. Louis Composition Essentially extracts of plant drugs including red pepper small amounts of camphor and chloroform alcohol (about 6 per cent) sugar and water. For diarrhea cholera morbus colic etc. Fraudulent therapeutic claims—[N J 22605 February 1935]

Bloodzone and Bloodzone Special—East India Medicine Co. St. Louis Composition (Bloodzone) Essentially small amounts of plant drug extracts including licorice with alcohol (15.4 per cent by volume) sugar and water (Bloodzone Special) essentially plant drugs potassium iodide alcohol sugar and water. Bloodzone for impure blood Bloodzone Special for skin diseases syphilis eczema rheumatism etc. Fraudulent therapeutic claims—[N J 22605 February 1935]

Fresca Antiseptic Powder—Fresca Co. Lansing Mich. Composition Essentially boric acid alum and small amounts of phenol and oil of peppermint. Not antiseptic as represented. For female troubles hemorrhoids, abscesses athlete's foot and ringworm. Fraudulent therapeutic claims—[N J 22610 February 1935]

Tona Spaf—Sunshine Pharmaceutical Co. Inc. New York Composition Essentially iron and phosphorus compounds with traces of an arsenic compound, with alcohol water and flavoring. For influenza, anemia diabetes blood disorders etc. Fraudulent therapeutic claims—[N J 22612 February 1935]

Apple Lax—Apple Concentrates Corp. New York. Composition Phenolphthalein and concentrated apple juice with sugar coating and red color. Laxative. Misbranded because the laxative element was a synthetic one the drug phenolphthalein. False and misleading claims.—[N J 22614 February 1935]

Iodogrin—Bundt Laboratories Inc. Detroit Composition Essentially ammonium iodide extracts of alkaloid bearing plant drugs alcohol (3.8 per cent by volume) sugar and water. Misbranded because alcohol content was declared on label to be 15 per cent which it was not though no declaration was made on the package. Misbranded also because of fraudulent therapeutic claims as an alleged cure for asthma, hay fever, bronchitis etc.—[N J 22617 February 1935]

Devine's Australian Eucalyptus Inhaler Set—P. E. Devine Jeffersonville Ind. Consisted of a glass inhaler, a bottle of liquid labeled Eucalyptus Inhaler Re Charge and an ointment labeled 'Naxalline'. The liquid was chiefly eucalyptus oil, Naxalline was essentially volatile oils including eucalyptus oil (65 per cent) in petrolatum. For catarrh asthma, neuritis hay fever, etc. Fraudulent therapeutic claims.—[N J 22644 February, 1935]

Kamforina Salve—Sweet Mfg Co Inc Pittsburgh Composition. Essentially camphor and oleoresin of red pepper in petrolatum. For muscular rheumatism lumbago bronchitis, etc. Fraudulent therapeutic claims.—[N J 22618 February 1935]

Miller's Rosy—John Miller Mobile Ala. Composition. Essentially salicylic acid olive oil a volatile oil such as juniper alcohol (39.8 per cent by volume) and water. Misbranded as to alcohol content and as to fraudulent therapeutic claims as an alleged remedy for eczema ulcers pimples.—[N J 22624 February 1935]

Erdeky's Reparat—Kalerd Laboratories Co Inc Pittsburgh Composition. Essentially petroleum oil such as kerosene with chloroform (53.1 minims per fluid ounce) and volatile oils including camphor mustard and wintergreen. For rheumatic and neuralgic pains nervous headache cramps etc. Fraudulent therapeutic claims.—[N J 22628 February 1935]

Erdeky's Lung Tea—Kalerd Laboratories Co Inc. Pittsburgh Composition. Essentially plant material including horehound marshmallow root Iceland moss licorice elder flowers and hinden flowers. For influenza bronchitis croup coughs etc. Fraudulent therapeutic claims.—[N J 22628 February 1935]

Erdeky's Lung Balm—Kalerd Laboratories Co Inc Pittsburgh Composition. Essentially tannin and wild cherry a phenolic body alcohol (27 per cent by volume) chloroform sugar and water. For pneumonia whooping cough lung fever etc. Fraudulent therapeutic claims.—[N J 22628, February, 1935]

Erdeky's Mustard Ointment—Kalerd Laboratories Co Inc Pittsburgh Composition. Essentially petrolatum with volatile oils including mustard and lemon. For tonsillitis rheumatism bronchitis lumbago etc. Fraudulent therapeutic claims.—[N J 22628 February 1935]

Erdeky's Blood Tonic—Kalerd Laboratories Co Inc Pittsburgh Composition. Essentially plant drug extracts including a laxative drug and potassium iodide glycerin alcohol (63 per cent by volume) and water. Fraudulent therapeutic claims.—[N J 22628 February 1935]

Erdeky's Blood Tea—Kalerd Laboratories Co Inc Pittsburgh Composition. Essentially senna leaves juniper berries gentian root calamus root and fennel seed. For blood liver kidney and stomach disorders etc. Fraudulent therapeutic claims.—[N J 22628 February 1935]

Erdeky's Blood Purifier—Kalerd Laboratories Co Inc Pittsburgh Composition. Essentially plant drug extracts including a laxative drug and potassium iodide, glycerin, alcohol (61 per cent by volume) and water. For venereal diseases enlarged glands eczema etc. Fraudulent therapeutic claims.—[N J 22628 February 1935]

Erdeky's Nerve Medicine—Kalerd Laboratories Co Inc Pittsburgh Composition. Essentially compounds of calcium sodium potassium, ammonium iron manganese strychnine quinine bromides hypophosphites sugar and water. Fraudulent therapeutic claims.—[N J 22628 February, 1935]

Erdeky's Stomach Regulator—Kalerd Laboratories Co Inc Pittsburgh Composition. Essentially pepsin hydrochloric acid compounds of strychnine and brucine extracts of plant drugs including a laxative and sugar alcohol (19.7 per cent by volume) and water with flavoring. For dyspepsia dizziness colic, liver troubles etc. Fraudulent therapeutic claims.—[N J 22628 February 1935]

Erdeky's Mother Drops—Kalerd Laboratories Co Inc Pittsburgh Composition. Essentially alcohol (64.6 per cent by volume) plant material including aloe and resins and water. Misbranded because it contained more than the 50 per cent of alcohol declared on label.—[N J 22628 February 1935]

Erdeky's Cough Balm—Kalerd Laboratories Co Inc. Pittsburgh Composition. Essentially tannin and wild cherry a phenolic body chloroform alcohol (2.6 per cent by volume) sugar water and flavoring including sassafras oil. Fraudulent therapeutic claims.—[N J 22628 February 1935]

Erdeky's Women's Friend—Kalerd Laboratories Co Inc. Pittsburgh Composition. Ferrous carbonate Glauber's salt and arsenic trioxide (3/60 grain per tablet) coated with sugar and iron oxide. For female disorders. Fraudulent therapeutic claims.—[N J 22628 February 1935]

Erdeky's Herb Tea—Kalerd Laboratories Co Inc Pittsburgh Composition. Senna leaves juniper berries cinchona bark, fennel seed gentian root and calamus root. For impure blood, liver kidney and stomach disorders etc. Fraudulent therapeutic claims.—[N J 22628 February 1935]

Erdeky's Cough Tea—Kalerd Laboratories Co Inc Pittsburgh Composition. Essentially horehound althea root Iceland moss licorice root, elder flowers and hinden flowers. For tuberculosis pneumonia peritonitis, whooping cough etc. Fraudulent therapeutic claims.—[N J 22628 February 1935]

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

SPONTANEOUS THROMBOSIS OF UPPER EXTREMITIES

To the Editor—Miss E. B. aged 28 5 feet 3 inches (160 cm.) in height weighing 156 pounds (71 Kg.), a trained nurse and hospital floor superintendent on March 27, late in the afternoon while driving her car suddenly had pain in her right arm in the region of the elbow joint. A member of the staff found a small nodule on the under side of the upper part of the forearm. The lower part was cold bluish and swollen. She gave no history of having injured her arm. She was put to bed the arm was elevated and immobilized a hot moist dressing was applied continuously for four days and acetylsalicylic acid was given for pain and bromides for nervousness as she was quite apprehensive of her condition. In twenty-four hours one of the veins of the lower arm could be palpated for six inches, extending for 2 inches above the elbow joint. The urine was normal. The blood chemistry was normal, though no blood platelet count was made. The clotting time was three-fourths minute. The pulse temperature and respiration were normal throughout her illness. April 6 she was allowed out of bed and a plaster molded splint was applied with the arm in an angular position. April 9 she reported for duty, the arm in splint and sling. It was still swollen and discolored when swung by the side. The patient had always been healthy. The ancestors on both sides were inclined to be stout. She had the usual diseases of childhood. Her weight five years ago was 185 pounds (84 Kg.). Four years ago she had her tonsils removed the clotting time was three-fourths minute. During the summer of 1934 she took for ten days dinitrophenol sodium on the advice of a physician and lost 18 pounds (8 Kg.). She had a severe anaphylactic reaction from the drug. The systolic blood pressure four years ago was 125. March 27 1935 115 June 6 1935 90. She is quite nervous and apprehensive that she will have another thrombus at some other part of her body or in the same arm which is still enlarged. June 12 blood examination revealed red blood cells 4,170,000 white blood cells 6,400 hemoglobin 81 per cent color index, 9 plus polymorphonuclears, 58 per cent small morphonuclears 34 per cent large morphonuclears, 3 per cent eosinophils 3 per cent basophils 2 per cent blood clotting time thirty seconds blood platelet count 780,000. Malaria negative basal metabolic rate -14 a blood calcium determination was not made for fear of causing another thrombus on collecting the blood. What caused this embolus and thrombosis? Would this condition be caused by an endocrine disturbance? How about a parathyroid hypersecretion as a cause and what could be done about it? What will lower the high platelet count. Please omit name. M.D., Florida.

ANSWER.—Spontaneous thrombosis of the upper extremities is a definite disease entity. It is usually precipitated by some mild, not unusual muscular effort and is often referred to in the literature as effort thrombosis. It affects young persons usually in excellent health and physical fitness. It is characterized by a sudden excruciating pain in the arm or axilla, with irradiation to the elbow or wrist, and is followed shortly by a hard, painless cyanotic edema and considerable impairment of function. This edema may slowly subside but may remain stationary. Following muscular exercise there develops a feeling of lassitude and weakness, which is not identical with the intermittent claudication of arterial obstruction. There are also associated vasomotor phenomena, such as flushing of the arm after exercise, vessel spasms, and sensitivity to environmental temperature.

The etiology of these effort thromboses is variable and cannot always be definitely established. A preexisting low grade latent phlebitis has been proved by culture of the clot and microscopic study of the vein in some cases. There are numerous other cases in which an infectious phlebitis cannot be demonstrated. Mechanical causes, such as compression of the axillary vein by the costocoracoid ligament, compression of the superior vena cava by mediastinal lymph glands or by an aortic aneurysm, must be considered. There is finally a group in which a sudden venous spasm may be suspected which, if it lasts long enough, may lead to thromboses. In nervous persons with unstable vasomotor systems, with evidence of accompanying arterial spasm, such a spasm may be a contributing factor.

In case the edema and the functional disability do not disappear, an excision or stripping of the affected venous segment has been suggested and carried out with success.

The high platelet count ought to be checked. Much depends on the method used for counting platelets. There is no satisfactory evidence as yet that the coagulability of the blood varies with the platelet count. The number of platelets is unaltered in hemophilia, while the coagulation time is greatly prolonged. In certain types of purpura the platelets may almost disappear, while the coagulation time is within normal limits. The bleeding time, however, may show a relation to platelets and this phase might be investigated.

SWALLOWED SAFETY PIN

the Editor—Recently at a staff meeting at the local hospital there was a discussion as to the best procedure in treating a child or baby who has swallowed an open safety pin. Is it best to operate immediately to remove an open safety pin from the stomach of a 7 months old baby or to leave the pin without opening the stomach or to await developments? What authorities differ however what is considered the safest? What is the percentage of death with operation also the frequency of tearing up the mucous membrane of the stomach in closing the pin through the wall of the stomach after opening to and through the peritoneum.

E M FAHNESTOCK M D Gulfport Miss

ANSWER—Data obtained at a clinic where this subject has been studied for forty years shows that about 95 per cent of swallowed safety pins that have naturally reached the stomach will pass safely through the intestinal canal, about 5 per cent will cause potentially fatal complications. It all depends on the size of the pin in relation to the size of the patient's viscera. A very short pin will turn over and over and is likely to become hooked in doing so. A relatively long pin will jam in the sharp and somewhat fixed turns of the duodenum, an unfavorable place for abdominal operation. A medium sized pin will pass along the spring end leading, the point trailing. (THE JOURNAL, January 26, p 272) If these sizes are not easily determined in a given case the rule is to remove the pin through the mouth by gastroscopic endogastric version or straightening (Jackson, Chevalier, *Endoscopic Removal of Safety Pins, Arch Otolaryng* 3 [May] 1926). Since the operative risk in abdominal section in a 7 months old infant is more than 5 per cent it would seem better to wait than to operate externally, but as there is no safety associated with skillfully done peroral gastrosomy, this method would seem preferable to either of the alternatives mentioned. The dangers of waiting are intestinal not gastric management while waiting is given in an article on peroral gastrosomy by Chevalier and Chevalier L Jackson (THE JOURNAL, January 26, p 269).

Pinching up of a fold of gastric wall in closing a pin by operation through the unopened stomach has occurred in babies from whom the shortness of the abdominal incision limits the power of manipulative fingers that can be introduced into the abdomen. Pinching together a small fold of gastric wall pulled through the necessarily small incision, and closing the pin in the small, pinched fold, probably involve considerable loss of anchorage of the pin in one of the rugae. The accident, therefore, would be likely to happen in a 7 months old infant. In an adult, in whom the closing could be done without the incision or in a large bag of stomach brought out of the abdomen by a long incision, the possibility is remote. In any case it should be determined that the pin really is in the stomach and not anterior to it in the colon, or posteriorly transfixed in the wall of the duodenum, or, as has happened in the costophrenic space, is of the right lung back of the stomach.

PEMPHIGUS

the Editor—I have had a white man aged 83 under my care for about four years who is afflicted with pemphigus. During this time he has received heavy doses of arsenic iron and cod liver oil in addition to local ointments. Three years ago the eruption was over his entire body but it cleared up in a few weeks except on both ankles where it remained localized since then. It has now started to ascend again and spread over his body. Could you suggest any further treatment for him? Would x-rays be beneficial to these areas? Is there any new treatment that might be of value? Please omit name. M D Ohio

ANSWER—Salt retention is a feature of pemphigus therefore a salt-free diet seems logical and has been successful in some cases. Colon irrigation has been used with good results in connection with the administration of arsenic compounds. Tryparsamide may be tried. It has been successful in a number of cases. The eyes, particularly the visual fields, must be examined before the administration of tryparsamide and every day for the first three weeks and then once a month. The successful cases have responded to moderate dosage. Urine is a time honored remedy for pemphigus and has recently not yet been tried in the case under discussion. After cautious beginning to discover whether the patient is sensitized to it, the dosage should be pushed to the physiologic limit. Nine hydrochloride may be given intravenously in 0.5 per cent strength in physiologic solution of sodium chloride every day and day up to 1 Gm per dose.

The patient's own venous blood or blood serum may be injected intramuscularly in amounts from 5 to 20 cc., at intervals of five days. At least five treatments should be given before one decides that the treatment is of no value. A mild toxic reaction may occur after the first dose and should cause alarm. If this fails, blood transfusion may be found helpful. The Davis treatment, a thromboplastic substance intramuscularly every other day and iron cacodylate solution intrave-

nously on the alternate days, was effective in a good percentage of cases. Nowadays good authorities report as much benefit from the use of the iron cacodylate alone, given every day. Cannon reports better results from alkalization than from any other treatment.

Locally, x-rays produce temporary benefit. One-fourth skin unit once a week may be given until the dose on any particular area totals two whole skin units. It should not be carried further. General ultraviolet irradiations are recommended for tonic effect. Acriflavine base 1,000 in physiologic solution of sodium chloride may be painted on the skin. The bullae may be opened and emptied and a bland dressing such as olive oil and lime water in equal parts may be applied, or 10 per cent boric acid in ointment of rose water. Some patients do well on the powder bath, after a few days of discomfort. Talcum powder is used in the bed in large amounts, no baths being given. In other cases a continuous bath or interrupted bath may give greater comfort.

Improvement must not be too quickly ascribed to treatment. Spontaneous exacerbations and remissions are characteristic of the disease.

ACNEFORM ERUPTION AT MENSTRUAL PERIOD

To the Editor—May I enlist your aid in a case that has been of a baffling nature to me for the past year and a half. A white American housewife aged 29 has had an eruption on the face and neck for the past eight years. The lesions vary in size up to a five cent piece (21 mm in diameter) and appear to be abscesses with the characteristic swelling and redness. Frequently a white stringy material exudes and when large they are painful. The onset and regression is cyclic. They make their appearance at ovulation time. That is about the eleventh or twelfth day in the patient's twenty six day cycle. The menses are scant of two days duration and unaccompanied by any symptoms. After about one week they begin to subside and at the menstrual onset the face and neck are quite clear and remain in fairly good condition until the next ovulation time when the condition recurs. This phenomenon has recurred constantly for the past eight years with the exception of the first three months of pregnancy three years ago and for a short time post partum. Smears have been repeatedly negative. The Wassermann reaction is negative and the blood counts and hemoglobin are normal. The pulse is normal the blood pressure a little low and the temperature normal. The urine is normal. The basal metabolic rate is plus 3 and plus 8. Forty cc. of premenstrual blood showed a subthreshold amount of estrogenic substance by the Frank and Goldberger technic. Skin tests to infection have shown no hypersensitiveness to twelve of the more common varieties. The patient is in good health except for an occasional spell of constipation. Local treatment and ultraviolet rays have been of no avail. Glandular medication, including anterior pituitary and whole pituitary tablets, antuitrin S, theelin, theolol, progynon, agomensin and sistomensin and various corpus luteum preparations have all been used at various times. They have of course been properly timed and spaced in the menstrual cycle. As much as 10,000 Allen Doisy rat units of estrin in a single menstrual cycle has made no change either in the condition of the skin or in the scanty menses. The ovaries are anatomically intact. This is the gist of the case, and any information relative to the etiology or treatment would be most highly appreciated.

R P ALDERMAN M D Syracuse N Y

ANSWER—The lesions described in this case most likely belong in the group of acneform eruptions, hence in seeking possible etiologic factors it is important to rule out such drugs as bromides and iodides, the latter taken in the form either of medication or of food. M B Sulzberger, Adolph Rostenberg and J J Sher (*New York State J Med* 34 899 [Nov 1] 1934) have shown that, in patients with acne, even relatively small amounts of ingested iodides regularly produce new lesions or exacerbations of the acne.

Because of the relationship of these abscesses to the menstrual flow, it is logical to assume that there is a hormone factor involved in the process just as there is in outspoken cases of acne. In most normal women there is an increased amount of estrogenic substance in the blood and elsewhere just before the monthly flow of blood sets in. However, Theodore Rosenthal and Raphael Kurzrok (*Proc Soc Exper Biol & Med* 30 1150 [May] 1935) have shown that the amount of estrogenic substance excreted in the urine was subnormal in women suffering from acne. This may explain why some women who have acne are considerably relieved by the administration of estrogenic substance. In the case described the lesions are absent just before and during the menstrual flow. On the other hand, in many women with typical acne there is an exacerbation just before the flow of blood begins. This patient was free from the distressing abscesses during the first three months of pregnancy and for a short time post partum. Normally there is an increase in the amount of estrogenic substance after the eighth week of pregnancy. Following labor there is a sudden decrease in the amount of estrogenic hormone in the circulating blood and in the urine.

Since endocrine therapy has not helped this patient, it may be advisable to have an autogenous vaccine made. If the organ

ism involved is the staphylococcus, staphylococcus toxoid may be tried. If the administration of vaccine or of toxoid does not help, roentgen therapy may be applied locally. However, this treatment should be carried out cautiously and only by one experienced in the use of roentgen therapy. This form of treatment reduces the activity of hyperstimulated gland and follicle orifices. Preparations containing vitamin D may be of value.

Careful search should be made for foci of infection. The intestinal tract should also be investigated roentgenologically and by examination of the stools for *Endamoeba histolytica*.

STERILITY

To the Editor—A married woman aged 42 desires a child. She has been married ten years and her husband is well. The patient had three miscarriages (two at two months one at four and one half months) from unknown causes. She never used contraceptives. Her periods have been characterized by being irregular (every two to three weeks) the passing of clots profuse flow dysmenorrhea and exhaustion. She had a curettement in July 1930 and there have been no pregnancies since. Physical examination is negative except for a profuse vaginal discharge in July 1934 diagnosed as showing *Trichomonas vaginalis*, this was satisfactorily cleared up by douches (tincture of green soap, potassium permanganate) and tampons (glycerin sulphated bitumen compound). The Kahn test is negative. The patient is 30 pounds (13.6 kg.) over weight. She had lost 12 pounds (5.4 kg.) after strenuous dieting. The following has been my treatment: 1. In October 1934 four treatments of 1 cc each of (H) pituitary. 2. In November anterior pituitary extract (Lilly) one capsule (2½ grains or 0.16 Gm.) three times a day for ten days. 3. In December and during each month since 5 cc of amniotin (Squibb) for oral use in 5 cc vials. She has used five of these 5 cc vials. Her present condition is characterized by (1) no dysmenorrhea (2) only an occasional blood clot (3) no profuse flow (4) regularity of periods (twenty-eight days) and (5) a general feeling of well being. What treatment would you suggest to overcome her sterility? Examination of the husband has given negative results. The patient is most desirous of having a child. Please omit name. M D Michigan

ANSWER—The patient is approaching the age of the menopause, and, if she is anxious to become pregnant, little time should be lost. The menstrual history suggests fibromyomas in the uterus, however, since the periods improved by the administration of a variety of hormone substances, there may be none found.

A complete "infertility-sterility" investigation made by some one specially qualified and equipped to carry it through for both partners is indicated. The use of polyglutular therapy is purely empirical and may produce results opposite to those sought. Hühner's and Rubin's tests should be informative, and pneumoroentgenography may reveal the underlying pathologic condition that is interfering with conception. The entire matter was described by Stein and Leventhal in *THE JOURNAL*, Feb 20, 1932, page 621.

LEUKORRHEA

To the Editor—Kindly list for me the causative conditions for leukorrhea in young girls when repeated examinations of smears prove to be negative for organisms and physical examination is essentially negative. A white girl aged 18 years has had a thin white scanty discharge for 8 months. It becomes worse after the menses and at times is copious so that she notices it trickling down her leg. The menses began at 14 years and were regular every thirty days up to a year ago at which time they became prolonged to eight or nine days and were accompanied by severe dysmenorrhea. Previously they lasted five or six days. The uterus is slightly anteverted the hymen is intact and the adnexa are normal. The sigmoid colon is dilated and tender. The patient has constipation, has frequency dysuria and urinates once during the night. Under treatment the constipation and genito-urinary symptoms are lessened but the vaginal discharge persists. Kindly suggest a line of treatment for the leukorrhea. Please omit name. M D Pennsylvania

ANSWER—Leukorrhea in young girls arises usually from hypersecretion ascribable to emotional stimulation. The increased physiologic secretion macerates the cervical mucosa, a glandular hyperplasia ensues, erosions form, and the leukorrhea persists.

Occasionally there is a pathologic condition, despite negative evidence on palpation and the absence of a history of infection or instrumentation. The prolonged menstruation accompanied by dysmenorrhea suggests obstructed uterine drainage, or disturbed ovarian function.

Preliminary to treatment, an examination should be made to rule out vaginal folds and pockets, and the cervical canal should be dilated to insure adequate drainage. The basal metabolic rate should be determined, and thyroid administered, unless contraindicated, in an effort to decrease the excessive menstruation. Hygienic measures are important and improved general health may suffice alone to effect a cure. Destruction of hyperplastic cervical glands is readily accomplished by radial incisions with a nasal cautery tip.

FLUID FOR WASHING NOSE AND SINUSES

To the Editor—I have been using a sinus drainage suction apparatus for cleaning out the sinuses by mild suction and washing the mucous membranes of the nose. It gives gratifying results especially in acute sinusitis coryza and "chronic catarrh." I use a quart rubber bag elevated to the height of the patient's head, a tube to one nostril and another tube from the other nostril to the floor a five foot drop. I use a half teaspoonful each of sodium bicarbonate and sodium chloride to the quart of lukewarm water. Will you give me a prescription that is better? I should like one with zinc sulphate, sodium bicarbonate, sodium perborate and chloride and a little flavoring. I should like to mix up a large batch a pound or so and use a teaspoonful or so to 1000 cc of water. Will you figure out a correct proportion of each for me so that the osmotic pressure is right and the various ingredients listed are in correct proportion? If you have a better formula please advise me.

EDWARD MARTIN REPP M D Philadelphia

ANSWER—The sodium bicarbonate and sodium chloride in the proportion one teaspoonful to one pint of water gives about the same concentration as that of the blood. Fluids used in the nose should be at or a little above body temperature, and no excessive pressure should be employed. The mixture of sodium chloride and sodium bicarbonate just mentioned is as efficient as any for cleansing purposes. One may employ a powder consisting of equal parts of sodium chloride, sodium borate and sodium bicarbonate, and of this mixture use a teaspoonful and a half in a quart of water. At the same time, if any flavoring is desired, about 1½ drachms of oil of cassia may be added to the mixture.

SENSITIVITY TO BUTESIN AND PICRATES

To the Editor—A short while ago a patient came to see me with a mild burn of the right forearm. I applied butesin picrate ointment to the burn area and it healed in a few days. About one week after the ointment was applied a papular eruption appeared over the area to which the ointment had been applied. Itching was not very bad. A few days later the eruption appeared on the face and the left forearm but here instead of a discrete pale papular eruption it was very red maculopapular and blotchy. All areas itched. In the next few days the later eruption became generalized. Temperature pulse and respiration have been continually normal. For ten days now there has been no change. Can you give me some information as to the treatment symptoms cause and prognosis of these toxic reactions due to butesin picrate ointment? Please omit name. M D Pennsylvania

ANSWER—The occurrence of toxic cutaneous reactions following the application of butesin picrate ointment to burns has been reported on a number of occasions. The treatment consists in the complete removal of the irritant, local soothing and emollient applications and the use of sodium thiosulphate intravenously, in the event of no response to local therapy. In most of the reported cases, recovery has occurred. The genesis of this type of dermatitis is discussed by Sulzberger and Wise (*Arch Dermat & Syph* 28 461 [Oct.] 1933). In a report of their observations in four cases, two of the three patients that they were able to test were sensitive to both butesin and trinitrophenol (picric acid), while the third patient was sensitive to butesin alone. They state that this suggests that the application to a burned (injured) area may constitute a situation peculiarly favoring sensitization.

REDUCING SUBSTANCE IN URINE

To the Editor—A few years ago I found on examining my urine that the Benedict solution turned green about two hours after a meal. This occurs occasionally. I am 35 years of age 5 feet 8 inches (173 cm.) in height and weight 145 pounds (66 kg.). There is no family history of diabetes mellitus. I have no symptoms of any kind and feel well except for a slight tendency toward diarrhea probably a condition of irritable colon. I have increased 10 pounds (4.5 kg.) in weight in the last ten years. My fasting blood sugar is 0.1 per cent and the dextrose tolerance curve is normal with the urine sugar free. Is this an incipient diabetes mellitus or alimentary glycosuria or renal diabetes? Should I restrict my diet in any way? Am I prone to acquire diabetes? Please let me know your opinion as the men here differ on this. Please omit name. M D Minnesota

ANSWER—From the description, no diagnosis of any of the conditions mentioned can be made. The probability is that the reducing substance that occasionally appears in the urine is not dextrose. It may be levulose, pentose or lactose. When reduction occurs in the urine the presence of these substances may be determined by comparatively simple tests given in most textbooks. Occasionally an increased excretion of glycuronates in the urine may cause some reduction of Benedict's solution. The glycuronates are increased in the urine after such substances as acetylsalicylic acid, antipyrine, camphor chloral hydrate, menthol, and amidopyrine are taken.

The presence of a non-dextrose reducing substance in the urine is not an indication of a susceptibility to diabetes. As to dietary restriction, the ideal weight calculated from the

correspondent's age and height lies somewhere between 150 and 160 pounds (about 70 kg). It would be wise for the inquirer like every normal person, not to exceed this weight, since overweight is known to be the greatest single predisposing factor in the etiology of diabetes.

SEDIMENTATION RATE IN BLOOD

To the Editor—Kindly let me know what is considered the normal sedimentation rate of the blood by the Westergren method. I believe the reference is *International Clinics* 1:70 (March) 1928.

M F LAUTMAN M D Hot Springs Ark

ANSWER—Westergren in the *American Review of Tuberculosis* (14 94 [July] 1926) described a satisfactory method for determining the red blood cell sedimentation rate.

A sedimentation of not over 3 mm in the first fifteen minutes, and not over 8 mm in the thirty minute period, is the strict normal. Anything over 10 mm in the thirty minute period, or over 15 mm in the forty-five minute period, may be regarded as definitely pathologic. The rates tend to be slightly higher in women (by 3 to 4 mm in forty-five minutes) than in men, and to be higher during menstruation.

A sedimentation rate of from 15 to 30 mm in forty-five minutes is a slight increase, from 30 to 50 mm a moderate increase, and from 50 to 100 mm a severe increase.

This test is not a specific test for any disease. The rate is accelerated in active tuberculosis, acute inflammation, infectious diseases, carcinoma, pregnancy and the toxemias. It is of chief value in distinguishing between inflammatory and noninflammatory processes, and for estimating the activity or progress of pulmonary tuberculosis.

REMOVAL OF TONSILS AT 70

To the Editor—A man aged 70 has asked me to remove his tonsils. Backache appeared to be his only reason for this request. He has heard of another man much younger however who obtained relief from joint pains following a tonsillectomy. Physical examination, in addition to a moderate hypertrophy of the tonsil on the right side revealed a blood pressure of 210 systolic, 100 diastolic and urinalysis showed four plus albumin. Under these conditions I advised electrocauterization. Your comment and advice would be appreciated. Kindly omit name.

M D Illinois

ANSWER.—It is difficult to say in any particular case whether joint pains are present as a result of tonsillar infection. The history of attacks of tonsillitis, the finding of actual pus in the tonsils and the elimination of other foci in the body are necessary before one can definitely state that tonsillectomy is likely to give relief of the joint pains. With a marked hypertension and other signs and symptoms it would probably be better to avoid surgery at the age of 70. Carefully performed electrical coagulation may in such cases be advisable if there are definite indications for the elimination of the tonsils. It is necessary, however, as a rule to use electrical coagulation at quite a number of sittings, and there is also the possibility of secondary hemorrhage a number of days after each coagulation.

SYPHILIS IN MICE

To the Editor—Mice rats and guinea pigs are I understand experimentally susceptible to syphilis and although no local lesion appears at the site of infection the brain is often seriously involved. Will you please tell me whether syphilis in such animals produces any lesions in the eyes and if so what ones and whether severe? Please do not print name.

M D Minnesota

ANSWER.—The majority of reports on the successful inoculation of white mice with *Spirochaeta pallida* emphasize the absence of specific lesions, although organisms may be recovered from such animals for long periods by the injection of various tissues into rabbits. A summary of the subject together with numerous references appears in a recent monograph by Gastonel and Pulveris, *La syphilis experimentale*, Paris, 1934.

MICROCEPHALY

To the Editor—A girl aged 4 years has microcephaly. Would you be kind enough to outline the latest treatment and management of this condition paying especial attention to glandular therapy? Does anterior pituitary extract help? Please omit name.

M D, Massachusetts

ANSWER.—A case of true microcephaly in a 4 year old child implies an arrested development of the brain. In such a condition no glandular therapy is of any avail and anterior pituitary extract would be useless in the treatment.

The best treatment for such a child would be a special school where, according to the state of the child's mentality, she could be trained and taught up to her learning capacity.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Kansas City Mo May Sec Dr C Guy Lane, 416 Marlboro St. Boston
AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada Dec. 7. Applications must be filed not later than Nov 1. Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6)
AMERICAN BOARD OF OPHTHALMOLOGY St Louis Nov 18 Asst Sec Dr Thomas D Allen 122 S Michigan Ave. Chicago
AMERICAN BOARD OF ORTHOPAEDIC SURGERY St Louis, Jan Sec Dr Fremont A Chandler 180 N Michigan Ave. Chicago
AMERICAN BOARD OF OTOLARYNGOLOGY Kansas City Mo May 9 Sec Dr W P Wherry 1500 Medical Arts Bldg Omaha
AMERICAN BOARD OF PEDIATRICS St Louis Nov 20 Sec Dr C A Aldrich 723 Elm St. Winnetka Ill
AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY New York Dec 30 Sec Dr Walter Freeman 1726 Eye St, N W Washington D C
AMERICAN BOARD OF RADIOLOGY Detroit Dec 12 Sec Dr Byrl R Kirkin Mayo Clinic, Rochester Minn
ARKANSAS Basic Science Little Rock Nov 4 Sec Mr Louis E Gebauer 701 Main St Little Rock Medical (Regular) Little Rock Nov 12 Sec State Medical Board of the Arkansas Medical Society
Dr A S Buchanan Prescott Medical (Electric) Little Rock Nov 12 Sec Dr Clarence H Young 207 1/2 Main Street Little Rock
CALIFORNIA Sacramento Oct 21 24 Sec Dr Charles B Pinkham 420 State Office Bldg Sacramento
CONNECTICUT Medical (Regular) Hartford Nov 12 13 Endorsement Hartford Nov 26 Sec Dr Thomas P Murdock 147 W Main St Meriden Medical (Homeopathic) Derby Nov 12 Sec Dr Joseph H Evans 1488 Chapel Street New Haven
FLORIDA Tampa Nov 11 12 Sec Dr William M Rowlett Box 786 Tampa
ILLINOIS Chicago, Oct 22 24 Supt. of Regis Dept of Regis and Edu Mr Homer J Byrd Springfield
KENTUCKY Louisville, Dec 3 Sec Department of Health Dr A T McCormack 532 W Main St Louisville
MAINE Portland Nov 12 13 Sec. Board of Registration of Medicine Dr Adam P Leighton Jr 192 State St Portland
MASSACHUSETTS Boston Nov 12 14 Sec. Board of Registration in Medicine Dr Stephen Rushmore 413 State House Boston
MISSOURI Kansas City, Oct 24-26 State Health Commissioner Dr E T McLaugh Capitol Building Jefferson City
NATIONAL BOARD OF MEDICAL EXAMINERS Part III Baltimore Oct 22 24 and Boston Nov 5 7 Exec Sec Mr Edward S Elwood 225 So 15th St Philadelphia
NEBRASKA Lincoln Nov 19 20 Dir Bureau of Examining Boards Mrs Clark Perkins State House Lincoln
NEVADA Carson City Nov 4 Sec Dr Edward E Hamer Carson City
OHIO Columbus Dec 3 5 Sec State Medical Board Dr H M Platter 21 W Broad St Columbus
OREGON Basic Science Portland Nov 16 Sec Mr Charles D Byrne University of Oregon Eugene
SOUTH CAROLINA Columbia Nov 12 Sec Dr A Earle Boozer, 505 Saluda Ave Columbia
TEXAS Houston Nov 18 20 Sec, Dr T J Crowe 918 Mercantile Building Dallas
WEST VIRGINIA Huntington Oct 28 State Health Commissioner Dr Arthur E McClue Charleston

Colorado July Report

Dr Harvey W Snyder, secretary, Colorado State Board of Medical Examiners reports the written examination held in Denver, July 2, 1935. The examination covered 8 subjects and included 80 questions. An average of 75 per cent was required to pass. Fifty-three candidates were examined, 52 of whom passed and 1 failed. Seven physicians were licensed by endorsement. The following schools were represented:

| School | PASSED | Year Grad (1933) | Per Cent |
|---|---|---------------------------|----------------------|
| University of Colorado School of Medicine (1935) | 82 2 83 83.2 83 4 84 84 4 85 85 3 85 3 85 3 86 86 86 86 86 1 86 1 86 2 86 3 87 88 88 88 88 2 88 3 88 4 89 89 89 2 89 4 90 90 1 90 2 | | 86 1 |
| Northwestern University Medical School (1935) | | | 87 3 |
| University of Maryland School of Medicine and College of Physicians and Surgeons (1934) | | | 89 |
| University of Michigan Medical School (1934) | | | 89 1 |
| Washington University School of Medicine (1934) | | | 86 2 |
| Université de Strasbourg Faculté de Médecine (1918) | | | 87 * |
| Johann Wolfgang Goethe-Universität Medizinische Fakultät Frankfurt am Main (1933) | | | 86 5 * |
| Osteopaths † | 77 77 5 78 4 81 3 81 5 83 83 5 85, 87 3 | | |
| School | FAILED | Year Endorsement Grad. of | Endorsement |
| University of Arkansas School of Medicine (1933) | | | Arkansas |
| Chicago College of Medicine and Surgery (1916) | | | Illinois |
| University of Kansas School of Medicine (1934) | | | Kansas |
| University Medical College of Kansas City Mo (1908) | | | Kansas |
| University of Nebraska College of Medicine (1932) | | | Kansas |
| Jefferson Medical College of Philadelphia (1906) | | | Iowa (1920) New York |

* Verification of graduation in process

† Licensed to practice medicine and surgery

‡ Examined in medicine and surgery

Ohio June Report

Dr H M Platter, secretary, Ohio State Medical Board, reports the oral, written and practical examination held at Columbus, June 4-7, 1935. The examination covered 10 subjects and included 80 questions. An average of 75 per cent was required to pass. Two hundred and fifty-two candidates were examined, 249 of whom passed and 3 failed. Forty-eight physicians were licensed by reciprocity and 3 physicians were licensed by endorsement. The following schools were represented:

| School | PASSED | Year Grad | Per Cent |
|--|---------|-----------|----------|
| Loyola University School of Medicine | (1935) | 79 4 | 81 7 |
| Northwestern University Medical School | (1934) | | 85 3 |
| Rush Medical College | (1935) | 80 7 | 81 5 |
| School of Medicine of the Division of the Biological Sciences | (1933) | | 79 3 |
| University of Louisville School of Medicine | (1935) | | 84 9 |
| Johns Hopkins University School of Medicine | (1932) | | 78 8 |
| University of Maryland School of Medicine and College of Physicians and Surgeons | (1935) | | 83 4 |
| Harvard University Medical School | (1934) | | 85 7 |
| University of Minnesota Medical School | (1935) | | 81 |
| St Louis University School of Medicine | (1934) | 77 7 | 80 6 |
| Washington University School of Medicine | (1934) | | 86 |
| Creighton University School of Medicine | (1934) | | 78 7 |
| Cornell University Medical College | (1934) | | 83 |
| University of Buffalo School of Medicine | (1934) | | 75 9 |
| Eclectic Medical College Cincinnati | (1935) | | 78 2 |
| 78 7, 79 7, 79 6, 79 7, 80 2, 80 6, 81 4, 82 5, 83 8, 83 2, 84 6, 84 7, 85 7, 87 | | | |
| Ohio State University College of Medicine | (1935) | | 75 1, |
| 75 9, 76 1, 76 4, 76 7, 76 8, 77 2, 77 4, 77 5, 78 3, 78 3, 78 4, 78 4, 78 5, 79 1, 79 1, 79 4, 79 7, 79 8, 79 9, 80 8, 80 1, 80 2, 80 3, 80 5, 80 5, 80 6, 80 6, 80 6, 80 7, 80 8, 80 9, 81 8, 81 1, 81 1, 81 1, 81 1, 81 3, 81 4, 81 5, 81 6, 81 6, 81 6, 81 9, 82 8, 82 1, 82 2, 82 3, 82 4, 82 4, 82 4, 82 5, 82 5, 82 6, 82 8, 82 8, 83 1, 83 1, 83 2, 83 2, 83 3, 83 5, 83 5, 83 6, 83 7, 83 7, 83 8, 83 8, 83 9, 84 8, 84 3, 84 5, 84 7, 84 9, 84 9, 85 8, 86 2, 86 4 * | | | |
| 86 9, 88 6, 89 1 | | | |
| University of Cincinnati College of Medicine | (1935)† | | 75 5 |
| 76 2, 76 6, 77 7, 77 2, 77 6, 78 1, 78 7, 78 9, 79 2, 79 2, 79 8, 80 1, 80 2, 80 3, 80 6, 80 6, 80 8, 80 8, 80 8, 80 9, 81 8, 81 2, 81 4, 81 4, 81 5, 81 5, 81 6, 81 8, 81 8, 81 9, 81 9, 82 8, 82 1, 82 1, 82 2, 82 3, 82 4, 82 4, 82 6, 82 7, 82 7, 82 8, 82 9, 83 8, 83 2, 83 2, 83 5, 83 9, 84 8, 84 1, 84 2, 84 2, 84 3, 84 7, 84 7, 85 2, 85 3, 85 6, 86, 86 9 | | | |
| Western Reserve University School of Medicine | (1935) | | 75 |
| 75 7, 75 9, 77 2, 77 4, 77 4, 77 9, 77 9, 78 7, 78 8, 78 1, 78 1, 78 6, 79 7, 79 1, 79 2, 79 2, 79 2, 79 3, 79 4, 79 5, 79 6, 79 7, 79 8, 79 9, 79 9, 79 9, 79 9, 80 2, 80 2, 80 4, 80 6, 80 7, 80 7, 80 8, 81 1, 81 2, 81 3, 81 3, 81 6, 81 8, 82 8, 82 1, 82 2, 82 3, 82 3, 82 3, 82 4, 82 4, 82 5, 82 8, 82 8, 82 9, 83 4, 84 1, 84 3, 84 4, 85 1, 85 2, 85 4, 85 5, 85 6, 86 2 | | | |
| Jefferson Medical College of Philadelphia | (1934) | | 76 9* |
| Woman's Medical College of Pennsylvania | (1934) | | 79 |
| Marquette University School of Medicine | (1934) | | 79 3 |
| University of Western Ontario Medical School | (1934) | | 77 9 |
| Schlesische Friedrich Wilhelms Universität Medizinische Fakultät Breslau | (1933) | | 80 1† |
| School | FAILED | Year Grad | Per Cent |
| University of Cincinnati College of Medicine | (1935) | | 72 7† |
| Western Reserve University School of Medicine | (1935) | | 73 2 |
| Universität Köln Medizinische Fakultät | (1934) | | 70 5‡ |

| School | LICENSED BY RECIPROCITY | Year Grad | Reciprocity with |
|---|-------------------------|-----------|------------------|
| Loyola University School of Medicine | (1927) | (1928) | Illinois |
| Northwestern Univ Medical School | (1932) | (1933) | Illinois |
| Rush Medical College | (1928) | (1934) | Michigan |
| University of Illinois College of Medicine | (1928) | (1925) | Illinois |
| Indiana University School of Medicine | (1934) | (1934) | Indiana |
| Keokuk Medical College, Iowa | (1898) | (1898) | Illinois |
| State University of Iowa College of Medicine | (1924) | (1924) | Iowa |
| University of Kansas School of Medicine | (1930) | (1930) | Kansas |
| University of Louisville School of Medicine | (1934 3) | (1934 3) | Kentucky |
| Tulane University of Louisiana School of Medicine | (1915) | (1915) | Alabama |
| Johns Hopkins University School of Medicine | (1934) | (1934) | Maryland |
| Harvard University Medical School | (1931) | (1931) | N Carolina |
| University of Michigan Medical School | (1930 2) | (1932), | |
| (1933) (1934, 2) Michigan | | | |
| St Louis Univ School of Med | (1930) (1933 2) | (1934 8) | Missouri |
| Washington University School of Medicine | (1933), | (1934) | Missouri |
| New York University, University and Bellevue Hospital Medical College | (1931) | (1931) | New York |
| Jefferson Medical College of Philadelphia | (1925) | (1925) | Penna |
| University of Pennsylvania School of Medicine | (1930) | (1930) | Michigan |
| Univ of Pittsburgh School of Med | (1912), (1932 2) | (1933) | Penna |
| University of Tennessee College of Medicine | (1934) | (1934) | Tennessee |
| Vanderbilt University School of Medicine | (1934) | (1934) | Tennessee |
| Medical College of Virginia | (1931) | (1931) | Virginia |
| University of Wisconsin Medical School | (1931) | (1931) | Wisconsin |

| School | LICENSED BY ENDORSEMENT | Year Endorsement of |
|---|-------------------------|---------------------|
| School of Medicine of the Division of the Biological Sciences | (1934) | (1935) N B M Ex |
| Harvard University Medical School | | (1930) N B M Ex |

* License has not been issued

† These applicants have received an M B degree and will receive an M D degree on completion of internship

‡ Verification of graduation in process

Book Notices

The Principles and Practice of Urology. By Frank Hinman A.B., M.D. Clinical Professor of Urology at the University of California Medical School. Cloth. Price \$10. Pp 1111 with 613 illustrations. Philadelphia and London W B Saunders Company 1935

In his preface the author of this excellent book states that his objective was the presentation of the principles of urology in a form that would be of practical use to the medical student and the man in general practice. One does not have to read far before discovering that the author has not only accomplished what he set out to do but also has produced a work that will serve as a reference book for the urologist and a helpful aid to the teacher. The rapid changes and advances in this branch of surgery have produced an urgent call for a textbook of this kind. The first part deals with the principles of urology, which the author divides into the biologic principles and the clinical principles. The subdivisions under these two headings are clearly and precisely defined and, although brevity is stressed, nothing seems to have been omitted. This section of the book offers an excellent opportunity for the teacher to assign definite parts of the fundamentals of urology with a feeling that the student will obtain a clear and concise insight into the subject. The second part deals with the practice of urology. Here again the author covers the subject in a most complete manner. The chapter on gonorrhea, so essential in a book of this kind, is fully presented. Ample consideration is given physiology, pathology and diagnosis and while operative technic and proceedings are fully described, the details of surgical technic must necessarily be limited in a single volume. The bibliography is well handled. The book is replete with excellent illustrations. This volume may be classed as a standard English textbook on urology and can be recommended to the student and the general practitioner and as a reference book for the urologist. The author has well accomplished his purpose and is to be congratulated on having contributed this excellent volume to the advancement of urology.

Koronarinfarkt und Koronarinsuffizienz in vergleichender elektrokardiographischer und morphologischer Untersuchung. Von Professor Dr med. Franz Büchner, Vorstand des Pathologischen Instituts am Horst-Wessel-Krankenhaus der Stadt Berlin. Professor Dr med. Arthur Weber, Vorstand des Balneologischen Universitätsinstituts in Bad Nauheim und Dr med. Berthold Haager, Assistent am Balneologischen Universitätsinstitut in Bad Nauheim. Paper. Price 12 marks. Pp 104 with 131 illustrations. Leipzig Georg Thieme 1935

The authors report forty-three cases of heart disease that they have observed, giving brief details of the clinical history and necropsy. Their especial purpose is to find out how much the electrocardiogram may reveal as to the nature and localization of lesions in the heart. A commendable feature is the manner in which on the one page are briefly set forth the history, the electrocardiographic observations, the record of the necropsy and a discussion of the salient features of the case, while on the page opposite are the electrocardiograms taken at various times, a diagram indicating the condition of the coronary arteries as to sclerosis and thrombosis, and a "photogram" of the heart showing in a remarkably clear manner the location of the lesion and the naked eye appearances of the damaged myocardium. Only heart disease the result of anatomically proved coronary obstruction or of "coronary insufficiency" is considered. Cases of acute and chronic obstruction due to thrombosis, of aortic regurgitation due to rheumatism or syphilis, as well as cases associated with anemia are among those discussed. In general there is a confirmation of the well known facts of electrocardiography. At times it seems as though the authors are unduly interested in proving their pre-conceived notions as to the significance of the tracings. Thus without any description whatever they occasionally summarily dismiss a tracing because it is 'not characteristic,' which sounds as though they were reporting not impartially what they find so much as what they are looking for. Q waves, even very small ones, in leads 1 and 2 are regarded as of great significance, yet comparatively little attention is given to even large ones in lead 3. It is sometimes difficult to follow their reasoning when they declare the existence of coronary insufficiency but no evident obstruction. There is here a perplexing confusion of pathologic anatomy and pathologic physiology. While

in no sense epoch making, the work is commendable in that it adds to the knowledge of a subject that is far from settled and that, because of its complexity and the many variables involved, will probably for long defy accurate clinical analysis.

The Subnormal Mind By Cyril Burt M.A. D.Sc. Professor of Psychology University of London University of London Heath Clark Lectures 1933 delivered at the London School of Hygiene and Tropical Medicine Cloth Price \$3.75 Pp 368 New York & London Oxford University Press 1935

The author of this volume is the leading English exponent of mental testing. He has revised the Binet test for use in England and his previous contributions on the present subject have been well received. Unfortunately the title of the present volume is a misnomer, for not only does the author treat of mental efficiency as the title would imply but he treats also of the "abnormal" mind. In spite of this, the book is excellent. It is a revision of lectures presented at the London School of Hygiene and Tropical Medicine, and the purpose of delivering them was to introduce to physicians the elements of clinical psychology as it is practiced today. The book is simply written with an interesting style, logically put together, and it covers a surprising amount of ground when one considers the number and variety of the topics dealt with. There are eight chapters, the first one treating of the concept of normality in regard to psychological testing. The second and third present the problems of the mentally defective and the dull and backward child. The fourth chapter is an excellent, sensible and modern presentation of the subject of delinquency and should be read by every one interested in studying the etiology and treatment of crime. The fifth, sixth and seventh chapters are discussions of the neuroses, particularly those seen in children, and the modern points of view are strictly adhered to throughout these chapters. There is a concluding chapter and three appendices. The book should be of value to pediatricians and psychiatrists.

Arthritis and Rheumatoid Conditions Their Nature and Treatment By Ralph Pemberton M.S. M.D. F.A.C.P. Professor of Medicine in the Graduate School of Medicine University of Pennsylvania Second Edition Cloth Price \$5.50 Pp 455 with 70 illustrations Philadelphia Lea & Febiger 1935

Pemberton is conceded to be a leading authority on rheumatic diseases. He has done excellent experimental and research work on this and related conditions. He is chairman of the American Committee for the Study and Control of Rheumatism and a prime factor in the formation of the American Association for the Study and Control of Rheumatic Diseases. The present work attempts to view the problem of arthritis from a broad physiologic standpoint and to consider the interrelationship of the various factors that constitute it. One can be sure that the data contained represent an accurate statement of the present-day conception of these conditions. The material is presented in excellent sequence, the book presents a dispassionate account of a difficult subject, concerning which much is controversial. It was written largely to show the practitioner what to expect in the way of symptoms, what to do in the way of correction along broad physiologic lines, and what to do in the matter of specific activity toward certain phases of the problem. It is not to be supposed that the thesis developed in this text, that a disturbance of blood supply constitutes part of the pathologic deviation producing the phenomena of arthritis, affords in the mind of the author the whole or even the dominating explanation of the rheumatoid syndrome. The evidence strongly indicates that, whether or not any additional mechanism is concerned denial to the muscular tissues of their usual degree of contact with the circulating blood interferes with the withdrawal of dextrose, so that when sugar is fed a "lowered tolerance" results. This clearly suggests that circulatory changes contribute to the pathology of arthritis and focal infection with which a lowered sugar tolerance is closely associated. The clinical benefits following therapeutic measures that improve the blood flow emphasize the relation of circulatory changes to arthritis. Evidence is presented to indicate that there is a low grade edema of the tissues in active arthritis. The blood volume of atrophic patients has been found to be increased above normal whereas in hypertrophic patients low readings are recorded. There is a diminished variability of skin function in arthritic patients as shown by the comparatively sluggish response of skin temperature to changes in environmental temperature.

One of the first lessons to be learned in treating this disease is the importance of maintaining a broad-minded attitude. There is no simple panacea in the treatment of arthritis, nor can there be, in the nature of things. In view of the wide disturbance of physiologic function and the secondary invalidism dependent on it, it is obviously impossible that any single measure could be adequate to restore this state of affairs to normal. Results will be largely determined by the judgment used in the selection of cases appropriate for treatment. The two great types of arthritis cannot definitely and finally be wholly divided one from the other, least of all from the standpoint of treatment. A proper coordination of diet, as a foundation with other well considered measures, will achieve a highly gratifying percentage of benefit in properly selected subjects. In some cases of pernicious anemia treated successfully on the large liver diet, hypertrophic arthritis developed. The inability of the medical profession to care adequately for persons with arthritis has been a potent factor in the development of those cults which depend chiefly on manipulation and massage or some modification of these measures.

Pemberton is one of the few internists who know the subject of physical therapy from the theoretical as well as the practical point of view.

Traité de thérapeutique Par A. Theohari professeur de clinique thérapeutique à la Faculté de médecine de Bucarest Tome I Tube digestif glandes salivaires pancréas foie Tome II Appareil respiratoire reins nutrition avitaminoses glandes endocrines rhumatismes chroniques Publié par les soins de Dr I. Gheorghiu Popesco Paper Price 125 francs per set Pp 686 721, with illustrations Paris Masson & Cie 1935

One appreciates this posthumous work when one reads that it is the fruit of thirty years of scientific activity, and one may well believe this in spite of the fact that it is unfinished, for it represents a meticulous and painstaking garnering of data. The first volume deals with the therapy of the diseases of the digestive tract and the second with diseases of the respiratory system, the kidney, of nutrition, of the endocrines, with avitaminoses, and of chronic rheumatism. The author was known especially for his researches on mineral waters, particularly those of Rumania, the effect of diet in experimental nephritis, and the use of emetine in pulmonary gangrene and chronic bronchitis. The book is written not only in the French language but also in the French style of therapeutic abundance, not to say redundancy, the author not only telling what he actually knows of the value of remedies but also displaying his erudition by discussing critically or uncritically the other methods of treatment he knows. It would seem that what this world needs more than anything else is reliable guidance in therapeutics. Judged from this standpoint the present book leaves much to be desired, as do indeed nearly all other books on therapeutics. To the initiated, Theohari's life work is a quarry hiding many a golden nugget, to the medical practitioner, a mine containing ore with much slag, to the medical student, a hopeless mass of rubble. Probably to indicate that it is unfinished, the book has no index.

Gestalt Psychology A Survey of Facts and Principles By George W. Hartmann Ph.D. Professor of Psychology the Pennsylvania State College Psychology Series edited by Albert T. Poffenberger Ph.D. Professor of Psychology Columbia University Cloth Price \$3.50 Pp 325 with 44 illustrations New York Ronald Press Company 1934

American psychologists have been greatly interested in this new field of psychology, developed in Germany, known as the gestalt school. The picture of mental processes as understood by old school psychologists differs markedly from the ideas of gestalt psychology. The understanding of perception has been altered greatly by the views put forth by the gestalters and many previously poorly understood mental activities have been interpreted in a clearer light. The gestalt theory is known as the configurational theory and its implication is that perception is a matter of gross patterns rather than a simple synthesis of sensations. Much new material has been developed in America by genetic psychologists and animal psychologists which tend to substantiate or to cast doubt on the gestalt theories. Previous to the present volume, the only books on the subject were written by simon-pure gestalt psychologists. The present writer, while sympathetic with the school, could not be called a member of it. Hence he presents the material both pro and con that recent research has revealed. His presentation is complete,

simple and well expressed, and it forms an adequate textbook. The first part of the book is historical, the second part is theoretical, pointing out the physical, physiologic and philosophical foundations of the theory, the third part is empirical, treating of such subjects as visual perception, audition, memory, learning, insight and conation. There is a fourth part which points out the relations of this theory to psychiatry, industrial psychology and educational psychology, and the fifth and concluding part is devoted to valid criticisms of the gestalt theories. There is a good chronology and a fair glossary, and the references in the text are well annotated. There are points of view expressed in the present book with which any one interested in psychiatry should be familiar, but the volume has no direct significance to physicians as a whole.

A Bibliography of Two Oxford Physiologists Richard Lower 1631 1691 John Mayow 1643 1678 By John F. Fulton M.A. Sterling Professor of Physiology in the Yale University School of Medicine [Reprinted from the Oxford Bibliographical Society Proceedings and Papers 1935 Volume IV Part I] Paper Pp 62 with 7 illustrations London Oxford University Press 1935

Bibliophiles and all who are attentive to the history of science in general and of medicine in particular will welcome this scholarly book, which is a fitting companion to the translation of Lower's *De corde*, made by Franklin in 1932. It is not, as bibliographies are wont to be, a mere compilation, it is much more. It is a painstaking study with wise comments, a study that evinces erudition and a genuine love of the task. One finds here the same high order of merit shown by Fulton's bibliography of Robert Boyle, published in 1932. The promised bibliographies of Willis, Hooke and others will be awaited with interest.

New Minds for Old The Art and Science of Mind Training By Esme Wingfield Stratford D.Sc. M.A. Cloth Price \$3 Pp 452 New York Macmillan Company 1935

The author's record as research student of economics, fellow of King's College, Cambridge, soldier poet, novelist and writer on historical and pedagogic subjects shows a versatility that is evident in the present volume. It is an attempt to outline "the master science of mind-training, or self-training, on which all the rest depend." The essence of his motive is expressed in the following: "The very notion that improved machines demand improved men seems to have occurred to no one. We talk of reconstructing society, as if such a task were conceivably practicable without first reconstructing ourselves. You go into training for everything whatever at which you want to excel, with the sole and monstrous exception of the art of life itself—the art of feeling and thinking and willing, and of replying to the challenge of environment." One of the results is shown in certain nations where a team spirit is imposed on "a community of mental slaves" joyfully flocking to the service of any tyrant who will take from their minds the burden of thought and from their souls the incubus of conscience.

In four parts entitled "The Foundations," "Mind Building," "Mens Sana" and "Mind in Action" the author presents in leisurely fashion his many ideas and suggestions. The style is excellent and the frequent humor and keen criticism make for easy reading. The psychiatrist, the psychoanalyst and the psychologist will each find points for objection. The intelligent layman will find much stimulating material. The book will be valuable as a guide to parents and teachers. The dull and tired citizen who needs it most will be discouraged by its length. For him it is to be hoped that the author will prepare a simple digest of his material.

La cianosis de los cardíacos negros de Ayerza Su estudio semiológico clínico y fisiopatológico. Por Eduardo L. Capdehourat Jefe de Clínica de la Facultad de Medicina Trabajo de la cátedra de clínica médica del Profesor Dr. Mariano R. Castex. Paper Pp 373 with 55 illustrations Buenos Aires Anceloto Lopez 1934

This is an account of the symptomatology, pathologic physiology and diagnosis of Ayerza's disease according to the author's conception of that disorder. The latter consists in a firm belief that chronic bronchopulmonary disease precedes the development of pulmonary arteriosclerosis and is the essential factor in the production of cyanosis. This thesis is defended valiantly if somewhat argumentatively. The colored plates, protocols of the author's cases, and index are excellent. The bibliography is extensive.

Medicolegal

Workmen's Compensation Acts Silicosis and Tuberculosis Not Compensable in Absence of Existing Disability—The North End Foundry Company had to reinsure its employees. The prospective insurer demanded as a condition precedent to the execution of a policy that all employees be examined by a physician selected by it. Before the examination was made, all employees were discharged. Only those were reemployed who were believed to be physically fit for the duties to be imposed on them. Five employees who were not reemployed, because they were not physically fit, were awarded compensation by the industrial commission, under the Wisconsin workmen's compensation act. Thereupon their employer and its insurance carrier brought actions against the commission and the several claimants to set aside the awards. From a judgment modifying and affirming the award in each case, the industrial commission, the several claimants, the employer and the employer's insurance carrier all appealed to the Supreme Court of Wisconsin.

The Supreme Court based its decision on the case of one claimant, Pernovich, as the same questions were involved in all cases. Pernovich, before he was discharged, had worked steadily. He was not aware that he was suffering from any disease. The physical examination, however, showed that he had had silicosis for probably five years or more and was in the second stage of that disease and that tuberculosis had already developed. Although at the time of the examination Pernovich was able to perform his work, his chance of recovery would be diminished if he remained in the dusty employment in which he had been engaged. Reexamination three months later showed that his ability to do work requiring physical exertion was greatly diminished, if he could be said to be able to do it at all. Nevertheless Pernovich's employer and its insurance carrier contended that he had suffered no compensable injury in the course of his employment with his employer, the North End Foundry Company.

Disability within the meaning of the statute, said the Supreme Court, occurs when an employee is disabled from rendering further service, that is, when he no longer has physical ability to perform his work in the usual and customary way. Unless he is so disabled he sustains no compensable injury even though in the course of his employment he is subjected to conditions that contribute to disability as an end result. The right of an employee to compensation depends on whether or not, in the course of his employment and because of it, an occupational disease renders him incapable of performing his customary work. It has been argued, said the court, that if an employee is entitled to compensation, as he is when he voluntarily ceases work because of physical incapacity to continue, then an employee who is discharged by his employer because of potential physical disability is equally entitled to compensation. For the latter contingency, however, the present law, which was framed to cover injuries resulting from accident, rather than incapacity resulting from occupational disease, affords no relief. An employee who has been exposed to industrial hazards, who has suffered no "physical disability" that prevents his performing his work in his usual and customary way, and who is discharged because an examination discloses that such disability may arise in the future, is not entitled to compensation for "medical disability."

It has been argued that it is against public policy to permit an employer to discharge an employee who has been exposed to industrial hazards, in order to anticipate his employee's future disability. That, however, said the Supreme Court, is a problem for the legislature and not for the courts. The courts can do nothing more than interpret and administer the statute. The remedy lies solely with the legislature. Finding no evidence to show that the claimants suffered disability within the meaning of the law during the period of their employment with the North End Foundry Company nor until after the relation of employer and employee had been terminated, the judgments of the courts below in the several cases were reversed and remanded with instructions to enter judgments setting aside the awards of the industrial commission.—*North End Foundry Co v Industrial Commission (Wis.)*, 258 N W 439

Libel and Slander Imputing Drunkenness and Untruthfulness to Physician Slandering Per Se—The Industrial Life & Health Ins. Company promised to pay certain benefits to Anna Washington in event of the illness of her son. The son became ill and was treated by the plaintiff in this case, a physician. Thereafter the mother applied to the local agent of the insurance company for a claim blank, which he refused to give her. She then obtained from the plaintiff a statement certifying to her son's illness and forwarded it to the company. The claim not having been paid, the mother asked the local agent of the insurance company the reason. He replied that her son had not been sick and, referring to the plaintiff, told her in the presence of a third person: "Your lying, drunken friend fixed up that slip to send to the company and I told them not to pay it." On being informed of the agent's statement the plaintiff sued the insurance company and its agent for slander. The trial court gave judgment for the plaintiff, and the insurance company appealed to the Supreme Court of South Carolina.

In determining whether the words used were slanderous without proof of actual injury to the plaintiff, the court quoted from *Boling v. Clinton Cotton Mills*, 163 S. C. 13, 161 S. E. 195, as follows:

In 36 C. J. 1170 it is said: "Oral imputations of falsehood are not actionable per se unless they charge a crime or affect one in his business or profession. In view of the fact that the natural effect of the charge of falsehood to the minister was calculated to expose him to public hatred, contempt, ridicule, aversion or disgrace to induce an evil opinion of him in the minds of right thinking persons to deprive him of that friendly intercourse and society and calculated to seriously affect his usefulness in his profession as a minister, the statement alleged was actionable per se."

In the case cited, said the Supreme Court, the person alleged to have been slandered was a minister, in this case he is a physician. The relation of trust and confidence existing between a physician and his patients is often as close as that existing between a minister and his congregation. The oral imputation that a physician is a liar and a drunkard is certainly calculated to affect his business or profession and to injure him in the community in which he gains his livelihood. Such words addressed to such a man are undoubtedly slanderous per se. A charge that a physician is a liar and a drunkard, however, does not impute gross ignorance or unskillfulness or the commission of a crime, and when the trial court instructed the jury, at the request of the plaintiff, that to charge a professional man with acts or omissions that clearly impute to him gross ignorance or unskillfulness or the commission of a crime for which he could be indicted, tried and punished would justify an award of damages, it injected into the case issues that were prejudicial to the defendant. For that reason, the judgment of the trial court was reversed and the cause remanded for a new trial.—*Harper v. Industrial Life & Health Ins. Co. of Atlanta, Ga.* (S. C.), 177 S. E. 787.

Workmen's Compensation Acts Activation of Tuberculosis by Injury, Compensability—Morrill, a granite cutter, while operating a silicon carbide saw for the defendant, August 27, fell and injured his left hip, side and chest. At the time he was apparently in good health and able to work, although he was suffering from silicosis and latent tuberculosis. On the day following the accident he went to bed where he remained until his death October 8 from acute pulmonary tuberculosis. His widow brought proceedings under the workmen's compensation act of Vermont to recover compensation for herself and her children. From an award in her favor, but denying the compensation to her children, confirmed by the county court, she appealed to the Supreme Court of Vermont as did also the employer.

There is no question, said the Supreme Court, but that Morrill sustained personal injuries by accident. Compensation is not allowable if death resulted solely from a so-called occupational disease. The question, then, is whether Morrill's disability and death resulted from the accident. The evidence tended to show that the injuries resulting from the accident "lighted up," aggravated or accelerated a preexisting disease and caused death earlier than otherwise would have been the

case. It is not apparent that the nature of silicosis from which Morrill was suffering, whether it was an occupational disease or not, is material to the determination of the question of compensability. It cannot be that one who has incipient silicosis is precluded from compensation when injured, because the silicosis from which he is suffering, or ailments consequent on it might ultimately result in disability or death. The compensation act prescribes no standard of fitness to which an employee must conform, and compensation is not based on any implied warranty of perfect health or immunity from latent and unknown tendencies to disease that may develop into positive ailments if incited into activity by accidental injury. Although Morrill's disability and death were due to the development of a disease that he had in his system when he was injured, if his injuries were a contributing and proximate cause of such development, the disease, in the opinion of the court, resulted from the injury "within the meaning of the workmen's compensation act and the motion of the defendant for a directed verdict was properly denied by the trial court. The judgment of the trial court in favor of the claimant, but denying compensation to her children because they were not shown to be dependents of the deceased, was affirmed.—*Morrill v. Charles Bianchi & Sons, Inc. (Vt.)*, 176 A. 416.

Vaccine Liability of Manufacturer for Death Following Administration of Antirabic Vaccine, Res Ipsa Loquitur Not Applicable—Tremaine, a veterinarian, was bitten by a dog. He and his wife administered, by hypodermic injection, according to directions, thirteen doses of a "fourteen-dose" treatment of "killed bacteria" antirabic vaccine, procured from the defendant company. After the thirteenth dose, lumps formed in his abdominal wall at the sites of injection and he was unable to take the fourteenth dose. On the eighteenth day after beginning treatment one of his legs became paralyzed. About nine months later he died of inflammation of the spinal cord. A few years before he had taken a twenty-one dose treatment of "live bacteria" antirabic vaccine without ill effect. His widow sued the defendant company, the maker of the vaccine. The jury returned a verdict in her favor but the trial court entered a judgment for the defendant company notwithstanding the verdict. Thereupon the widow appealed to the Supreme Court of Pennsylvania.

The plaintiff's theory was that the vaccine was not sterile and that it was unsafe and unsuitable for the purpose intended in that it contained organisms and other ingredients which were destructive to human life. She alleged that the injection of such vaccine caused the illness and death of her deceased husband. One of the medical expert witnesses called by the plaintiff stated that inflammation of the spinal cord might be caused by injury to the cord or by infection and that it might originate without discoverable cause. Another such witness said that the deceased's illness was due to the injection of the antirabic vaccine. There was no testimony, however, to show that the vaccine was improperly or negligently prepared.

The plaintiff, said the Supreme Court, totally failed to prove the negligence alleged, and it could not reasonably be inferred from the evidence that the defendant company's conduct was a substantial factor in bringing about harm. The fact that the deceased administered to himself or had administered to him serum made by the defendant and that he thereafter became ill and died does not constitute legal proof that his death was caused by the serum or that the serum was "negligently, carelessly and improperly prepared and unfit, unsuitable and unsafe for the purpose intended." In *Nixon v. Pfahler*, 279 Pa. 377, 124 A. 130 the court had said that it had never applied the rule of *res ipsa loquitur* against a medical practitioner, "who is within the general rule that negligence will not be presumed from the mere happening of an accident."

Proof as to cause of death said the court, lacked much in positiveness. The expert testimony was to the effect that by eliminating all other causes the conclusion was reached that the sickness of the deceased was caused by the injections of the antirabic vaccine and that death followed infection from it. But this testimony, said the court, did not exclude the hypothesis that the illness might have been due to carelessness in administering the vaccine or to the patient's systemic repug-

nance to it. And even if the court should assume that death was caused by the serum, the charge that the serum was negligently prepared would still be without evidentiary support.

In the absence of evidence to the contrary, said the court, the presumption is that the serum furnished by the defendant was not negligently prepared and that it was safe for the intended use. The fact that the plaintiff failed to produce an analysis of the unused fourteenth dose of vaccine, which was in her possession, supported an inference adverse to her. Such an adverse inference was within the province of the jury. The entry of judgment notwithstanding the verdict was based, however, not on an inference but on the failure of the plaintiff to furnish adequate evidence to support her contention that her deceased husband's illness and death were due to deleterious serum negligently prepared and supplied by the defendant. Accordingly, the court held that a judgment for the defendant company notwithstanding the verdict was warranted and it therefore affirmed the judgment of the trial court.—*Tremaine v H K Mulford Co (Pa)* 176 A 212

Accident Insurance Death Under Spinal Anesthesia and Appendectomy an "Accidental Event"—The defendant insurance company insured Whatcott against death "resulting from a personal bodily injury which is effected solely and independently of all other causes by happening of an external violent and purely accidental event." Under spinal anesthesia produced by injecting procaine hydrochloride into the spinal canal the insured was operated on for chronic appendicitis. He died while the operation was in progress. The plaintiff, the beneficiary under the insurance policy, sued the insurer to compel the payment of the amount promised in the policy, alleging that an idiosyncrasy or hypersusceptibility of the insured to procaine, together with the abdominal incision was the sole cause of his death, and that death was an "accidental event" within the meaning of the policy. From a judgment in favor of the insurance company the beneficiary appealed to the Supreme Court of Utah.

In numerous cases, said the Supreme Court, in which insurance policies have promised benefits only in case of injury or death caused by 'accidental means' the conclusion has been reached that unexpected results caused by intentional acts are not covered by the policies. In other words it has been held that the means by which injury or death has been produced were not accidental means. In Utah, however, a contrary rule has been laid down and the beneficiary under such a policy is entitled to recover benefits for injury or death from the unusual or unexpected results of an intentional act, even though such results occur without mischance, slip or mishap. The court called attention, too, to the fact that the policy to be construed in the present action did not insure against the results of accidental means but against injury caused by the happening of an accidental event. The means may not in any way have been accidental, yet the event because of some unknown and unknowable factor, may have been highly accidental. The death of the insured was an event which, if the testimony of one of the expert witnesses for the plaintiff was to be believed, was the unexpected and unusual effect of the injection of procaine into the spinal canal and hence was an accidental event within the meaning of the policy.

The instructions of the trial court that required the plaintiff to prove that the intraspinal injection of procaine was the sole cause of her husband's death, to the exclusion of any effect that may have been produced by the incision, were erroneous. The evidence showed without conflict that it was very unusual for a person to die as the result of an incision such as that made in the abdomen of the deceased. Death from an incision is no less an accidental event than is death caused by the injection of procaine. Death caused by either or both was, according to all the evidence, an unusual event which could not be foreseen and which could not be reasonably expected. An event, such as the death of the insured, which is unusual and unexpected is none the less an accidental event when it results from two causes rather than from a single cause.

The judgment of the trial court in favor of the insurer was reversed and the cause remanded for a new trial.—*Whatcott v Continental Casualty Co (Utah)*, 39 P (2d) 733

Workmen's Compensation Acts Death from Tuberculosis Activated by Silica Dust an Accidental Injury—Beaver entered the employ of the Morrison Knudsen Company in 1928. At that time he had tuberculosis in an arrested stage but otherwise seemed to be in good physical condition. He was able to carry on regular manual labor. In the course of employment he was subjected to clouds of dust, containing from 80 to 85 per cent silica, and was more or less bothered by coughing, which became more frequent as time passed. In 1931 he became ill with active tuberculosis and filed a claim under the workmen's compensation act of Idaho. After the hearing before the industrial accident board Beaver died, and his administratrix was substituted as claimant. From a judgment of the district court affirming a decision of the board disallowing compensation, the claimant appealed to the Supreme Court of Idaho.

It seems clear from the evidence, said the Supreme Court, that the inhalation of silica dust activated a latent tuberculous condition in the employee's lungs which in 1931 suddenly lighted up and resulted in death. No one was able to testify as to the specific time when the injury was received or the fatal draft of dust was inhaled. Who can in truth and fairness say that there was not a compensable "accident"? All accidents are preceded by a cause in some cases that cause may have operated instantaneously in others it may have been operating for days, months or years, and ultimately the accident occurs and the 'blow up' happens. A workman works for years on a given job in which he regularly has to lift a considerable weight. In the course of time his heart grows weaker. Eventually he lifts a similar load his heart fails and he dies. He has over strained himself in lifting the load and it is said to be an "accident" arising out of his employment. *In re Larson*, 48 Idaho 136 279 P 1087. Strain may impair or rupture some other part of the body so that the final effort at labor accomplishes the breakdown and it is held to be an "accident." *Hanson v Independent School District 11-J* 50 Idaho 81 294 P 513. In principle, said the court the cases cited are not dissimilar from the one here under consideration. In view of the facts and circumstances bearing on the injury in this case, said the court, and of the uniform purpose of the court to give the workmen's compensation law a liberal construction in favor of the injured workman, we are constrained to hold that the workman in this case met with an "accident" in the course of his employment and was entitled to compensation.

The judgment of the lower court was reversed, with directions to remand the case to the industrial accident board with instructions to enter judgment in favor of the claimant.—*Beaver v Morrison-Knudsen Co (Idaho)*, 41 P (2d) 605

Society Proceedings

COMING MEETINGS

American Academy of Tropical Medicine, St. Louis Nov. 20-21. Dr. Earl B. McKinley 1335 H Street N.W. Washington D. C. Secretary.
American Association of Railway Surgeons Chicago November 13-15.
Dr. Louis J. Mitchell 86 E. Randolph St. Chicago Secretary.
American Clinical and Climatological Association, Princeton N. J. Oct. 21-23. Dr. Francis M. Rackemann 263 Beacon Street, Boston, Secretary.
American College of Surgeons San Francisco October 28-November 1.
Dr. George W. Crile 40 East Erie St. Chicago.
American Society of Tropical Medicine St. Louis November 19-22. Dr. Alfred C. Reed 350 Post Street San Francisco Secretary.
Association of American Medical Colleges Toronto, Canada Oct. 28-30.
Dr. Fred C. Zapffe 5 South Wabash Avenue Chicago, Secretary.
Central Society for Clinical Research Chicago Nov. 1-2. Dr. Lawrence D. Thompson 3720 Washington Boulevard St. Louis Secretary.
Clinical Orthopedic Society Indianapolis and Louisville Nov. 15-16. Dr. J. E. M. Thomson 1307 N. Street Lincoln Neb. Secretary.
Nevada State Medical Association Elko Oct. 25-26. Dr. Horace J. Brown 120 North Virginia Street Reno Secretary.
Omaha Mid West Clinical Society Omaha Oct. 28-Nov. 1. Dr. J. D. McCarthy 107 South 17th Street, Omaha Secretary.
Pacific Coast Society of Obstetrics and Gynecology Los Angeles Nov. 6-9. Dr. T. Floyd Bell 400 29th Street, Oakland Calif., Secretary.
Radiological Society of North America, Detroit, Dec. 2-6. Dr. Donald S. Childs 607 Medical Arts Building Syracuse, N. Y. Secretary.
Southern Medical Association, St. Louis November 19-22. Mr. C. P. Loran, Empire Building Birmingham Ala., Secretary.
Southern Surgical Association Hot Springs Va. Dec. 10-12. Dr. Alton Ochsenr 1430 Tulane Ave. New Orleans Secretary.
Western Surgical Association, Rochester Minn. Dec. 6-8. Dr. Albert H. Montgomery 122 South Michigan Boulevard, Chicago Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to *THE JOURNAL* in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama Medical Association Journal, Montgomery

5: 41 100 (Aug.) 1935

- Skin Grafting Its Relation to General Surgery N Owens New Orleans—p 41
Acute Pancreatitis Necrosis Acute Hemorrhagic Pancreatitis D C Donald Birmingham—p 47
Chronic Undulant Fever More Critical Consideration of Neurasthenic Syndrome Hyperthyroidism an Underlying Condition E Thames Mobile—p 54

American Journal of Cancer, New York

24: 751 1024 (Aug.) 1935

- *Peripheral Manifestations of Specific Nerve Sheath Tumor (Neurilemoma) A P Stout with assistance of W Carson New York—p 751
Fatty Tissue Tumors of Breast J G Menville New York—p 797
Quantitative Study of Growth of Walker Rat Tumor and Flexner Jobling Rat Carcinoma R Schrek Nashville Tenn—p 807
Carcinoma of the Mammary Gland in Inbred Stock of Albino Mice A C Williams L E Silcox and B Halpert New Haven Conn—p 823
Carcinoma Metastases to Heart and Subcutaneous Tissues W D Nusbaum Lancaster Ohio and F W Heyer Nanticoke Pa—p 831
*Spontaneous Regression of Hypernephroma M Viola Rae Calgary Alta—p 839

Peripheral Manifestations of Specific Nerve Sheath Tumor—Stout synthesizes the clinical and pathologic features of the specific nerve sheath tumor as it occurs outside the cranium and spinal canal from a study of fifty new cases and a review of 194 published reports of cases. He proposes the term "neurilemoma" meaning "nerve sheath tumor." The tumor is found within or attached to the sheaths of nerves of various sizes and causes few symptoms other than those due to the presence of the mass. Pain tenderness and paresthesia are symptoms in less than half the cases. Intracapsular degeneration is common and permits transillumination of some tumors. The neoplasm is encapsulated and has a specific morphology that differentiates it from the neurofibroma and all other tumors. While it occurs in cases of von Recklinghausen's disease, its exact relation to the latter condition is unknown. The neurilemoma occurs commonly only in definite localities rarely in others, and has never been found in the feet, the genito-urinary system, the lungs, the esophagus or the rectum. The tumor grows slowly and is entirely benign. It is best treated by surgical removal. If the nerve involved is an important one the tumor should be dissected out of its capsule with as little damage as possible to the nerve fibers. If the nerve is small and of little relative importance, it is usually not seen and is resected with the tumor capsule without untoward effects. Only one authentic example of local reappearance after excision has been reported. Although several cases of apparent malignant metamorphosis of neurilemoma have been reported, in none of them is the evidence of sufficient weight to permit a positive statement that this change ever occurs.

Spontaneous Regression of Hypernephroma.—Rae calls attention to a large tumor of the kidney that had undergone necrosis and calcification. The case is an instance of almost complete regression of a malignant tumor. The finding of a small piece of viable tumor indicates that growth was not entirely abolished. The process by which regression was instituted is not clear. Total thrombosis or infarction of the tumor is ruled out by the existence of capillary blood spaces containing normal blood within the remnants of tumor tissue. No obvious systemic or metabolic conditions occurred that might be related to the process of healing. It is only possible to suggest that some complex form of local or general immunity

developed, which established retrogressive changes in the tumor. From the gross appearance of the tumor and its location in the kidney it was considered to be a calcified hypernephroma. The discovery of small groups of typical nephroma cells definitely decided the diagnosis. Sections from the remaining portion of the kidney showed no evidence of tumor invasion. A small atrophic left adrenal that was not involved in the tumor was removed at operation.

American Review of Tuberculosis, New York

32 127 228 (Aug.) 1935

- Postwar Changes in Trend of Tuberculosis Mortality J H Watkins New Haven Conn—p 127
Tuberculosis Among Rural and Village School Children in Buncombe County North Carolina P P McCain Sanatorium N C C D Thomas Danville Va and H L Sumner Asheville, N C—p 150
Follow Up Study of Medical Student and Physician Patients Discharged from Trudeau Sanatorium 1916 1931 R R Bates Boston—p 161
Incidence of Tuberculous Infection and Disease in Private School for Boys T N Horn Bloomfield Hills Mich—p 166
Tuberculosis Among University of Wisconsin Students R H Stiehm Madison Wis—p 171
Study of Racial Incidence of Tuberculosis in the Province of Manitoba C H A Walton Winnipeg Manit—p 183
*Age Distribution and Pathogenesis of Tuberculous Meningitis in Children M Siegel New York—p 196
Silicosis and Silicotuberculosis Census Response of Silicotuberculosis to Treatment Preliminary Report D M Brumfield and L U Gardner Saranac Lake N Y—p 208
The Place of the Laboratory in the Sanatorium H S Willis Northville Mich—p 211
*Attempt to Desensitize Tuberculous Guinea Pigs with Dead Vaccine and Products of Tubercle Bacillus C L Derick E A G Branch and M P Crane Boston—p 218

Tuberculous Meningitis in Children—Siegel analyzed the ages in 445 cases of tuberculous meningitis among 742 children who died of tuberculosis at the Josef-Kinderspital, Mount Sinai Hospital and Sea View Hospital. A similar analysis was made of about 3000 cases of tuberculous meningitis reported in the literature in the last thirty years. Of the total cases in childhood there were 57 per cent in the first three years, 26 per cent in the next three years and 17 per cent between 6 and 12 years of age. The greatest number of cases occurred between the ages of 9 and 15 months. No undoubted case of tuberculous meningitis was reported in infants who died at the age of less than 2 months of either acquired or congenital tuberculosis. There were a few cases of tuberculous meningitis in the third month. At this age the percentage of cases of lethal tuberculosis with meningitis was low (7.9 per cent). After the third month the incidence of tuberculous meningitis in infants who died of tuberculosis increased markedly reaching 33 per cent in the fourth month and 50 per cent in the sixth month. The proportion gradually increased in older infants and reached its maximum (about 80 per cent) in the third and fourth years. There were no cases of tuberculous meningitis in sixty-eight cases of acute meningitis in infants less than 2 months of age. About 90 per cent of these cases were caused by the streptococcus colon bacillus, pneumococcus and meningococcus. Tuberculous bacillema is the precursor but not the direct cause of meningitis which may eventually result from extension of a local tuberculous focus into the subarachnoid space or ventricles. The incidence of tuberculous meningitis in lethal tuberculosis as reported from various hospitals, depends largely on the type of tuberculous case admitted to these hospitals and on the duration of hospitalization.

Attempt to Desensitize Tuberculous Guinea-Pigs—Derick and his associates used four antigens in their desensitizing experiments: heat-killed and formaldehyde-killed tubercle bacilli; Koch's bacillary emulsion and a protein fraction from the tubercle bacillus. By using quantitative skin tests they have obtained some evidence of desensitization by the use of heat-killed vaccine but not by the use of the other antigens. A substantial prolongation of life followed the use of heat-killed vaccine only although in the series receiving the bacillary emulsion several animals showed little or no tuberculosis at the time of death. It must not be assumed, however, that all animals with a negative skin test outlived the others or that those with a strongly positive test died earliest. They believe that dosage may be an important factor, and this is difficult to grade, since there may be a delayed response following the use of whole bacterial vaccine in particular. The intravenous

method of inoculation in the doses used proved too severe and had to be discontinued. None of the antigens used can be considered ideal, though heat-killed vaccine seems to have definite value. In common with other workers, the authors found that it is much more difficult to diminish the hypersensitive state of animals when this state is due to infection with the tubercle bacillus than when due to other organisms, such as the streptococcus, in spite of the fact that every attempt was made to keep the latter animals hypersensitive by repeated injections of living organisms or the subcutaneous presence of infected agar foci. An explanation of these differences is not forthcoming at present. During the course of their work, skin tests were done on several patients as well as on themselves. The test doses used were 0.1 cc of a 1:100,000 dilution of unheated tuberculin and 0.1 cc of an emulsion containing 1,000,000 heat-killed tubercle bacilli per cubic centimeter. One of the authors reacted violently to the tuberculin in twenty-four hours, but only a slight reaction was noted at the site of the injected vaccine until ten days later. The latter then proceeded to become inflamed. It ruptured finally and drained for a period of two weeks and then healed leaving a small white scar. This result would appear to be of great importance if one contemplates using whole tubercle bacilli for purposes of vaccination. Since any attempt to increase dosage should be based on the reaction to the previous inoculation there should be a considerable interval between treatments. Also the initial inoculation of whole organisms should be much smaller. Another one of the authors did not react to either of the dilutions mentioned making one doubtful of the clinical value of the tuberculin test, since the former individual has never had active tuberculosis while the latter has had.

Annals of Surgery, Philadelphia

102: 161-320 (Aug.) 1935

- Treatment of Bronchial Asthma by Dorsal Sympathectomy. Direct and Indirect. G. I. I. Jevon. Leamington Spa, England.—p. 161.
- Me enteric Vascular Occlusion. H. Sneideron, Binghamton, N. Y.—p. 171.
- Perforated Ulcers of Duodenum. Study of Forty One Cases. E. C. Brenner. New York.—p. 185.
- *Enlargement of the Gallbladder. R. F. Carter. New York.—p. 194.
- Relation of Cholecystitis to Pathologic Changes in the Liver. R. Colp. H. Douillet and I. F. Gerber. New York.—p. 202.
- The Sequels After Cholecystectomy with Special Reference to Cholelithiasis. W. H. Barber and F. M. Harrison. New York.—p. 213.
- *Histologic Grading of Mammary Carcinoma in a Series Followed for Ten Years. I. Sophian. New York.—p. 224.
- Cancer of the Breast. Early Diagnosis of Cancer of the Breast. R. B. Greenough. Boston.—p. 231.
- Id. Biopsy in Breast Lesions in Relation to Diagnosis, Treatment and Prognosis. J. C. Bloodgood. Baltimore.—p. 239.
- Id. Classification of Mammary Cancer. J. F. King. New York.—p. 249.
- Id. Surgical Principles in Cancer of the Breast. D. Lewis. Baltimore.—p. 252.
- *Id. Value of Preoperative Irradiation in Breast Cancer. Studies on Fifty One Operable Cases. F. L. Adair and T. W. Stewart. New York.—p. 254.
- Bone Growth and Repair. D. B. Phemister. Chicago.—p. 261.
- Treatment of Tuberculosis of Spine in Young Children. F. L. Compere and J. T. Jerome. Chicago.—p. 280.
- *Modification of Operation for Spinal Fusion. A. Cruca. Iwowa, Poland.—p. 297.
- Ligation of Varicose Veins. Ambulatory Treatment Preliminary to Sclerosing Injections. J. K. Ferguson. Philadelphia.—p. 304.

Enlargement of the Gallbladder.—Carter mentions that during a period of four years in studying patients having disease of the gallbladder the medical and surgical clinic of the New York Post Graduate Hospital has gradually come to realize the importance of changes in the size and contour of the gallbladder. In patients with typical gallbladder symptoms, definite pathologic changes were found to be present and borne out by operative observations even though the roentgenogram showed repeatedly the absence of positive or negative shadows of stones and normal filling and emptying. The most important change is enlargement, for in enlargement one has a definite result of stasis, the most frequent accompaniment of gallstones found in operative specimens. Enlargement of the gallbladder, as shown by roentgen shadows and in operative specimens, follows, in the main, a hypotonic and a hypertonic type. In the former, a rounded balloon type of shadow appears. The latter types are elongated, tubular and pear shaped, with convolutions in the ampulla and cystic duct. The hypotonic type of gallbladder shadow is found in individuals

having few symptoms attributable to the organ directly, but with the usual type of dyspepsia associated with the achylia, overweight and indolence of middle age. The hypertonic type of gallbladder shadow is found in individuals having marked symptoms of pain and attacks of colic, frequently requiring sedatives long before stones can be demonstrated roentgenologically or in operative specimens, accompanied by the usual type of dyspepsia associated with hyperacidity, pylorospasm and duodenitis. The changes in the shape and size of both types of gallbladders are depicted by sixteen illustrations.

Histologic Grading of Mammary Carcinoma.—Sophian carried out a histologic analysis of 124 cases of mammary carcinoma treated by radical operation and followed for a period of ten years or longer. A definitely lower incidence of axillary metastases at the time of operation was noted in the cases with grades 1 and 2 adenoid arrangement, compared with those growing in solid cords and masses (grade 3). This fact appears to account for the previously recognized favorable clinical aspect of the adenocarcinoma. Degrees of fibrosis appeared to exert no influence. Marked lymphocytic infiltration (grade 1) was noted in a group which had a slightly better clinical result than that without this feature. The most significant correlations of clinical outcome and grading appeared in respect to adenoid arrangement, nuclear constancy, nuclear size mitoses and secretion. The few cases in this series with papillary and comedo arrangement were found to have had a more favorable course. By a method of combining the information concerning each of the criteria employed, a grading of each case was achieved which shows a definite statistical parallelism with the percentage of ten year cures. This is found to depend on the incidence of cases without axillary metastases. The cases with metastases show uniformly poor ten year results probably because of the advanced stage of the disease at the time of treatment. Since such cases outnumbered the favorable ones more than two to one, it becomes evident that the invisible extensions of carcinoma not recognizable at the time of operation form the major controlling factor in the prognosis of the individual case. The histologic analysis indicates nevertheless a relatively slower or more rapid clinical course according to the grade of the tumor.

Preoperative Irradiation in Breast Cancer.—Adair and Stewart employed preoperative irradiation in eighty-one cases of operable mammary cancer. Thirty-nine cases were treated by the radium element pack and forty-two were treated by the high voltage (200 kilovolt) roentgen rays. From two to three months after the completion of the irradiation, a radical amputation was performed. Careful tissue studies were then made of the residual tumor. A positive aspiration biopsy complemented the clinical diagnosis. Into a rubber catheter were inserted in tandem from six silver tubes containing radium emanation each 16 mm long. These capsules were separated from one another by a cord knot so that there was a space between the capsules of about 3 mm. The filter of the capsule is equivalent to 1 mm of platinum. The length of the radium bearing area is about 11 cm. Under local anesthesia a long uterine dressing forceps with a slight curve at the end of the blade was pushed through the axillary fascia, parallel to the axillary vein, going behind the pectoralis major muscle and the pectoralis minor muscle. The point of the clamp was then brought up through the pectoralis major muscle and on through the integument at the edge of the sternoclavicular joint. Procaine hydrochloride was used only at the site of entrance through the skin of the axilla and at the site of emergence at the sternoclavicular joint. The point of the dressing forceps while still in place grasped the free end of the catheter, which was then pulled backward through the tract by the forceps. The radium string was held accurately in place by one suture. The authors began by using three skin erythema doses of 3 mm. The amount has been gradually increased to seven skin erythema doses, and during this time neuritic symptoms have not appeared. In the study of cases in which treatment by the radium pack was employed, it was found that when 20,000 millicurie hours was employed per port there was no case of a persistent ulcer of the skin. When 24,000 millicurie hours was used per port, a persistent ulcer of the breast occurred in 60 per cent of twenty cases. Furthermore,

when the cases were treated by 24,000 millicurie hours per port, the largest group of completely destroyed tumors occurred. This was likewise true in the successful destruction of the nodes. From a study of the lesions it seems that a tumor having a diameter of 2 or 3 cm has a much better opportunity of complete regression than one of great bulk. In the cases in which high voltage roentgen therapy was employed the skin although markedly damaged usually cleared up within from two to three weeks after the completion of treatment. The radium pack produces a slower skin damage than high voltage roentgen therapy. In some of the cases treated by the 200 kilovolt apparatus 1200 roentgens was given to each of six ports in some cases 1500 roentgens per port was given and in a few 1800 roentgens. Five tenths mm of copper filter was used. This dose was somewhat lighter in most instances than the doses delivered by the radium pack, however, there were seven cases in which complete microscopic disappearance of the tumor occurred. External irradiation as applied in this series did not effectively combat axillary disease, and this fact points to the necessity of additional interstitial irradiation. It is the authors' impression that eventually irradiation will be with smaller doses extended over a longer period and that end results will be improved thereby, that the five year cures will be definitely increased by the employment of preoperative irradiation, and that it should be employed in all instances of cancer of the breast complicated by pregnancy, in cases of bulky axillary disease and in cancer in young women.

Modification of Operation for Spinal Fusion—The operative method that Cruca describes differs from other procedures in that 1 It brings the point of action of the operation close to the lesions in the bodies of the vertebrae 2 The implanted graft is situated almost entirely within bone tissue 3 Fusions of the laminae joints and the spinous processes proceed rapidly 4 The operation does not damage any of the elements normally immobilizing the spine such as the ligaments and muscles 5 The biologic influence of the graft, owing to its situation close to the foci and within the bone tissue, is rapid, conspicuous and of long duration

Archives of Internal Medicine, Chicago

56 211-412 (Aug.) 1935

- Pathology of Vessels of Pulmonary Circulation Part I O Brenner Birmingham England—p 211
- Cardiovascular Complications of Trichinosis W W Spink Boston—p 238
- *Obstructing Pericarditis Effect of Resection of Pericardium on Circulation of Patient with Concreto Cordis C S Burwell and D Flickinger Nashville, Tenn—p 250
- Pulmonary Tuberculosis of Lower Lobe D Reisner New York—p 258
- Stab Wounds of the Heart Study of Electrocardiographic Changes Polycoronitis (Pick's Syndrome) and Pericarditis J D Koucky and G Miles Chicago—p 281
- *Infection and Hemorrhagic Nephritis W L Winkenwerder N McLeod and M Baker Baltimore—p 297
- Viscerogalvanic Reaction E A Spiegel and M G Wohl Philadelphia—p 327
- *Effect of Diuretics on Cardiac Output of Patients with Congestive Heart Failure B Friedman New York H Resnik Jr Nashville Tenn J A Calhoun Boston and T R Harrison Nashville Tenn—p 341
- Teaching Medical Students Objectives for Care of Patients and Social Aspects of Illness Ethel Cohen and H A Derow Boston—p 351
- Increased Effectiveness of Insulin When Given by Injections of Doses of Equal Unitage at Intervals of Two to Four Hours I Use of Insulin in Divided Doses to Manage Severe Uncomplicated Diabetes and to Control Complicated Medical Cases B B Clark, R B Gibson and W D Paul Iowa City—p 360
- Influence of Dinitrophenol on Carbohydrate Metabolism M Wishnofsky A P Kane E L Shlevin and C S Byron Brooklyn—p 374

Obstructing Pericarditis—Burwell and Flickinger cite a case in which a high degree of obstructing Staphylococcus aureus pericarditis was present. Removal of a portion of the pericardium was followed by a fall in venous pressure, a rise in cardiac output and an increase in pulsation of the heart. Increased venous pressure and decreased cardiac output appear to be the chief mechanisms underlying the symptoms and signs of concreto cordis. The period before operation was marked by a continuous rise in the venous pressure. When the patient was last seen, eight months after operation, the venous pressure as measured on the arm was found to be 125 mm of water

After the operation, four determinations of the cardiac output were made. The total output varied between 25 and 38 liters, and the arteriovenous difference between 72 and 92 cc. per liter. The last observations, made several weeks before the patient's discharge, showed a cardiac output of 38 liters and an arteriovenous difference of 72 cc. These figures are within the limits of normal. Even the output per beat increased and reached 35 cc. The cardiac output rose as the venous pressure fell and as the patient's strength and comfort increased.

Tuberculosis of the Lower Lobe—Reisner discusses the subject of pulmonary tuberculosis of the lower lobe in adults, with particular attention to the early reinfection changes. Strictly basal tuberculosis must be differentiated from lesions involving the superior portion of the lower lobe. Early changes limited to the base of the lung are extremely rare, whereas the apical and subapical regions of the lower lobe represent a typical site of predilection for initial manifestations in the adult form of phthisis. This area is also a fairly frequent location of early bronchogenous metastases in progressive tuberculosis of the upper lobe. The tuberculous changes occurring in the apex of the lower lobe are almost invariably of the exudative and caseous type with early cavity formation. Collapse therapy is the only effective treatment and artificial pneumothorax is the procedure of choice despite the location in the lower lobe. The roentgen observations in tuberculosis of the lower lobe are discussed and it is emphasized that changes in its apical region frequently present the misleading appearance of so-called hilus lesions. It is also stressed that in general there is no adequate foundation for the conception of a hilar form of pulmonary tuberculosis as a pathogenic entity. Tuberculosis of the lower lobe occurs principally in women and is very uncommon in men. An explanation of this difference in the behavior of the sexes has been attempted on the basis of existing physiologic variations in the respiratory mechanism.

Infection and Hemorrhagic Nephritis—Winkenwerder and his associates submit an analysis of the relationship between infection with Streptococcus haemolyticus and hemorrhagic nephritis in a series of seventy-eight cases observed for from one to eight years. Twenty-two of the patients are well, twenty one are in the latent stage of the disease, seventeen are in the progressive stage and nineteen are dead. Infections, usually of the upper respiratory tract, caused by Streptococcus haemolyticus (alpha type, in a few cases), preceded the onset of hemorrhagic nephritis in the great majority of cases in this series. Streptococcus haemolyticus is apparently related to the progress of nephritis for the numbers in which it occurred diminished markedly during recovery but persisted during the progressive stages of the disease. The cases of hemorrhagic nephritis that were preceded by acute infection manifested by both local and constitutional reactions almost always ended in recovery or entered the latent phase, the cases of nephritis associated with chronic infection at the onset almost always became progressive. The prodromal period between the beginning of infection and the onset of nephritis varied from three to twenty-eight days. A seasonal variation in the onset of hemorrhagic nephritis coincided with the months during which respiratory infections are most frequent. Exacerbations of nephritis in most instances followed streptococcal infections of the upper respiratory tract, these exacerbations occurred more frequently in the latent and in the progressive stages of the disease. The prodromal period between infection and the exacerbation of the nephritis was usually from twenty-four to forty-eight hours in contrast to the prodromal period at the onset of nephritis. Exacerbations also occurred without relation to infection and also after operative procedures. Streptococcal infections that occurred during the convalescent stage did not prevent recovery from nephritis and rarely caused relapses, whereas the 'carrier state' was characteristic of the progressive stage of hemorrhagic nephritis. Surgical removal of foci of infection may fail to influence the outcome of hemorrhagic nephritis. The authors suggest that recovery from or progression in hemorrhagic nephritis is related more to the character of the causal infection, a severe acute infection presages a favorable course and a chronic infection an unfavorable outcome. Patients with acute infection possess the capacity to react to Streptococcus haemolyticus, so that some form of resistance to the infection develops and as a result recovery

from nephritis follows and disappearance of the organism occurs. In patients with chronic infection, this capacity to react to streptococcal infection is lacking.

Effect of Diuretics on Cardiac Output in Congestive Heart Failure.—From a study of the effect of diuretics on cardiac output in cardiac disease, Friedman and his associates conclude that diuretics may possibly have a twofold action on the circulation. 1 Reduction of peripheral edema may be associated with a decrease in the flow of blood through edematous tissues in proportion to the metabolism. The resulting decline in venous return and in venous pressure tends to decrease the output of the heart. 2 Reduction of myocardial edema may lead to an increase in the contractile power of the heart and consequent increase in output. The final result may be a rise, a fall or no change in cardiac output. The important point is that diuretic drugs appear to aid the heart by (1) decreasing its load and (2) increasing its ability to carry the load. Either of these effects tends to produce benefit by diminishing the energy expended by the heart. Whenever rest, reduction of the intake of fluids, digitalis and sedatives fail to produce clinical improvement in patients with congestive heart failure, diuretic drugs, the authors believe, should be given a trial, even though there may be no obvious subcutaneous edema.

Journal of Comparative Neurology, Philadelphia

62: 1262 (Aug. 15) 1935

- Efferent Nerve Fibers in Lumbar Dorsal Roots of Dog. A. M. Okelberry—p. 1
Developmental Pattern of Ectodermal Placodes in *Rana pipiens*. R. A. Knouff. Columbus Ohio—p. 17
Reaction of Cochlear Nerve to Destruction of Its End Organs. Study on Deaf Albino Cats. H. A. Howe. Baltimore—p. 73
Early Development of Human Diencephalon. Margaret Shea Gilbert. Ithaca N. Y.—p. 81
Optic Connections of Diencephalon and Midbrain of Cat. R. W. Barris. W. R. Ingram and S. W. Ranson. Chicago—p. 117
Nissl Granules of Autonomic Neurons. W. H. Hollinshead and S. L. Clark. Nashville Tenn.—p. 155
Brain Case and Endocranial Cast of *Eryops megacephalus* (Cope). W. T. Dempster. Ann Arbor Mich.—p. 171
Central Nervous System of Oniscus (Isopoda). R. Walker. New Haven Conn.—p. 197
Topographic Analysis of Thalamus and Midbrain of *Amblystoma*. C. J. Herrick. Chicago—p. 239

Journal of Immunology, Baltimore

29: 87-174 (Aug.) 1935

- Relationship Between Complement and Prothrombin. A. J. Quick. New York—p. 87
Response to Yellow Fever Virus in Nonsusceptible Rabbit. L. Whitman. New York—p. 99
Experiments on Reactivation of Virus in Neutral Serum Virus Mixtures. R. K. Goyal. Edinburgh Scotland—p. 111
Nonidentity of Jack Bean Agglutinin with Crystalline Urease. J. B. Sumner and S. F. Howell. New York—p. 133
Antigenic Action of Cholesterol. A. Wadsworth, Elizabeth Maltaner and F. Maltaner. Albany N. Y.—p. 135
Further Note on Quantitative Determination of Fixation of Complement by Immune Serum and Antigen. Elizabeth Maltaner and F. Maltaner. Albany N. Y.—p. 151
Cytotoxic Principle in Anti Euglena Rabbit Serum. Mary Elmore Sauer. Lawrence Kan.—p. 157
Studies on Venoms of North American Pit Vipers. T. S. Githens. Glenolden Pa.—p. 165

Antigenic Action of Cholesterol.—From seven of the ten rabbits inoculated with mixtures of cholesterol and swine serum, Wadsworth and the Maltaners obtained antisera that reacted to a definite degree with a suspension of cholesterol as antigen in the usual form of complement fixation test. With special methods of comparative titration, these reactions differed from those of known specificity and also appeared similar to the nonspecific reactions of normal serum. In the reactions of known specificity that have been studied, the amount of complement fixed was directly proportional to the amount of immune serum used, whereas in the reaction of cholesterol and cholesterol antisera it was not directly proportional—quite the contrary. Furthermore, reactions of known specificity were not appreciably affected when the concentration of serum constituents in the dilutions of serum tested was maintained constant by the use of normal serum instead of physiologic solution of sodium chloride as a diluent, whereas under similar conditions the reactions with cholesterol that were observed when

dilutions were made with sodium chloride solution did not develop when normal serum was substituted. The reactions obtained with cholesterol and the sera of rabbits inoculated with cholesterol-swine-serum mixtures are apparently due to the effect on complement of the increased anticomplementary properties of these sera, together with fluctuations in the stability of the cholesterol suspensions occasioned by changes in the amount of protective serum colloids present in dilutions of the antisera prepared with solution of sodium chloride. The comparative titrations of the activity of immune and normal sera, as evolved in these studies, provide a method for the analysis of serologic reactions, which has heretofore been lacking.

Journal of Pediatrics, St. Louis

7: 157-302 (Aug.) 1935

- Neuroblastoma of Adrenal in Children. J. A. Askin and C. F. Geschickter. Baltimore—p. 157
Semen Allergy in Children. W. L. Cooper. Los Angeles—p. 179
Epiphyses in Rickets, Syphilis and Thyroid Deficiency. J. Signorelli, H. Hosen and J. M. Miles. New Orleans—p. 182
*Primary Peritonitis in Children. J. S. Leopold and F. Castrovinski. New York—p. 187
Simple Method of Transfusion for Infants and Children. M. L. Spivek. Chicago—p. 199
Determination of Insensible Water as Means of Calculating Heat Production over Weekly Period. Preliminary Report. J. L. Law. Ann Arbor, Mich.—p. 205
*Case of Hepatonephromegaly Glycogenica—von Gierke's Glycogen Storage Disease. R. L. Wilder. Minneapolis—p. 214
Anemia of the New Born and Erythroblastosis—Are They Inseparable? P. Cohen. New York—p. 220
Myasthenia Gravis in a Child. Observations on Effect of Ephedrine Therapy. W. E. Nelson. Cincinnati—p. 231
Effect of Tuberculin Test on Monocyte-Lymphocyte Ratio in Children. A. Kato. Chicago—p. 238

Primary Peritonitis in Children.—Leopold and Castrovinski report eleven cases of primary peritonitis (seven pneumococcal and four streptococcal) that occurred in female children between the ages of 2 and 10 years. Abdominal puncture was performed in three cases. Operation was performed in nine cases. The general mortality was 75 per cent. Two patients with pneumococcal peritonitis were operated on and recovered, and one patient with streptococcal peritonitis recovered without operation. The questions as to the portal of entry and as to the most favorable time for operation still remain unanswered. The clinical pathologic picture strongly suggests that the organisms enter the abdominal cavity at the ileocecal appendical region. It is impossible to prove whether the organisms reach this site through the genital tract, through the intestinal tract, through the lymphatic system or by means of the vascular system. Abdominal puncture should be performed oftener in order to establish an early diagnosis. The objections against the use of this diagnostic measure may be classed as theoretical.

Glycogenic Hepatonephromegaly.—Wilder presents the case of a girl $3\frac{1}{2}$ years old, in whom a diagnosis of glycogenic hepatonephromegaly as described by von Gierke seems most probable. This is based on the early onset of the enlarged abdomen (at 6 months), the absence of symptoms, the physical appearance of the child with Olympian brow, large head and trunk and relatively small limbs, the marked enlargement of the liver, the increased size of the roentgen shadow of the right kidney, the absence of enlargement of the spleen, the absence of ascites, the absence of a history of jaundice together with normal van den Bergh test, normal heart observations, the normal blood picture, the decreased water storage ability of the liver and the presence of acetoneuria, which, although variable in single specimens, was constant in its daily occurrence. Although the epinephrine effect on the blood sugar level in this case was apparently normal, it seems possible that the underlying cause of disturbed carbohydrate metabolism may vary in different cases, so that the response to epinephrine might also vary. The present case raises the question of whether a similar clinical picture of hepatomegaly might result from disturbed carbohydrate metabolism as the result of internal hydrocephalus with pressure changes in the region of the hypothalamus and pituitary. Although there are no histologic data in this case on which the diagnosis of glycogen storage disease can be proved the author believes that the evidence available justifies

placing the case of this child in this group. He states that further study on the pituitary relationship to glycogen storage disease seems to be indicated.

Journal of Pharmacology & Exper Therap, Baltimore

54: 353-488 (Aug.) 1935

- Antiseptic Action of Carbazole-3 Diazonium Chloride and Certain Other Diazonium Compounds with Note on Preparation of Carbazole-3 Diazonium Chloride. C. H. Browning, R. Gulbransen and S. H. Tucker. Glasgow, Scotland—p. 353.
- Cesium Tetraiodophenolphthalein. New Salt for Gallbladder Visualization. J. Johnson and L. H. Hitzrot. Philadelphia—p. 358.
- Trypanocidal Action of Certain Styryl Selenazole Compounds. C. H. Browning, R. Gulbransen, Glasgow, Scotland and W. McCartney—p. 367.
- Alcohol Injected Intravenously. Rate of Disappearance from Blood Stream in Man. H. W. Newman and W. C. Cutting. San Francisco—p. 371.
- Evaluation of Conadotropic Hormone Preparations on Basis of Rat Mouse Ratio Assay. W. O. Nelson and M. D. Overholser. Columbia Mo—p. 378.
- Simple Method for Administration of Estrogenic Substances of Urine. A. Grollman, H. B. Shumacker Jr. and Evelyn Howard. Baltimore—p. 393.
- Pharmacologic Action of Ergotocin. A New Ergot Principle. M. E. Davis, F. L. Adair, Chicago. K. K. Chen and E. E. Swanson. Indianapolis—p. 398.
- Urinary Bladder Mechanisms. V. E. Henderson and M. H. Roepke. Toronto—p. 408.
- Cumulative Poisoning by Lanadigin, Ouabain and Digitoxin in Dogs. R. C. Li and H. B. Van Dyke. Peiping, China—p. 415.
- Effect of Various Anesthetics on Salivary Secretion. B. H. Robbins. Nashville, Tenn—p. 426.
- Studies on Reduction of Pitressin and Pitocin with Cysteine. R. R. Sealock and V. du Vigneaud. Washington, D. C—p. 433.
- Toxicity of Methyl Mercaptan for Fresh Water Fish. A. E. Cole. Madison, Wis—p. 448.
- Metabolic Response of White Rats to Continued Administration of Dinitrophenol. B. Terada and M. L. Tainter. San Francisco—p. 454.
- Contribution to Pharmacology of Nicotine. H. Gold and F. Brown. New York—p. 463.

Journal of Thoracic Surgery, St. Louis

4: 547-660 (Aug.) 1935

- *Putrid Abscess of Lung Following Dental Operations. L. Stern. New York—p. 547.
- *Symptomatology of Putrid Abscess of Lung. A. S. W. Touroff and S. E. Moolten. New York—p. 558.
- Clinically Significant Irregularities of Diaphragm. H. C. Ballou. Montreal—p. 573.
- Postpneumonic Atelectasis as Possible Cause of Chronic Empyema. E. F. Butler. New York—p. 580.
- *Experimental Total Pneumonectomy. J. J. Longacre. Cincinnati—p. 587.
- Open Intrapleural Pneumolysis Operation. R. Davison and F. I. Fremmel. Chicago—p. 607.
- Mortality of Empyema. Analysis of One Hundred Consecutive Deaths from Records of Charity Hospital in New Orleans. U. Maes, J. R. Veal and Elizabeth M. McFetridge. New Orleans—p. 615.
- Hernia of Lung. Report of Case Outlining Mode of Fascia Lata Repair. A. H. Winkel. Seattle—p. 627.
- Experimental Observations on Effect of 95 Per Cent Oxygen on Absorption of Air from Body Tissues. J. Fine, S. Frehling and A. Starr. Boston—p. 635.
- Artificial Pneumothorax Treatment of Lobar Pneumonia. S. J. Shipman and F. Cox. San Francisco—p. 643.
- Application of Zipper Rubber Dam in Lobectomy. H. B. Stephens. San Francisco—p. 646.

Abscess of Lung Following Dental Operations.—Stern states that twelve of seventy consecutive patients with pulmonary abscess gave histories strongly suggestive of causes traceable to dental operations. Pulmonary abscess may occur after tooth extraction without the aspiration of gross material such as a tooth or filling. Gross aspiration did not occur in any of the cases. More cases followed the use of local than of general anesthesia. This is probably accounted for by the fact that today local anesthesia is the method of choice in dental surgery. Thorough investigation of the dental history in cases of abscess of the lung may reduce the percentage of cases formerly grouped as pulmonary abscess of unknown origin. Clinical and pathologic evidence point to aspiration as the usual mechanism in the production of putrid pulmonary abscess. The anesthesia and other factors associated with tooth extraction offer optimal conditions for the aspiration of infected particulate matter. There is evidence to suggest the association of a diminished or inactive reflex during dental operations with the occurrence of abscess of the lung. The prevention of pulmonary abscess following dental procedures may depend on the recog-

nition and elimination of the hazards of aspirating infected particulate material dislodged during such procedures.

Symptomatology of Putrid Abscess of Lung.—Touroff and Moolten believe that putrid lung abscess is produced by infection of the lung with anaerobic micro-organisms aspirated from the mouth or the pharynx. In nearly half the cases no causative factors are known. The possible importance of badly diseased teeth and gums is suggested. The onset in typical cases of lung abscess is like that of acute bronchitis or grip, or a mild lobar pneumonia. The gangrenous nature of the underlying disease is revealed, only after an interval of time, by the appearance of blood in the sputum and the large amount of foul-smelling pus. In most cases this occurs by the end of the second week. The typical roentgenogram reveals a single pneumonic shadow with a central spherical cavity. The variation in width and density of the infiltration about the cavity is important as a guide to the behavior of the lesion. Spontaneous remission of some degree is usual during the primary stage of the disease. The only safe criterion of cure is disappearance of all symptoms and of the roentgenographic shadow completely. Relapse into a chronic progressive form of the disease is the rule in the majority of cases of lung abscess untreated during the primary stage. The chronic phase is usually definitely established in from three to four months. If untreated, this type of case has an average life expectancy of only three years. Fibrosis and bronchiectasis are the usual accompaniments of chronic lung abscess and may overshadow and obscure the original condition. Individual differences in symptoms of onset, pain, fetor, bleeding, clubbing, and degree of toxemia are of much importance in the evaluation of the type of case, its prognosis and indication for treatment, and in the diagnosis of complications. The onset and early course of putrid lung abscess in young children is often atypical or unrecognized. The foul odor of putrid abscess is distinguished from other foul odors by its pungent or acrid quality. Putrid superinfection of other diseases of the lung is rare. It is usually easy to differentiate from primary putrid lung abscess by means of the history. The location of chest pain generally indicates the site at which the abscess is most superficial. Bleeding is more common in lung abscess than in tuberculosis or carcinoma. Clubbing of digits appears earlier in lung abscess than in any other pulmonary disease and disappears only when all infection has subsided. The most important intrathoracic complication commonly encountered is putrid empyema or pyopneumothorax resulting from perforation of the abscess into the pleura. This may persist in chronic form.

Experimental Total Pneumonectomy.—Longacre is of the opinion that the ideal technic of pneumonectomy for the closure of the bronchial stump will be that method in which meticulous care is taken not only to prevent infection but also to minimize the trauma to the bronchus along with avoiding any disruption of the normal continuity of structures about the hilus. The technic as described by Willy Meyer meets most of these requirements but has, he believes, several distinct disadvantages. In the attempt to overcome these disadvantages, he made certain modifications and carried out his technic in thirty dogs. The technic requires the separate treatment of blood vessels along with an atraumatic division of the bronchus followed by the closure of the bronchial stump by means of inverting Cushing and mattress sutures. Considerable emphasis has been placed on the preservation of the blood supply to the peribronchial tissues. The sutures are introduced only through the peribronchial tissues, care being taken never to penetrate the bronchial lumen. The sutures are tied only tight enough to approximate and not to strangulate the tissues. By means of this technic the largest bronchial stump can be gradually, easily and completely closed. In many of the dogs the lung was removed because of a chronic experimentally produced lung abscess. Because of the high incidence of bronchial fistulas in earlier work in which the stumps were closed with catgut, the author decided to run two series (A and B) for which all details of technic would be the same except for the suture material. In series A (twelve dogs) in which twenty-day number 0 chromic catgut was used, the mortality rate was 75 per cent and the incidence of bronchial fistula was 66.6 per cent. In series B (eighteen dogs) in which fine and medium silk was used, the mortality was 16.6 per cent and the incidence of bronchial fistula

55 per cent. Histologic examination of the bronchial stumps at various stages of the healing process reveals marked inflammatory reaction to catgut buried in the peribronchial tissues, in sharp contrast to the slight reaction to the silk suture material. Silk is tolerated remarkably well in the peribronchial tissues, and vestiges are still present at the end of one year. It soon becomes encysted in a fibrous tissue capsule and so it remains, provided care has been taken to prevent its penetration into the bronchial lumen. The healing was in all cases brought about by the peribronchial tissues, although sluggish in contrast to other tissues. The author feels that the advantage of silk lies in the fact that it is less irritating to tissues and that its tensile strength is not easily affected and, consequently, it holds the peribronchial tissues in apposition during the relatively long period required for the solid repair of the bronchial stump.

Medical Annals of District of Columbia, Washington

185:208 (July) 1935

- Incidence, Diagnosis and Treatment of Cancer of Stomach J. S. Horsley Richmond Va.—p. 185
 Diagnosis and Treatment of Ocular Tuberculosis W. H. Wilmer Washington—p. 191
 Clinical Features of Gonorrheic Arthritis. Observations in Eighty-Five Cases W. K. Myers and H. B. Gwynn Washington—p. 194
 Endometriosis. Report of Two Cases J. F. Crowley, Washington—p. 197
 Systematic Diagnosis of Anemias J. Minor Washington—p. 200

New England Journal of Medicine, Boston

213:287-338 (Aug. 15) 1935

- Volvulus of Cecum Acute and Chronic with Reports of Eight Cases R. H. Sweet Boston—p. 287
 Subphrenic Abscess R. H. Overholt and J. C. Donchess Boston—p. 294
 Use of Sodium Evipal as Anesthetic for Short Surgical Procedures W. F. Garrey and R. B. Colin Boston—p. 301
 Cyclopropane: New and Valuable Gas Anesthetic I. F. Sise, P. D. Woodbridge and U. H. Fyversole Boston—p. 303
 Management of Roentgen Sickness G. W. Holmes and T. T. Hunter Boston—p. 308
 Vorhees Bag in Treatment of Placenta Praevia M. A. Kappius Boston—p. 310
 Fracture of Epiphysis of Lesser Trochanter of Femur S. M. Fitchet Boston—p. 313
 Medical Economics A. B. Van Fossen New York—p. 315

Radiology, Syracuse, N. Y.

25:131-260 (Aug.) 1935

- X-Ray Diffraction Studies on Nerve F. O. Schmitt, R. S. Bear, St. Louis and G. L. Clark Urbana Ill.—p. 131
 Squamous Cell Carcinoma of Kidney. Report of Four Cases B. H. Nichols Cleveland—p. 152
 Significance of Wedge Shaped Deformity of Body of Vertebra G. W. Grier Pittsburgh—p. 159
 Intensity and Dosage Near Radium Needles G. C. Laurence Ottawa Ont.—p. 166
 Distribution of Roentgen Radiation Within Average Female Pelvis for Different Physical Factors of Irradiation A. N. Arneson and F. H. H. Quimby New York—p. 182
 Relation of Air Ionization to Radiation Absorbed and Effect on Body Tissues W. H. Meyer New York—p. 198
 Treatment of Advanced Malignant Disease L. S. Auster New York—p. 207
 Pied Forcé or Deutschlander's Disease A. A. Zeitlin and I. N. Odessky Moscow, U. S. S. R.—p. 215
 Relation Between Age and Radiosensitivity of *Drosophila* Eggs C. Packard New York—p. 223
 Intravenous Urography in Injuries to Genito-Urinary Tract W. J. Corcoran Scranton Pa.—p. 231

Distribution of Roentgen Radiation Within Female Pelvis—Arneson and Quimby state that a study of the various charts illustrating the percentage distribution of radiation in the pelvis for different methods of external irradiation reveals that certain procedures have definite advantages over others. The use of large single fields on the anterior and posterior pelvic surfaces delivers a greater dose to the bladder and rectal regions than to the cervix. Double small fields, half the size of the larger ones, can be used to irradiate an equal area of skin, to deliver the same depth dose and to spare the bladder and rectum from doses in excess of that reaching the cervix. The addition of lateral fields to any port arrangement increases the depth dose delivered at all points within the pelvis. The greatest improvement is in the parametrial regions, which, at a distance of 6 cm. from the midline, receive more radiation than the cervix. In view of these facts it seems that a six-port

arrangement with a 70 cm target-skin distance is the best of the methods for delivering roentgen radiation to patients with cervical cancer. No set rules can be established for the treatment of all patients. In most cases it is possible to irradiate the whole tumor-bearing region by the six-field technique. As far as the ratio between surface and depth dose is concerned, it makes no difference whether the radiation is administered at a single sitting or in several exposures. If a divided dose method is used, a greater total amount of radiation may be delivered to the skin and the total depth dose increased in the same ratio.

Southern Surgeon, Atlanta, Ga.

4:227-296 (Aug.) 1935

- Some Atypical Cases of Malignancy of Stomach J. S. Horsley Richmond Va.—p. 227
 Spinal Anesthesia. Note on Evipal W. F. Harper, Selma Ala.—p. 240
 Tetanus and Its Treatment Mims Gage and M. DeBakey New Orleans—p. 246
 Present Status of Wound Treatment V. B. Philpot Houston Miss.—p. 260
 Diagnosis of Intracranial Tumors C. H. Moore Birmingham Ala.—p. 266
 Surgical Treatment of Angina Pectoris T. C. Davison Atlanta—p. 274
 Management of Toxic Goiter W. M. Scruggs Charlotte N. C.—p. 283

Surgical Treatment of Angina Pectoris—Davison points out that surgery has attempted to relieve the painful attacks of angina pectoris by cervical sympathectomy and by alcohol injection of the thoracic sympathetic ganglion. These procedures have proved somewhat dangerous and the results unsatisfactory. Subtotal thyroidectomy gave only temporary relief, as the basal metabolic rate was soon restored to normal and the anginal attacks recurred. Total thyroidectomy gives immediate and prolonged relief in the majority of cases, apparently because the lowered metabolism has decreased the demands on the heart. If the resultant myxedema becomes annoying, small doses of thyroid extract may be given, care being taken not to restore the metabolic rate to normal. The technique of total thyroidectomy is more difficult than that of the usual subtotal operation on account of the necessity of coming in direct contact with the recurrent laryngeal nerve and the parathyroid bodies. These structures are occasionally injured and a surgical tragedy may result. Of the fifty-four cases of Cutler, Mixer, Blumgart and Berlin and the authors there were only two deaths, a mortality surprisingly low considering the risks involved. The majority of the patients were relieved entirely of attacks, and others experienced greatly modified ones. Many have resumed their business activities under certain restrictions. Total thyroidectomy for the relief of angina pectoris is of too recent origin to give statistics as to longevity. The patients generally consider it a success.

Southwestern Medicine, Phoenix, Ariz.

19:261-300 (Aug.) 1935

- Treatment of Head Injuries H. Fleming San Francisco—p. 261
 The San Diego Central Medical Service. Postpayment Plan of Medical Care for Low Income Groups H. G. Holder San Diego Calif.—p. 264
 Prevention of Dental Disease G. S. Millberry San Francisco—p. 272
 Curability of Tuberculosis of the Bowel S. H. Watson and W. R. Hewitt, Tucson Ariz.—p. 278
 Heat in Pelvic Inflammation. Description of Cheap Efficient Apparatus H. M. Purcell Phoenix Ariz.—p. 281
 Health Publicity in New Mexico Health District Sally Lucas Jean—p. 285
 Pertussis Bacilli in Etiology of Asthma and Bronchitis J. M. Rawlings El Paso Texas—p. 288

West Virginia Medical Journal, Charleston

31:341-388 (Aug.) 1935

- Uterine Hemorrhage I. Abell Louisville Ky.—p. 341
 Conservatism in Pelvic Surgery T. E. Vass Bluefield—p. 349
 Few Points in Connection with Lighting and Seeing J. E. Blaydes Bluefield—p. 352
 Report of Study of Lighting in Schools in Fayette County West Virginia G. Fordham Powellton—p. 357
 Obstetric Injuries to the Birth Canal E. J. Humphrey Huntington—p. 359
 Traumatic Rupture of the Spleen. Report of Case Showing Delayed Rupture with Operation and Recovery W. Bronaugh Belpre, Ohio—p. 363
 Role of Civilian Physician in Program for National Defense W. M. Sheppe Wheeling—p. 367

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

10: 211-336 (Aug.) 1935

- Infantile Scurvy. Its History. G. F. Still—p. 211
Dr. Cheadle and Infantile Scurvy. F. J. Poynton—p. 219
Cases Described as Acute Rickets Which Are Probably a Combination of Scurvy and Rickets. The Scurvy Being an Essential and the Rickets a Variable Element. T. Barlow—p. 223
Isolation and Identification of Vitamin C. S. S. Zilva—p. 253
Recognition of Scurvy with Especial Reference to Early X-Ray Changes. E. A. Park, Harriet C. Guild, Deborah Jackson and Marian Bond—p. 265
Vitamin C and Its Effects on Structure of Teeth. A. T. Pitts—p. 295
Malnutrition and Latent Scurvy. T. Frolich—p. 309
Vitamin C Content of Liver of New Born Infants. K. U. Toverud—p. 313
Investigations into Pathogenesis of Scorbutic Dystrophy. P. Rohmer and A. Bezzansonoff—p. 319
Studies in Anemia of Infancy and Early Childhood. Part V. The Anemia of Infantile Scurvy. L. C. Parsons and W. C. Smirwood—p. 327

British Journal of Experimental Pathology, London

16: 349-434 (Aug.) 1935

- Spectrophotometric Determination of Blood Cholesterol by Means of Oxide of Silica. H. Foy and Athena Kondi—p. 349
Complement Fixation with Vaccinal Elementary Body Suspensions and Antivaccinal Rabbit Serum. M. H. Finlayson—p. 358
Plasma Phosphatase in Various Types of Jaundice. Freda K. Herbert—p. 365
Phagocytosis of Bacillus Typhosus in Relation to Its Antigenic Structure and to Antibody Components of Sensitizing Serum. S. S. Bhatnagar—p. 375
Relative Pathogenicity for Rabbit of Gravis Mitis and Intermediate Strains of Corynebacterium Diphtheriae. J. F. Murray—p. 384
Internal Structure of Bacterial Cells. K. B. Merling Eisenberg—p. 388
Prophylaxis of Experimental Vibrio Septique Infection and Practical Application of Antibacterial Methods. D. W. Henderson—p. 393
Inactivation of the H Antigen by Dilute Mineral Acid. J. T. Duncan—p. 405
Observations on Life Cycle of Pleuropneumonia Virus. K. B. Merling Eisenberg—p. 411
Adsorption and Elution of Rous Sarcoma Agent. E. M. Fienkel and C. A. Mawson—p. 416
Further Observations on Properties of Vi Antigen of Bacillus Typhosus and Its Corresponding Antibody. A. Felix and S. S. Bhatnagar—p. 422

Plasma Phosphatase in Various Types of Jaundice.—Using the method of Jenner and Kay for phosphatase estimation, Herbert found that in jaundice due to gross mechanical obstruction of the bile ducts the plasma phosphatase is always above normal and usually markedly raised. In jaundice due to toxic or infective disease of the liver the plasma phosphatase is in many cases normal and in others usually only slightly raised though occasional high figures occur. In hemolytic jaundice the plasma phosphatase is normal or shows no significant increase. The diagnostic value of the test is limited by the fact that moderate rises in plasma phosphatase may occur both in jaundice due to mechanical obstruction and in toxic or infective jaundice. The estimation of phosphatase may give assistance in diagnosis in some cases. The figures for phosphatase and directly reacting bilirubin in the plasma do not run parallel. It may be possible, however, to explain phosphatase retention as due to biliary obstruction without any alteration in the accepted interpretation of the van den Bergh reaction.

Properties of Vi Antigen of Bacillus Typhosus.—Felix and Bhatnagar state that the Vi antibody produced by immunization with suspensions of virulent strains of Bacillus typhosus in the living state exerts a powerful phagocytosis-promoting action on strains containing Vi antigen, while it is without any effect on strains devoid of this antigen. The Vi antibody excels the O antibody in the phagocytosis-promoting function in the same way as it does in the protective action against attack by strains of high virulence. There is a summation effect in the sensitizing activities of Vi and O antibodies and their respective modes of action seem to be essentially similar since both depend on the active participation of complement. The Vi antibody elaborated in response to immunization with formalized Vi antigen is not identical with that resulting from immunization with the "natural" Vi antigen contained in the living virulent

bacilli. The phagocytosis-promoting activity and the protective power of the former are much inferior to those of the latter, though there is no difference in the agglutinating properties of the two varieties of antibody. The "functional deficiency" of the altered Vi antibody is discussed, and the apparent analogy to the relationship existing between haptens and antigens is tentatively considered. The extreme susceptibility to phenol of the Vi antigen of Bacillus typhosus is demonstrated. The necessity of using the "natural" Vi antigen from live bacilli for the preparation of therapeutic antityphoid serum of high potency is emphasized. The possible application of these facts to other bacterial species is suggested.

Indian Journal of Medical Research, Calcutta

23: 1316 (July) 1935

- Anterovascular Sugar Difference in Diabetes Mellitus. Its Value in Judging Severity of Disease. J. P. Bose—p. 1
Endemicity of Plague in Mysore State. Part I. J. V. Karve and E. R. Sundararajan—p. 21
Comparative Results of Bacteriologic Examination of Madras Waters at Source and After Transport to Distant Laboratory. W. J. Webster and T. N. S. Raghavachari—p. 57
Histopathology of Liver in Infantile Biliary Cirrhosis. M. V. Radhakrishna Rao—p. 69
Toxicity Tests of Novarsenobenzene in White Mice Bred in India. J. Taylor and M. L. Ahuja—p. 91
Serologic Relationships of Certain Vibrios Isolated from Noncholera Sources in India. J. Taylor and M. L. Ahuja—p. 95
Observations on Neutralization of Hemorrhagin of Certain Viper Venoms by Antivenene. J. Taylor and S. M. K. Mallick—p. 121
Coagulant Action on Blood of Daboia and Echis Venoms and Its Neutralization. J. Taylor, S. M. K. Mallick and M. L. Ahuja—p. 131
Observations on Poisoning with Venom of Echis Carinata and Its Treatment with Heterologous Antivenene. J. Taylor and S. M. K. Mallick—p. 141
Short Note on Use of Glycerinated Medium in Technique of Single Cell Isolation of Bacteria. R. Sanjiva Rao—p. 147
Cancer in India. Vishwa Nath and K. S. Grewal—p. 149
Motor Functions of Bowel in Avitaminosis B and in Starved Animals. D. D. Chatterjee—p. 191
Description of Adult Filaria (Male) Removed from Anterior Chamber of Eye of Man. R. E. Wright, P. V. Seetharama Iyer and C. G. Pandit—p. 199
Probable Trend of Population Growth in India. K. C. K. E. Raja—p. 205
Simple Form of Electrodialyser. G. Sankaran—p. 219
Molecular Formula of Thyroglobulin. G. Sankaran and M. Patnaik—p. 223
Influence of Cereals on Calcium Magnesium and Phosphorus Assimilation. Preliminary Note. S. Ranganathan—p. 229
Spectrographic Examination of Urinary and Biliary Calculi. S. Ranganathan and N. K. De—p. 237
Vitamin C Content of Some Indian Foodstuffs. S. Ranganathan—p. 239
Contributions to Protozoal Immunity. Part III. Role of Electrical Charge in Phagocytosis of Red Cells. K. V. Krishnan, R. N. Chopra and S. N. Mukherjee—p. 253
Pharmacologic Action of Tylophorine. Alkaloid Occurring in Tylophora Asthmatica. R. N. Chopra, N. N. De and M. Chakrabarty—p. 263
Probable Vector of Oriental Sore in Punjab. H. E. Shortt, J. A. Sinton and C. S. Swaminath—p. 271
Note on Some Experiments with Sandfly Fever Blood and Serum. H. E. Shortt, L. T. Poole and E. D. Stephens—p. 279
Adsorption of Antigens by Antibodies or Vice Versa. Part I. Theoretical. B. N. Ghosh—p. 285
Hematologic Studies in Indians. Part II. Normal Standards for Bengal Town Population. L. E. Napier and C. R. Das Gupta—p. 305
Id. Part III. Normal Standards for Tea Garden Coolie Population. L. E. Napier and C. R. Das Gupta—p. 311

Microscopic Changes in Liver in Infantile Biliary Cirrhosis.—Radhakrishna Rao studied the microscopic changes in the liver in five cases of infantile biliary cirrhosis by the application of different staining methods, including the silver impregnation of the reticulum. He emphasizes the following histopathologic features: (1) varying degrees of necrosis of the liver cells, almost uniformly distributed throughout the organ; (2) an avascular, noninflammatory, edematous connective tissue network enclosing in its meshes small islands of hepatic parenchyma of very unequal sizes and in varying degrees of degeneration; (3) an obliterative lesion of the terminal and some of the bigger divisions of the hepatic venous tree without appreciable changes in the portal venous and biliary trees; (4) areas showing disorganization of the reticulum of the sinusoidal capillary bed mostly round the hepatic venous terminals; and (5) poor attempts at regeneration of the hepatic parenchyma as evidenced by the small size of the rounded nodules of liver

cells distributed throughout the organ. The genesis of the fibrous tissue in the liver is traced to an atrophy and degeneration of the parenchymal mantle round the hepatic venous tree and collapse, condensation and sclerosis of the reticular framework of the corresponding sinusoidal capillary bed. The pathologic changes in the liver in the present series of cases were similar to those described in toxic cirrhosis. But, because of the fine pseudolobulation and the coexistence of the necrotic lesions with regenerative changes in the hepatic parenchyma, it is suggested that the etiologic noxa is probably of a subacute nature. Whatever might be the exact nature of the toxin responsible primarily for the lesions of the hepatic vein and secondarily for the parenchymal loss, its action is not acute, but probably subacute atrophy and necrosis of the hepatic parenchyma and the resulting cirrhosis (residual fibrosis) can be determined only by a further clinical investigation. The condition in the liver is shown to be one of subacute toxic cirrhosis in the four cases and mixed cirrhosis—subacute toxic cirrhosis with cholangitis—in the fifth case. The genesis and function of the so-called bile ducts (pseudobile canaliculi) seen in the connective tissue network, the mechanism of ascites and the production of icteric necrosis and bile thrombi are discussed.

Serologic Relationships of Certain Vibrios.—Taylor and Ahuja found agglutinable vibrios isolated from healthy persons in an endemic cholera area in Bengal to be serologically indistinguishable from an authentic vibrio strain maintained in subculture, when examined by both qualitative and quantitative methods. Two such vibrios differing from each other in their chemical structure, have given the same serologic reactions as an authentic cholera vibrio of the type commonly encountered in India, which differs in chemical structure from either of them. A vibrio, isolated from water in an area widely removed from places in which cholera is endemic and which had been free from cholera for a number of years, was inagglutinable when first received, but in a period of six months of subculture developed all the biologic characters of an authentic cholera vibrio, including H and O agglutination to full titer, and was indistinguishable from a cholera strain when quantitative tests were applied. This strain differed in chemical structure from the cholera strain with which it was compared and from the agglutinable carrier vibrios. Vibrios possessing five different types of chemical structure, as shown by the nature of their protein and carbohydrate fractions have given identical serologic and biochemical reactions. Serologic methods of examination alone fail to show definite differences that may exist in vibrios. The epidemiologic significance of vibrios that are agglutinable with cholera high titer serum but at the same time differ in chemical constitution from *Vibrio cholerae* of the type commonly isolated from cholera cases in India has not been determined. A series of inagglutinable vibrios isolated from healthy persons in the same endemic cholera area have not been found to fall into any consistent serologic group or to show relationship with inagglutinable vibrios from other sources. One strain of this group, although inagglutinable, was agglutinogenic for cholera strains and for the agglutinable vibrios isolated in the area. This agglutination was in relation to the heat-labile fraction only and may suggest a group relationship to these vibrios.

Journal of Physiology, London

85:1116 (Aug. 22) 1935

- Pharmacologic Estimation of Adenosine and Histamine in Blood G. S. Barsoum and J. H. Gaddum—p. 1
Some Observations on Salivary Secretion W. Feldberg and J. A. Guimarães—p. 15
Effect of Pituitary (Posterior Lobe) Extract on Urinary Flow in Non-anesthetized Dogs A. Saman—p. 37
Explanation of Increase in Systemic Flow Caused by Occluding Descending Thoracic Aorta H. Barcroft and A. Saman—p. 47
Further Observations on Respiratory Accelerator Fibers of Vagus M. Hammouda and W. H. Wilson—p. 62
Intermittent Conduction in Spinal Cord D. H. Barron and B. H. C. Matthews—p. 73
Recurrent Fibers of Dorsal Roots D. H. Barron and B. H. C. Matthews—p. 104
Influence of Calcium on Intestinal Absorption E. J. McDougall—p. 109

Influence of Calcium on Intestinal Absorption.—McDougall studied the influence of calcium on the permeability of the intestine and also by decreasing the blood calcium by

feeding, not by extirpation of the parathyroids together with the thyroids, the absorption both of sugars which are known to be absorbed by a selective process (dextrose) and of those which are absorbed by diffusion only (xylose and sorbose). The influence of calcium was therefore tested both on the synthetic process and on the pure diffusion process. It was found that rats reared on a diet which caused low serum calcium absorbed isotonic solutions of dextrose, xylose and sorbose at the same rate as normal rats, when these sugars were injected directly into the small intestine in urethanized animals.

Journal of State Medicine, London

43:435-496 (Aug.) 1935

- Limits of Antenatal Care A. W. Bourne—p. 435
Antenatal Care of Teeth T. T. Read—p. 445
Economic Aspects of Spa Treatment W. Edgcombe—p. 449
Source of Natural Mineral Waters A. Woodmansey—p. 467
The Secret of the Spas F. H. Humphris—p. 473
Some Social Aspects of Housing and Rehousing M. R. Baskett—p. 489

Journal of Tropical Medicine and Hygiene, London

38:197-212 (Aug. 15) 1935

- Reaction of Organisms on Arbutin Agar A. Castellani and M. Douglas—p. 197
Ulcer Syndrome in Tropical Africa A. A. F. Brown—p. 201

Lancet, London

2:287-354 (Aug. 10) 1935

- Pruritus Horder—p. 287
Cod Liver Oil Treatment of Wounds J. P. Steel—p. 290
Neurosis and Unemployment A. Lewis—p. 293
Some Interrelations Between Water and Fat Metabolism in Relation to Disturbed Liver Function H. Selye, J. B. Collip and D. L. Thomson—p. 297
Colostomy and Its Inherent Difficulties Suggested Operative Technique T. Warwick—p. 298

Cod Liver Oil Treatment of Wounds.—Steel has obtained good results with cod liver oil in the treatment of burns. Lint heavily soaked in cod liver oil was applied widely over the part to be treated and covered with a dressing. The dressing is left in place and re-soaked with cod liver oil every twenty-four hours, the lint not being taken from the skin surface until the end of forty-eight hours—an obvious advantage when the area to be treated is large. When cases have not reacted previously to the ordinary dressings, it has been found that cod liver oil hastens recovery, and the speed with which an indolent area is transformed into one of healthy granulation is remarkable. Almost every patient has said that the first application of cod liver oil has given much greater ease than other dressings. The author also used crude cod liver oil as a dressing in indolent ulcers and deep abrasions, but always following the rule "if there is pus, it must be let out." It has been found of advantage in a great number of slow healing areas. After the removal of pus or gangrenous patches of skin, oil applied in the way described has induced rapid granulation of tissue previously indolent in leg ulcers and even in fistulas. One patient having a fistula had been in the hospital for thirty-four days under routine treatment and still showed a slight serous discharge. After the wound was packed for six days with cod liver oil, the patient was able to leave the hospital and needed to make only two outpatient attendances for the renewal of the dry dressings.

Medical Journal of Australia, Sydney

2:133-166 (Aug. 3) 1935

- Agranulocytosis A. S. Walker—p. 133
Establishment of Mossman Coastal and Other Previously Unclassified Fevers of North Queensland as Endemic Typhus A. M. Langan and R. Y. Mathew—p. 145

2:167-198 (Aug. 10) 1935

- Sleep and Sleeplessness H. M. North—p. 167
Insomnia Due to Physical Causes G. C. Willcocks—p. 170
Surgical Anuria R. G. S. Harris—p. 173
Congenital Clubfoot H. A. Sweetapple—p. 176
Growth Curve of Australian Infants During First Year of Age. II Comparison—North Queensland, Tasmania and New South Wales. F. W. Clements—p. 182

Annales de Medecine, Paris

38: 117 212 (July) 1935

Treatment of Hyperthyroidism by Roentgen Rays M Labbé and E Azérad—p 117

*Uremic Dechloridation Gastro Enteritis P Merklen and H Gounelle—p 154

New Studies on Lesions of His Tawara Bundle Left Branch Block and Its Pathogenesis I Mahaim—p 185

Uremic Dechloridation Gastro-Enteritis—Merklen and Gounelle observed seven patients with acute uremic dechloridation gastro enteritis. The first was too old to be effectively rechloridized but served to emphasize the satisfactory effects of salt in the following five cases. Administration of salt in these resulted in marked clinical improvement and restoration of the chloride reserve. The use of salt in certain vomitings of pregnancy seems especially promising, but its method of use is not yet certain.

Presse Medicale, Paris

43 1217 1232 (July 31) 1935

*Carotid Sinus Denervation R Leriche R Fontaine and F Froehlich—p 1217

Sympathetic Operations in Severe Asthma H Godard—p 1220

Carotid Sinus Denervation—Leriche and his co workers made bilateral denervations of the carotid sinus in twenty-six dogs. The operations were performed in one or two stages and the animals were given either morphine or general anesthesia. In most of the animals the denervation was performed by a slow and minute dissection of all the nervous elements reaching the carotid bifurcation. In the majority the ablation of the carotid body was verified histologically. In all animals the arterial pressure was recorded before, during and after the operation. In two dogs electrocardiograms were taken. None of the dogs died as the result of the procedure. The immediate result of unilateral denervation was a slight arterial hypertension. This was accentuated after bilateral denervation. Experimentally, no important sequels resulted from this operation. Seven patients have been operated on, five for bilateral and two for unilateral denervation. In man the denudation of the pulling and especially the injection of procaine hydrochloride around the carotid sinus cause an instantaneous increase of arterial pressure which returns gradually to nearly the previous level. The procedure apparently causes, therefore no important changes experimentally or clinically in blood pressure, cardiac rhythm or respiration. The operation seems to be indicated, first, in the conditions in which it is desirable to increase the cerebral and ocular circulation and, secondly, when it is advisable to raise the general arterial pressure.

43: 1249 1264 (Aug 7) 1935

*Spontaneous Gastroduodenal Fistulas P Moiroud—p 1249

*Roentgen Therapy of Inflammatory Disorders I Solomon and P Gibert—p 1251

Liberation of Pleural Adhesions O M Mistal—p 1253

Spontaneous Gastroduodenal Fistulas—Moiroud describes the case of a woman, aged 81, who developed a spontaneous gastroduodenal fistula from a benign ulcer of the lesser curvature. The roentgenogram was verified by necropsy. He also discusses three similar observations made by others. As a result he believes that it is possible to list the changes manifested by roentgen examination. These are gastric filling following the lesser curvature, notching of the greater curvature the presence of a gastric bottom with prolonged stasis and a visible black line leading directly from the lesser curvature toward the duodenum. The question of a definite clinical picture resulting from a fistula thus established is still uncertain.

Roentgen Therapy of Inflammatory Disorders—Solomon and Gibert discuss the treatment of inflammatory conditions by roentgen rays. Treatment is possible with the simplest kind of machine. The more acute the process the weaker the dose advisable. Their experience showed that the optimal dose lies between 100 and 200 roentgens. The field of irradiation should be much wider than the inflammatory zone. The frequency is variable. Such treatment gives good or promising results in many superficial skin diseases, in acute inflammations of the mouth, of the pharynx or sinus and of the female genital

organs, in anorectal disorders and in some disorders of the nervous system. Whatever the explanation of the favorable results observed, this treatment is full of promise for the future.

Schweizerische medizinische Wochenschrift, Basel

65 805 844 (Aug 31) 1935 Partial Index

Position of Physical Therapy in General Medicine and Tasks of Physical Therapeutic Research K von Neergaard—p 805

Estimation of Sympathetic Neuroses in Practice B Rocco—p 808

*Poisoning with Nitrite E Ruegg—p 809

Acute Gastritis During Childhood W Rutimeyer—p 811

Recurrence of Acute Infectious Diseases During Childhood P Ryhiner—p 813

Late Fatalities After Diabetic Coma with Aspects of Progressive Adynamia H Schuler—p 814

*Aspects of Unusual Forms and Possibilities of Infection in Erysipeloid A Schuler—p 817

Poisoning with Nitrite—Ruegg observed three cases of nitrite poisoning in the members of one family (father, mother and daughter). The symptoms developed immediately after they ate a meal that had been seasoned with nitrite, which had been mistaken for ordinary salt. Vomiting and diarrhea developed and stupor and unconsciousness followed. The patients were not discovered until several hours later. All recovered. The author discusses the pharmacology of nitrites, calling attention to the formation of nitrous acid in the stomach with subsequent irritation of the gastric and intestinal mucous membrane, the vascular dilatation, the paralyzing action on the vasomotor center, the narcotic action and other effects. He thinks that the fatal outcome of nitrite poisoning is primarily the result of the transformation of the blood pigment into methemoglobin. In discussing treatment, he says that gastric lavage should be done at once, to prevent resorption of the poison. Then 10 Gm of animal charcoal in from 100 to 200 cc of water should be given several times, and finally 10 Gm. of sodium sulphate or castor oil may be administered. Some of the poison can be removed by venesection and infusion. Blood transfusion is effective, because it supplies normal hemoglobin. Oxygen inhalation is advisable in order to utilize the patient's own normal hemoglobin. The vascular paralysis is counteracted by stimulating the vasomotor center. The respiratory center should likewise be stimulated. The stimulants used for these purposes, as a rule, also stimulate the cardiac action. The use of caffeine should be avoided, because of its vasodilatory effect. The author also mentions sodium thiosulphate, guaracol and Berlin blue, the injection of which proved effective in poisoning experiments in animals.

Infection in Erysipeloid—Schuler gives the history of a man, aged 36, who was stung by an insect on the lower part of the left leg. On the following day fever developed and the area of the sting became edematous with a bluish discoloration. Under treatment the symptoms disappeared. However, several weeks later there was a recurrence of the symptoms with fever. The symptoms in the leg gave the impression of an atypical erysipelas. The attack subsided, but there were several relapses at intervals of several weeks. It was finally decided that the disorder was not erysipelas but erysipeloid. In the course of a renewed attack erysipelas serum was injected around the involved areas on the leg and this was followed by immediate improvement. Nevertheless, there was a renewed attack in the course of which serum was administered once more. A period of well being lasting several weeks was followed by an attack of chills, high fever, painful swelling of the inguinal glands, nausea and pains in the joints, the back and the head. Suddenly extremely severe pains developed in the epigastric region and perforation of the stomach was considered. However, the pains subsided again as did also the glandular swellings. Subsequently the patient was given repeated injections of erysipelas serum, but there was another recurrence months later. In spite of the fact that the diagnosis was not corroborated by bacteriologic tests, the author is inclined to believe that the condition was an erysipeloid, pointing out that lymphangitis, lymphadenitis and pains in the joints are occasionally observed in erysipeloid, and he thinks that the favorable response to erysipelas serum is likewise a corroboration of this diagnosis. The question as to whether the peculiar abdominal symptoms were related to the erysipeloid is answered in the affirmative. In trying to explain the relationship, the

author rejects the possibility of a true septicemia. He assumes an irritation by a slightly virulent bacterial metastasis or by toxins that have reached the circulation. The localization seems to contraindicate an erysipeloid, for this condition develops generally on the fingers and hands. Moreover, transmission of the virus by insect bites is rather rare, but the author cites the case of another observer, which was caused in this manner. The author says that, although the majority of cases recover with symptomatic treatment, many authors consider serum therapy the best.

Riforma Medica, Naples

51 1273 1308 (Aug. 24) 1935

- *Intravenous Streptococcus Vaccine Therapy in Rheumatic Conditions
T. Corelli—p. 1275
- Serologic Changes in Paroxysmic Hemoglobinuria Due to Exposure to Cold
G. D. Alessandro—p. 1280
- Ligation of Lingual Artery at Pirogoff's Angle in Different Periods of Life
F. Belli—p. 1285

Streptococcus Vaccine in Rheumatic Conditions—Corelli administered streptococcus vaccine intravenously to twenty patients presenting acute, subacute and chronic articular rheumatism, chorea, sciatic neuritis, rheumatic polyneuritis and perivisceritis. The vaccine was produced from streptococcus strains cultivated from the blood and from the articular exudate of a patient having acute articular rheumatism. The initial dose in all cases was three million organisms per cubic centimeter of a 0.5 per cent phenicated physiologic solution. Increase of dosage depended on the individual reaction of the patients. Injections were generally given every four or five days. When a favorable reaction set in, the dose was decreased. The majority of patients responded well to treatment. The best results were observed in cases of subacute articular rheumatism. In four of six patients there was constant diminution and disappearance of pain and of articular swelling, increase of movements and disappearance of fever. These were also observed in a case of chronic articular rheumatism that resisted other treatment. In nervous cases such as in chorea and rheumatic polyneuritis, good results were obtained by combining vaccine therapy with salicylate treatment. In a case of perivisceritis, the temperature disappeared and the abdominal pains diminished after only four injections. The author does not attribute the primary etiologic importance to the streptococci cultivated from the blood and the articular exudate. He maintains that this treatment is not specific but essentially a treatment of stimulation.

Semana Medica, Buenos Aires

42: 521 596 (Aug. 22) 1935 Partial Index

- *Zarate's Symphysiotomy in Relative Osseous Dystocia
N. Palacios Costa and M. V. Falsa—p. 521
- Myorhythmia of Eyes, Larynx, Pharynx and Velum Palatinum in Protuberant Syndrome. Case
J. C. Montanaro and J. I. Hanón—p. 537
- Juvenile Diabetes in Persons Between the Ages of Fifteen and Twenty
Five
F. Puchulu—p. 548
- *Chemical Test in Diagnosis of Pregnancy
R. A. Ferrari and D. J. Francis—p. 555
- *Treatment of Leprosy by Fish Oils—O. Calcagno—p. 557

Symphysiotomy in Relative Osseous Dystocia—Palacios Costa and Falsa state that symphysiotomy, according to Zarate's technic, is absolutely indicated in relative pelvic dystocia, that is, disproportion between the pelvis of the mother and the head of the fetus, when uncomplicated by other dystocia and providing that the uterine dynamics are efficient. Symphysiotomy is indicated also in the following complications of labor: narrow pelvis in primiparas or in multiparas after a period of expectancy called the "test of delivery" in which the inability of the head of the fetus to pass through the pelvis is proved, in fetal suffering with a living fetus, in amniotic infection during labor, in lack of dilation of the cervix (complemented in this case by manual dilation of the cervix or by some simple incision in it), in deflected cephalic presentations especially forehead and face presentations, and finally in retention of the head after delivery of the body. Out of a group of 1,969 pregnant women seen in the maternity department of the Rawson Hospital during 1934, 132 had a defective pelvis. Symphysiotomy was performed on fourteen of this group—twelve multiparas and two primiparas. Spontaneous delivery

followed in each case. Small incisions of the cervix were made only in one. In a few cases the dynamics of the uterus were reinforced by the administration of a pituitary preparation, or the Kristeller method of expression of the fetus from the uterus was resorted to. There were no fatalities in this group. Women with a narrow pelvis and an obstetric conjugate diameter of the pelvis larger than 83 cm. had spontaneous deliveries after the "test of delivery." Symphysiotomy was used to deliver women with an obstetric conjugate diameter of the pelvis larger than 78, but smaller than 83 cm.

Chemical Test in Diagnosis of Pregnancy—Ferrari and Francis used the Kapeller-Adler test for the diagnosis of pregnancy on 263 women in different stages of pregnancy and on twenty normal women as controls. The test is based on the detection of histidine in the urine of pregnant women by treating it with a 1 per cent solution of bromine in a 33 per cent solution of acetic acid and then by a mixture of two parts of ammonia with one part of a 10 per cent solution of ammonium carbonate. The technic and results of the test appeared in the *Wiener klinische Wochenschrift* abstracted in THE JOURNAL, April 14, 1934, page 1265. In the group of nonpregnant women the test gave positive results in two cases and negative results in eighteen (10 per cent of error). In the group of pregnant women the greater percentage of error was obtained in cases of early pregnancy—during the first four or five weeks. In all cases the Friedman test, used to check up the results of the histidine test, gave positive results. The histidine test gives the best results in women who are in the fourth or fifth month of pregnancy, and the sensitivity of the test decreases as pregnancy advances. The authors believe that it is probable that the elimination of histidine in pregnancy, which has been calculated as fluctuating between 6 and 74 mg. per hundred cubic centimeters of urine, varies in the different months of pregnancy because of certain unknown biochemical factors. The authors' results, which do not agree with those of the originator of the technic, lead them to conclude that the test is not sensitive enough and that its use is not advisable in the diagnosis of pregnancy, especially in early pregnancy, unless the originator modifies his technic.

Treatment of Leprosy by Fish Oils—Calcagno made a chemical study of the oil of *Salminus brevidens* as well as of that of *Prochilodus platensis* and *Pimelodus clarias*. When the fatty acids from the oils are distilled between 193 and 210 C., the ethyl esters obtained are not as active as the oils themselves. It is possible that, when they are distilled at higher temperatures, dextrorotatory esters of higher boiling points and greater activity may be obtained. The oils of these fish and their ethyl esters can be used without distinction in the treatment of leprosy because their chemical composition is about the same. The oils may be washed in alcohol. When they are to be used in injections, it is advisable not to wash them, because their fatty acids would be washed away, which may result in a diminution of their therapeutic properties. A series of preparations, such as those made with chaulmoogra oil, was made by the author with the fish oils as well as with their ethyl esters, fatty acids oil in sodium salt solutions and emulsions. The author advises their clinical application in verifying the therapeutic value of the oils and their derivatives in leprosy.

Archiv für Kinderheilkunde, Stuttgart

100 164 (Aug. 13) 1935

- *Local Lipomatosis Following Insulin Injections
R. Priesel—p. 1
- Congenital Atresia of Pancreatic Duct and Hypertrophy of Islands of Langerhans
Diagnosis of Pancreatic Disturbances
W. Tiling—p. 9
- Significance of Demonstration of Tubercle Bacilli in Secretion of Fasting Stomach
Edith Kruger—p. 16
- Studies on Dysentery
Carbohydrate Metabolism
L. von Kostyal and Marie D. Weinrich—p. 21
- *Cutaneous Vaccinations with Influenza Bacilli
Z. Tevel—p. 27
- *Irradiation of Hydrocephalus
E. von Lederer—p. 31
- Electrocardiogram of Cardiac Disturbances that Develop in Children During Typhoid
P. von Kiss and B. Wollek—p. 38

Local Lipomatosis Following Insulin Injections—Priesel reviews the literature on local lipomatosis after insulin injections and then describes his own observations on a boy, aged 8 who had received insulin treatments for the last four years and who died in diabetic coma. In this boy indolent

swellings had developed at all sites of insulin injection. A necropsy was made and the pancreas, the liver, the kidneys, the heart, the parathyroids and particularly the cushion-like proliferations of the subcutaneous fat tissues at the sites of injection were subjected to histologic examination. The author says that the cause of the local lipomatosis is unknown, just as is the cause of the localized lipodystrophy that has been observed after insulin therapy. He admits that these two conditions have even been observed in the same person. He cites reports indicating that in children lipomatosis is somewhat more frequent than lipodystrophy. It appears to be a tendency of the young organism to react with fat proliferation. Frequent changing of the sites of injection may prevent the development of the lipomatosis in predisposed persons. Once the lipomas have developed, a partial regression may be expected by avoiding for a time renewed injections into the proliferated portions. The tricesol addition to insulin, which has been considered the cause of lipodystrophy, cannot be held responsible for the lipomatosis, since the latter has been observed in cases in which the insulin did not contain this addition.

Cutaneous Vaccinations with Influenza Bacilli—Tevel shows that, whereas there is general agreement regarding the value and nature of the tuberculin, Schick and Dick reactions opinions are still divided in regard to skin tests with other bacteria. He decided to make skin tests with influenza bacilli. By making the tests on children of all ages (from newly born infants to children of 15 years) he hoped that more light would be thrown on the problems of allergy, parallergergy and so on. For the preparation of the vaccination material he used a twenty-four hour culture of influenza bacilli. He mixed with 20 cc. of distilled water an amount of bacilli equal to that on a well grown agar slant. This mixture was kept in the incubator for six days and then mixed with an equal amount of a 17 per cent solution of sodium chloride so as to produce a physiologic sodium chloride concentration. The vaccination material obtained in this manner was slightly turbid and was not changed after three or four weeks storage on ice. Since the size of the individual influenza bacillus varies greatly, the strength of the vaccination material was not expressed by the number of bacteria but rather by the degree of turbidity. The vaccination was done on the flexor surface of the forearm and the reaction was read after from twenty to twenty-four hours. Positivity was indicated by an inflammatory reaction varying in size from a bean to the palm of a child's hand. In case of severe reaction the center of the inflamed area was dark red or livid red. The total number of nurslings and children subjected to this test was 225. It was found that older nurslings (more than 3 months old) and children give a positive reaction in response to the cutaneous vaccination with the influenza bacilli. The resulting inflammation seems to be an allergic reaction. The nurslings, who were vaccinated during the first three months of life, rarely gave a positive reaction. The reaction was found to be abolished not only during influenzal bronchopneumonia but also during other febrile disorders and the author thinks that this is the result of the influence exerted by the exhausted organism on the allergic condition.

Irradiation of Hydrocephalus—According to von Lederer, the treatment of hydrocephalus has been mostly symptomatic, for lumbar and cisternal punctures or puncture of the corpus callosum and drainage produce as a rule only a temporary improvement. Since several investigators had seen favorable results from the use of roentgen rays in animal experiments on hydrocephalus, the author resorted to this treatment in seventy-three cases from the neurologic department of the children's clinic. Of this number, fifty-five had hydrocephalus. The irradiations were given with a maximal tension of 200 kilovolts, the filter consisted of 0.5 mm. of tin with 1 mm. of aluminum, and the focal skin distance was 30 cm. To five fields, measuring 6 by 8 cm. 10 per cent of the unit skin dose was applied. As a rule, the different fields were irradiated at intervals of two days. (In some cases 30 per cent of the unit skin dose was applied to three fields at weekly intervals.) The series were repeated two or three times within a period of from four to eight weeks. The author gained the impression that roentgen therapy promises favorable results in cases of hydro-

cephalus in which a hypersecretion of fluid exists, whereas there is less probability of cure in cases in which there is subnormal resorption or occlusion. Roentgen therapy was found helpful also in some cases of poliomyelitis, in that the paralytic conditions improved or disappeared. However, the results cannot be definitely ascribed to the influence of the rays, for spontaneous improvements are quite likely. In cases of imbecility, particularly in mongolian idiocy, roentgen therapy promises no results.

Deutsche medizinische Wochenschrift, Leipzig

61: 1345-1384 (Aug. 23) 1935 Partial Index

Increased Incidence of Aseptic Encephalomeningitides in Silesia J. Lange—p. 1345

Use of Amidopyrine and of Similar Substances H. Dennig—p. 1349

*Nasal Application of Hypophyseal Preparations L. Schneider—p. 1351

Pathogenesis and Course of Pyuria During Childhood E. Holzmann—p. 1352

Does Oral Application of Saccharin Influence Blood Sugar? F. Fischer and A. Schroter—p. 1354

*Relations Between Stomach and Blood Picture. Mahlo—p. 1358

Nasal Application of Hypophyseal Preparations—In discussing the use of the extracts of the posterior lobe of the hypophysis in obstetrics, Schneider points out that, because the extracts lose their efficacy when administered by mouth, it is necessary to administer them by injection. However, injections frequently prove annoying and, since it was discovered that the extracts of the posterior lobe of the hypophysis are absorbed by the mucous membranes, nasal application was tried. The author administered a pituitary preparation in the form of a snuffing powder and reaches the conclusion that, as regards its ecbohic efficacy, the pituitary snuffing powder is not superior to the administration by injection. However, the nasal administration is valuable.

Relations Between Stomach and Blood Picture—Mahlo points out that, according to Naegeli, pernicious anemia does not have a uniform etiology but may be caused by different factors. He discusses liver therapy and Castle's principle and shows that there are at least two substances which influence the blood picture of pernicious anemia and that the normal function of the stomach is important for a normal blood picture. He shows that normal gastric juice forms the Castle principle only in the presence of food protein and thereby influences the blood picture. He cites studies on the gastric mucus, emphasizing the importance of its action as membrane and pointing out that gastric mucus has the capacity to absorb not only hydrochloric acid but probably also ferments and food hormones. He assumes that the gastric mucus is capable of storing the Castle factor as such or in a preliminary form. Then he shows that gastric mucus which has been saturated with hydrochloric acid has the same effect on the blood picture of pernicious anemia as does the Castle principle but that the formerly employed pepsin hydrochloric acid therapy is unsatisfactory. He points out that Hitzenger has assumed that polyglobulism is probably caused by an excess of Castle's principle. The author is inclined to agree with this, but instead of accepting Hitzenger's suggestion to counteract this by resection of the pylorus he cites Mulli's observations, in which it was found that the Castle factor is destroyed if there is a pH of 6.6, and he suggests that alkali therapy in the form of large doses of sodium bicarbonate will counteract the excessive production of Castle's principle and the polyglobulism.

Medizinische Klinik, Berlin

31: 1093-1124 (Aug. 23) 1935 Partial Index

*Significance of Osteodystrophia Fibrosa Generalisata (Recklinghausen's Osteitis Fibrosa) for Obstetrics L. Nurnberger—p. 1093

Hereditary Disorders of Organ of Hearing H. Leicher—p. 1096

*Erythrocytosis in Gastric and Duodenal Ulcers H. Otto—p. 1105

Diagnosis of Suppurating Mediastinitis R. Pohl—p. 1106

Progress in Treatment of Concomitant Strabismus K. Ascher—p. 1108

Aspects of Pyemia Caused by Bacillus Fusiformis L. Wechsler—p. 1110

Recklinghausen's Osteitis Fibrosa in Obstetrics—Nurnberger shows that Recklinghausen's osteitis fibrosa is just as important for obstetrics as is osteomalacia, because it may produce pelvic deformities that greatly resemble those caused by osteomalacia. In reviewing the aspects of osteitis fibrosa,

he shows that, in spite of the pathologic anatomic differences between this disease and osteomalacia, the two disorders may nevertheless produce similar changes in the body structure so that the external aspects will not permit a differentiation. For this reason osteitis fibrosa is frequently not recognized and is erroneously diagnosed as osteomalacia, which results in grave consequences, because the patient does not receive the proper causal therapy, which should consist in the extirpation of the parathyroid "tumors." The author points out that the demonstration of hypercalcemia, hypercalciuria or urinary concrements in patients in whom osteomalacia had been thought of militates in favor of Recklinghausen's osteitis fibrosa and against osteomalacia. Roentgenoscopy of the entire skeleton will definitely decide the diagnosis.

Erythrocytosis in Gastric and Duodenal Ulcers—The detection of an erythrocytosis in the blood picture of a woman with duodenal ulcer induced Otto to study the incidence of erythrocytosis in patients with gastro-intestinal ulcers. Observations on several hundred patients with ulcer revealed that erythrocytosis exists in a large number of these patients. The author points out that continuous dripping of blood, which characterizes some ulcers, stimulates the bone marrow, which in turn responds with an increased erythropoiesis. The excessive formation of young erythrocytes is indicated by the greater number of reticulocytes in the blood. The blood pictures of patients with gastritis and with gastric cancer were likewise examined and the author records the results of his studies in tabular reports. He reaches the following conclusions in regard to the rapid determination of the origin of a gastro-intestinal hemorrhage. 1 A secondary anemia with a hemoglobin content of less than 70 per cent and 35 million erythrocytes, which cannot be traced to a manifest hemorrhage, indicates hemorrhage of carcinoma. In this case the examination of the stool reveals occult blood. 2 In nonbleeding or slightly bleeding ulcers the blood status varies between 70 and 90 per cent hemoglobin content and between 3.5 and 4.5 million erythrocytes. 3 An erythrocytosis in patients with ulcer symptoms indicates the presence of a chronic bleeding ulcer, even if the examination of the stool is negative. In these patients the hemoglobin content is usually above 100 per cent and the number of erythrocytes above 5 million. 4 In patients who present the symptoms of gastritis and in whom the anamnesis indicates ulcer, the existence of an erythrocytosis justifies the diagnosis of ulcer, even if the roentgenologic examination is negative. 5 After gastro-enterostomy and after Billroth I and II operations the existence of an erythrocytosis indicates a peptic lesion, even if the roentgenogram is negative.

Zentralblatt für Gynakologie, Leipzig

59: 1985 2048 (Aug 24) 1935 Partial Index

Internal Hyperrotation of Head and Forceps Delivery R Cordua—p 1996

Obstetric Twilight Sleep Produced by Rectal Administration of Evipan H Dietel—p 2003

*Attempt to Simplify and Accelerate Hormone Diagnosis of Pregnancy A P Nikolaew—p 2010

Hormone Diagnosis of Pregnancy—Nikolaew calls attention to studies conducted by Ludwig and Riss, who observed that red rays activate the ovarian hormone. He mentions that the pregnancy test can be completed more quickly in rabbits than in mice and that an addition of sugar to the urine that has been detoxicated with ether makes the test clearer. By utilizing these various improvements, he simplified and accelerated the pregnancy test. The urine is treated with ether and sugar and is then exposed for five hours to red rays. Then 15 cc. of the urine is injected under the skin (back) of a female rabbit. After eighteen or fifteen hours, and in sexually mature rabbits even after twelve hours, the reaction is complete. Later studies disclosed that it is unnecessary to treat the urine with ether and sugar and that, after the preliminary irradiation with red rays, urine that has not been treated with ether and sugar will produce a reaction in from twelve to fifteen hours. The preliminary irradiation of the urine with red rays was tried also when mice served as test animals, and in a few cases the test proved complete after fifty-one or sixty hours and in most cases after seventy-two hours.

Hospitalstidende, Copenhagen

78 821-832 (Aug 6) 1935

*Influence of Histamine on Renal Function. T Bjerring—p 821

Influence of Histamine on Renal Function—Bjerring found that the injection of 1 mg of histamine resulted in reduction of both the systolic and the diastolic blood pressure and simultaneously a decrease in the creatinine and urea clearance, more marked in the latter. There was no constant relation between the decrease in blood pressure and clearance. The creatinine and urea index increased, showing that both the glomeruli and the blood vessels about the tubuli were affected by the histamine. In a patient with essential hypertension, in whom the increased blood pressure was especially pronounced, albuminuria appeared without other demonstrable pathologic changes in the urine. The eliminated amount of total protein followed the variations in filtration. The total protein in the blood was not influenced by the injections of histamine.

Ugeskrift for Læger, Copenhagen

97 837 866 (Aug 15) 1935

*Polomyelitis in Denmark in 1934 and 1935 Committee—p. 837

Polomyelitis Epidemic in Haderslev in 1934 (from July 25 to Dec. 31) General Remarks Casuistic Polomyelitic Radiculoneuritis M Norn and N B Møller—p 841

*Polomyelitis Epidemic in Faaborg in 1934 R. E. Christensen—p 855 Nonhospitalized Cases of Abortive Polomyelitis? L. C. Stage—p 857

Polomyelitis in Denmark—The committee appointed to investigate the polomyelitis epidemic of 1935 by questionnaires to hospitals obtained information on 3,938 cases of which 78 per cent were admitted within the first two days of the disorder. Serum treatment was given to 80 per cent, dementia paralytica occurred in 15 per cent and the mortality was 19 per cent. A high cell count was found to be unfavorable prognostically. Experience showed that the length of hospitalization should hardly be less than three weeks. There were only half as many cases of dementia paralytica among the patients given serum treatment within the first forty eight hours as among those treated later. The recommended lines of treatment are early hospitalization and serum treatment, a beginning dosage of about 1 cc per kilogram of body weight, if feasible intravenously, possibly intramuscularly, and immediate repetition of the serum injection, perhaps with larger doses, on the slightest sign of aggravation.

Polomyelitis Epidemic in Faaborg in 1934—Christensen's material consists of 600 cases. He asserts that infection was probably by contact (droplet infection?), the port of entry being most often the tonsils. Transmission of the infection was presumably as a rule in the incubation stage, but occasionally after the end of the disturbance (bacillary carriers?), and in these cases the period of incubation appeared to be about one week. Continued use of convalescent serum is advised.

97: 891 912 (Aug 29) 1935

Schizophrenia (Dementia Praecox) H H Reistrup—p 891

Investigation on Tuberculin Sensitivity in Tuberculous Lymphadenitis. Illuminated by Graduated Intracutaneous Reactions Together with Significance of Latter in Diagnosis P Bonnevie and T K With—p 893

Allergic Vasomotor Rhinitis in Bakers K H Baagø—p 897

*Influence of Adrenal Cortex Extract on Length of Life of Adrenalectomized Young Rats Together with Length of Life After End of Sufficient Hormone Treatment P Schultz—p 901

Influence of Adrenal Cortex Extract on Adrenalectomized Rats—Schultz used adrenalectomized rats 4 or 5 weeks old. In his earlier control experiments 100 per cent of the rats died in an average of 57 days. By means of daily injections of adrenal cortex extract, twenty-seven animals were kept alive for three weeks, on cessation of the injections they died in an average of 59 days. These results, he says, demonstrate that the administered extract was effective, and the fact that the rats do not die sooner after adrenalectomy than after adrenalectomy combined with three weeks of extract treatment shows that death does not depend on operative shock and that the organism apparently has no store of the adrenal cortex extract.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 105, No 17

CHICAGO, ILLINOIS

OCTOBER 26, 1935

PATHOLOGY AND PRACTICE

GEORGE BLUMER, M D
NEW HAVEN, CONN

Medical and surgical diagnosis rests to a large extent on the recognition of the nature and cause of gross changes in structure and their consequences on function—LUDWIG HEKTOEN

Any one who has the hardihood to attempt a discussion of such a time-worn subject as the relation of pathology to practice runs the risk of producing something which, in the words of the melancholy Dane, is "stale, flat and unprofitable." And yet on an occasion like this when we are marking the end of a period, it seems worth while to chance this risk. It is advantageous, no doubt, to take stock from time to time of the situation that confronts us particularly during a period when both the science and the art of medicine are in a state of flux, as they have been during the last fifty years. The reasons for the rapidly changing conditions that have characterized this period are not far to seek. New diseases have been discovered, old diseases have been restudied by new methods, diseases that were originally local have become world wide through travel, trade or war, and entirely new disciplines, which necessitate new points of view, have developed. In such circumstances it is well to ask ourselves whether our program of medical training is meeting the altered conditions, whether it is a well balanced one, or whether the itch for novelty, for which even scientific human nature is ever greedy, may not have led us to exalt the new and spectacular at the expense of the old and well tried.

It is my purpose in this paper to discuss briefly the importance to the clinician of a sound training in pathology, a doctrine which, in view of the antiquity of recorded medicine, is not such a very old one. It is true that as early as the seventeenth century William Harvey stated that "from a knowledge of pathology the practice and art of healing, and numberless new methods of treatment, will naturally spring." His postmortem studies, which might well have influenced the profession at that time, were unfortunately destroyed by the parliamentary troopers who sacked his chambers in 1642, and it was not until the publication of Morgagni's observations a century later that the leaders in the profession awoke to the possibilities that lay in the combined clinical and pathologic study of disease. While many of those who succeeded Morgagni, Baillie, Bichat, Laënnec, Rokitsansky and Bright, for example, accepted and expanded his point of view, it took a long time for it to make a lasting impression on medical education and a still longer time for it to filter through to

the consciousness of the mass of the profession. It was not, of course, until Virchow's time, and Virchow did not die until this century, that the development of pathologic histology broadened the field and it was still later that the development of bacteriology and the application of the newer chemical and physical methods still further extended it.

It is obvious from this brief historical survey that pathology now covers a much wider field than it did in its infancy, when it consisted of gross pathology, in its childhood, when it was a combination of morbid pathology and histology, or even in its adolescence when the germ theory extended its scope. Since then clinical pathology, chemical pathology, pathologic physiology and experimental pathology have all developed and have grown apace. It therefore becomes necessary to define more precisely the particular aspects of pathology that are considered of maximum importance in the training and development of good clinicians, for, needless to say, every student of medicine should have some knowledge of the field as a whole.

It has always seemed to me, and I am doubtless influenced by my own training, that the fields of pathology whose cultivation is most essential to the development of the clinician are morbid anatomy and histology. A study of these subjects makes for precision in diagnosis and, after all, the basis of good clinical work is exact diagnosis, without which the prognosticator and the therapist are mere empiricists groping in the dark.

Objections have been raised against the view that morbid anatomy and histology are of abiding importance in the training of the clinician mainly on two grounds.

It has been claimed that their study withdraws attention from morbid physiology or, to put it in another way, that the pursuit of morbid anatomy causes overlooking of the general principles of pathology. One can only say in reply to this objection that it presupposes an attitude of mind on the part of pathologists singularly lacking in imagination and insight. How any thoughtful individual engaged in the study of morbid anatomy and histology could avoid pondering over the effect on function of the structural changes that he observes passes my comprehension. Morbid anatomy and histology passed out of the purely descriptive stage of development generations ago, their method is now that of science in general, namely, observation plus induction.

The second common criticism brought against the study of morbid anatomy and histology is that they reveal only end results. This is a half-truth and, as Professor Leacock has epigrammatically remarked, "a half-truth, like half a brick, is always more forcible as an argument than a whole one—it carries further." It needs very little pathologic experience to enable one to realize that in many chronic diseases all stages of a pathologic process are present in the body at the same

time Furthermore, the early stages of chronic disease may often be detected and studied in patients dead of accident or acute disease In acute disease the duration of illness is often so short and the lesions are so clear cut that the "end results" argument carries no weight

It is difficult for a clinician who feels his indebtedness to his pathologic training to formulate precisely the ways in which it has influenced his clinical career Pathology, like diagnosis, is based on observation and induction, and it is clear that for this reason it is a preliminary training in method But, further than this, it gives the student a much wider point of view of disease than is usually obtained in practice Many diseases which in the living patient appear to have attacked a single organ or tissue are found on the post-mortem table to be much more widespread in their effects than the clinician had suspected Thus pathology gives an insight into disease as a whole and a clinician with a good pathologic training tends, as a result, to visualize what is going on in the entire body As one writer puts it, "the greater our power of visualizing the underlying pathological process the closer we come to a proper concept of disease" Furthermore, such visualization based as it is on accurately observed facts, protects the clinician from the very human tendency to theorize and speculate on insufficient data, which has been such a prominent feature of medicine at certain periods, notably the eighteenth century The value of morbid anatomy and histology as methods of checking the accuracy of diagnosis and showing the clinician his mistakes is so obvious that it need be mentioned only in order to point out the necessity of encouraging their use to the fullest extent We all learn more from our mistakes than from our successes, but we cannot learn from our mistakes unless we have them demonstrated to us

If I have succeeded in making it clear that morbid anatomy and histology are of paramount importance in the training of clinicians, certain practical considerations naturally arise It is pertinent to inquire whether, under existing conditions, sufficient opportunity is afforded to the medical student and the practitioner for the study of pathology There is no doubt that improvements in the teaching of pathology have been developed in recent years, notably the well conducted clinical-pathologic conferences that exist in some teaching centers and the seminars on tumor pathology that have been developed in many places as the result of the crusade against cancer In the training of medical students there is still too great a tendency in some places to treat pathology as a preclinical subject rather than as the most important liaison subject between the laboratory and the clinic During his clinical years the student should be required much more frequently than he is at present to follow his patients to the autopsy room, indeed, a revival of the method long used at Edinburgh and Manchester of requiring students during their clinical training to pursue such a course and to write case reports that coordinate the whole disease picture from both clinical and pathologic points of view is highly desirable But the main problem does not lie in the teaching hospitals but in the nonteaching ones in which the majority of graduates spend their intern years It is essential that all such hospitals should have adequate pathologic departments under well trained pathologists and that the members of the house staff should be required to follow their cases to the autopsy room and study the pathologic observations In these hospitals the members of the visiting staff should be

encouraged to take a much greater interest in pathology than they have in the past, for without their active cooperation little of permanent value can be accomplished Furthermore, bodies such as the American College of Surgeons and the American College of Physicians might well demand of aspirants for admission to their ranks not merely clinical but clinical-pathological reports on their patients Nor must it be forgotten that our chief aim in this training is the development of a point of view rather than the mere inculcation of facts, for, as Osler well said, "the mental attitude controls the course of a man's evolution as a clinical physician"

195 Church Street

CHANGES IN INTERNAL MEDICINE SINCE 1900

JAMES B HERRICK, M.D.
CHICAGO

A fairly complete catalogue of the changes that have taken place in internal medicine since 1900, a catalogue especially adapted to an American audience, could be made if one consulted as source books the *Transactions of the Association of American Physicians*, or the *Index Medicus* and the *Cumulative Index*, or the successive editions of such textbooks as those of Strümpell or of Osler In fact, this was recently done by Dr James G Carr in a scholarly paper entitled "Eleven Editions of Osler" It would, however, be too time consuming for the compiler and too wearisome for the listener if more than the most important changes were discussed, and especially as I shall take the liberty of extending the scope of the topic, so that it will include the last few years of the nineteenth century, for many of the advances in internal medicine of the past thirty five years were but the continuance of changes that began several years before I shall also take the liberty of indulging in personal reminiscence Need we be bound by the dictum of the psalmist that if years are added to the traditional three score and ten they must be years of labor and sorrow? May not one at that age have the privilege and pleasure of going in the direction of least resistance, which is—is it not—toward reminiscence? May not one be permitted to call to mind events that one has seen, if there is avoided the pathetic error of claiming *quorum pars magna fui*?

IMPROVEMENTS IN MEDICAL SCHOOLS AND HOSPITALS

In 1888 I was graduated from a two-year short term medical college, in which the teaching was almost entirely by repetitional didactic lectures There was no ward work In anatomy and practical medical chemistry there were laboratory exercises, none whatever in physiology, pharmacology or pathology I had never seen a case of labor, nor had I myself cut and stained a section for microscopic examination

However, change was imminent Thomas Huxley at the opening of Johns Hopkins University School of Medicine had glorified the application of the scientific method to the study and practice of medicine Young doctors were returning from Vienna and other European medical centers praising the refinements of clinical diagnosis with impartial postmortem check, speaking

Read before the Section on Pathology and Physiology at the Eighty-Sixth Annual Session of the American Medical Association Atlantic City N J June 12 1935

familiarly of bacteria as a cause of disease, showing enthusiasm over experiment and research. Then Abraham Flexner extolled German methods and advocated having as instructors in medicine those whose life work was teaching and investigation. The Council on Medical Education and Hospitals of the American Medical Association was formed, inferior colleges were weeded out, the standards of others were raised. Medical schools were united to universities. It was declared that a major function of the hospital was to further medical education, internships became obligatory. Richly endowed institutes were founded, entirely devoted to medical research.

Surely one of the significant changes of the last fifty years has been the improvement in medical schools and hospitals and the rise of productive research. The men who teach and those who practice are not necessarily of larger caliber than their forefathers, nor are all the methods in vogue today to be regarded as above criticism or beyond improvement. But, judged by ideals and by results, schools, hospitals and the practice of medicine are of distinctly higher grade.

BACTERIOLOGY

A second major change was the continuing development of the still youthful bacteriology, its application in practice and the outgrowth of such subjects as serology, immunology and allergy.

The germ theory of disease was somewhat slow in getting under way in this country. At the competitive examination for interns at the Cook County Hospital in 1888, William T. Belfield examined in pathology. He had just returned from Europe, perhaps a little puffed up by having been invited to give the Cartwright Lecture in Bacteriology at Yale and at having been asked by William H. Welch regarding some of the technic of staining the tubercle bacillus. I recall most vividly one scene of the examination. The twenty-two competitors, of whom I was one, suddenly stop their writing, gaze blankly and open mouthed as this question is written on the blackboard: "Describe the bacillus of cholera and tell how you would distinguish between it and the Finkler-Prior bacillus." Consternation is on every face. Not a man but knows his mark on that question will be zero. After the examination one candidate, a little bolder than the rest, ventured to protest at such a question on the ground that no college in Chicago, perhaps none in the country, was teaching this subject. Dr. Belfield sarcastically replied that he was well aware of the fact, but that the colleges should be teaching it, and for that reason he had asked the question.

Those who are younger cannot understand the thrill that came as in rapid succession there were announced as fresh discoveries many facts that today are accepted as proved beyond dispute—the germs of suppuration, the antitoxin of diphtheria, the Widal test for typhoid, the transmission of malaria by the mosquito. And the joy that came from identifying for oneself the tubercle bacillus, or from making lumbar puncture and demonstrating the intracellular diplococcus of Weichselbaum! The fun of watching the dance of the pigment granules in the plasmodium of malaria! The miracle unfolded before one's eyes as one injected the 10 cc. of Behring's 1,000 units of antitoxin and watched results! That one first case was proof positive. What about controls? There had been scores of controls in the cases formerly treated empirically with always the spreading membrane, always the fetor, the enlarged glands, the anemia,

the fever, the slow convalescence, often the paralysis, or the all too frequent death from exhaustion, laryngeal suffocation or sudden collapse.

One thrill I missed. One evening in 1905 I planned to attend a meeting of the Berlin Medical Society. A German fellow laboratory student advised against it. The program, he said, would be dull. The main paper would be just another unfounded claim of having discovered the cause of syphilis. By those who knew, the writer's contention was practically discredited in advance. I have always regretted that I took my German friend's advice. By so doing I missed hearing Schaudinn announce the discovery of the spirochete of syphilis.

It was not alone that we learned of the causative organisms of so many diseases, not alone that we were aided in diagnosis by identifying these organisms in smears from the throat or in other exudates or even in the blood, or that we were helped by specific blood tests, such as those for typhoid fever or syphilis. It meant much more, for there was unfolded a new conception of infectious disease. A Frenchman once, in writing of malignant endocarditis, said that the disease could be understood if one kept in mind what Virchow had taught concerning embolism and what Pasteur had taught concerning bacteria, and if one looked on the valvular lesion not alone as infectious but also as infecting. This, expressed with Gallic clarity, is what we began to understand—bacteremia with attending toxemia, the transport of germs to distant regions, thus explaining the formerly mysterious and accidental complications, primary and secondary foci of acute infection. And later the misused, much abused, yet fruitful conception of chronic focal infection.

With knowledge of the cause of infections, preventive and active treatment was put on a scientific basis with astonishing results. For years, every summer and autumn, typhoid patients were daily entrants into our wards. One in ten went to the morgue. Today the case in the ward or the morgue is excitedly utilized as a rare educational exhibit of a disease that has almost vanished. Malaria, diphtheria, tetanus, yellow fever, typhus, epidemic meningitis, scarlet fever, uncinariasis, certain types of pneumonia are in the category of diseases for which there is a reasonably reliable preventive or active treatment. "Rats, Lice and History" a generation ago would not, even with the facile pen of its gifted author, have been a title to conjure with. Today it is a best seller to physicians and laymen.

When the true definitive history of the world is written such events as these will bulk large—larger than the story of dynasties and wars. Perhaps they will lead to the use—the horrible use—of bacterial weapons that will prevent future war by revealing its unspeakable and unendurable realities.

INSTRUMENTS OF PRECISION

A third notable change was the invention of many instruments useful in diagnosis and treatment, often spoken of as instruments of precision.

About 1898, at a crowded meeting of the Chicago Medical Society, there were shown for the first time in that city prints made from X-ray plates—the bones of the hand, a few coins and keys in a pocketbook. So crude were these prints that many hearers were skeptical as to the importance to medicine of the discovery of the Würzburg physicist three years before. Two speakers, however, predicted great things, one reminding the audience that modern photography started from

small beginnings by Daguerre, the other stating his belief that some day even stones in the kidney or gall-bladder might be shown. How the x-rays have advanced beyond the wildest dreams of those days is familiar to all. Yet it is not always realized how far reaching has been their influence on medicine. They have revolutionized diagnosis and opened up a new type of treatment. Many diseases are incompletely studied if they are not investigated by the x-rays, which often show with marvelous detail pathologic changes otherwise overlooked. Treatment by x-rays as well as by ultraviolet rays and radium is rapidly being established on a scientific basis and gives rich promise for the future.

Numerous other inventions have made some physicians fearful lest the detection of disease would become, in a literal sense, a mechanical process with no place for history, physical diagnosis or logical reasoning, just a robot performance. Not only has the electrocardiograph cleared up many problems as to the heart's normal and abnormal processes, it has become an instrument of practical clinical value. The cavities of the body are illuminated by electric light—by the cystoscope, bronchoscope and other instruments. Blood pressure and basal metabolic rates are determined instrumentally with reasonable accuracy. Local anesthesia makes biopsy or exploratory operation a comparatively simple procedure. One may even class the rubber glove as a device of precision as it encourages digital examinations that formerly were often omitted because repellent alike to physician and patient. And it is no exaggeration to place among helpful instruments the humble needle and syringe. Exploratory aspiration to determine the presence or nature of fluid accumulations and lumbar puncture for diagnosis or treatment are everyday occurrences. And what a change has been wrought in laboratory and bedside work by the simple withdrawal of blood from the vein, an operation generally delegated to the intern or a technician. The blood is studied for bacteria, for its chemical content, for its physical properties, for its suitability for transfusions, or remedial agents are injected directly into the blood stream.

CHEMISTRY

Applied chemistry is today indispensable in diagnosis. The order to the intern to "do a blood chemistry" may not be grammatical but it means that the next morning the attending physician knows the amount of blood sugar or of creatinine, calcium or phosphorus. And this order is issued not merely to satisfy an academic curiosity, it is realized that it may disclose diabetes, uremia or hyperparathyroidism.

DEFICIENCY DISEASES

In the nineties we knew of myxedema. I recall the glow of pleasure with which I recognized my first case of cretinism and saw the response to treatment. How keyed up I was when, showing the patient, I devoted an alumni clinic to the topic of the thyroid gland, contrasting myxedema and exophthalmic goiter! Today deficiency diseases are commonplaces. There has arisen the specialty of endocrinology. Closely related and overlapping in borderland territory are certain nutritional and dietary subjects. There is an abundant literature revealing the interest in, and investigation of, such subjects as the underactivity, overactivity or perverted activity of such glands as the thyroid, the adrenal, the parathyroid, the gonads, the pituitary, the pancreas. Pellagra, rickets, beriberi, anemia, diabetes,

obesity are understood and treated as never before. Even the laity talks calories, vitamins, hormones, insulin, liver therapy.

OTHER DISEASES

One might go on and cite later knowledge concerning other infections—undulant fever, tularemia, amebiasis, psittacosis. One might refer to the new conception of renal disease, the better understanding of cardiac arrhythmias, the various types of endocarditis, disorders of the coronary arteries, neurocirculatory asthenia, ulcer of the duodenum, diverticulitis—partly revealed by the surgeons, tumors of the lung and bronchi, the more accurate diagnosis and more effective treatment of tuberculosis and of syphilis, new phases of nervous diseases, encephalitis, the stress on psychiatry, the astonishing saving of infant life by the pediatricians, physical therapy, the more intelligent use of tested drugs, e. g., digitalis, arsphenamine, salyrgan, and the lessened use of exploited "patent" remedies. The story of diabetes might be rehearsed with the shifts in treatment through starvation and calculated diets up to insulin, with resulting prolongation of life, or one might tell of the toxic thyroid gland with the brilliant triumph of partial thyroidectomy, the material help from iodine. Those of us who in the earlier days after laboriously translating Ehrlich were fascinated by morphologic studies of the blood, who have seen chlorosis disappear and leukocytosis regarded as a valuable symptom, again have the pulse quicken as we see the results of liver therapy, still eagerly await revelations as to the true nature and the rational treatment of agranulocytosis.

PUBLIC HEALTH

The present generation has seen increased interest in public health. There is a more intelligent attitude toward checking the development and spread of contagious diseases by inspection of schools for such diseases as incipient diphtheria, scarlet fever, the common cold or sore throat. Supplies of water, milk and other foods are more carefully watched. Industrial hazards are diminished by law. Sanitation has become a department of medicine as well as of engineering.

RELATION OF MEDICINE TO OTHER SCIENCES

Another tendency is evident. As no man liveth to himself alone, so no science lives isolated and apart. Medicine, largely through her closeness to other departments of the university, has more intimate contacts with other sciences—physics, chemistry, biology. The results have been mutually beneficial. Physiologists cooperate with chemists, pharmacologists ask help of physicists and botanists, anatomists consort with zoologists and veterinarians, and clinical medicine is the gainer. Furthermore, medicine shows more concern than formerly to regard the patient as a human being, medicine is rubbing elbows with sociology. Perhaps some will say this is not an advance, it is a throwback to the practice of the old time family doctor. At any rate, physicians and the public are considering, more seriously than ever, questions as to the social and economic relations of the doctor, the patient and the state. Health and old age insurance, group practice, qualifications for specialists, rights of physicians as individuals are topics very much alive today.

THE FUTURE

In reading medical history, every once in a while one comes across statements made by men of prominence that little more could be added to the sum of

medical knowledge as it existed at the periods in which these men were living. Only recently I saw practically the same sentiment expressed regarding the present. But I must enter an objection. *Laudatores temporis acti?* Indeed, yes. But not to the disparagement of the present or of the future.

In 1902 at a meeting of the Section on Medicine of the American Medical Association—there were less than 100 in the room—I happened to sit next to Dr Osler. The new side-chain theory of Ehrlich was being discussed. It seemed to be epochal, it was evidently obscure to Dr Osler, as it certainly was to me. Seriously, wistfully, Dr Osler whispered to me, "I wish I were 19 and had it all to do over again." Some of us of the passing generation may wish that we were young so that we might take part in the advances of the future, the solving of the riddles of cancer, endocrines, infections yet untamed or even unnamed, degenerative vascular disease. But with an *ave et vale* we may retire content, assured that internal medicine of the future in its research, as in its practice, will be in safe hands, knowing that when another generation has passed and there is held the seventieth anniversary of the Section on Pathology and Physiology, glorious achievements of the preceding generation will be recounted and that then, as now, a glorious future will be predicted.

242 East Walton Place

THE DEVELOPMENT OF PATHOLOGY SINCE 1900

WITH SPECIAL REFERENCE TO NEOPLASTIC
DISEASES

WALTER L. BIERRING, M.D.
DES MOINES, IOWA

Since the beginning of this century the advances in special fields of study have been more marked than in general pathology. Notable among these has been the developing knowledge regarding tumor growth and neoplastic diseases, and it is to that phase of pathology that this presentation will confine itself.

At the close of the last century pathologists were largely engaged with the detailed study of the morphology of tumors, their histogenesis and their separation into different varieties as well as the collation of such facts as pertained to the natural history of malignant disease.

The twentieth century opened with an experimental era of investigation and systematic study of tumors throughout the entire animal kingdom that has brought forth a new conception of various neoplastic diseases and promises to have a profound influence on prognosis and a more successful prevention and therapeutic control.

An epoch making demonstration at the beginning of the century by Jensen¹ in Copenhagen and Leo Loeb² in Chicago was that carcinoma and sarcoma could be transplanted and retransplanted in mice and rats for an apparently unlimited time. After more than thirty-four years the Jensen mouse cancer is still being transplanted, and the cells now growing in laboratory mice are descendants of the original Jensen cancer mouse.

This suggests that cancer cells are immortal, as are all cells if they can be freed from the limitations of life of the organism as a whole.

These contributions demonstrate an analogy between spontaneous cancer and carcinoma as it occurs in man in two directions that cancer may arise (1) as the result of chronic irritation of tissues and (2) because of inherited characteristics.

HEREDITY

A number of the early observers, as Leo Loeb,³ Tysser⁴ and Murray,⁵ suggested that heredity might play a role in the occurrence of spontaneous tumors in animals. It was Maud Slye who first showed on a large scale with mice of known ancestry how important a part heredity plays in producing tumors. This work of Miss Slye has established the fact that, by proper breeding, strains of mice and rats may be obtained with a high incidence of tumors, even independent of the application of any unusual stimulus or other factor to cause tumors to appear. Likewise, the intensive study given to these growths in mice has evidently removed all doubts that they represent fundamentally the same disease of cancer in animals as in man.

The cells of malignant animal tumors resemble fundamentally those of human cancers in that they are embryonal in character, showing mitoses of cells and atypical arrangement, with the tendency to infiltrate adjacent tissues and to invade the blood and lymph vessels, producing tumor emboli and metastases in remote organs.

Wells,⁶ who was associated with Maud Slye in a number of her investigations, records having observed in Miss Slye's mice most of the forms of tumors seen in man, even such rare tumors as papilloma arising from the ependyma of the lateral ventricle, malignant adenomatous growth of the anterior lobe of the hypophysis, and primary liver cell carcinoma.

Benign tumors have the same histologic characters and behave as such. Uterine fibroids, teratoma of the ovary, hypernephroma of the kidney and thyroid tumors are alike in mice, dogs and man.

The striking fact has been noted that gliomas of the brain, so common in man, are quite unknown in other species.

These studies in comparative pathology support the view that the inherited constitutional make up of species is an important factor in determining what sort of tumor will occur in that species. A human analogy is furnished by the markedly greater tendency of Negroes to develop fibroid tumors of the uterus and keloid growths than white persons.

The further studies of Maud Slye⁷ in comparative pathology promise to throw light also on leukemia, pseudoleukemia and related conditions, which are widely distributed throughout the animal kingdom and seem to correspond closely to similar diseases in man.

In Miss Slye's experience, chronic leukemia and true pseudoleukemia behave like malignant neoplasms, shading off into local lymphosarcoma with metastases. This is in agreement with pathologists who regard these conditions in man as true neoplastic processes.

Whether or not Miss Slye has completely established the heredity mechanism of cancer as a simple mendelian inheritance, as her observations indicate, she has

Read before the Section on Pathology and Physiology at the Eighty-Sixth Annual Session of the American Medical Association Atlantic City, N. J., June 12, 1935.

¹ Jensen, C. B. *Centralbl. f. Bakt.* 34: 28, 1902.

² Loeb, Leo. *Centralbl. f. Bakt.* 37: 235, 1904.

³ Loeb, Leo. *J. Cancer Research* 6: 197 (July) 1921.

⁴ Tysser, C. C. *J. M. Research* 12: 199, 1907.

⁵ Murray, J. A. Report of the Imperial Cancer Research Fund, 1911, p. 114.

⁶ Wells, H. G. *J. M. Research* 33: 171, 1915.

⁷ Slye, Maud. *Am. J. Cancer* 15: 3 (July) 1931.

unquestionably shown more conclusively than was previously done "that heredity is an essentially important factor in determining whether cancer will or will not appear under ordinary conditions of life"

Although the exact mechanism of hereditary influence has yet to be determined, it is safe to maintain the existence of a hereditary influence as to susceptibility and resistance to cancer established both for man and for animals

There is at present no similar human material to compare with that of Miss Slye in which the complete ancestry for many generations is known. The evidence collected from human material is rather conflicting, being also inadequate as to amount and character

Wells⁸ considers it reasonable to look forward to finding eventually a definite explanation of the genetic mechanism determining susceptibility and resistance to human cancer

TERMINOLOGY

According to Ewing,⁹ the terminology of tumors should designate their etiology, regional location or histologic structure, and of these the histogenesis is the preferable since it suggests the type of cell or cells of a growth and probably serves best by indicating the chief characteristics of its component elements. The histogenic method of classification has specially influenced a newer conception of the tumors of the central nervous and reticulo-endothelial systems

CENTRAL NERVOUS SYSTEM

A completely new nomenclature has been developed in connection with tumors of the central nervous system. This is based entirely on histogenesis, and the advance of knowledge in this direction is due largely to the fundamental histologic technique developed by Cajal,¹⁰ and Hortego¹¹ of the Spanish group, and adopted by Bailey,¹² Cushing,¹³ Penfield¹⁴ and other investigators in this country

Two general classes of benign tumors are recognized: meningeal and perineural fibroblastomas. They arise not from within the nervous system itself but from the specialized coverings that separate and insulate the nervous tissue from the rest of the body. The meningeal fibroblastic tumors have their point of attachment from the dura mater and do not invade the brain or spinal cord. In this group are now included psammoma, dural sarcoma, meningioma, endothelioma and arachnoid fibroblastoma

Under perineural fibroblastomas are grouped neurofibroma, neurinoma, gliofibrosarcoma and cerebellopontine angle tumors. The multiple neuromas constituting von Recklinghausen's disease are also included

The newer classification of the gliomas, which form from 40 to 50 per cent of all brain tumors, presents a bewildering variety of terms used in their differentiation. To those who are not constantly working with these tissues it may be somewhat difficult to understand clearly all their phases

Mallory¹⁵ in 1905 showed that a separation of gliomas from other tumors could be made on the basis

of cell differentiation and pointed out the distinguishing features of neuroglia fibers

Bailey and Cushing¹⁶ in 1926, after studying the unrivaled pathologic collection of Cushing's clinic, subdivided 254 verified gliomas on a developmental and structural basis into fifteen classes

The following year Bailey¹⁷ published a histologic atlas illustrating the different types of gliomas made from preparations stained with the ordinary methods used in pathologic laboratories. The significant statement is made that no two gliomas look just alike, because the gliomas do not fall into distinct groups in which all the members look alike but consist of variant individuals with family resemblances. "It would appear that to find a typical member of each family with which the others may be recognized on comparison is about as difficult as to find a typical member of the Alpine or Dinaric race

Penfield¹⁸ in 1928 proposed a differentiation into eight classes, adding the statement that groups of tumors such as gliomas may be recognized as histologic entities and their biologic behavior predicted with a considerable degree of certainty

Roussy and Oberling¹⁹ in 1931, speaking to some extent for the French school, published a classification with an atlas which is very similar to the one outlined by Penfield, except that the term neurospongionoma is substituted for medulloblastoma. Bailey in a later publication, 1932, dropped out certain subdivisions proposed in the original classification, so that the nomenclature is becoming somewhat more simplified

A knowledge of the histogenesis of the central nervous system is essential for a clear understanding of the tumors of the brain substance known as gliomas. Fundamental is the medullary epithelium with its derivatives on the one hand of spongioblasts, bipolar and unipolar, which grow gradually into astroblasts and astrocytes, and in another direction into ependymal cells, and again to medulloblasts with the derivatives of oligodendroglia and various polar neuroblasts to the final neuron formation

Further derivatives are the pineal parenchyma and choroidal epithelium. The gliomas are divided generally according to the nature of cells that predominate, comprising three main varieties, as astrocytomas, which are formed essentially by astrocyte elements, the oligodendrocytomas, formed by a profuse multiplication of the oligodendroglia elements, and the glioblastomas, which are formed by young cells of indifferent character resembling more or less the glioblasts of the embryonic nervous system (Roussy)

The classification of Penfield, with the Bailey and Penfield modification, seems to be generally acceptable and includes the main varieties—glioblastoma multiforme, medulloblastoma, astrocytoma, ependymoma, astroblastoma, spongioblastoma, oligodendroblastoma and neuro-epithelioma

According to Penfield there are three important groups which together compose three fourths of all these tumors: astrocytoma, glioblastoma multiforme and medulloblastoma. The latter is chiefly a tumor of the cerebellum of infants and young children. Glioblastoma multiforme is a tumor of middle life, its site

8 Wells H. G. *Cancer Statistics as They Appear to a Pathologist* J. A. M. A. 88:399 (Feb. 5) 1927

9 Ewing James. *Neoplastic Diseases* ed. 1 Philadelphia W. B. Saunders Company 1915

10 Cajal S. R. *Paris A. Maloine et fils* 1909 1911

11 Hortego Pio del Rio. *Arch. d. cardiol. y hemat.* 2:161, 1921

12 Bailey, Percival. *A Study of Tumors Arising from Ependymal Cells* Arch. Neurol. & Psychiat. 11:1 (Jan.) 1924

13 Cushing Harvey. *Cameron Lecture* New York Oxford University Press 1925

14 Penfield Wilder. *The Classifications of Gliomas and Neuroglia Cell Types* Arch. Neurol. & Psychiat. 26:745 (Oct.) 1931

15 Mallory F. B. J. M. Research 13:113 1904 1905

16 Bailey Percival and Cushing Harvey. *A Classification of the Tumors of the Gloma Group* Philadelphia, J. B. Lippincott Company 1926

17 Bailey Percival. *Histologic Atlas of Gliomas* Arch. Path. & Lab. Med. 4 871 (Dec.) 1927

18 Penfield Wilder. *Principles and Pathology of Neuro-Surgery* report 15 McGill University 1932

19 Roussy G. and Oberling C. *Tumors of the Central Nervous System* Arch. Neurol. & Psychiat. 27 1281 (June) 1932

of election being deep in the cerebral hemisphere. The astrocytomas appear in the hemispheres of the cerebrum and in the cerebellum, cerebellar astrocytomas being rarely seen in adults.

The rarer forms of glioma are the remaining more or less clearly defined tumors, as the spongioblastoma, astroblastoma, oligodendroblastoma, ependymoma, neuro epithelioma and pinealoma. Of these the neuro-epitheliomas are the rarest, the most malignant and the least differentiated.

The astroblastomas and oligodendroblastomas are formed chiefly in the cerebral hemispheres. Ependymomas appear near the ventricular walls and the central canal of the spinal cord or filum terminale, while the polar spongioblastomas like the astrocytomas may be encountered anywhere in the cerebrospinal system.

The metastasis of gliomas through the blood stream is almost unknown, according to Davis.²⁰

Other types of tumors of the nervous system have been occasionally noted, as ganglioneuromas, gangliomas, papilloma of the choroid plexus, hemangioma, cholesteatoma and chordoma.

The triumphs of neurosurgery are intimately linked with the constantly developing knowledge of the neoplasms involving the central nervous structures.

RETICULO-ENDOTHELIAL SYSTEM

It has been twenty years since the first publications of Aschoff and Landau²¹ and of Kiyon²² proposing "to group together a special type of cells of wide distribution in the mammalian organism as a system of reticulo-endothelial cells" and now generally referred to as the reticulo-endothelial system.

Since then many articles have appeared particularly as to its role in pathologic conditions. In American literature Jaffe,²³ Rinehart,²⁴ Ewing,²⁵ Krumbhaar,²⁶ Goldzieher and Hirschhorn,²⁷ Caldwell²⁸ and Giffin²⁹ have contributed to our knowledge of this phase of pathology.

The reticulo-endothelium has been related to blood formation, particularly the lymphocytes and monocytes, and a third type of leukemia known as monocytic leukemia has been accepted.

Hodgkin's disease is also regarded as belonging to the reticulo-endothelioses.

Ewing³⁰ states that in the origin of lymphosarcoma two specific cells participate, giving rise to two specific forms of tumor. These cells are (1) the reticulum cell of the germinal centers of the follicles and pulp cords and (2) the lymphocyte. Thus arise two types of lymphosarcoma, which may be designated as (1) reticulum cell sarcoma, or round cell sarcoma, and (2) malignant lymphocytoma.

When the relationship of the reticulum cells of the mature lymphocytes has been definitely established, it may then be apparent that the reticulo-endothelial system is thus indirectly the source of the malignant lymphocytomas. In that case, lymphatic leukemia and the lymphoid type of aleukemic leukemia may like-

wise hold a relationship to the tumor-like growths of reticulum cells.

Endotheliomas of the reticulo-endothelial system or reticulo-endotheliomas offer further diagnostic difficulties to the pathologist. More than twenty years ago Ewing emphasized the difficulty of differentiating these endotheliomas of lymph nodes from metastatic carcinoma, especially when the cervical lymph nodes were involved. In more recent years Ewing³¹ and Cutler³² have published rather pessimistic reports concerning the recognition of endotheliomas of cervical lymph nodes because of their close similarity with metastases of transitional cell carcinomas.

Giffin and Watkins³³ have made a distinction between splenic anemia and subleukemia or splenic reticulo-endotheliosis, reporting several cases as leukemic reticulo-endotheliosis.

Rous sarcoma of the chicken is composed of monocytes but definite tumor formations consisting of monocytes have so far not been reported in man. Tumors originating from the fixed reticulo-endothelial cells are represented by the hemangio-endotheliomas of the liver described by Fischer,³⁴ Kahle,³⁵ Goedel³⁶ and others.

The extent and importance of the reticulo-endothelial system is not generally appreciated, because its physiology and pathology are still rather confusing. It is probable, however, that the studies of hematologists and tissue morphologists will lead the way to a clearer conception of clinical manifestations and their relation to pathologic changes.

HORMONIC ACTION OF NEOPLASMS

The newer revelations regarding the physiologic significance of tumors have tended to modify the pathologic point of view of tumors, particularly of the endocrine organs, and to disprove the older concepts that tumor cells are purely parasitic and nonfunctional.

These observations present a new phase of endocrinology and deal with the possible hormone effects of certain gonadal tumors, more particularly of the ovary and also of the pituitary, parathyroid and adrenal cortex.

Novak and Long³⁷ presented an interesting discussion before this section two years ago on ovarian tumors associated with secondary sex changes. These neoplasms were of two classes, (a) granulosa cell tumors and (b) arrhenoblastomas. The former arise from the early oophorogenic structures in the sex gland area, and the histogenesis of the latter, according to Meyer,³⁸ was to be sought in certain undifferentiated cells persisting in the rete and capable of later function along either male or female lines.

The granulosa cell is a typically feminine cell, producing the ovarian follicular hormone. The hormone effects produced by tumors of this variety are along the line of feminization, with overaccentuation of certain female sex characters and functions.

The arrhenoblastomas, or second group of tumors under consideration, produce effects on the sex characters along quite opposite lines, in that they tend toward a defeminization and masculinization of the individual. Pathologically these tumors are classed as testicular adenomas.

- 20 Davis Loyal. *Ann Surg* 87: 8 (Jan.) 1928.
21 Aschoff and Landau. *Med Klin* 11: 29 1915.
22 Kiyon K. *Jena. Gustav Fischer* 1914.
23 Jaffe, R. H. *Arch. Path. & Lab. Med.* 4: 45 (July) 1927.
24 Rinehart, J. F. *Am J Path* 3: 525 (Sept.) 1930.
25 Ewing James. *Neoplastic Diseases* ed 2 Philadelphia W B Saunders Company, 1922.
26 Krumbhaar E. B. *Internat. Clinics* 2: 280 (June) 1925.
27 Goldzieher M. A. and Hirschhorn L. *Arch Path & Lab Med* 4: 958 (Dec.) 1927.
28 Caldwell G. T. *South M J* 27: 205 (March) 1934.
29 Giffin H. Z. and Holloway J. K. *Am J M Sc* 170: 186 (Aug) 1925.
30 Ewing James. *Surg Gynec & Obst* 22: 461 1916.

- 31 Ewing James. *Am J Path* 5: 99 (March) 1929.
32 Cutler, Max. *Radiosensitive Intra Oral Tumors* *Arch Surg* 18: 2303 (April pt 2) 1929.
33 Giffin H. Z. and Watkins C. H. *Tr. A. Am Physicians* 1934.
34 Fischer B. *Ztschr f Path.* 12: 399 1913.
35 Kahle, H. *Virchows Arch f path Anat* 226: 44 1919.
36 Goedel A. *Ztschr f Path* 29: 375 1923.
37 Novak Emil and Long J. H. *Ovarian Tumors Associated with Secondary Sex Changes* J. A. M. A. 101: 1057 (Sept 30) 1933.
38 Meyer Robert. *Am J Obst & Gynec.* 22: 697 (Nov) 1931.

According to Fischel,³⁹ the close contiguity of the adrenal anlage with that of the gonad, and the fact that both are derived, according to the new view, from the wolffian mesenchyma, make it easy to understand why cortical tumors of the adrenal may give rise to a syndrome very similar to that produced by the tumors originating from the rete region of the ovary. Removal of these tumors has usually brought about a regression of the clinical symptoms.

Reference should be made to the obvious functional role of the cells of the acidophilic pituitary adenomas in the production of acromegaly or gigantism and particularly the interesting syndrome reported by Cushing⁴⁰ associated with basophil adenomas of the pituitary body.

Pituitary adenomas, according to Cushing, are of three principal varieties, neutrophil, acidophil and basophil, but no constitutional disorder has been definitely ascribed to the basophil variety.

The polyglandular syndrome, formerly supposed to be of cortico-adrenal origin, is characterized in its full-blown state by acute plethoric adiposity, by genital dystrophy, by osteoporosis and by vascular hypertension. At autopsy in six out of the eight instances observed by Cushing it was associated with a pituitary adenoma and in three of the most carefully studied cases it was definitely shown to be composed of basophil elements, the lesion in one instance having been clinically predicted before its postmortem verification.

A further evidence that tumors may possess function is furnished by the studies in recent years of Ballin,⁴¹ Barr, Bulger and Dixon,⁴² Jaffe⁴³ and Wilder⁴⁴ or by parathyroidism, in which adenomas of the parathyroid are definitely related to multiple cystic and giant cell tumors of the bone, this evidently being one of the expressions of exaggerated parathyroid activity. When the parathyroid adenomas are removed, a regression takes place in the bone tumors.

Paik⁴⁵ has also reported some experiments that show a close relationship between the growth of rat carcinoma and the internal secretion of the parathyroid, the secretion stimulating the development of rat carcinoma, but a decrease of the internal secretion interfering with its development.

GRADING OF MALIGNANCY

Pathologists for some time have considered the possibility of detecting a clinical malignant growth by microscopic examination. In recent years careful studies of carcinoma cells have developed a more concrete knowledge.

About ten years ago Broders⁴⁶ proposed a method of grading the malignancy of carcinoma, which has been extensively adopted. It is based on the original studies of Hansmann⁴⁷ on the cytogenesis of carcinoma cells and pertains to a dedifferentiation of the cells, a so-called anaplasia or backward formation of epithelial cells undergoing malignant transformation. The grading method of Broders is made on a basis of one to four degrees of malignancy independent of the clinical history. The mitotic figures and one-eyed cells are undifferentiated cells, and in the proportion that the

undifferentiated cells appear in the microscopic section as compared to the differentiated cells 25, 50, 75 or 100 per cent the grades of malignancy are stated as 1, 2, 3 and 4.

The confirmation of this method by clinical experience has justified the conclusions on which it is based, and the extensive study of the cellular and histologic structure of carcinoma has added to our knowledge of these neoplastic diseases.

RADIOSENSITIVENESS OF TUMOR CELLS

Within the past twenty-five or thirty years numerous and extensive experiments on animals and abundant clinical evidence have established the fact that every variety of cell in the body, as well as every organ or structure composed largely of one variety of cell, has a specific sensitiveness to roentgen and radium rays.

Earlier investigators—Heineke,⁴⁸ Warthin,⁴⁹ Krause and Ziegler,⁵⁰ Regaud and Cremieu,⁵¹ Aubertin and Bordet⁵² and others—demonstrated conclusively that the lymphocytes in the spleen, lymph nodes, intestinal lymph follicles, bone marrow, circulating blood and thymus gland were the most sensitive in the body, the organs next to the lymphoid tissues in sensitiveness to radiation being the testes and ovary. The sensitiveness of the genital glands applies particularly to the basal epithelium of the seminal tubules and the ovarian follicles.

According to Desjardins,⁵³ the factors responsible for such specificity are not yet determined, but the sensitiveness peculiar to each kind of cell appears to be related chiefly to the natural life cycle. Thus the lymphocytes, the metabolic cycle of which among human cells is the shortest, are also the most radio sensitive, and the nerve cells, the life cycle of which is the longest, are also the most resistant to irradiation.

The susceptibility of normal and pathologic cells of the same kind has been shown to be essentially the same.

More recently Desjardins⁵⁴ has proposed irradiation as a means of differentiating certain varieties of tumor and made many other interesting contributions to the subject. His diagnostic classification recognizes three groups as radiosensitive, moderately radiosensitive and radioresistant tumors. In the first group are included lymphosarcoma, Hodgkin's disease, lympho-epithelioma, embryonal carcinoma of the testis and ovary, giant cell tumor and multiple myeloma of bone, basal epithelioma and hemangioma, the moderately radiosensitive growths being carcinoma of the uterine cervix, thyroid, breast and rectum, epitheliomas of tonsils, bronchus, lip, eyelids, mouth, tongue and skin, and chondrosarcoma of bone, while the radioresistant tumors are fibromyoma of the uterus, carcinoma of the esophagus and stomach, mixed tumor of the parotid, hypernephroma, osteogenic sarcoma of bone, melano-epithelioma, teratoma, neuro fibroma, lipoma and myoma.

This indicates a comparatively wide variation in radiosensitiveness between tumors which on strictly pathologic grounds have heretofore been regarded as more closely related than they are likely to be in the future.

39 Fischel A. *Ztschr f Anat. u. Entwicklungsgesch.* 92:34 (1930)
40 Cushing Harvey. *Bull. Johns Hopkins Hosp.* 50:137 (March) 1932
41 Ballin, Max and Morse B. F. *Am J Surg.* 12:403 (June) 1931
42 Barr D. P., Bulger H. A., and Dixon H. H. *Hyperparathyroidism*, J. A. M. A. 92:951 (March 23) 1929
43 Jaffe H. L. *Bull. New York Acad. Med.* 10:539 (Sept.) 1934
44 Wilder R. M. *Endocrinology* 13:231 (May/June) 1929
45 Paik T. S. *Am J Cancer* 15:2756 (Oct.) 1931
46 Broders A. C. *Arch. Path. & Lab. Med.* 2:376 (Sept.) 1926
47 Hansmann D. *Virchows Arch f. path. Anat.*

48 Heineke H. *München med. Wehnschr.* 1:2090 (Dec.) 1903
49 Warthin A. S. *Internat. Clinics* 15:243 (March) 1906
50 Krause, Paul and Ziegler Kurt. *Fortschr. a. d. Geb. d. Roentgenstrahlen* 10:126 (1906/1907)
51 Regaud, Claude and Cremieu, R. *Compt. rend. Soc. de biol.* 71:325 (Oct.) 1911
52 Aubertin C. and Bordet E. *Arch. d. mal. du cœur* 2:321 (1909)
53 Desjardins, A. U. *Am. J. Roentgenol.* 32:493 (Oct.) 1934
54 Desjardins A. U. *Radiotherapy as a Method of Identifying Certain Varieties of Tumor* J. A. M. A. 101:1705 (Nov. 25) 1933

The occurrence of malignancy in radioactive persons has been reported by Martland,⁵⁵ based on a rather large experience in such cases. Further important papers by Hoffman,⁵⁶ Castle and Drinker,⁵⁷ Flinn,⁵⁸ St George, Gettler and Muller⁵⁹ and Barker and Schlundt⁶⁰ covering the nature of the exposure, factory inspections and methods of detection of radioactivity during life with a description of treatment, have added valuable information regarding this new industrial hazard.

Martland's observations were connected with the occurrence of this occupational disease in an accumulative total of about 800 girls employed in a factory in New Jersey, painting the dials of watches and clocks with luminous paint.

The mode of poisoning was by ingestion, arising from a general habit among the workers of pointing their brushes in their mouths while painting the dials, thus swallowing small amounts of radioactive paint day after day.

The following lesions from this mode of poisoning were encountered: irritative hyperplasia of the bone marrow, leukopenias, fatal anemias of the megaloblastic type with leukopenias approaching agranulocytosis, radiation osteitis, necrosis of the jaw, deformities of the spine, spontaneous fractures, multiple myelomas, and osteogenic sarcomas.

Five deaths occurred from osteogenic sarcoma in a total of eighteen cases. The sarcomas evidently developed in areas that had previously been the seat of a radiation osteitis.

It is suggested that radioactivity in the human body can play an important part in the production of other forms of malignancy, as indicated by the high incidence of primary carcinoma of the lungs in the cobalt miners of Schneeberg and in the pitchblende mines of Joachimsthal.

The multiplicity of lesions and diseases produced by irradiation from external exposure to radium and x-rays has been noted by a number of observers.

These observations may have an important bearing on future research on the etiology of cancer and certain obscure blood diseases.

This cursory review of the developments in pathology in thirty-five years might properly be enlarged on in many directions, but the studies recorded in tumor pathology reflect the varied avenues into which pathological investigations have been extended.

It is significant that pathology has been accorded its proper place among the biologic sciences and withal has maintained its ancillary relation to every other branch of medical progress.

406 Sixth Avenue.

- 55 Martland H S. *Am J Cancer* 15:2435 (Oct.) 1931.
56 Hoffman, F L. Radium (Mesothorium) Necrosis. *J A M A* 86:961 (Sept. 26) 1925.
57 Castle, W B. Drinker K R and Drinker C K. *J Indust Hyg* 7:371 (Aug.) 1925.
58 Flinn, F B. Elimination of Radium Salts from the Human Body. *J A M A* 98:1763 (May 23) 1931.
59 St George A V. Gettler A O and Muller R H. Radioactive Substances in a Body Five Years After Death. *Arch Path* 7:397 (March) 1929.
60 Barker H H and Schlundt Herman. *Am J Roentgenol* 24:418 (Oct.) 1930.

High Arterial Tension—There are cases of high arterial tension which are best left untreated. This statement is contrary to much of the generally accepted teaching of the day but it has been brought home to me forcibly and not infrequently—Dr Samuel West, quoted by Fisher. *Alexander Aphorisms in Clinical Medicine Canad J Med & Surg* 77:166 (June) 1933.

RESULTS AND DANGERS IN THE TREATMENT OF AMEBIASIS

A SUMMARY OF FIFTEEN YEARS' CLINICAL EXPERIENCE AT THE MAYO CLINIC

PHILIP W BROWN, MD
ROCHESTER, MINN

An excellent symposium on amebiasis, which gives a summary of the present knowledge of the disease, was presented at the 1934 session of the American Medical Association.¹ This symposium, together with two earlier clinical reports on the results of treatment (Knowles and his associates² in India, and Willner³ in China), suggested reviewing experience at the clinic in the past fifteen years with the type of amebiasis that is encountered chiefly among patients from the north temperate zone.

There have been numerous reports praising or condemning various drugs, pessimistic and optimistic reports on the possibilities of curing the disease, presentations of results of administering drugs based on insufficient experimental or clinical data, and warnings, possibly unduly fearful, of the danger of using different drugs. An outstanding contribution to the chemotherapy of amebiasis has come from the group headed by Leake, Reed and Anderson. It is from such critical studies that not only facts in regard to present drugs but also possibilities of developing new and better ones are obtained. Most workers in this field have long since agreed that emetine in safe amounts fails to cure more than half the cases of amebiasis, and that even doses to the point of toxicity often fail. The organic arsenicals seem definitely established as more effective amebicides, although since arsenic is a well known poison there has been the search to obtain an effective but safe preparation. At present it would seem that there will always be some risk in the use of any effective arsenical because of occasional individual sensitivity. The dose may be safe in most cases, and experiments on animals indicate a wide margin of safety, but it must be remembered that arsenic or any other active drug is a potential poison. One should therefore always have respect for such preparations and use them cautiously.

The oxygenated quinolines have been the third chief type of drugs used in the treatment of amebiasis. Some early reports on chiniofon, introduced as yatren, were most enthusiastic, and in the twelve years in which it has been used its worth has been established. More recently, the administration of vioform has been suggested, as experimentally it was found to be very effective. Too short a time has elapsed, however, to establish its final rating. An even more recent drug for the treatment of amebiasis is diiodohydroxyquinoline, regarding which only a few scattered but encouraging reports are available.

For this period of fifteen years, data on the treatment of amebiasis in 834 cases are obtainable. In 523 of these cases, information as to results of treatment was

From the Division of Medicine, the Mayo Clinic.
Read before the Section on Gastro-Enterology and Proctology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.
1 Craig C F. The Epidemiology of Amebiasis. *J A M A* 103:1061 (Oct. 6) 1934. McCoy G W and Chesley A J. Control of Amebic Dysentery. *ibid* 103:1145 (Oct. 13) 1934. Meleney H E. The Pathology of Amebiasis. *ibid* 103:1213 (Oct. 20) 1934.
2 Knowles R, Ajit L D G, and Gupta Umapati. The Treatment of Intestinal Amebiasis. (An Analysis of Results and a Review of the Literature). *Indian M Gaz* 63:455-482 (Aug.) 1928.
3 Willner Otto. Remedies Recently Introduced in Therapy of Amebiasis. *Medicine* 6:341-374 (Sept.) 1927.

secured later. This group of 834 cases comprises a large part of the cases in which a diagnosis of amebiasis has been made in this period. To facilitate analysis of so large a group, the first section of this paper will deal with some of the more commonly used drugs in this fifteen year period, with particular emphasis on reactions, the second section will relate results of treatment.

SECTION I COMMONLY USED DRUGS AND THEIR REACTIONS

Since ipecac, with its later derivatives emetine hydrochloride, bismuth emetine iodide, auremetine and the short-lived preparations alcrestal adsorbed emetine and propylcephaline is the oldest specific drug used in treating amebiasis it is naturally the one about which much has been written. Ipecac has dropped out of the armamentarium largely because of the great difficulties encountered in maintaining adequate dosage. Of thirty-six patients at the clinic who received ipecac 50 per cent suffered severe nausea and vomiting so that hospitalization always was necessary (table 1). Even as late as 1927 and 1928 two patients who were resistant to other forms of treatment received ipecac. It seems

TABLE 1—Reactions to Drugs

| | Number Treated | Nausea and Vomiting | Neuritis or palsy | Toxic erythema | Diarrhea | Urticaria | Severe Local Reaction | Theoretical Reactions Present Dosage per cent |
|------------------------|----------------|---------------------|-------------------|----------------|----------|-----------|-----------------------|---|
| Ipecac | 36 | 18 | | | | | | |
| Bismuth emetine iodide | 15 | 15 | | | | | | |
| Emetine hydrochloride | 14 | | 10 | | 1 | 4 | 2 | 0.34 |
| Arsphenamine | 2 | | | | | | | |
| Treparsol | 2 | | | | | | | |
| Acetarzone | 12 | | 2 | 13 | | | | 2.6 |
| Chiniofon | 18 | | | | 18 | | | |
| Vioform | 1 | | | | | | | |
| Carbarsone | 8 | | | 1 | | | | |

* 70 per cent 12.5 per cent 2.6 per cent 8.6 per cent

ironical that ipecac at present is remembered only for its pioneer role in the treatment of amebiasis.

Bismuth emetine iodide continues to be in some favor especially in England. It too however has the disadvantage of frequently causing nausea and vomiting. In the first seven years of the fifteen thirty-five patients with amebiasis were given it (table 1), its use was then discontinued, however, in favor of emetine provided any form of emetine was indicated. Bismuth emetine iodide has the advantage that it can be administered orally, which makes its use advisable in some cases.

Emetine hydrochloride has seemed to be a standby through this entire fifteen-year period. With the advent of treparsol and acetarsone (stovarsol), however its use decreased somewhat but it resumed an active rôle in the treatment of amebiasis in conjunction with treparsol. Ever since Sir Leonard Rogers' 4 vivid report (1912) of his first three cases in which emetine hydrochloride was administered, no worker in this field has failed to marvel time and again at one of the therapeutic miracles in medicine—the prompt response of acute and amebiasis to 0.19 Gm or 0.26 Gm (from 3 to 4 grains) of this drug. At the clinic emetine hydrochloride has always been administered subcutaneously, and it is well to note that much undue

local reaction is avoided by observing care in injecting it subcutaneously, it is not injected intramuscularly or intradermally, and we see no need of intravenous administration.

Naturally, with the widespread use of emetine there soon appeared discouraging reports about its failure to effect a cure in more than half of the cases. Occasional reports also appeared of neuritis or palsy, myocardial injury, profound local reactions at the site of injection and finally, deaths associated with its use. I have been able to find reports of ten deaths attributed to emetine in the period from 1912 to 1935. The United States Bureau of Vital Statistics has no records of death due to emetine poisoning in the United States, although there are two or more reported in the literature. An article by Chopra and Ghosh 5 in 1922 quoted Hall and Dahmer as each reporting three fatal cases. Unfortunately the references were omitted, and I can find only Dahmer's article in 1917, 6 quoting in turn two cases of emetine neuritis or palsy. By no means is there any intention to minimize these tragedies, yet with the millions of injections this small number of untoward reactions is extraordinary. In these ten fatal cases the dose received ranged from one dose of 0.02 Gm, given to a child aged 2 years 7 who died very suddenly after the injection to 2.64 Gm administered in the course of eight weeks. Leibly's 8 case (1.28 Gm in eight weeks—equivalent to 34 mg per kilogram) and Levy and Rowntree's 9 case (1.74 Gm in eighteen days, equivalent to 25 mg per kilogram) are the only two cases in which I find data as to the dose per kilogram of body weight. The other seven patients received 1.07, 1.44, 1.04, 1.52, 1.08, 1.88 and 0.48 Gm in periods of from two to eight weeks.

In the series at the clinic of 554 patients who received emetine (table 1) the usual dose ranged from 0.24 to 1.17 Gm, the latter dose being given in a month's time and being not more than 17 mg per kilogram. In the past seven years the usual dose has been from 0.39 to 0.65 Gm in any one month or about 9 mg per kilogram (estimating an average normal of 70 Kg). There have been no deaths in these 554 cases except of one patient who was moribund on admission as a result of peritonitis from a ruptured abscess of the liver, death occurred seventy-two hours later. He had received 0.39 Gm of emetine in that time.

The not tragic but nevertheless distressing complications of emetine therapy are peripheral neuritis or palsy and cardiovascular disturbances. It is well to remember that the effect of emetine is cumulative and that it is eliminated slowly just as is the arsenic in acetarsone and carbarsone. In 1920 Mattei 10 demonstrated this fact and in one case found emetine present in the urine sixty days after an eight day course of 0.48 Gm of the drug. No doubt not all deaths have been reported and certainly many of these less serious reactions have not. I have found thirty-seven such cases in the literature in which the average amount of emetine given was 1.0 Gm, eight of the patients having been poisoned by 0.65 Gm or less. This gives no idea of the incidence of injury to nerves or myo-

5 Chopra, R. N. and Ghosh, B. N. The Therapeutics of Emetine. Indian M. Gaz. 57: 248-253 (July) 1922.
6 Dahmer, R. La toxicité du chlorhydrate d'émétine. Presse med. 25: 33-35 (Jan. 18) 1917.
7 Stern, E. Trop. Dis. Bull. (abstr.) 7: 237 1916.
8 Leibly, F. J. Fatal Emetine Poisoning Due to Cumulative Action, in Amoebic Dysentery. Am. J. M. Sc. 179: 834-839 (June) 1930.
9 Levy, R. L. and Rowntree, L. G. On the Toxicity of Various Commercial Preparations of Emetine Hydrochloride. Arch. Int. Med. 17: 420-443 (March) 1916.
10 Mattei, M. C. Toxicité élimination urinaire et accumulation de l'émétine chez l'homme. (1) Bull. et mém. Soc. méd. d'hop. de Paris 11: 531-544 (April 30) 1920.

4 Rogers, Leonard. The Rapid Cure of Amoebic Dysentery and Hepatitis by Hypodermic Injection of Soluble Salts of Emetine. Brit. M. J. 1: 1424-1425 (June 22) 1912.

cardium Only two cases, with accompanying electrocardiograms, have been reported in which it was felt that there was cardiac injury, in one¹¹ the vagal influence had not been ruled out by atropine and in the other¹² the patient had received digitalis prior to the taking of the electrocardiogram, the tracing was normal three weeks later. There is no question that intoxication is manifested by rapid pulse, asthenia, vomiting and diarrhea and that it often goes on to frank neuritis or palsy. As to how much actual myocardial injury is produced in patients who survive is still debatable. It has been suggested that trichocardia¹³ is due more to irritation of the vagus nerves than to the myocardial injury. The experiments on animals¹⁴ leave no doubt that emetine is a protoplasmic poison while the nerve lesions are the result of degeneration of fibers in the motor roots and not actual neuritis. Clinically, emetine should be used at a point far below toxicity leaving only a very small chance of reaction in the exceedingly hypersensitive individual. In many of the reported cases of intoxication and in our own there have often been warnings of intolerance which in retrospect are quite definite. In some cases the reaction appeared without any warning.

The probability of myocardial injury increases at the age of 60 years and beyond, so that one might expect to note some evidence of cardiac disturbance on giving emetine to older patients. There are data on twenty-five patients whose ages extend from 60 to 74 years all of whom received from 0.26 Gm (4 grains) to 1.1 Gm (17 grains) in from two to four weeks' time (an average of 0.65 Gm, or 10 grains). In two cases neuritis developed, in one the symptoms came on after 1.1 Gm (17 grains) of emetine had been given and the patient suddenly recalled having recently received emetine elsewhere. Throughout the first three weeks during which neuritis was most marked, this patient's blood pressure held constantly at 175 to 180 mm of mercury systolic and 90 to 94 mm diastolic, with a pulse rate at 80 beats a minute. The second patient was not seen at the clinic after neuritis appeared as it had followed a second course of 0.26 Gm (4 grains) of emetine administered by his local physician. Report was made only of weakness of the extremities. The remaining twenty-three patients showed no intolerance to the drug.

In the 554 cases at the clinic in which emetine was given (table 1), there were eight in which there was generalized asthenia and weakness of the extremities to an extent that would justify classifying it as a neuritis or palsy. In eight other cases, exhaustion and general depletion were definite and possibly should likewise be considered as a mild palsy. The first eight patients received emetine in doses of 1.1, 1.04, 0.65, 0.52, 0.91, 0.97, 0.65 and 0.78 Gm. Six of the second eight patients received 0.78 Gm, one received 0.75 Gm, and one received 2.73 Gm. In no case was there any particular reference to disturbance of the cardiovascular system. In six of these sixteen cases there were early warnings after the first course of from 0.24 to 0.39 Gm had been given, such as hives, increased diarrhea, joint pain and weakness, but the administration of emetine

was continued. In ten cases the symptoms appeared shortly after completion of the course of emetine. One must accept the entire sixteen, or 2.8 per cent of the 554 cases, as the incidence of emetine reaction, with our present average dose of 0.65 Gm, however, it is noted that only three of the sixteen reactions occurred at this dose or less. Merely for contrast, as well as to emphasize the all important factor of individual tolerance, I have the record of three patients who received 8.3 Gm (125 grains), 8.7 Gm (134 grains) and 11.6 Gm (180 grains) respectively in a period of from eight to twelve months, in addition, many others have received two or three times the usual 0.78 Gm in three months' time. In none of these cases were there signs of intoxication. In two additional cases urticaria was prominent, and in still two others large ecchymotic areas, with induration, developed at the sites of injection. The last two might have been due to errors in technic or perhaps to a faulty product.

From these observations in 554 cases it hardly seems justifiable to discard emetine, although it should be reemphasized that emetine in the total dose of 0.65 Gm in two weeks is employed only to control acute manifestations of the disease and to give the patient prompt relief but not with the idea of continuing with the drug to bring about a cure. With this in mind, exception will not be taken to my stating that three reactions to 0.65 Gm or less in 554 cases (0.54 per cent) is about the incidence of reaction or idiosyncrasy to emetine.

Organic Arsenicals—Arsphenamine, acetarsone and treparsol have been the arsenicals used at the clinic (table 1). In the last two years we have had occasion to employ carbarsone, but in too few instances to justify any conclusions. From the studies of Reed, Anderson, David and Leake,¹⁵ carbarsone is shown to produce fewer reactions than either treparsol or acetarsone, although I have had reported to me two cases of toxic erythema and one case of neuritis. The slow elimination of carbarsone, as with acetarsone, suggested the possibility of an occasional neuritis. Arsphenamine has been put aside not so much from fear of it but rather because the expense and time element favored orally administered drugs. Thirty-eight patients received arsphenamine, and with no untoward reactions.

Acetarsone was thoroughly tried and seemed to be the answer to the problem of an easy, inexpensive drug that would complement emetine, emetine being used for control of acute symptoms and acetarsone for eradication of the amebas. Deaths are recorded in several reports, but in the 232 cases in this study (and in many others in which acetarsone was prescribed) a death has not occurred. Toxic erythema has been noted, however, occasionally being severe enough to be considered as dermatitis exfoliativa, toxic erythema was encountered in thirteen (5.6 per cent) of the 232 cases in which patients received acetarsone (stovarsol). Three patients were quite ill for a week, the others were moderately sick and the symptoms abated in from forty-eight to seventy-two hours. Severe peripheral neuritis occurred in one case, recovery from which took almost a year. A second but milder case occurred, and the patient was well in from six to eight weeks. In both instances arsenic was present in the urine months after the administration of acetarsone had been stopped.

In view of these two cases of neuritis and thirteen of toxic erythema it was realized that the risk of treat-

11 Anderson H H and Reed A C Untoward Effects of Antiamebic Drugs *Am J Trop Med* 14: 269-281 (May) 1934.
12 Chopra R N and Sen B Toxic Effects of Emetine on the Cardiovascular System *Indian M Gaz* 69: 262-263 (May) 1934.
13 Cawston F G Emetine Poisoning *J Trop Med* 32: 22-24 (Jan 15) 1929.
14 Young W A and Tudhope G R The Pathology of Prolonged Emetine Administration *Tr Roy Soc Trop Med & Hyg* 20: 93-99 (March-May) 1926.
15 Reed A C Anderson H H David N A and Leake C D The Oral Toxicity of Emetine Hydrochloride and Certain Related Compounds in Rabbits and Cats *Am J Trop Med* 10: 249-259 (July) 1930.

15 Reed A C Anderson H H David N A and Leake C D Carbarsone in the Treatment of Amebiasis *J A M A* 98: 189-194 (Jan 16) 1932.

ment was considerable and that it was particularly dangerous to prescribe the drug unless the patient was under constant observation

Flandin¹⁶ stated that the arsenic of treparsol was eliminated within two or three days after completion of a course of this drug. This suggested that the neuritic complication could be avoided and the immediate acute reactions perhaps lowered. Flandin's statement as to the rapidity of elimination was confirmed and, clinically, no cases of neuritis have occurred. Since 1925, 301 patients have received treparsol, and it was prescribed for others whose treatment was carried out elsewhere. There occurred eight, or 2.6 per cent, instances of toxic erythema in the 301 cases. One additional patient had nausea and vomiting after taking four tablets (1 Gm.), and administration of the drug was discontinued rather than risk any chance of reaction. Four of these eight patients manifested erythema at the end of the first course (3 to 3.75 Gm.), whereas four showed reactions during or toward the end of a second course of 3 Gm. Symptoms of all subsided in from three to five days. While deaths from treparsol have been recorded, none have occurred in cases at the clinic.

While chiniofon ("yatren," "anayodin") has been regarded with favor at the clinic and employed since 1926, it has not been the drug of first choice. Possibly

TABLE 2—Results Obtained with Specific Drugs

| | 'Cure' | | Failure | |
|--------------|--------|----------|---------|----------|
| | Cases | Per Cent | Cases | Per Cent |
| Emetine | 88 | 55 | 73 | 45 |
| Ipecac | 11 | 73 | 4 | 27 |
| Arsphenamine | 10 | 91 | 1 | 9 |
| Acetarsone | 112 | 85 | 19 | 15 |
| Treparsol | 34 | 89 | 4 | 11 |
| Chiniofon | 22 | 82 | 5 | 18 |

the earlier item of expense (when it was imported as "yatren"), as well as the frequency with which it temporarily increased the diarrhea, first led to the use of emetine, in conjunction with treparsol. Chiniofon is noted as being used in only thirty-seven of the 834 cases (table 1). This gives a rather unfair picture, however, for most of these patients had received previous, and unsuccessful, treatment with emetine and arsenic. Aside from the rather frequent inconvenience of increased diarrhea on the usual dose of 3 Gm. daily, no untoward difficulties occurred. The two deaths that followed the intravenous administration of chiniofon in cases of actinomycosis are quoted constantly and indicate that the drug is not without some danger. However, the danger would seem minimal in the usual doses administered orally.

Vioform is another halogenated quinoline that has been used at the clinic. As it was available only during 1933 and 1934, it has been tried in only eighteen cases (table 1). There were no difficulties and less irritation from its use than with chiniofon. As with carbarsone, we have had too little experience to offer any conclusions. Recently, a third compound of this group has been offered for trial, diiodohydroxyquinoline. In only one case has it been possible to follow up the patient, and in this case stool tests were negative three months after treatment.

The use of colonic irrigations of any of the foregoing medicaments has, unfortunately perhaps, not been tried. I have not been convinced that they added to the treat-

ment, and no doubt there was an underlying prejudice against colonic irrigations.

As a matter of record, experiences with retention enemas of coal oil should be noted. In most instances there was no difficulty other than the attendant nuisance plus a persisting aroma of kerosene during treatment. A few patients would smell and taste kerosene in eructations of gas, which quite definitely was the result of reverse peristalsis. In one case a severe and rather dramatic reaction occurred. Immediately after receiving coal oil, the patient complained of a very tight feeling in the chest. The respiration rate rose to 36 per minute and the temperature to 102 F. Coarse râles were heard in both lungs. The patient was very restless and apprehensive, and grave anxiety was held as to the outcome. The symptoms slowly subsided, however, and in twenty-four hours he had entirely recovered.

SECTION II RESULTS OF TREATMENT

In the evaluation of results of treatment it is essential not only to have later and repeated examinations of stools but also to have information as to what types of amebiasis are encountered in any particular report. The effectiveness of treatment in a group of cases of latent amebiasis might be quite different from that in a similar number of cases presenting hepatic abscesses or acute dysentery.

In this review, 278 of the 834 patients (33 per cent) had evidence of active amebiasis on admission, 424 (50 per cent) had intermittent diarrhea associated with various abdominal complaints, some of which were and some of which were not improved by antiamebic treatment, and 132 (16 per cent) were considered as having latent amebiasis. In the latent group were listed fifty-one patients with chronic ulcerative colitis, in all of whom colitis had persisted after antiamebic treatment. There is no doubt that the relative percentage of latent cases can be varied almost at will, depending on how routine the examination of the stool is. Since the stools of patients who come to the clinic are not all examined and, further, as this group of 834 cases consists merely of those in which data as to treatment are available, the foregoing percentages do not give a true ratio of the incidence of the various degrees of amebic infection in the north temperate zone.

Of the total group of 834 cases, 523 afforded sufficient data to warrant tentative conclusions as to the results of treatment. It is realized that in many the ideal of repeated examinations over a prolonged period has not always been possible, yet I believe that the follow-up data have been sufficiently adequate to indicate what has transpired (table 2). The word "cure" is used in this paper to imply that not less than two examinations of stools were made on successive days following completion of treatment, while in most cases repeated examinations were made over a period of months to several years. In addition, clinical symptoms of amebiasis no longer existed. "Failure" implies that the parasite was identified in the stool after treatment was completed even though there were no clinical symptoms. In contrast to institutional patients, our patients had returned to their original environment, so that reinfection might have occurred, yet we have considered as failures any cases in which the parasites were found after conclusion of treatment.

Treatment with emetine consisted usually in giving an average dose of 0.78 Gm. (12 grains) over a period of four weeks. In most cases a series of kerosene enemas were given during the month, and in a number

16 Flandin C. Le dérivé formylé de l'acide méta-amino-para-oxy-phényl-arsénique (treparsol) dans le traitement de l'amébiase, Bull. et mém. Soc. méd. d'hop. de Paris 2 1628 1636 (Nov. 21) 1924.

of cases chiparro amargoso was administered orally. Hence whatever virtue there may have been in kerosene and chiparro, they did not enhance the value of emetine as a curative agent to any marked extent. The observation of emetine failing as a curative agent in 45 per cent of cases is in record with that of many other observers. Ipecac, in the few cases in which it was used, shows a better result, but one that is still far from satisfactory, in addition there is marked

TABLE 3—Combinations of Emetine and Arsenicals

| | Cure | Failure |
|---|------|---------|
| Emetine and arsphenamine | 7 | |
| Ipecac and arsphenamine | 1 | |
| Emetine and treparsol | 111 | 15 |
| Emetine and acetarsone | 13 | 3 |
| Ultimate results with emetine and arsenic | 142* | 8† |

* 94.7 per cent

† 5.3 per cent

unpleasantness from its oral administration in 50 per cent or more of cases. Bismuth emetine iodide was frequently used to supplement other treatment, yet as a primary weapon of attack it seems to have been used in only two cases of which we have record, "curing" the patient in one and failing in the other. Nausea and vomiting and diarrhea occur in some cases, although they are less severe than with ipecac.

The primary results of treatment with the organic arsenicals is much better than with emetine or ipecac. Failure to obtain a cure, in addition to the occasional reaction, in only 9 to 15 per cent of cases, is most encouraging although still not at the desired goal.

Too few results are available on the efficacy of the oxygenated quinolines. It is not because of fear or prejudice but rather because there has been such a comfortable feeling with the emetine-arsenic regimen since before the quinolines were available that we have used them later more as "shock troops." In eight cases chiniofon (yatren) was used primarily, and in fourteen cases secondarily, for a total of twenty-two cures. Failure resulted in one case in which treatment was primary and in four cases in which it was secondary. This is not a just estimate of the drug's value, as the eighteen cases in which treatment was secondary indicate that a more stubborn infection existed. Likewise, too few results were available on the efficacy of carbarsone and vioform. In only one case was vioform used alone, in this case active amebic dysentery persisted in spite of the fact that emetine had been administered elsewhere to the point that peripheral neuritis had developed. Vioform failed to result in a cure. In two cases it was combined with treparsol and a cure was effected. In fifteen other cases vioform was given but the results of treatment were unknown. Nine patients received carbarsone, but data are available for only three of them. Used alone, carbarsone failed to cure, in conjunction with chiniofon one patient was cured, and with emetine one failed.

The high percentage of failures with alkaloids and the much better results with the arsenicals naturally suggested the value of combining emetine and an arsenical, the former to be used only in sufficient dosage to control acute symptoms, thereby keeping well below even a minimal danger of poisoning, and the latter to be used in smaller doses and yet prove effective in eradicating the amebas. The results noted in table 3 confirmed this opinion, for in 150 cases there were eighteen primary failures, or 12 per cent, on treatment at the clinic. Ten of these patients were later cured,

leaving eight regarding whom no further data were available. The final results were that treatment failed in 5.3 per cent and was successful in 94.7 per cent of the cases.

Results of Treatment After Original Failure—This is the group that naturally causes the most anxiety of all and serves as the stimulus to more effective treatment. As previously noted, the incidence of the more severe manifestations of amebiasis is probably higher in the tropics, so that any reports from the north temperate zone may not be comparable to those originating in the Orient, in India or in Panama. In the 523 cases at the clinic 398 primary cures were obtained, but it is the 125 failures that are of the most concern (table 4).

Striking improvement coincides with the wider use of the organic arsenicals. It also signifies that the profession has ceased to look to emetine as a curative agent but rather as a means of controlling the acute symptoms. Of the 125 patients whose original treatment failed, sixty were later cured, twelve persisted with the disease in spite of continued treatment, and for fifty-three no further data were available. It may be unfair to include all these fifty-three cases as final failures, just as it is rather optimistic to include all the remainder as true cures, but nevertheless sixty-five are listed as failures. But to consider these sixty-five cases as final and absolute failures is not justified, for as time goes on the majority of these present failures gradually become apparent cures, which observation has repeatedly been confirmed.

With present knowledge, the "reclaiming of failures" lies in a systematic and conservative variation in the treatment. If failure has followed the use of emetine and treparsol, success is unlikely to follow their continued administration, likewise, the possibility of drug reaction increases. Two or three courses of chiniofon are prescribed (21 Gm a week, with a week's interval between courses). If amebas persist, six weekly injections of arsphenamine or bismuth emetine iodide, with large doses of bismuth subcarbonate, are employed. In other words, varying the ammunition minimizes reactions to the drugs and seems more effective in finally

TABLE 4—Results of Original and Later Treatment

| | Total | Cure | | Failure | |
|--------------------|-------|-------|----------|---------|----------|
| | | Cases | Per Cent | Cases | Per Cent |
| Original treatment | | | | | |
| 1920 to 1925 | 187 | 111 | 59.4 | 76 | 40.6 |
| 1925 to 1935 | 336 | 237 | 65.5 | 99 | 29.5 |
| Total | 523 | 348 | 66.5 | 175 | 33.5 |
| Final results | | | | | |
| 1920 to 1925 | 187 | 152 | 81.3 | 35 | 18.7 |
| 1925 to 1935 | 336 | 300 | 91.1 | 36 | 8.9 |
| Total | 523 | 452 | 87.0 | 71 | 13.0 |

obtaining a cure. As one reviews the sixty cases finally considered as cured, the barrage of arsphenamine, emetine, bismuth emetine iodide, chiniofon, carbarsone, acetarsone, treparsol, vioform and ipecac is indeed startling, and one asks what good any one drug is when such a variety is used. In any event, a cure was eventually obtained.

Of the twelve cases in which failure persisted even after further treatment, five occurred in 1920 when more emetine and ipecac were given. One patient later received one course (4 Gm) of acetarsone, but without avail, at present I would not consider that sufficiently varied and persistent treatment had been given.

One patient had a course of six injections of arsphenamine after the course of emetine had failed. Another patient received 1.52 Gm of emetine (24 grains) on top of an original course of 0.78 Gm (12 grains). The other five patients received fairly intensive treatment with emetine, acetarsone, treparsol and chiniofon, but in spite of this the parasites were not eradicated. Although these five cases were still failures, yet of the sixty eventual cures in the original 125 failures these sixty had as much or more treatment, some for two to three years. Hence it is hoped that judicious and varied treatment with the present drugs will result successfully in almost all cases of amebiasis encountered at the clinic.

The figure 91.1 per cent as representing cases in which an apparently final cure was obtained in the past decade will undoubtedly provoke criticism, and I realize that, if repeated examinations of the stools of these patients could be made over a period of months, the final result would be less. On the other hand, instituting the program of variation in further treatment makes me optimistic enough to believe that the final outcome would yield as high or even a higher percentage. As one respects the potential dangers of the drugs that are employed, so the recognition of the ameba as a wily and stubborn enemy results in a more determined and judicious management. Again it must be stated that those manifestations of the disease are

TABLE 5—Results of Treatment on Amebic Rectal Ulceration

| | Total | Cure | | Failure | | No Data |
|----------------------------|-------|-------|----------|---------|----------|---------|
| | | Cases | Per Cent | Cases | Per Cent | |
| Amebic proctitis | 105 | 115 | 62 | 26 | 18* | 54 |
| No proctitis | 330 | 174 | 84* | 34 | 16* | 122 |
| Chronic ulcerative colitis | 51 | 36 | | 1 | | 14 |

* Percentage based only on cases in which further data were available

not encountered when one considers ileostomy or appendicostomy, or colostomy for rectal stricture.

Among the more serious complications of the disease to be dealt with should be noted clinically recognizable injury to the liver, which occurred in twenty-two cases. In sixteen cases there was abscess formation, whereas in six there were chills, fever, leukocytosis, and tenderness in the region of the liver, which certainly suggests hepatic involvement. As has been stated, one of the patients was practically moribund on admission and died of general peritonitis. Drainage of the abscess had been established and 0.39 Gm (6 grains) of emetine had been administered. Necropsy revealed that an abscess had ruptured into the peritoneal cavity.

In the remaining fifteen cases of known abscess, aspiration or open drainage had been done, accompanied by antiamebic treatment. So far as we know, all these patients have been cured. Five of the six patients with hepatitis likewise have remained well although the sixth, treated late in 1934, has written that she is still having some trouble.

With the exception of the patient who died and two others who were treated in 1920 and 1924, all patients received neoarsphenamine, acetarsone or treparsol in conjunction with emetine. In no case was there evidence of untoward reaction or of an increase in hepatic injury. In fact, in one case convalescence was prolonged and more complete recovery occurred only after treparsol was given, treparsol had been withheld for fear of injuring the liver. With even nineteen cases

of hepatic injury it is not proper to state that the arsenicals are not dangerous, but in cautious and interrupted courses their administration has not only not caused harm but has proved beneficial.

Another aspect of the results of treatment of the more severe types of amebiasis is seen in cases in which amebic rectal ulceration could be demonstrated. Of 576 patients who were examined proctoscopically, 195 (33.8 per cent) had amebic proctitis, 330 (57 per cent) were normal and 51 (8.8 per cent) had idiopathic ulcerative colitis. The last were cases in which amebas played only an incidental role and the colitis persisted after the amebas had been eradicated. Several patients in the first group had some associated stricture, but only one had a marked tubular stricture. The last, a Nicaraguan, is one of a group of patients who received combined antiamebic treatment and local treatment of the rectum for more than three years, a cure was finally obtained and the patient had an adequately functioning rectum (table 5).

PRESENT METHODS OF TREATMENT

If the patient has not received antiamebic treatment recently, he is given 0.065 Gm (1 grain) of Burroughs, Wellcome & Co. emetine hydrochloride, subcutaneously, twice daily for three days. After an interval of a week, 0.043 Gm (two-thirds grain) of emetine is given twice daily for three more days. With the institution of the emetine, treparsol, 0.25 Gm (4 grains), is administered orally with each meal for four days. If there is no intolerance to arsenic, two more such courses are prescribed with intervals of ten days between the courses.

If the patient is quite ill, he is kept in bed for the first few days, if he is not particularly ill, hospitalization is not necessary. Obviously the diet may need to be bland and simple if there is much dysentery, but very rapidly, that is, within twenty-four to forty-eight hours, a full and generous diet is begun. In any depleting disease, adequate amounts of nourishing, utilizable food are most essential. As recently demonstrated in experimental amebiasis by the Tulane group (Faust, Kagy¹⁷ and others), the importance of a rich, high vitamin diet had a profound influence on the healing of amebic ulceration. Hepatic involvement may subside, but if there is a large collection of broken down material, aspiration preferably, or occasionally open drainage, may be required.

If stool tests are positive following this regimen, three courses of chiniofon are prescribed, 3 Gm orally per day for a week and repeated for two more such courses, with a week's interval between courses. If diarrhea is increased, the daily dose is decreased, thereby prolonging each course. Failure after this would indicate a course of one injection of arsphenamine weekly for six weeks, and 1 drachm (3.88 Gm) of bismuth subnitrate from three to six times daily during the period. As it was aptly expressed by Anderson and Reed,¹⁸ "No one drug is known today to be completely effective and the therapeutic hazard should not exceed the disease hazard." Hence there is need to vary the treatment in regard to the individual patient as well as to the type or degree of severity of the infection. With continued search for more effective and safer drugs, and with a better knowledge of the "soil" of the patient, this present regimen will be simplified.

17 Faust, E. C. and Kagy, E. S. Studies on the Pathology of Amebic Enteritis in Dogs. *Am J Trop Med* 14: 221-233 (May) 1934.
18 Anderson, H. H. and Reed, A. C. Carbarsone Rectally in Amebiasis. *Am J Trop Med* 14: 257-267 (May) 1934.

SUMMARY AND CONCLUSIONS

1 The use of 0.65 Gm (10 grains) of emetine hydrochloride subcutaneously in a month's time should involve a risk of reaction in less than 1 per cent of the cases

2 The use of any of the present organic arsenicals is attended by some risk, but by observing the rule of interrupted courses as well as observation of the patient this risk is minimized

3 In our experience at the clinic, acetarsone, treparsol and carbarsone have produced reactions. Clinically acetarsone produced the most and carbarsone the least

4 The use of the arsenicals has not proved detrimental in the treatment of amebic liver abscess

ABSTRACT OF DISCUSSION

DR. MOSES PAULSON, Baltimore Dr Brown has comprehensively reviewed the pharmacotherapeutic measures in amebiasis. I agree with his conclusion that the vast majority of amebiasis encountered in the north and midtemperate zones respond completely to the use of one or more of the several measures available. I should like to stress, because of the not infrequent recurrences, that patients should be observed for a longer period of time than is generally done before they are discharged as "cured." Since I have seen recurrences—possibly reinfections—in the fourth month following seemingly adequate therapy, Andrews and I, in work a report of which we are about to publish, state that we believe that a "cure" should not be regarded as having been attained until three fecal specimens monthly, obtained preferably after a saline purge are negative over a period of six months. Dr Brown has indicated the relative harmlessness of emetine hydrochloride in amebic dysentery. This must be emphasized, since undue references to its dangers have appeared recently, and there is greater danger that an important therapeutic agent may be discarded. It is striking that in his hands only slightly more than 0.5 per cent of cases manifested untoward reactions. Besides, there is no authentic report of myocardial damage in any adult receiving a total of 0.65 Gm or less. If there is no satisfactory response to this dose, larger doses are usually of no avail. These are important considerations, for I believe that emetine hydrochloride is the best drug in amebic dysentery. It is a prophylactic as well as a specific in amebic hepatitis. The action of emetine is not understood, it is thought that it attacks the tissue invaders; therefore it must be complemented by another drug—usually an arsenical—to destroy the lumen dwellers. At the Johns Hopkins Hospital, in amebic dysentery, I use emetine subcutaneously simultaneously with the arsenical carbarsone by mouth. Immediately on cessation of acute manifestations, emetine is discontinued but carbarsone is continued. Recurrences are treated with another course of carbarsone. The rare further recurrence is treated with the oxyquinoline derivative vioform. In carriers I have never given emetine; carbarsone is administered and used for recurrences. In subsequent recurrences vioform is used. Carbarsone has been extremely satisfactory and no untoward reactions have been noted.

DR. SIDNEY SIMON, New Orleans My experience is that the treatment of this disease, which extends back for more than thirty years, doesn't coincide in a great many particulars with the results that Dr Brown has reported. Ipecac was the first drug that modern medicine used in the control of amebiasis; emetine was discovered three years after the reintroduction of ipecac and was used almost to the exclusion of ipecac by most men for a period of almost fifteen years. In Dr Brown's first paper, the only effect of ipecac the only reaction, as he called it, was nausea and vomiting. There was no other untoward effect. Ipecac can be given in massive doses without any untoward effect other than the nausea and vomiting, which can be controlled to a great extent by careful administration. The ill effects of emetine have been grossly overemphasized; however, emetine is an undesirable drug in amebiasis for the reason that it is inadequate. Emetine is much like morphine

an excellent drug to use in emergencies of acute amebiasis, when one has to control the immediate symptoms of an acute dysenteric attack. Ipecac, on the other hand, in more than 500 cases that I tabulated several years ago, proved completely successful in more than 90 per cent as compared to the rather low percentage that Dr Brown has given. The treatment of amebiasis should be standardized. The treatment has been passed back and forth as a football. There is a modern method of treating amebiasis and a successful one, and that is that one has the choice of two modern drugs, both of which are eminently successful: carbarsone, preferably, which gives a very high percentage of good results without any toxic arsenical effect, and either vioform or chiniofon, which are quinoline derivatives. The curative effect fails in less than 10 per cent with these drugs. Then there is ipecac to fall back on, which I am still holding in reserve as a means of curing cases that cannot be cured by emetine. Emetine is the worst drug that can be used in the resistant cases, carbarsone or vioform is better. Ipecac is still a drug to be reckoned with as almost a specific in amebiasis.

DR. PHILIP W. BROWN, Rochester, Minn. The question of what our present regimen of therapy is and what we mean by the word "cure" is covered in detail in the paper. I have tried to avoid talking about vioform. I have used carbarsone rather extensively but it seems to me that there are differences in what can be accomplished with them. Vioform has proved inefficient in my hands, while carbarsone has proved much safer but less efficient than treparsol. For these reasons we seem to stick to the drugs that have given us the best results.

THE REDUCTION OF DIPHTHERIA
FOLLOWING THREE DOSES
OF TOXOID

FURTHER OBSERVATIONS

N. E. McKINNON, M.B.
AND
MARY A. ROSS, PH.D.
TORONTO, ONT.

In 1926 the Department of Public Health of the City of Toronto offered immunization with diphtheria toxoid to children in the public schools of the city.¹ Such immunization was carried on till June 1929. Advantage was taken of the opportunity to gain an accurate estimate of the efficiency of toxoid in preventing diphtheria in the group so treated. The results of that study, with the methods of calculation, have been published.² Table 1 presents, in summary, the data of that time. Here the inadequacy of one dose is at once apparent and needs no comment. The advantage of a secondary stimulus in immunization is evident in the much greater reduction of diphtheria (74 per cent) in those given two doses of toxoid. The superiority of three doses is evident in the 90 per cent reduction of cases, with no deaths, in the 16,829 children given three doses of toxoid in the 1927-1930 period. The estimated reductions in diphtheria agree with the percentages of individuals showing 0.04 unit of antitoxin per cubic centimeter of blood serum, as determined by actual titration, after two and three doses of toxoid.³

From the Department of Epidemiology and Biometrics, University of Toronto School of Hygiene.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.

¹ Burke, F. S. The Administrative Control of the Diphtheria Toxoid Campaign in Toronto, 1930. *Canad. Pub. Health J.* 21: 209 (May) 1930.

² McKinnon, N. E., Ross, Mary A., and Defries, R. D. Reduction in Diphtheria in 36,000 Toronto School Children as a Result of an Immunization Campaign. *Canad. Pub. Health J.* 22: 217-223 (May) 1931. Ross, Mary A., and McKinnon, N. E. The Efficiency of Toxoid in Controlling Diphtheria, Toronto, 1926-1930. *ibid.* 22: 333-342 (July) 1931.

³ Moloney, P. J. Personal communication to the authors.

In 1930 the program of immunization was renewed and is still in progress. Table 2 shows, in summary form, the analysis of the data collected until August 1932 for children given three doses of toxoid. The increment was 14,191 children in 1930-1931* and 13,871 in 1931-1932. The group was therefore of considerable size. When the rates in the controls, schoolmates, cor-

TABLE 1—*Reduction in Diphtheria in School Children Subsequent to Toxoid—Toronto Public Schools, 1926-1930*

| Doses of Toxoid | Cases | | Percentage Reduction | Deaths |
|-----------------|------------|--------|----------------------|--------|
| | Estimated* | Actual | | |
| One dose | 34 | 24 | 29 | 3 |
| Two doses | 200 | 62 | 74 | 2 |
| Three doses | 222 | 23 | 90 | 0 |

* At rate in controls (schoolmates) corrected for age, monthly distribution, and susceptibility.

rected for age, for monthly distribution and for difference of susceptibility are applied, as previously, to those given three doses of toxoid, the estimated number of cases for 1930-1931 is 133, the actual cases fourteen, or a reduction of 89 per cent. For 1931-1932 the number of estimated cases is 105, the actual three, a reduction of 97 per cent, and for the two-year period 1930-1932

TABLE 2—*Reduction in Diphtheria in Immunized Children—Toronto Public Schools 1927-1932**

| Year | Cases | | Percentage Reduction | Deaths |
|-----------|------------|--------|----------------------|--------|
| | Estimated† | Actual | | |
| 1927-1928 | 25 | 1 | 96 | 0 |
| 1928-1929 | 84 | 7 | 92 | 0 |
| 1929-1930 | 113 | 15 | 87 | 0 |
| 1930-1931 | 133 | 14 | 89 | 0 |
| 1931-1932 | 105 | 3 | 97 | 0 |
| 1927-1932 | 460 | 40 | 91 | 0 |

* Given three doses of toxoid.

† At rates in controls corrected for age, monthly distribution and susceptibility.

238 and seventeen, a reduction of 93 per cent. Over the five-year period of 1927-1932, the estimated number of cases is 460. The actual cases numbered forty, a reduction of 91 per cent. In these forty cases there were no deaths. There is so little variation between these estimates of reduction in diphtheria and between them and the previous estimate that the figure of 90 per cent can be accepted as fairly representative of

TABLE 3—*Number Immunized and Under Observation—Toronto Public Schools, 1927-1932**

| 1927-1928 | 1928-1929 | 1929-1930 | 1930-1931 | 1931-1932 |
|-----------|-----------|-----------|-----------|-----------|
| 11,514† | 11,039 | 10,237 | 9,808 | 8,099 |
| | 4,081† | 4,545 | 4,284 | 3,907 |
| | | | 14,191† | 13,871† |
| (301)† | (333)† | (396)† | (751)† | |
| 11,514 | 15,720 | 14,782 | 27,783 | 39,681 |

* Given three doses of toxoid—46,038.

† The number immunized in each year.

‡ Preschool children immunized previously who arrived at 5 years of age in year indicated.

the efficiency of three doses of toxoid under the conditions of high prevalence of diphtheria obtaining at that time.

But the group each year is not necessarily homogeneous in regard to immunity, as it contains children immunized in the respective year, some the year before, some the year previous to that, and so on. To show the reduction in each year subsequent to immunization, tables 3 to 5 have been prepared.

4 Data are classified by the September through August year.

Table 3 shows the group immunized each year and its subsequent decrease by advancing the age, annually, excluding patients 15 years old from the study and adding a number of children, immunized previously but becoming 5 years of age at the time indicated, and therefore included in the study. It is apparent that the various groups were of a size that might be considered sufficient to give reliable results under usual conditions of diphtheria prevalence and represent a considerable part of the school population of 90,000.

Table 4 shows the diphtheria expectancy, estimated by applying the rates in the unselected controls, corrected for age, for monthly distribution and for differ-

TABLE 4—*Diphtheria, Estimated and Actual, in Immunized Children—Toronto Public Schools, 1927-1932**

| Given Three Doses of Toxoid In | Diphtheria Cases In | | | | | | | | | |
|--------------------------------|---------------------|--------|------------|--------|------------|--------|------------|--------|------------|--------|
| | 1927-1928 | | 1928-1929 | | 1929-1930 | | 1930-1931 | | 1931-1932 | |
| | Estimated† | Actual | Estimated† | Actual | Estimated† | Actual | Estimated† | Actual | Estimated† | Actual |
| 1927-1928 | 25 | 1 | 63 | 7 | 76 | 11 | 67 | 11 | 31 | 0 |
| 1928-1929 | | | 21 | 0 | 37 | 4 | 32 | 0 | 14 | 0 |
| 1929-1930 | | | | | | | 34 | 3 | 47 | 3 |
| 1930-1931 | | | | | | | | | 13 | 0 |
| 1931-1932 | | | | | | | | | | |

* Given three doses of toxoid.

† Cases estimated by applying rates in controls corrected for age, monthly distribution and susceptibility.

ence in susceptibility, and the actual cases in each group each year. It is apparent that in 1931-1932, in spite of a significantly larger group, the expectancy is smaller than previously, so that one is confronted with the uncertainty of small numbers. In spite of this, the percentage reductions in each group have been calculated and are shown in table 5. The estimates for the last two years are more subject to correction than the earlier estimates, on account of the large numbers of children immunized in the later years by the private physicians in the city. These children are included in the control group. Correction for them would give a higher number of estimated cases and therefore a higher degree of efficiency of toxoid. The figures in the last

TABLE 5—*Reduction in Diphtheria Subsequent to Immunization—Toronto Public Schools 1927-1932**

| Given Three Doses In | Percentage Reduction in Diphtheria In | | | | |
|----------------------|---------------------------------------|-----------|-----------|-----------|-----------|
| | 1927-1928 | 1928-1929 | 1929-1930 | 1930-1931 | 1931-1932 |
| 1927-1928 | 96 | 89 | 86 | 84 | 100 |
| 1928-1929 | | 100 | 89 | 100 | 100 |
| 1930-1931 | | | | 91 | 94 |
| 1931-1932 | | | | | 100 |

* Three doses of toxoid.

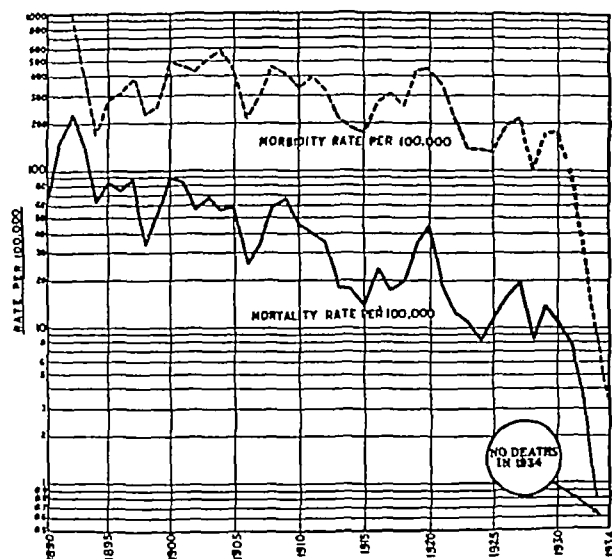
column are, of course, of uncertain significance, owing not to small numbers of children in the various groups but to the paucity of diphtheria in the city, which is disappointing as far as the experimental observations are concerned but very gratifying otherwise. The continued decrease in diphtheria in the nonimmunized as well as the immunized has reduced the expectancy in each group to numbers too small to form a reliable basis for further estimates, by this method, of the efficiency of toxoid. The estimated reduction in table 5 suggests that immunity tends to be highest in the year in which the toxoid is given and that in subsequent years there is a slight decline. But the high level of approximately 85 to 90 per cent efficiency at which immunity is maintained for a period of from

four to five years, at least, is the outstanding finding in this analysis. It is of real significance that there was not one death in any of the forty cases and, in fact, there has not been to date a death from diphtheria in any of the 46,000 children given three doses of toxoid in Toronto. Evidently the infection has been met in each case with a degree of immunity which, along with

one death from diphtheria. This decline has occurred following fairly extensive immunization, and considering the all too small decline in morbidity in the thirty years previously and the established value of toxoid, it is not unreasonable to attribute, for the present at least, the larger part of the decline, directly or indirectly, to immunization.

The data support a not unreasonable hypothesis that a lower degree of immunity, insufficient to control diphtheria completely when it is highly prevalent, is sufficient when the prevalence of diphtheria is low. This is supported, too, by the observations in a group of Schick-negative children and in those with a higher degree of sensitivity to the specific protein, as shown by the reaction test, neither of which were given toxoid, and, too, in children given but two doses of toxoid as shown in table 6. However that may be, modern public health practice requires not only the protection of the community against epidemic disease but also the protection of the individual, and for the individual the best possible immunity should be maintained.

Two other pertinent observations may be mentioned. First, Dr. Ambrose Moffat, director of laboratories of the Department of Public Health of Toronto, reports that in 1926 there were 13,231 city swabs examined. Of these, 2,564, or 19.4 per cent, were positive. In 1929 the number examined was 16,542, with 2,754 positive, or 16.6 per cent. In 1934, 4,516 were examined and but twenty-eight, or 0.6 per cent, were positive. In the years mentioned, the cases of diphtheria numbered 1,098, 1,030, and eighteen respectively. Comparison with the number of swabs reveals a much more diligent or widespread collection of swabs in relation to cases in 1934 than in the former years, but in spite of this the number of positives found was practically



Mortality and morbidity rates per hundred thousand for diphtheria in Toronto from 1890 to 1934

the usual antitoxin treatment, was sufficient to eliminate any fatalities.

The question of diagnosis of the recorded cases must be considered. Malaise, sore throat and fever were present in all cases. A membrane was present in twenty-eight out of thirty-one from whom information in this regard was obtained, two showed "spots" and one was first diagnosed as Vincent's angina. These three gave "positive swabs." Those from the "spots" were not tested for virulence but that from the case of Vincent's angina was positive.

All but one of the forty cases gave "positive swabs." Of twenty-seven examined for virulence, twenty-six were positive. Even the three cases occurring in 1930-1931 in the group immunized that year were undoubtedly diphtheria. Sore throat, fever and a membrane were present in each. Each gave a positive swab, and two tested for virulence were positive. Two of these cases occurred in the same family within three days of each other, and the third dose of toxoid had been given on the same day four months previously. The diagnoses of diphtheria and therefore occurrence of diphtheria in immunized children must be accepted without question.

It is apparent in the accompanying chart that when the campaign was started diphtheria morbidity and mortality were very high and that for thirty years there had been little if any reduction in morbidity. In 1926 there were more than 1,000 cases with ninety deaths, a mortality rate of 16.2 per hundred thousand. In 1927 the deaths numbered 114, a mortality rate of 20 per hundred thousand. At that time diphtheria was the chief cause of death in the whole age group of 2 to 14 years of age. Under these conditions the campaign was initiated and the first comparisons were made. In 1934 in the same city with a population of 630,000 there were eighteen cases, and for a period of fifteen months, January 1934 to March 1935, there was not

TABLE 6—Diphtheria in Certain Small Groups—Toronto Public Schools, 1926-1932

| | 1926 1927 | 1927 1928 | 1928- 1929 | 1929- 1930 | 1930- 1931 | 1931 1932 |
|-----------------------------------|--------------|--------------|---------------|---------------|---------------|--------------|
| Schick negatives | | | | | | |
| Number under observation | 4 835 | 4 274 | 4 302 | 3 566 | 2 861 | 2 097 |
| Estimated cases* | 10 | 19 | 10 | 17 | 13 | 7 |
| Actual cases | 1 | 6 | 8 | 2 | 2 | 1 |
| 3+ reactors to the reaction test† | | | | | | |
| Number under observation | 1 224 | 1 008 | 2 139 | 1 906 | 1 477 | 1 738 |
| Estimated cases* | 2 | 6 | 9 | 9 | 11 | 6 |
| Actual cases | 0 | 2 | 2 | 1 | 0 | 0 |
| Children given 2 doses of toxoid | | | | | | |
| Number under observation | 7 114 | 6 931 | 7 316 | 7 120 | 6 587 | 7 113 |
| Estimated cases* | 24 | 58 | 52 | 66 | 63 | 27 |
| Actual cases | 7 | 10 | 16 | 19 | 3 | 1 |
| Reduction per cent | 71 | 83 | 69 | 71 | 95 | 96 |

* Estimated by applying rates in unselected controls corrected for age monthly distribution, and, for two dose children susceptibility. There were two deaths among the two dose cases, one death among the 3+ reactors, and none among the Schick negatives.

† Those showing induration at the site of the test.

The Schick tests were made by competent physicians of the toxoid teams in 1926-1927 with toxin which on distribution, conformed with the requirements of that time, namely 1/50 minimum lethal dose in 0.1 cc. Such toxin was not entirely free from possible deterioration in handling or from experimental error in diluting. When the cases were classified according to date of testing it was found that in five instances there were two cases which had been Schick tested on the same day. This grouping of cases to certain days of testing suggested such deterioration or error. Stabilization of dilute toxin with gelatin has eliminated such inaccuracies so that it is reasonable to expect a higher degree of correlation between the Schick negative state and actual immunity than is suggested here. It is probable too that at least in some instances the individual may have become Schick positive before the onset of diphtheria. The cases were confirmed as diphtheria by clinical and bacteriologic evidence.

negligible. This is a striking change following thirty years of no significant decline in diphtheria morbidity and suggests that elimination of cases controls the infecting organism or its spread. It helps, too, to lay the bog of increased danger of carriers.

Second, Dr. G. M. Little of the Red Deer Health Unit in Alberta reports that in 603 children Schick

tested two years after immunization with three doses of toxoid, 98.8 per cent were Schick negative. He adds the very significant information that a Schick-negative reading is a rare finding in that district except following immunization or a history of diphtheria. In that rural community it is very unlikely that latent immunization played any part in the maintenance of that degree of immunity.

SUMMARY AND CONCLUSIONS

In a previous publication covering the period 1927-1930 it was shown that when the corrected rates of diphtheria obtaining in the controls (schoolmates) were applied to 16,829 children given three doses of toxoid in Toronto public schools, the expected cases numbered 222. There were actually 23 cases, a reduction of 90 per cent. There were no deaths in the 23 cases.

Later observations on this group and on 29,029 additional children given three doses of toxoid subsequent to 1929-1930 are reported here. For the whole period 1927-1932, instead of 460 cases, as estimated by applying the rates in controls, there were actually forty cases, a reduction of 91 per cent. In each year the reduction approximated this figure. To date no death from diphtheria has occurred in any of the 46,000 children given three doses of toxoid.

In dividing the data so as to follow the reduction of diphtheria in each year subsequent to immunization, there is some evidence that the reduction is greatest and therefore immunity greatest in the year of immunization, that in subsequent years there is a slight decline, but that immunity remains at a very high level, from 80 to 90 per cent, for at least four or five years.

The decline in diphtheria in the nonimmunized as well as immunized vitates comparisons of later data.

Diphtheria morbidity rates in Toronto had shown no definite decline over a period of thirty years. In 1926 and 1927 the mortality rates, quite typical of that period, were 16.2 and 20 per hundred thousand. Following the progress of immunization, diphtheria has fallen so that in 1934, in a city of 630,000 population, there were but eighteen cases and for a period of fifteen months there was not one death. In 4,516 swabs examined in 1934 from suspected cases, carriers and contacts, only twenty-eight, or 0.6 per cent, were positive. This change in diphtheria in Toronto suggests that reduction of cases in immunized children reduces the cases in the nonimmunized and that the control of cases controls also the infecting organism or its spread.

POSTSCRIPT—September 18, since this paper was written, a death occurred from diphtheria in a child 6½ years of age, who was given three doses of toxoid five years previously at 1 year of age.

ABSTRACT OF DISCUSSION

DR. M. P. RAVENEL, Columbia, Mo. The precipitated toxoid was made first by Glenny in England and was popularized in this country by the late Dr. Leon Havens of Alabama and carried on by Dr. Baker and others. I think I am right in saying that in America we think the use of toxoid is a little behind the times. We have used chiefly the alum precipitate. I have been trying to find out why the Connaught Laboratories do not approve of the alum precipitate, and why Canada continues to use the toxoid. I have asked Dr. McCoy of the National Institute of Health and other authorities, and nobody knows why Canada has adhered to the toxoid.

DR. N. E. McKINNON, Downsview, Ont. I tried to indicate that the reduction in diphtheria was comparable with the number of individuals showing one twenty-fifth unit of antitoxin per cubic centimeter of blood serum. Three doses of toxoid will give from 90 to 100 per cent immunity in those who get

one twenty-fifth unit of antitoxin. With the number of cases occurring in children, immunity is necessary. Nothing else is entirely satisfactory. I don't know of any other product or procedure that will give that degree of immunity. Of course we do get cases in children giving Schick negative reactions, and they are diphtheria. They have membrane, fever, malaise, sore throat, and, when we get swabs from them, they are causative and, when swabs are tested for virulence, they are positive, so they are diphtheria, and there is no question about the diagnosis of diphtheria in the immunized children giving negative Schick tests. While the Schick test is a good test, it isn't a final test of immunity, and we are aiming at getting that level of immunity and will not be satisfied with anything less. Does that answer the question?

DR. RAVENEL. I am asking why you don't use alum precipitate. It produces as good effects as multiple doses of toxoid, and I think that Dr. Baker can give figures of some 18,000 cases which will bear out my assertion.

DR. J. N. BAKER, Montgomery, Ala. Between 16,000 and 18,000 cases were reported more than a year ago.

DR. McKINNON. Three doses of toxoid give a higher level of antitoxin and a correspondingly greater reduction in diphtheria than do two doses. As some cases do occur after three doses of toxoid, it would not seem advisable to advocate any procedure which gives a lower level of antitoxin and, therefore, according to our data, a smaller reduction in diphtheria. One dose of alum precipitated toxoid gives a lower level of antitoxin than do three doses of unmodified toxoid. Schick tests may not reveal this difference, but it is readily apparent when blood titrations are done.

DR. D. T. FRASER, Toronto. The most critical comparison for assessing the antigenic value of diphtheria toxoid in man is to use one given lot or batch of toxoid, of which one portion was prepared as alum precipitate, the other portion unmodified. The number of flocculating units per cubic centimeter in each portion was adjusted so that they were equal, namely, twenty. These preparations were used on a homogeneous group from whom blood had been drawn and whose serum was shown initially to possess no detectable antitoxin (less than one five hundredth unit). Subsequent titrations of antitoxin were made at intervals, after injection of toxoid, to measure the response of each individual. The question as to whether one dose of alum precipitated toxoid will effectively protect against diphtheria can be determined only by an experience covering five or six years and then subjecting the data on immunization and subsequent diphtheria to a critical statistical analysis. Meanwhile, we have been interested in comparing only the response in antitoxin to one dose of alum precipitated toxoid with three doses of unmodified toxoid. Our groups at the present time are admittedly small: forty and thirty-five. In the one dose (alum toxoid) group, after ten weeks, twenty-five, or 62 per cent, had more than one one-hundredth unit, in the three dose (unmodified toxoid) group, ten weeks after the first dose, thirty-two, or 91 per cent, had more than one one-hundredth unit. After one year, in the former group, 19 per cent had more than one one-hundredth unit, in the latter group, 91 per cent. The individual titers in the one dose alum group were very much lower than were those in the three dose unmodified toxoid group. After one year, though individually the titers had dropped in both groups, none had dropped below one one-hundredth unit in the three dose group, whereas fifteen of the thirty-six tested had dropped below this figure in the one dose group. The choice of one one-hundredth unit per cubic centimeter of serum is somewhat arbitrary, but it is approximating the Schick level. Persons possessing one one-hundredth unit are Schick negative, those with less than one two hundred and fiftieth unit are Schick positive. We interpret our observations as indicating that one dose of alum is inferior to three doses of unmodified toxoid.

DR. BAKER. In 1931 and 1932 the director of the Alabama laboratory, Dr. L. C. Havens, carried out experimental work in trying to determine how the three-dose toxoid might be reduced to one dose and yet give the desired immunity, thereby simplifying the technique of immunization as well as the labor, in mass application of the immunizing agent. We worked on this clinically and steadily for over a year. The one-dose alum precipitated product was used in one county in

something like 1,000 cases. This study revealed about 95 per cent, at the end of a period of from three to six months, to be Schick negative. Shortly after this work in Alabama, Dr McGinnis of Virginia became interested in the possibilities inherent in the one dose product and conducted many series of studies, which were carefully checked, with the one dose toxoid, and with results even more conclusive than those procured in Alabama. At the 1934 meeting of the American Public Health Association the work done both in Virginia and in Alabama was submitted somewhat in detail. Also at the 1933 meeting of the American Public Health Association I submitted an outline of the work which had been done up to that time in Alabama, with the one-dose toxoid. Within the past two years many of the biological houses have been marketing this one dose product. Apparently there has not been uniformity of procedure in the preparation of these products, and as a consequence occasional untoward effects have resulted. It is felt by our laboratory workers in Alabama that a rigid adherence to the technic recommended by them would obviate such complications in a large measure and we have so advised. My feeling is that the one dose alum precipitated toxoid rests today on solid scientific and clinical ground and that it, or some modification of it, is here to stay.

DR N. E. McKINNON. One dose of alum precipitated toxoid is much better than one dose of unmodified toxoid, and, if under certain circumstances only one dose can be given, the alum toxoid should be used. Those using it should be aware however, that the resulting immunity is definitely less than that produced by three doses of unmodified toxoid.

DEMENTIA PARALYTICA AND TABES

A STUDY WITH REFERENCE TO PRECOCIOUS DEVELOPMENT

UDO J. WILE, M.D. DUNCAN O. POTH, M.D.
AND

BURTON F. BARNEY, M.D.

Professor of Dermatology and Syphilology, Instructor in Dermatology and Syphilology and Research Assistant in Dermatology and Syphilology respectively at the University of Michigan Medical School

ANN ARBOR, MICH.

The age distribution of patients with dementia paralytica and tabes dorsalis as observed in this clinic has afforded the basis for this study. A large number of cases have occurred under the age of 30 years in the group of dementia paralytica patients of all ages. This observation was commented on by Felix Plaut,¹ Josef Ladassohn,¹ L. M. Prutier¹ and Bruno Bloch¹ during their visits to this clinic. The age incidence was apparently much higher in their clinics in Europe, and the occurrence of dementia paralytica in acquired cases of syphilis in patients under 30 years of age was regarded by them as unusual.

It was thought important to compare this group of cases with a series of tabetic cases seen over exactly the same period and under the same conditions.

Accordingly, there are available for study over a period of eight years, from July 1925 to July 1933, 436 cases of dementia paralytica and 378 cases of tabes. Of this number, seventy-seven cases, or 18.3 per cent, occurred in dementia paralytica patients under 30 years of age, and twenty-one tabetic patients, or 5.5 per cent, fall in the group below 30 years of age. All the cases presented in this study were frank clinical examples of the two syndromes in which the diagnosis

was substantiated by typical changes in the spinal fluid. Cases of juvenile dementia paralytica and tabes were excluded from this study.

The entire group of patients presented herein represents 48.1 per cent of all patients in whom a diagnosis of neurosyphilis was made, 25.6 per cent of whom had dementia paralytica and 22.5 per cent tabes. This discrepancy is a fair indication of the ratio of frequency of these two divisions of neurosyphilis.

Dementia paralytica from acquired syphilis occurring in a young age group has been reported by Kirschbaum.² This observer records thirty-six cases of dementia paralytica in individuals under 30 years of age, representing from 3 to 4 per cent of his entire dementia paralytica material. He also found an average elapsed period of five years from the date of infection to the onset of symptoms in the young group. This figure corresponds to our own of 5.34 years for the same group. However, our age incidence in the younger group is six times as high as that recorded by Kirschbaum.

In seeking causative factors for the early occurrence of cortical degeneration in so young a group, Kirschbaum suggests poor protoplasm (constitution) and excessive indulgence in alcohol as contributing factors. In connection with the latter factor, it is interesting that our study entailing a much higher percentage of cases occurred during the period of national prohibition. While alcohol was clandestinely procurable during this period, we failed to find it a factor of major importance. Kirschbaum further states that therapy—good, indifferent or bad—was not a factor in the shortness of the period of latency. Another finding of interest in his study which is definitely borne out in our own is a greater degree of mental deterioration in the younger group than occurred with older dementia paralytica patients.

The age incidence of dementia paralytica at St. Peter State Hospital, St. Peter, Minn., was reported by Petersen.³ He reports an age variation of from 20 to 77 years in his cases and found a predominance of males in all decades except in the decade from 20 to 30. He reports 6 per cent of 179 cases of dementia paralytica as occurring under 30 years of age, which is one third as many as has been found in our series.

For purposes of comparison, the cases of dementia paralytica and tabes are divided into those under and those over 30 years of age. These two groups will hereafter be referred to as the younger and the older groups. These groups are compared with regard to the age, sex, occupation, nationality, duration of infection and previous treatment given the patient before the onset of symptoms. The mental changes encountered in the series of dementia paralytica patients and the symptomatology of the tabetic patients are commented on in both age groups.

AGE AND SEX

The age and sex distribution of the entire group of cases is shown in table 1. It is seen from this table that the majority of cases of dementia paralytica in both sexes occurred between the ages of 30 and 50 years, while the majority of tabetic cases occurred between 40 and 60. In dementia paralytica 18.3 per cent of the cases occurred under 30, compared with only 5.5 per cent of cases of tabes occurring under 30, whereas 16.3 per cent of cases of dementia paralytica

Studies and Contributions of the Department of Dermatology and Syphilology, University of Michigan Medical School, service of Dr. Udo J. Wile.

Read before the Section on Dermatology and Syphilology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.

¹ Personal communication to the authors.

² Kirschbaum, W. *Ztschr. f. d. ges. Neurol. u. Psychiat.* 137: 552-559 (Nov.) 1931.

³ Petersen, W. F. *Am. J. Syph. & Neurol.* 18: 75-91 (Jan.) 1934.

and 38.5 per cent of tabes occurred over the age of 50. It is at once apparent that the precocity of development is greater in dementia paralytica and the age onset of tabes is considerably higher than that of dementia paralytica. It is interesting to note that there were twice as many tabetic as compared to dementia paralytica patients over 50 years of age and that there were three times as many young dementia paralytica patients as

TABLE 1—Age and Sex Distribution in 436 Cases of Dementia Paralytica and 378 Cases of Tabes Dorsalis

| Age | Males | | Females | | Totals | |
|--------|---------------------|-------|---------------------|-------|---------------------|-------|
| | Dementia Paralytica | Tabes | Dementia Paralytica | Tabes | Dementia Paralytica | Tabes |
| 10-20 | 0 | 0 | 4 | 0 | 4 | 0 |
| 20-30 | 51 | 10 | 22 | 5 | 73 | 21 |
| 30-40 | 103 | 79 | 20 | 16 | 123 | 95 |
| 40-50 | 143 | 100 | 28 | 18 | 163 | 118 |
| 50-60 | 43 | 90 | 16 | 15 | 59 | 105 |
| 60-70 | 12 | 28 | 2 | 0 | 14 | 31 |
| 70-80 | 0 | 2 | 0 | 1 | 0 | 3 |
| Totals | 344 | 314 | 92 | 64 | 436 | 378 |
| | | | | | 814 | |

there were young tabetic patients. With the average duration of the infection found to be practically the same (15.6 years for dementia paralytica and 16.8 years for tabes), this finding appears to be significant. It perhaps indicates a greater longevity for patients with tabes.

In the analysis of sex, a predominance of males is found in all groups. The ratio for the entire group of dementia paralytica is 3.7:1, while in tabes it is higher, being 5:1. This ratio is distinctly altered in the younger group, in which a ratio of 2:1 in dementia paralytica and 3:1 in tabetic patients was found. The ratio of the older group does not differ so markedly that of dementia paralytica being 4.4:1 and tabes being 5:1.

The age and sex distribution of the younger groups is shown in table 2.

The average age of the young dementia paralytica patient was 26.1 years, of the young tabetic, 27 years. It is noteworthy that, while four patients with dementia paralytica were under the age of 20 and seventeen were from 20 to 25 years of age, no tabetic patient was seen below the age of 22 years and only five between the ages of 22 and 25.

Of outstanding importance in the analysis of sex is that all four patients with dementia paralytica under 20 were women and that there were six women in the seventeen patients between 20 and 25 years of age. In tabes, the youngest patient seen was a woman, aged 22. Only four other patients were seen below the age of 26, all of them being men. The occurrence of a higher percentage of females in the younger group of dementia paralytica as compared to the older group concurs with the observations of Petersen.⁴ From these statistics it can be seen that dementia paralytica affects the female sex in greater proportion than does tabes, thus bearing out the observations in "Cooperative Clinical Studies in the Treatment of Syphilis",⁴ i. e., the female bears a greater immunity to tabes than to dementia paralytica. However, it is significant that in both dementia paralytica and tabes a proportionately

greater number of females appeared in the younger group than in the older. Sex, therefore, appears to constitute a predisposing factor in our younger group.

OCCUPATION AND NATIONALITY

In searching to find further predisposing causes, the occupation, intellectual background, nationality and race of the individual were studied in the younger groups and compared to the same factors in the older groups.

An analysis of the occupations of all dementia paralytica and tabetic patients revealed no essential differences. No data were available to account for either the youthfulness of the patient or the precocity of development of the neurosyphilis. For this reason, this factor will be studied collectively in the two age groups of both dementia paralytica and tabetic patients.

It has been the consensus of most syphilographers and psychiatrists that dementia paralytica affects a considerably greater percentage of the educated strata of society than does tabes. Of particular interest in our series of cases was the predominance of the non professional class in both dementia paralytica and tabes. This class constituted 65.58 per cent of all dementia paralytica and 70.4 per cent of all the tabetic patients. Only 4.5 per cent of all dementia paralytica patients and 3.5 per cent of all tabetic patients were of the professional class. The remaining percentages in both dementia paralytica and tabetic patients were about equally divided between housewives and individuals with no given occupation.

From this study it seems that occupation and intellectual background apparently play no important role in the occurrence of dementia paralytica or tabes. McKinlay,⁵ in a survey of dementia paralytica and tabes, found that the laboring class is the greatest affected in both diseases and that the intelligence quotient does not necessarily predispose to either.

Comparative study of the nationalities of the two age groups of dementia paralytica reveals a distinct difference. In the older groups, 20 per cent of dementia

TABLE 2—Age and Sex Distribution in Younger Groups of Dementia Paralytica and Tabetic Patients

| Age | Males | | Females | |
|--------|---------------------|-------|---------------------|-------|
| | Dementia Paralytica | Tabes | Dementia Paralytica | Tabes |
| 16 | 0 | 0 | 1 | 0 |
| 17 | 0 | 0 | 1 | 0 |
| 18 | 0 | 0 | 0 | 0 |
| 19 | 0 | 0 | 2 | 0 |
| 20 | 1 | 0 | 1 | 0 |
| 21 | 1 | 0 | 0 | 0 |
| 22 | 3 | 0 | 0 | 1 |
| 23 | 2 | 0 | 1 | 0 |
| 24 | 1 | 1 | 2 | 0 |
| 25 | 3 | 3 | 2 | 1 |
| 26 | 7 | 4 | 4 | 1 |
| 27 | 10 | 0 | 4 | 1 |
| 28 | 9 | 1 | 4 | 1 |
| 29 | 14 | 7 | — | — |
| Totals | 61 | 16 | 26 | 6 |

paralytica and 29.7 per cent of tabetic patients were foreign born. By contrast, in the younger groups, 3.8 per cent of dementia paralytica and 28.5 per cent of tabetic patients were not natives of this country. Summed up, therefore, a larger percentage of tabetic patients than of dementia paralytica patients were foreigners, foreign predominance being even more marked in the younger group.

Data as to the source of the infection, whether foreign or native, were not available. The foreign-born dementia paralytica patients represent twenty-one dif-

⁴ Clark, Tahaferro, Parran, Thomas, Jr., Cole, H. N., Moore, J. E., O'Leary, P. A., Stokes, J. H., and Wile, U. J., Cooperative Clinical Studies in the Treatment of Syphilis, Ven. Dis. Inform. 13: 135 (April 20) 1932. Stokes, J. H., Cole, H. N., Moore, J. E., O'Leary, P. A., Wile, U. J., Clark, Tahaferro, Parran, Thomas, Jr., and Usilton, Lida, J. ibid. 13: 165 (May 20) 207 (June 20) 253 (July 20) 1932.

⁵ McKinlay, P. L., J. Hyg. 28: 394-417 (Feb.) 1929.

ferent nationalities, and twenty-four nationalities are represented in the tabetic group. A possible significant feature, however, is that one third of the foreign group of dementia paralytica patients were native Greeks and Italians, while only one seventh of the similar group of tabetic patients were of these races.

It appears, therefore, from the data presented from the comparative study of the two age groups that dementia paralytica developed earlier in native-born patients than in those of foreign extraction, while this was not found to hold true for tabes. Conversely, it appears from this study that foreigners are more susceptible to cord involvement than to cortical involvement.

DURATION OF THE INFECTION

The presence of mental deterioration in the first examination of patients with dementia paralytica leaves the history of infection for the most part in obscurity. In a number of other cases in which a history could have been given, the infection, as so frequently happens, was an occult one and knowledge of the infection was denied. However, since mental deterioration is not part of the tabetic syndrome, a larger number of tabetic patients with accurate histories of infection might be expected. The accuracy of history is brought out in the following figures. Forty-four per cent of dementia paralytica in contrast to 55 per cent of tabetic patients of the older group knew of early manifestations. An accurate history of infection was determined in 33 per cent of the younger dementia paralytica patients and in 42 per cent of the corresponding group of tabetic patients.

The elapsed time between the date of the infection and the onset of symptoms in the older group of dementia paralytica patients varied from two to forty-two years and averaged 15.6 years. The corresponding latent period in a similar group of tabetic patients varied from one to forty-nine years and averaged 16.8 years. An onset of symptoms within five years after infection was found in thirteen dementia paralytica and fourteen tabetic patients of the older groups. It is apparent from these figures that we are dealing with a certain group of older patients who show a precocious onset of symptoms. This finding, however, does not bear on the development of dementia paralytica or tabes so far as the youthfulness of the patient is concerned.

The elapsed time between the date of the infection and the onset of symptoms in the younger group with dementia paralytica varied from six months to thirteen years and averaged 5.34 years, while in the young tabetic group it varied from two to eleven years and averaged 6.01 years. The elapsed time in the younger group with dementia paralytica is one third as long as in the older group, while it was only slightly less than one third in tabes.

One of us (U. J. W.) in his personal experience has seen dementia paralytica develop within the first year after infection and result in death established at autopsy within two years. Kirschbaum² found no cases with an elapsed time of less than three years in his series of cases. The patient in our study with an elapsed time of six months had clinical dementia paralytica. He was given six intravenous injections of arsphenamine (elsewhere) within the first six weeks of the infection. When he presented himself at this clinic six months after the infection, spinal fluid changes substantiating the clinical diagnosis of dementia paralytica were found. In addition, he was slightly deteriorated mentally. This patient was kept under

observation for ten months while receiving treatment. The spinal fluid changes remained abnormal and there was no improvement in the mental status of the patient.

Because of the youthfulness of the patient and the precocity of onset, the following case report is given. Difficulty in walking and a sensation of numbness brought the youngest tabetic patient to the clinic. The duration of his infection was two years. Examination revealed round, equal and reactive pupils, loss of lower reflexes and a typical ataxic gait. The serologic reaction of the blood was positive, and examination of the spinal fluid substantiated the clinical diagnosis. During the first two years following infection the patient received 100 mercury rubs and about 500 Gm of potassium iodide elsewhere. While under treatment at this clinic he received twelve intravenous arsphenamine, four tryparsamide and forty-eight bismuth salicylate injections and twelve malarial paroxysms. When last seen the patient was subjectively improved, having only occasional pains in the legs. Examination, however, after this lapse of time and treatment showed Argyll Robertson pupils, absent lower reflexes, swaying in the Romberg position, early optic atrophy, and an essentially normal spinal fluid.

In reviewing the entire group of both older and younger patients it was found that one dementia paralytica patient out of every five as contrasted with one tabetic patient out of every eleven showed a precocious onset of symptoms. With regard to the age distribution, dementia paralytica developed in one patient out of 56 of the entire group before the third decade, while only one tabetic case out of eighteen of the entire group occurred under 30 years of age. Comparison of these data reveals a striking difference, showing the precocity of development of dementia paralytica to be much greater than that of tabes.

PREVIOUS TREATMENT

With regard to previous treatment as bearing on the protection of the individual against the development of dementia paralytica and tabes, there are available for study 160 cases in the older age group of dementia paralytica and 196 cases in the corresponding tabetic group. As previously stated, the date of the infection was noted in all these cases. The type of treatment and the time at which the treatment was administered in relation to the age of the syphilis have been analyzed.

It was brought out by Moore and his associates⁴ that the development of neurosyphilis was more frequent in those patients receiving poor treatment than in those who received no treatment. As bearing remotely on this, our patients, both dementia paralytica and tabetic, who received poor therapy following infection developed neurosyphilis sooner than those who had received no previous treatment.

In "Cooperative Clinical Studies in the Treatment of Syphilis," it was found⁴ that the progression of neurosyphilis was much greater in patients receiving poor treatment than in those who received relatively good therapy. The protection afforded by adequate previous treatment, however, is demonstrated by the fact that only two dementia paralytica patients of the entire 160 and only four tabetic patients of 196 received adequate previous treatment. The remaining patients received poor, irregular or no treatment. The last figure bears out the view that inadequate or no treatment is a predisposing factor in the development of dementia paralytica and tabes.

In the younger group there are only twenty-six dementia paralytica and ten tabetic patients giving his-

tories of infection. These cases are so few as to render statistics unreliable. However, the percentage of cases in both younger groups receiving inadequate or no treatment was essentially the same as in the older group, thus bearing out the previous observations.

COMMENT

The incidence of marked mental deterioration in the younger group of dementia paralytica patients was higher than in the older group and, furthermore, the degree of deterioration was much more marked. Thirty-five, or almost one half of the patients in the younger group, showed varying degrees of deterioration at the first examination. This compares with but 32.2 per cent of the older group that were mentally deteriorated. These observations would not tend to corroborate those of Caldwell⁶ who states that the prognosis in the younger dementia paralytica patients is better than in the older ones.

The mental changes noted particularly in the younger group were the early onset of dysarthria, disorientation, euphoria and at times irritability. Factors that affect the neuropsychiatric condition of the individual, such as accidents and economic losses, appeared to precipitate the onset of symptoms.

There was no essential difference noted in the severity of tabes between the younger and older groups, i. e., age does not seem to be a factor in the severity of the disease.

CONCLUSIONS

1 In 436 cases of dementia paralytica and 378 cases of tabes studied with special reference to precocious development, the onset of symptoms occurred earlier in dementia paralytica than in tabes.

2 Dementia paralytica occurred more frequently in females than did tabes.

3 Of four patients in whom the dementia paralytica syndrome occurred before the twentieth year, all were women.

4 Occupation and intellectual background played no important role in the occurrence of dementia paralytica and tabes in this series.

5 Tabes occurred more frequently than dementia paralytica in the foreign born in this study.

6 Precocity of onset was found more frequently in dementia paralytica than in tabes.

7 As has been shown for neurosyphilis in general, the absence or inadequacy of treatment was a predominant factor in the precocious development of both dementia paralytica and tabes.

8 In the young group, severity of symptoms seemed more marked in dementia paralytica than in tabes.

ABSTRACT OF DISCUSSION

DR. A. BENSON CANNON, New York. I am impressed with the great number of cases of dementia paralytica and tabes that have been treated in this comparatively small community. In the hospitals with which I am associated in New York we find that there is a definite decrease in the number of cases with neurosyphilis, especially with cases of dementia paralytica and tabes. Only a few days ago, one of the attendants at the New York Neurological Institute spoke of the difficulty of getting a sufficient number of cases of tabes and dementia paralytica to demonstrate to the students. In recent years, neurologists have found it necessary to specialize in vascular diseases of the nervous system because of the scarcity of cases of neurosyphilis. The age distribution of dementia paralytica and tabes in the cases of Drs. Wile, Poth and Barnev is unusual. In studying the number of cases admitted to the Vanderbilt Clinic

and City Hospital for the past three years and combining these figures with those from the Neurological Institute for the past five years, we find 528 cases of dementia paralytica and tabes combined. Of this number we have about 299 cases of tabes, sixty-six of which were in women. There were 229 cases of dementia paralytica and only forty-one of these were in women. There was only one patient less than 21 years of age and that was a girl having dementia paralytica. In going over the records of our cases of dementia paralytica we had to change many of the diagnoses because of the patients' recovery. We have records of many cases showing typical dementia paralytica symptoms both clinically and serologically, diagnosed as dementia paralytica by competent neurologists. Some of these patients had even been confined in institutions, yet under adequate treatment they became clinically and serologically cured and have remained so for from seven to eight years. I feel that it is impossible sometimes to distinguish between dementia paralytica and meningovascular syphilis, and the results of the tests of the spinal fluid do not aid us in making the differentiation. A dementia paralytica curve means only that and does not necessarily signify that the patient has dementia paralytica. I also think that acute cerebrospinal meningitis of the basilar type is often hard to distinguish from dementia paralytica. Our own observations are in agreement with the authors', that is, our patients with tabes and dementia paralytica either had no previous treatment or else inadequate medication and I thoroughly believe with him that, if all patients with early syphilis had the proper standard treatment in the beginning there would be few or no patients with neurosyphilis.

DR. UDO J. WILE, Ann Arbor, Mich. The figures brought out in this study are a little difficult to understand if one has a rigid picture of the natural history of syphilis. However, if one takes a broad biologic view of syphilis as a disease constantly changing like other chronic infections these figures are not so difficult to understand. Most of us are educated in medicine with the concept that neurosyphilitic cases of the parenchymatous types are always late sequels of the disease. This has come down to us more or less as a tradition based on the facts and the character of syphilis as it existed two or three decades ago. Those of us who are able to make careful hospital study, together with the autopsies of syphilitic material have seen this disease gradually modifying its picture, and it is safe to predict that the next two or three decades will see the disease changing in its manifestations from the present-day picture. The material in this study establishes the fact that severe parenchymatous disease of the brain occurs not infrequently early in syphilis contrary to the generally accepted belief that it is always a late sequel. The differences established in point of time between the onset of tabes and dementia paralytica are not difficult to understand. While we generally place these two conditions more or less together, it is nevertheless a fact that they are distinctly different processes. In dementia paralytica we are dealing with a frank syphilitic encephalitis with many organisms and with active syphilomas and late degeneration, while in tabes the process is a simple degenerative one and in well established cases little residual syphiloma is present and few, if any organisms. The rapid onset of dementia paralytica and tabes as established in this paper leads to interesting speculation. It cannot be due, at least in this group, to the influence of arsphenamine or in any way connected with arsphenamine therapy, as the majority of patients here concerned had little or no treatment. If precocity of development is a new phenomenon in neurosyphilitic incidence, it may be explainable on the basis of a change in the natural history of the disease, always a possible factor in any morbid process, or it may be due to the stress and strain of life incident to the present period. These two factors may, of course, be concerned. At any rate we feel certain that under existing conditions severe neurosyphilitic accidents exemplified in dementia paralytica and tabes occur much earlier in the course of the disease than is generally known and accepted as fact.

DR. S. B. HADDEN, Philadelphia. We are engaged on a similar review of cases in the special clinic for the treatment of neurosyphilis at the Philadelphia Hospital—a series of slightly more than 1500—and I can appreciate the hours that

the authors have spent on this problem. Although our conclusions are far from being drawn, we have proceeded far enough in the work to have formed several opinions, which are in accordance with those of Dr Wile and his co-workers. It has been an observation in the department for a long time that the age of onset in dementia paralytica is much earlier than in tabes, and I agree with the reasons given for this by Dr Wile. In reviewing this group we have noted another factor that enters into the late age incidence of the tabetic patient. The tabetic patients represent a relatively untreated group. The dementia paralytica patients have received considerably more treatment. In the two groups, the onset has been premature in the patients who have received inadequate treatment before the development of secondary eruptions. We feel that the syphiloderm stimulates a mechanism that protects the central nervous system. A review of the admissions of dementia paralytica patients in two five year groups 1914 to 1919 and 1924 to 1929 has shown an increase of 549 per cent. These periods are used because routine spinal fluid examinations were made in practically all cases. We have noted in recent years a remarkable reduction in the incidence of aneurysm not only in the neuropsychiatric division but in the medical division as well. While aneurysm has been definitely decreasing in its frequency since the introduction of the arsphenamines, our admissions of dementia paralytica and tabes patients are steadily increasing. Inadequate treatment may be the answer.

DR. DUNCAN O. POTTER, Ann Arbor, Mich. The group of cases presented in the study occurred over an eight-year period. When these cases were called for from the record room we were presented with more than 1200 records of cases in which the diagnosis of dementia paralytica had been made. Out of this group we accepted 436 in which we feel that the diagnosis of dementia paralytica was clear and concise.

THE DEVELOPMENT OF THE THERAPEUTIC USE OF FORCED PERIVASCULAR (SPINAL) DRAINAGE

GEORGE M. RETAN, M.D.
SYRACUSE, N. Y.

In 1931 I published an article on the treatment of infections of the central nervous system by forced spinal drainage, describing cases of poliomyelitis, acute encephalitis, septic meningitis and syphilitic meningitis. These cases were treated by spinal drainage coincident with the intravenous injection of hypotonic solution. These were the first cases treated by this method to be described in the medical literature.

The term "forced spinal drainage" has led to some misconception as to the essential factor involved in this treatment. The term suggests that drainage of the spinal fluid is essential. If this were true, the amount of spinal fluid produced in a certain case would have some relation to the therapeutic result. This has not occurred. I have therefore suggested the term "forced perivascular drainage," to emphasize better one of the chief factors.

THE PHYSIOLOGIC BASIS OF THE TREATMENT

Starling¹ in 1909 published his studies on the formation of lymph. The essential facts as related to this subject are as follows:

Osmotic equilibrium between the blood stream and the pericellular fluid spaces of the body is maintained by the action of the nondiffusible colloids of the blood

and the crystalloids. Outside of the capillary wall the crystalloids are more concentrated than are the crystalloids of the blood stream, tending to balance the action of the nondiffusible colloids. Fluid movement through the capillary wall is therefore mainly produced by the increased blood pressure exerted in the arterial capillary. Passing through the arterial capillary to the venous side, the nondiffusible colloids are able to pull fluid into the venous capillary.

Water of metabolism, the breaking up of particles into smaller molecules, thereby multiplying their osmotic force, and certain electrical charges also influence this force.

Weed and McKibben² in 1919 found that the injection of hypotonic solutions into the blood stream of animals produced hydration of the perivascular fluid spaces in the brain and cord and widening of the perivascular fluid pathways.

In 1928 Kubie³ further demonstrated that, if a needle is introduced into the subarachnoid space and the cerebrospinal fluid allowed to drain, no hydration of the brain or spinal cord results either in gross or in microscopic sections.

DEVELOPMENT OF THE APPLICATION OF THESE PRINCIPLES

Spurling⁴ in 1928 published a report on eight cases of infections of the central nervous system in which he performed a lumbar laminectomy and gave quantities of water by mouth. He described the treatment in three cases of septic meningitis and one case of poliomyelitis with bulbar involvement.

In 1930 Freemont-Smith⁵ reported a group of cases of multiple sclerosis treated by continuous drainage coincident with the ingestion of quantities of water by mouth. As a part of the treatment he injected pitressin at intervals.

In 1930 Casten⁶ reported a case of trypanamide amblyopia, treated by a two hour drainage of cerebrospinal fluid and 2 liters of water by mouth. He gave 50 cc of doubly distilled sterile water intravenously and one ampule of solution of pituitary. The patient was improved.

The results of clinical research of this character are difficult of interpretation. The history of human immune serum in the treatment of preparalytic poliomyelitis illustrates this. The two diseases best adapted to a study of this kind are Sydenham's chorea and poliomyelitis in the monkey. In chorea marked and spontaneous improvement rarely occurs from one day to another, and modification of this disease by treatment is significant. In experimentally produced poliomyelitis, by employing intracerebral inoculations of virulent virus, a disease can be produced that will cause complete skeletal paralysis and death in all inoculated animals. Modification of the disease thus produced might lead to more accurate interpretation. Results can be compared with untreated controls.

In developing this treatment my aim has been to study the therapeutic effect of certain phases and factors involved, in the hope of determining the type of procedure that will produce the best therapeutic results.

² Weed, L. H. and McKibben, P. S. *Am J Physiol* 48: 512, 531 (May) 1919.

³ Kubie, L. S. *Brain* 51: 244 (June) 1928.

⁴ Spurling, R. G. *Kentucky M J* 26: 242 (May) 1928.

⁵ Freemont-Smith, Frank, Putnam, T. J. and Cobb, Stanley. *Forced Drainage of the Central Nervous System*. *Arch Neurol & Psychiat* 23: 219 (Feb.) 1930.

⁶ Casten, Virgil. *New England J Med* 202: 676 (April 3) 1930.

Read before the Section on Pediatrics at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

¹ Starling, E. H. *The Fluids of the Body*, London: Constable & Co. Ltd. 1909.

Certain factors are controllable, others uncontrollable
The controllable factors are

- 1 Concentration of salt in the intravenous solution
- 2 Rate of injection per pound hour
- 3 Length of time of the injection
- 4 Interval between treatments
- 5 Blood volume
- 6 Possible use of the hydration factor
- 7 Use of pitressin or solution of pituitary

The uncontrollable factors are

- 1 The existence of inflammatory tissue within the central nervous system
- 2 The existence of inflammatory tissue outside the central nervous system
- 3 Kidney function
- 4 Cardiac reserve strength
- 5 Vascular tone

CONCENTRATION OF SALT SOLUTION

The degree of change in the osmotic pressure produced by the intravenous injection would depend on the concentration of the salt solution and the rate of injection. The maximum effect would be obtained by a salt solution just above the point at which hemolysis of red cells would be produced. All my earlier work was done with 0.45 per cent sodium chloride, and I did not lower the salt percentage because I was obtaining good clinical results. A case of chorea that did not improve after two treatments with 0.45 per cent sodium chloride showed definite improvement when 0.375 per cent sodium chloride was given. Since that time I have mostly used this solution. I have been in the habit of testing the fragility of the red cells. This is not necessary, as the osmotic pressure of the blood stream is not lowered to the point represented by 0.375 per cent sodium chloride. I have failed to find any evidence of hemolysis in the cases tested. In a few cases in human beings I have used a 0.35 per cent solution but have never gone below this concentration.

Monkeys with poliomyelitis have not recovered when treated with 0.45 per cent sodium chloride, although several have recovered when 0.375 per cent sodium chloride was used. In one monkey in which we used a 0.35 per cent solution my associates and I found evidence of hemolysis of the red cells. However, this solution was given at too rapid a rate. At the present time we are doing all our poliomyelitis research in monkeys with 0.375 per cent sodium chloride. I believe that more experimental work needs to be done before it is known just what solution is best.

RATE OF INJECTION PER POUND HOUR

It would be desirable to determine the amount of hypotonic solution per pound of body weight to be injected each hour. The approach to this problem lies, first, in the effect of the rate of injection on blood volume, and, of greater importance, in the study of the therapeutic result. The latter offers difficulties. The movement of fluid within the body during the injection of massive doses of hypotonic solution varies a great deal in individuals and also in the same individual at different times. Monkeys treated with intravenous rates of less than 9 cc per pound hour have not recovered. However, monkeys in which injections averaging from 9 to 11 cc per pound hour, with 0.375 per cent sodium chloride have been used have recovered without paralysis. The blood volume has not been greatly increased during an eight hour injection of 0.375 per cent sodium chloride given at this average rate. This, however, cannot be exactly translated to human beings.

For example, I do not believe that one could safely give a 100 pound (45.4 Kg.) person 1 liter an hour for an eight hour period. The rate of injection per hour also depends on the number of hours that the injection is to be given. I have given a baby with acute encephalitis a four hour treatment at an average rate of 19 cc per pound. The blood volume as estimated by the erythrocyte count during the injection was not increased to any extent (table I). While body weight may be used as a guide, I believe that an exact mathematical ratio cannot be given. The condition of the cardiovascular and renal systems must be considered as well as the clinical behavior of the patient during treatment.

HYDRATION FACTOR

During the treatment in my early cases I was in constant fear of producing a serious state of hydration of the brain. This fear dictated a type of treatment in which varying amounts of spinal fluid were drained both before and after the introduction of the hypotonic solution. Experience has shown that this procedure was incorrect according to the present conceptions.

At that time it seemed necessary to reduce the pressure of the cerebrospinal fluid by drainage until it approached atmospheric pressure, thus preventing any interference with drainage of fluid from the perivascular spaces.

A properly conducted forced perivascular drainage will allow withdrawal of as little spinal fluid as is necessary for laboratory procedure, allowing no more fluid to escape until after the beginning of the injection of hypotonic solution. The spinal fluid can then be allowed to drain and, on completion of the intravenous injection, the spinal needle should be immediately withdrawn. This procedure will largely prevent headache and vomiting, I believe that in this way one can control the only dangerous accident, cerebellar herniation.

The curative effect of this treatment seems to be due to certain fluid movements through the tissues of the central nervous system, movements not constant in all cases treated or during different periods in the same case. Possibly the production of a certain amount of hydration of the tissues of the central nervous system is therapeutic. In testing this factor a monkey with poliomyelitis was given eleven eight hour treatments, with four hour rest periods, 0.375 per cent sodium chloride was injected into the vein continuously at the rate of about 10 cc per pound hour. During each treatment the subarachnoid space was closed except as 1 cc. of spinal fluid was removed at the beginning and the end of each period for cell study. This animal recovered without paralysis.

We have given thirty-three such treatments and during these periods the animals have seemed to be comfortable. They have never vomited and, except for short periods when they showed nervous irritability, they have eaten and behaved in a manner in nowise different from animals similarly treated with the spinal fluid draining.

I am cautious in using this factor in the treatment of human beings and have limited any closed period to half an hour. Spinal fluid pressure studies have shown considerable variation during the intravenous injection of 0.375 per cent sodium chloride. Apparently the production of a moderate amount of hydration of the brain and cord is in no way harmful, but before this principle is used to any extent in the treatment of human disease more research should be done.

THE EFFECT OF INTRAVENOUS HYPOTONIC SOLUTION
ON INFLAMMATORY TISSUE

In 1932 I⁷ was able to show that, when a hypotonic solution was injected intravenously, the fluid movement from the blood stream was greatest in inflamed tissues of the body. In cases of inflammation of the lungs or bronchi an acute edema of the lungs will develop almost as soon as the intravenous injection is begun. This has

TABLE 1—Case of Encephalitis in Baby Treated by Intravenous
Drip in Which Moderate Generalized Edema Devel-
oped, Blood Volume Only Slightly Increased

R. P., aged 4 months, weight 14 pounds 12 ounces, Feb. 14, 1933.
Cerebrospinal fluid: 7 cells, 6 lymphocytes, 1 polymorphonuclear leuko-
cyte, chlorides 730 mg, red blood cells 4,700,000

| Time | Cumulative Totals Intravenous Drip Cc | Interval Amount Cerebrospinal Fluid Cc | Count of Cells | Red Blood Cells Millions | Chlorides Mg per 100 Cc | Sugar Mg | Temperature F | Pulse | Respiration | Urine Cc |
|--------|---|--|----------------|-----------------------------|----------------------------|----------|---------------|-------|-------------|-------------------|
| 10 30 | | 10 | 7 | 4.7 | 730 | | 99.6 | 100 | 36 | |
| 11 00 | | | | 4.1 | | | | | | 5 |
| 11 35 | 230 | 6 | 4 | | 830 | 66 | 99 | 100 | 30 | |
| 12 10 | | | | 3.5 | | | | | | 40 |
| 12 35 | 500 | | | | | | | | | |
| 1 00 | | | | 3.0 | | | 99 | 140 | 36 | |
| 1 35 | 750 | 2 | 17 | | | | 99 | 140 | 36 | |
| 2 00 | | | | 3.7 | | | | | | |
| 2 10 | | | | | | | | | | 120 |
| 2 35 | 1,110 | 22 | 11 | | 760 | 66 | | | | (edema) |
| 3 00 | | | | 3.0 | | | | | | |
| 3 10 | | | | | | | | | | 60 |
| 3 35 | 1,360 | 10 | 9 | | | | 98 | 160 | 36 | |
| 4 00 | | | | 4.2 | 770 | | | | | (edema increased) |
| 4 35 | 1,560 | 20 | | | 720 | | | | | |
| 5 00 | 1,850 | 7 | 10 | 4.43 | | | | | | 70 |
| 6 00 | 2,050 | 10 | | 4.43 | | | 98.2 | 140 | 36 | |
| 7 hr | | | | | | | | | | |
| 23 min | 2,060 | 87 | | | | | | | | 350 |

Solution 0.35 per cent sodium chloride given at average of 18.8 cc per
pound hour

occurred in several cases of bronchitis associated with infections of the central nervous system and in one case of tuberculosis in a tabetic patient, also several times in monkeys with poliomyelitis that were suffering from pulmonary tuberculosis. In fact, two of these animals died of pulmonary edema.

In cases of pyuria a copious excretion of urine is found during treatment, with coincident lessening of the flow of spinal fluid. Hypodermic injections of pitressin in an effort to reduce the urinary output in these cases have achieved questionable success. In one human case and one in the monkey in which acute colitis was present, quantities of water were excreted from the colon. In the case of the monkey the excretion from the bowel nearly ceased in the interval between treatments, beginning again promptly on resumption of the intravenous injection. As a result, no spinal fluid was obtained during an eight hour treatment period (table 2). In one case of chorea in which there was an active endocarditis, two treatments were given without improvement, but a slight increase was noted in the patient's blood volume, which was checked at hourly intervals.

In one monkey with an inflammatory condition of the skin of the feet, large blisters were produced on the feet by the intravenous injection. These became progressively greater as the intravenous injection proceeded. Finally, during the active stage of poliomyelitis in the monkey we found the flow of spinal fluid greater than in the normal animal.

⁷ Retan, G. M. Forced Spinal Drainage in Its Relation to Infections of the Central Nervous System. J. A. M. A. 99: 826 (Sept. 3) 1932

Inflammatory disease of the lungs, bronchi, kidneys or heart often contraindicates treatment. Inflammation of the colon will interfere with any clinical improvement that might otherwise be obtained.

CEREBELLAR HERNIATION

I believe that properly conducted forced perivascular drainage is a safe procedure and that cerebellar herniation, the only substantial danger, can be recognized early and prevented. In 130 treatments I have met this condition only twice.

My first encounter with cerebellar herniation occurred after I had been working with this method for two and a half years.

A girl aged 9 years, developed chorea during convalescence from acute rheumatic fever and was treated ten days after its beginning. No breakfast or fluids were given, 30 cc. of spinal fluid was collected for some special laboratory tests, and 3,000 cc. of 0.45 per cent sodium chloride was injected during a four hour period. The patient vomited six times during this treatment. No occipital or suboccipital headache was complained of. The pulse rate continued around 120, respirations at 28, showing very little change during the treatment, in fact, the only untoward event was the vomiting.

TABLE 2—Experiment to Show Effect on Drainage of Spinal
Fluid with Inflammatory Tissue Existing in Colon

Monkey 39, weight 3.68 Kg, March 26, 1935. Inoculated 1 cc 140 dflu
from Rockefeller Institute and Brodie mixed virus intracerebrally

| Time | Fluid Amount Intravenous Drip Cc | Cerebrospinal Fluid Cc. | Cell Count Differential | | | | | Urine Cc. | Med | |
|--|--|----------------------------|-------------------------|-------------------------|---------------------------------|--------------------------|---|-----------|-------|--|
| | | | Cells | Leukocytes, per Cent | Large Lympho- cytes per Cent | Mononuclears per Cent | Polymorphonu- clear Leukocytes per Cent | | | |
| First Treatment (April 1 1935) | | | | | | | | | | |
| 9 20 p.m | Started | | | | | | | | | |
| 9 40 | puncture | | 501 | 73 | 19 | 8 | 0.5 | 12 | 1/8 p | |
| 10 25 | 54 | | | | | | | 65 | | |
| 11 25 | 91 | 0.2 (bl) | | | | | | | | |
| 12 25 a.m | 76 | 1.4 | 183 | 89 | | 4 | 7 | 8 | | |
| 1 20 | 60 | 0.5 | | | | | | 18 | | |
| 3 20 | 83 | 0.4 | 116 | 89 | 2 | 0 | 3 | 24 | | |
| 4 25 | 77 | 0 | | | | | | 27 | 1/8 p | |
| 6 20 | 21 | 0 | | | | | | 49 | | |
| 8 hrs | 462 | 2.4 | | | | | | 126 | | |
| Solution 0.375 per cent sodium chloride | | | | | | | | | | |
| Fluid movement diverted from central nervous system to colon | | | | | | | | | | |
| During four hour interval between treatments small amount of water excreted from the bowel at intervals of about one hour | | | | | | | | | | |
| Second Treatment (April 2 1935) | | | | | | | | | | |
| 9 20 a.m | Started | | | | | | | | 1/8 p | |
| 10 20 | 100 | 0 | | | | | | 44 | 1/8 p | |
| 11 20 | 100 | 0 | | | | | | 5 | | |
| 12 20 p.m | 83 | 0 | | | | | | 20 | | |
| 1 20 | 105 | 0 | | | | | | 15 | | |
| 2 20 | 60 | 0 | | | | | | 29 | | |
| 3 20 | 62 | 0 | | | | | | 9 | 1/8 p | |
| 4 20 | 51 | 0 | | | | | | 7 | | |
| 5 20 | 37 | 0 | | | | | | 0 | | |
| 8 hrs | 568 | 0 | | | | | | 133 | | |

Solution 0.375 per cent sodium chloride. Fur ruffled.
Watery discharge from colon followed within five minutes of the
beginning of the intravenous drip and continued through the eight hour
period of treatment. Note lack of cerebrospinal fluid production from
the beginning of the diarrhea.

After the completion of the intravenous injection the spinal fluid was allowed to drip for an hour and a half. Five minutes after the completion of the drainage severe generalized convulsions developed, with tremors over the whole body. The arms and legs were rigid. There was deep cyanosis. The temperature rose to 97 F., and the pulse was weak, irregular and rapid. The convulsions were controlled by ether inhalations, following which carbon dioxide and oxygen were given. The patient's condition was improved. The spinal fluid pres-

sure was found to be 4 mm. of mercury. Clonus could be easily produced at the ankles and fingers and seemed inexhaustible.

Four hours later there was a second, less severe, convulsion and a slight convulsion a half hour after this. The pulse was 126 and respirations were 28. During the next twelve hours she slept. Her color remained good. She voided several times involuntarily but at no time was there any complaint of suboccipital pain or any retraction of the neck. The next morning she ate her breakfast and seemed none the worse for her experience. The following day the choreiform movements had entirely ceased and her condition was excellent.

The objections to the procedure used in this case are as follows:

- 1 Food, and especially fluids, should not have been omitted before treatment was instituted.
- 2 Too much spinal fluid was removed before the intravenous injection was given.
- 3 The stylet should have been replaced in the needle for a short time on the advent of vomiting and perhaps for a second or third short period in case subsequent vomiting occurred.
- 4 The hour's drainage following the completion of the intravenous injection should not have been allowed.

The second case was one of bulbar poliomyelitis, complete paralysis of the throat of five days' duration, and partial paralysis of the tongue and of the legs. Examination showed 106 cells in the spinal fluid, of which 92 per cent were lymphocytes, at a pressure of 6 mm. of mercury, increasing with jugular compression. The patient was given 2,390 cc. of 0.45 per cent sodium chloride intravenously. A half hour after the treatment had begun his tongue protruded in the midline and continued to do so. Three hours after the beginning of the treatment the abdominal reflexes, which had been absent, returned but later were not obtained. His speech improved. Treatment was further uneventful. Following this he was given a rectal drip of 500 cc. of physiologic solution of sodium chloride. Having shown considerable clinical improvement, he was given a similar treatment seventeen hours later. Ability to swallow fluids had not returned. He was given 1,300 cc. of 0.45 per cent sodium chloride. There was a complaint of severe suboccipital headache but no vomiting. The pulse rate and temperature were not disturbed.

At the completion of the intravenous injection the patient was given a rectal drip of physiologic solution of sodium chloride and the spinal fluid was allowed to drain for one and a half hours. One hour later he was cyanotic, a jerky type of respiration developed, the pulse was irregular with a rate of 50 and of poor quality, and large coarse bubbling rales were heard in the chest. He was placed in a respirator and died in ten hours. Autopsy revealed a collar-shaped ridge in the cerebellum from contact with the posterior rim of the foramen magnum. The brain showed marked edema. It was the pathologist's opinion that herniation was not sufficient to cause death.

In this case a clysis of physiologic solution of sodium chloride should have preceded both treatments, and the period of drainage following the completion of the intravenous injection should not have been allowed. The interval between treatments should have been four or five hours, and 0.375 per cent would have been a better solution.

In the following outline the subject of cerebellar herniation is epitomized:

Incidence—Frequent in septic meningitis.

Rare in other diseases, two in 130 treatments.

Has not occurred during intravenous hypotonic injection.

Symptoms and Signs—Stage 1 Suboccipital pain and projectile vomiting followed by

Stage 2 Slowing of pulse, from 40 to 60, coincident with slowing of respiration, later, slow, jerky respiration followed by

Stage 3 Difficulty in swallowing, bloody spinal fluid, clonus, convulsions, respiratory paralysis.

Prevention and Treatment—Stage 1 Insert stylet in lumbar needle for half hour. Continue intravenous injection. Symptoms will be relieved. Stylet is then removed. The intravenous injection should often be given at a more rapid rate.

Stage 2 Replace stylet at once or remove spinal needle. Discontinue intravenous drip. Elevate foot of bed.

Stage 3 Same treatment as for stage 2. If relief is not obtained, give intravenous injection of 50 per cent dextrose.

Admonition—Do not remove a large amount of cerebrospinal fluid before beginning intravenous injection.

Do not drain cerebrospinal fluid after completion of intravenous injection.

This management will insure the patient against serious accident. These cases do not always follow the same pattern.

SEPTIC MENINGITIS

Forced perivascular drainage, in its present form at least, is not a cure for septic meningitis. I have treated twelve patients, all of whom have died. Since several did show considerable clinical improvement during the course of the treatment, it offered a certain modicum of courage to continue.

If the treatment is attempted, it should be instituted only when the case is seen early. There is certainly no hope for the later case. Furthermore, the organism must be seen in the direct smear of the spinal fluid, otherwise the operator may be dealing with an aseptic type of meningitis, secondary to an abscess contiguous to the dura. In these cases the treatment is distinctly contraindicated because of fear of converting an aseptic case into a septic one. There is a further difficulty, in the fact that cerebellar herniation is easily produced in this disease. In septic meningitis a plastic exudate attaches to the pia arachnoid, obstructing to some degree the normal flow of cerebrospinal fluid. If this fluid is obstructed in its passage, especially at the level of the foramen magnum, edema of the brain will be produced by the intravenous hypotonic solution. The brain stem is therefore forced into the foramen magnum. This accident can be prevented. It is discussed under the heading "cerebellar herniation." Unfortunately in the control of this complication it is necessary to interrupt the drainage of cerebrospinal fluid, and if this is done for any length of time the septic meningitis becomes worse.

Should an effective serum be available for the offending organism, it might be added to the hypotonic solution with the hope of carrying antibodies through the lesions.

SYDENHAM'S CHOREA

Chorea cases vary in their response to forced perivascular drainage. The most severe types of chorea have been the ones in which clinical improvement has been both prompt and complete. The mild types of hemichorea have been slow to improve and have required more vigorous treatment. I have treated eighteen cases, two of the milder type have been complete failures. One case showed definite improvement but was not cured after three treatments were given. Most of these cases were treated with 0.45 per cent sodium chloride. Two cases failed to improve with this solution but were promptly cured when 0.375 per cent sodium chloride was used.

Some have thought this treatment too radical for use in Sydenham's chorea. It certainly is indicated in severe cases and in cases which do not respond to other types of therapy. As to the question of radical procedure, forced drainage of the perivascular spaces can be so conducted as to be substantially safe.

POLIOMYELITIS

I have not yet had the opportunity to make a statistical study on which the evaluation of the treatment of acute human poliomyelitis must rest. The first case of preparalytic poliomyelitis treated by this method was treated by me in 1930.⁸ I have since treated five other cases, three of which were preparalytic and two active bulbar involvement.

I believe that this disease is amenable to forced perivascular drainage and that with properly applied technic and procedure it can be definitely modified.

Experimental poliomyelitis in the monkey (*Macacus rhesus*) is in nearly every respect the same as the human disease. The two definite differences have to do with the virulence of the infection and the cell behavior of the cerebrospinal fluid. In the human disease the host is relatively resistant and one finds a fairly high percentage of recoveries without paralysis in untreated cases. Although the death rate varies in different epidemics, it is usually not high. There is on the other hand, an entirely different picture with the experimental disease. When the virus is attenuated a disease may be produced which does not kill all the animals but with an adequate dose of virulent virus one can produce a disease in monkeys which causes complete skeletal paralysis and death in all infected animals. As far as I have been able to learn from a review of the literature, there have been no cures of this disease by any method when the monkey has been inoculated with adequate doses of virulent virus. It is therefore significant that six monkeys with acute poliomyelitis treated by this method have recovered without paralysis. A full report of this work will soon be published. Dr. O. D. Chapman has collaborated with me in this work.

A few of the important results will be mentioned here. 1. We have worked with both intranasal and intracerebral inoculations and report recoveries without paralysis following inoculation by both routes. 2. The concentration of the dose of virus does not seem to influence recovery. One of the animals that recovered without paralysis received intracerebrally fifty times the dose of virus which has killed all our control animals. In each experiment there has been one control animal similarly inoculated and untreated, in all of which complete skeletal paralysis has developed, followed by death. No animals have recovered when 0.45 per cent sodium chloride was used. 3. To date we have thought that our animals do best with eight hour periods of treatment followed by four hours of rest. One animal given fifty-nine hours of continuous treatment died. 4. We have had one recovery using the hydration factor in which no spinal fluid was allowed to drain with the exception of 1 cc collected for cell study at the beginning and the end of each treatment. In this work our objective has been to test the various factors involved in the treatment in order to determine what factor or factors are essential. I believe that poliomyelitis, from its nature, is well adapted to this type of therapy. In this disease there is no acute inflammatory process existing in organs outside the central nervous system that will cause a diversion of fluid movement. The disease is related to the vascular system within the central nervous system. Here the nerve cell is richly supplied with blood, providing an opportunity for fluid to pass through these capillary walls and bathe the nerve cell. Perivascular infiltration, edema and hyperemia are present, at times there is petechial hemorrhage.

The actual destruction of the nerve cell is a later event. This pathologic condition is found in the depths of the tissue, where it can be reached by this process of drainage. While the essential factor that explains the therapeutic results is not yet known, this type of therapy does profoundly modify acute poliomyelitis in the monkey.

My experience with the treatment of human poliomyelitis is insufficient for any conclusive statement. The four patients with preparalytic poliomyelitis recovered without paralysis or muscular weakness. It was significant however, that both during and following the treatment the tremors and the nervous irritability of these patients was definitely relieved. Considered in relation to other experiences both in poliomyelitis and in other diseases this fact may be of extreme importance.

A girl aged 12 years with bulbar paralysis, was treated. She had had fever, headache and vomiting for four days, inability to swallow and rapid breathing for three days, right facial paralysis, decreased movement of the diaphragm on both sides more marked on the left, and for the past few hours increased difficulty in breathing. There was rigidity of the neck, the temperature was 103 and the cell count of the cerebrospinal fluid was 155. She was given three forced perivascular drainage treatments with 0.45 per cent sodium chloride. During the course of the first treatment her breathing definitely improved, following this treatment she was able to swallow for the first time in three days and drank milk and water. Six hours later she lost her ability to swallow. The temperature rose to 102. She was given a second similar treatment of 3 liters of 0.45 per cent sodium chloride. There was still further improvement in her breathing and she was again able to swallow for a period of seven hours. Following a third treatment she showed further improvement and for a third time regained her ability to swallow liquids. The respirations were stronger but the facial paralysis remained unchanged. From this point the patient made a steady gain. Facial paralysis was less obvious the following day, there was some weakness of the extensors of the left arm. Three days later she was given solid food for the first time and from this point she made a complete and uneventful recovery.

Viewed from our recent experiences the following criticism of the foregoing treatment should be made. First the salt solution in the intravenous injections should have been 0.375 per cent instead of 0.45 per cent sodium chloride. Secondly, the interval between treatments should have been four hours rather than six or seven hours.

The technic that will produce the best results in the treatment of human poliomyelitis should be worked out by some one who thoroughly understands the subject and is conversant with the technical variations possible.

ENCEPHALITIS

Three cases of acute encephalitis have been treated. These were in infants with coma, severe continuous generalized convulsions, hyperpyrexia and various paralyses. The first case has already been reported.⁸

The second case was similar to the first and showed the same remarkable clinical response to treatment. This patient has since remained well.

The third patient, an infant, aged 1 year, with a temperature of 106, was in coma and had continuous convulsions, continuous convulsive movements of the eyeballs, periodic strabismus, transitory facial paralysis and a spastic paralysis of the right arm. The convulsions, coma and focal signs were all relieved by treatment. The temperature became normal. Unfortunately, a bronchial pneumonia developed which prevented further treatment, and he died.

One patient with chronic encephalitis of the parkinsonian type of four years' duration was given three treatments. He was almost completely relieved and remained so for a year, when he had a relapse. Forced perivascular drainage at that time was given without benefit. Fractions of spinal fluid from this patient gave the same cell picture that was found in the acute cases (table 3). I have treated several cases of chronic encephalitis of the parkinsonian type, of six and seven years' duration, without any clinical improvement. No cells were found in the spinal fluids.

Although experience is limited, the study of these cases suggests, first, that it is highly desirable to begin treatment of the more serious types of encephalitis as early as possible, with the hope of preventing as much cerebral damage as one can. Secondly, that the treatment should be pushed with vigor, and it would seem that eight hour treatments with four hour rest intervals would be the most successful, since these patients relapse in about twenty-four hours if only one treatment is given.

TABLE 3—*Parkinsonian Type of Chronic Encephalitis of Four Years' Duration*

T. M. aged 27 years Jan. 11, 1932

| Time | Cumulative Totals Intra-venous Drip Cc. | Interval Amount Cerebrospinal Fluid Cc. | Cell Count Differential | | |
|-------|---|---|-------------------------|------------------------------|---------------|
| | | | Cells | Polymorphonuclear Leukocytes | Mono-nuclears |
| 1 00 | | 18 | 8 | 0 | 8 |
| 2 00 | 350 | 90 | 20 | 0 | 20 |
| 3 00 | 600 | 32 | 12 | 3 | 9 |
| 4 00 | 1 000 | 37 | 11 | 0 | 11 |
| 5 00 | | 23 | 12 | 0 | 12 |
| 6 00 | | 26 | 11 | 0 | 11 |
| 6 hrs | 1 000 | 220 | | | |

Solution 0.45 per cent sodium chloride

Cell response. Cells mostly of mononuclear type. Lymphocytes and monocytes not differentiated. Similar cases of six and seven years' duration show no cell response. There was marked clinical improvement. Intravenous drip given too slowly and insufficient in amount. 1 200 cc of water given by mouth during course of the treatment.

The cell behavior in the cases treated both in acute encephalitis and in the one of four years' duration showed a similar pattern.

SYPHILIS OF THE CENTRAL NERVOUS SYSTEM

In 1930 I treated a case of syphilitic meningitis in an infant, aged 6 months. There was progressive hydrocephalus in spite of vigorous antisyphilitic treatment. The patient became steadily worse, and four forced perivascular drainage treatments were given. Arsenicals were added to the hypotonic solution with the hope of driving the arsenicals through the lesions. The patient made a remarkable recovery and has since developed normally. Following this I felt that a number of cases of syphilis of the central nervous system, treated at various stages of the disease, were benefited. It seemed that the best results were obtained in cases of tabes. Since this work was done before I had had the opportunity to improve technical procedures, I believe that there exists at the present time a fertile field for research in testing this method.

POSSIBLE DANGERS IN FORCED PERIVASCULAR DRAINAGE

As stated previously, the only substantial danger is that of possible cerebellar herniation.

Secondary infection into the subarachnoid space has been suggested but will not occur with aseptic technic, and the flow of the spinal fluid outward is also a protection against this accident.

In case of a dry tap caused by dehydration, repeated lumbar punctures should not be done until the hypotonic solution has been injected to the amount of about 500 cc. I have seen one extradural abscess produced by repeated dry taps.

The question of the possibility of producing a massive hemorrhage in cases in which petechial hemorrhage exists has been raised. This never occurs.

CONTRAINDICATIONS

Contraindications of the treatment are a cerebellar tumor or abscess or a closed cavity in the central nervous system from which cerebrospinal fluid cannot escape, inflammation of the lungs or bronchi, acute inflammatory disease of the heart, myocardial weakness or acute nephritis.

Acute colitis or pyuria does not contraindicate treatment but destroys its effectiveness.

PRESENT TECHNIC AND PROCEDURE

Three hours previous to treatment, the patient should be given food high in protein content and about three glasses of water. In case of dehydration a clysis of physiologic solution of sodium chloride should precede the drainage, after which lumbar puncture should be performed with the patient on a Bradford frame. The Queckenstedt sign is then tested. A specimen of spinal fluid is gathered for laboratory examination, care being exercised not to remove too much fluid. The stylet is then replaced in the needle and the needle gently rotated in order to enlarge the opening in the dura. The patient is rotated on the Bradford frame with the needle protruding through the window. An intravenous injection of hypotonic solution is given and, in case the patient is delirious or has a severe chorea, the internal saphenous vein is the vein of choice, for the reason that the foot can easily be immobilized to the frame. It is often desirable to tie the needle into the vein. When the flow of the intravenous solution has become established, the stylet is removed from the lumbar needle and the fluid allowed to drain. If the fluid spurts, the stylet should be introduced intermittently until a steady drop has been secured.

If frontal headache develops, an ice-cap or an injection of codeine may be used. If the headache is suboccipital or if it is followed by vomiting, the stylet should be inserted for about thirty minutes, after which the drainage can again proceed. Headache can also be controlled in many cases by increasing the flow of the hypotonic solution.

In case the flow of spinal fluid ceases altogether, a slight rotation of the needle upward will usually reestablish the flow. Should this occur early in the treatment and should the spinal drip not be reestablished after a period of thirty minutes, the intravenous injection should be stopped and a second lumbar puncture done. If it should occur late in the treatment, particularly following a free drainage of spinal fluid, it constitutes no reason for discontinuing the intravenous injection. Following the completion of the intravenous injection the spinal needle should be removed.

SUMMARY

1. Forced perivascular drainage is a powerful therapeutic agent.

2. Since it allows of considerable variation in procedure, it is still in an experimental stage of development.

3. Before its value can be known in the treatment of various diseases in which it may be indicated, statistical evidence is necessary.

4 In this discussion of the various factors involved, I have realized that future research may alter some of the present conceptions

5 From my present experience I believe that forced perivascular drainage will be of use in the following infections of the central nervous system: acute poliomyelitis, acute and chronic encephalitis, chorea, syphilitic meningitis and tabes dorsalis

6 While I am not in a position at the present time to advise the exact amount of hypotonic solution necessary in an individual case, 1 liter of hypotonic solution cannot be expected to be effective

7 I believe that this treatment should not be used until the physician has thoroughly acquainted himself with the subject

8 I further believe that this is a safe procedure and that the only danger is cerebellar herniation, which can be prevented and controlled

9 If it can be shown that the hydration factor does not interfere with the therapeutic result, and if it can be shown that the method can be used with safety in the treatment of human beings, it will be an agent of the greatest value, since it will contribute to the comfort and safety of the patient

459 James Street

ABSTRACT OF DISCUSSION

DR. TEMPLE FAY, Philadelphia Dr Retan's clinical results are distinctly encouraging. The method employed in his treatment therefore entails important factors for consideration. That improvement has followed this method of treatment does not in itself indicate that the explanations for the improvement are at the present justified or that they may necessarily be due to so-called forced spinal drainage. I should like to ask Dr Retan what the object of forced spinal drainage actually is in terms of relief to the central nervous system from certain pathologic states. Certainly the few cells washed out as indicated in his studies, cannot be considered an index of clearing this perivascular space, supposedly occluded. If such were the case this method should have been attended with beneficial results in the suppurative meningitic group, all of which patients died in spite of continuous drainage and elaborate methods of hydration. Considering the amount of spinal fluid yielded by drainage in proportion to the fluid administered as well as the relatively few cells "washed out," one cannot conclude that the method was responsible for the benefits, because in my experience with Sydenham's chorea with the parkinsonian syndrome and in a few cases of multiple sclerosis similar beneficial results have been obtained by forced drainage without permitting the patient to receive even the normal and usual intake of liquid. Encephalography produces a forced drainage in that all spinal fluid may be readjusted when an appropriate amount of air has been introduced to take its place. The beneficial effect on blood volume is that, as spinal fluid is withdrawn, an increase in blood volume within the craniocervical cavity occurs to the limits of vascular distention, both as to the venous sinuses and as to the capillary-arterial bed. This new hyperemic state is maintained until spinal fluid returns to fill the cavity, and the advantage gained in blood volume cannot be disturbed unless there follows a subsequent period of hydration and an increase of intracranial pressure. I believe, therefore, that Dr Retan's results may be attributed to an improved blood volume, better oxygenation and a better tissue function, in the same way that a chronic leg ulcer or bed sore responds to massage, increase in blood volume and better nutrition. Chloride values themselves may have a real part to play, but I doubt the value of the "washing out" process, which smacks of a laundry rather than a fundamental physical law relating to disturbances within a closed cavity following the Monro-Kellie doctrine. The improved clinical results reported argue well for the method, but my own results and experience indicate that the damage of hydration is real

and that the same results may be obtained by increasing the blood volume and associating this procedure with "dehydration," thus maintaining a more permanent shift in favor of better oxygen and nutrition

DR HENRY LOWENBURG, Philadelphia The inherent hazards of a therapeutic procedure must always be compared with the inherent hazards of the disease to be treated. On this basis it is evident that in chorea this procedure may not become the treatment of choice. The severest cases of chorea have yielded to simple measures or to none at all. Shortened time of cure, while desirable, may not become the deciding factor in the presence of acknowledged risks. As Dr Retan states, surgical drainage alone can never be expected to solve the problems of otitic and other forms of septic meningitis, because surgical drainage at its best is inadequate to drain and remove thick exudate and infected fluid. A single autopsy is sufficient to convince one of this. While all efforts, as this proposal, are to be encouraged a great deal cannot be expected from them. Four recent fatalities from hemolytic streptococcus meningitis treated in this fashion with radical otitic surgery are sufficiently discouraging to hope for something better. In meningococcal meningitis, pathologic involvement is just as extensive. Cure results not from surgical drainage but from the use of specific antiserum or antitoxin. This is an eloquent example that the hope of the future for all other types of meningitis resides not in surgical drainage but in a potent antiserum, antitoxin, bacteriophage or diffusible chemical agent, which, though innocuous, is also powerfully antiseptic and sterilizing and possesses the ability to dissolve exudate.

DR TRACY PUTNAM, Boston Ever since Dr Kubie's first description of the method of spinal drainage in 1927, we have occasionally used it in inflammatory diseases of the nervous system at the Neurological Unit of the City Hospital of Boston. We have begun to feel that it is a very valuable therapeutic agency, particularly in the milder forms of septic meningitis. If it is inadequate to cope with the more severe streptococcus and pneumococcus, this, I think, does not mean that it should be abandoned in the treatment of the milder types. We have had striking results in *Bacillus coli* and in staphylococcal meningitis with this method and also in draining compound fractures of the skull and spine. We have been somewhat less drastic than Dr Retan and contented ourselves with producing a hydrema by forcing fluid by mouth. Dr Retan's present work shows that intravenous injections of hypotonic solutions should be used. However, this method should be reserved for the definitely infectious diseases of the central nervous system, and little is to be expected from it in multiple sclerosis and the so-called encephalitudes following infectious diseases, which, I am convinced, are not infectious in nature. If they are not infectious if there is no specific toxin present, I think one cannot expect to accomplish much by the washing out process.

DR GEORGE M. RETAN, Syracuse, N. Y. The object of forced perivascular drainage is to wash products of inflammation, toxins from the depth of inflamed areas in the central nervous system through the perivascular channels by changing the osmotic force of the blood stream. Of course, that is partly theoretical. Dr Fay asks "Why perivascular drainage? How does one know that one is draining through the perivascular system?" Of course, the Virchow-Robins perivascular areas are drainage channels through which products of cell metabolism pass into the spinal fluid. If hypotonic injections are made into the blood stream of animals a dilatation of these perivascular channels can be produced as well as of the pericellular fluid areas. The next support to this theory comes from the fact that cells are washed from perivascular areas during this treatment. Eighty-seven cells in the case mentioned may not be a large number, but the number of cells obtained in fractions of spinal fluid examined from various diseases has varied a great deal. In cases of chorea, one may obtain a small number, maybe seven or eight cells, as compared with one cell found in the original fluid. In acute encephalitis the cell response is definitely greater and fractions contain from twenty-five to 200 cells. Very frequently fractions are taken from as much as 90 cc. which has drained in one hour and which contains definitely more cells than were found in the original spinal

fluid. There is no constancy of fluid movements when massive injections of hypotonic solution are used. Some patients lose an enormous quantity of fluid by the kidney, almost as much as is given. Those patients, I believe, often do not obtain the therapeutic result that is desired. They do not do as well as patients who do not lose fluid from the kidney so rapidly. The state of hydration of the tissues of the body, when this treatment is begun, is of importance and for that reason I believe that one should fill as much as possible the tissues of the body with fluid in order to get a better clinical result. I have frequently treated purposely a patient four hours after the completion of the first treatment when the tissues of the body are pretty well choked with water, and I believe that a better clinical result is obtained in the second than in the first treatment. Much work remains in testing this hydration factor. I doubt whether forced perivascular drainage with the canal closed will ever be done. My object in studying the possible dangers of hydration and the therapeutic result is to determine the effect of a forced drainage treatment with the canal closed part of the time.

AN EPIDEMIC OF TRICHINOSIS IN MAINE

E. H. DRAKE, MD
R. S. HAWKES, MD

AND
MORTIMER WARREN, MD
PORTLAND, MAINE

This year marks the one hundredth anniversary of the naming of *Trichina spiralis* by Richard Owen, the material studied having been obtained in the dissecting room by Sir James Paget.¹ *Trichinella spiralis* was later suggested as a substitute by zoologists, because the name used by Owen had been applied five years before to a genus of Diptera. The same parasite seems to have been described by Tiedemann² in 1822, and the museum at Guy's Hospital contains a specimen of *Trichinella* prepared by Peacock in 1828. The anatomist Leidy³ of Philadelphia first found trichinellae in pork in the year 1847. Zenker⁴ described clinical trichinosis in 1860. The eosinophilia of trichinosis was observed by T. R. Brown,⁵ then a student at Johns Hopkins, in 1897.

Osler⁶ observed the parasites as a student at Trinity in 1868 and he has written that two years later in the dissecting room of the medical school at Toronto he found "159 cysts in a single drachm of one of the muscles of the arm" in the body of the erstwhile janitor of the hospital. In 1873 he^{6a} saw a case of trichinosis in Traube's clinic at Berlin and wrote in his notebook "So far as I can learn only four or five cases of trichinosis have occurred in Canada, one in Montreal, three in Hamilton, and two cases in which I discovered the parasite post mortem in Toronto. Other cases may and probably have occurred." In 1900 he⁷ stated that "only rarely are cases diagnosed in hospital practice. With the exception of a typical case in one of Traube's wards (1873), I have never recognized an instance of the disease until the past eighteen months, during which time three cases have occurred in my service at the Johns Hopkins Hospital."

Only a little study is required to convince one that trichinosis is not a rare disease. According to Ransom's² 1915 report, U. S. government statistics then showed 1,550 cases with 240 deaths. During the year 1932, 263 cases were reported to the federal government from fifteen states. Conner⁸ in 1929 reported fifty-two sporadic cases admitted to the two medical services at the New York Hospital during the preceding fifteen years. Spink and Augustine⁹ have just described thirty-five unrelated cases seen in Boston during a three year period.¹⁰

The following epidemics have been recorded: fifty cases with four deaths in Boston in 1892,¹¹ fourteen cases in New York State in 1916,¹² forty-three cases in Spaniards in Albany, N. Y., in 1929,¹³ fourteen cases in East St. Louis in 1930,¹⁴ twenty-nine cases, all but one in Italians, in Pennsylvania in 1931,² a single family of Italians with eleven cases in 1932,¹⁵ and forty-three Italians in Atlantic City in 1933.¹⁶ A small epidemic caused by eating jerked bear meat was reported from California in 1932.¹⁷ These figures are dwarfed by the German epidemics: Hedersleben with 337 cases,¹⁸ Karlsruhe and Weingarten¹⁹ in 1924 with 150 cases, and the polar bear epidemic at Stuttgart²⁰ in 1930 with eighty-eight cases and twelve fatalities.

A still more convincing means of estimating the frequency of trichinosis is from autopsy and dissecting room figures. In 1894 Thornbury²¹ reported three cases found in twenty-one autopsies. Williams²² found trichinellae in 5.34 per cent of 505 routine autopsies at Buffalo in 1901. Queen²³ at Rochester, N. Y., in 1931 studied the diaphragms by digestion methods and found 17.5 per cent positives in 344 autopsies, at Boston 27.6 per cent of fifty-eight autopsies were positive.⁹ Riley and Scheffley²⁴ at Minneapolis in 1934 found 17.9 per cent of 117 cadavers showing encysted larvae, in a second series 20 per cent of fifty cadavers were positive.⁹

Man serves as an accidental host to *Trichinella* through the medium of meat from an infected animal, usually the hog. The gastric juice digests the wall of the encysted larvae, the parasites mature, copulation occurs, and the female deposits the embryos in the

1. Memoirs and Letters of Sir James Paget. New York, Longmans Green & Co. 1903.

2. Cited by Aldridge, F. C. An Outbreak of Trichinosis in Pennsylvania. *Am. J. M. Sc.* 181: 312 (March) 1931.

3. Leidy, Joseph. *Proc. Philadelphia Acad. Sc.* 3: 107. 1847.

4. Zenker quoted by Blumer in Nelson's Loose-Leaf Medicine 2: 453.

5. Brown, T. R. *Bull. Johns Hopkins Hosp.* 8: 79 (April) 1897.

6. Osler, William. *Trichina Spiralis*. *Canad. J. M. Sc.* 1: 134. 1876.

6a. Cushing, Harvey. *Life of Sir William Osler*. New York, Oxford University Press, 1925. p. 144.

7. Osler, William. *The Principles and Practice of Medicine*. ed. 3. New York, D. Appleton & Co. 1900. p. 356.

8. Conner, L. A. Atypical Forms of Trichinosis. *Ann. Int. Med.* 3: 353 (Oct.) 1929.

9. Spink, W. W. and Augustine, D. L. The Diagnosis of Trichinosis. *J. A. M. A.* 104: 1801 (May 18) 1935.

10. Other interesting reports: Pepper, O. H. P. Trichinosis. *M. Clin. North America* 15: 271 (Sept.) 1931.

Bettison, W. L. Trichinosis. *J. A. M. A.* 86: 609 (Feb. 27) 1926.

Birch, C. L. Trichinosis from Barbecue Stand. *M. Clin. North America* 15: 791 (Nov.) 1931.

11. Drew, F. H. Boston. *M. & S. J.* 127: 61. 1892.

12. Salzer, B. F. Study of an Epidemic of Fourteen Cases of Trichinosis with Cures by Serum Therapy. *J. A. M. A.* 57: 579 (Aug. 19) 1916.

13. McDonald, E. P. and Wadell, K. C. An Epidemic of Trichinosis. *J. A. M. A.* 92: 449 (Feb. 9) 1929.

14. Willett, J. C. and Pfau, C. L. Trichinosis. An Outbreak Involving Twenty Cases and one Death. *J. A. M. A.* 94: 1060 (April 5) 1930.

15. Reifenshtein, E. C., Allen, E. G. and Allen, G. S. Trichinosis. *Am. J. M. Sc.* 183: 668 (March) 1931.

16. Kilduffe, R. A., Barbash, S. and Merendino, A. G. A New Jersey Outbreak of Trichinosis with Report of a Case Complicated by Femoral Thrombosis. *Am. J. M. Sc.* 186: 794 (Dec.) 1933.

17. Walker, A. T. Trichinosis. Report of an Outbreak Caused by Eating Trichinosis Bear Meat in the Form of Jerky. *J. A. M. A.* 98: 205 (June 11) 1932.

18. Kratz, F. Vorläufiger Bericht über die Trichinen-Epidemie in Hedersleben. *Berl. Klin. Wchnschr.* 2: 509 (Dec.) 1865.

19. Heissen, F. Trichinen-Epidemie in Karlsruhe und Weingarten. *Deutsche med. Wchnschr.* 50: 948 (July 11) 1924.

20. Weitz, W. Zur Klinik der Trichinose. *Klin. Wchnschr.* 10: 938 (May 16) 1931.

21. Thornbury. University Medical Magazine. Buffalo. 1897. quoted by Williams.

22. Williams, H. U. Frequency of Trichinosis in United States. *J. M. Res.* 1: 64. 1901.

23. Queen, F. B. Prevalence of Human Infection with *Trichinella spiralis*. *J. Parasitol.* 18: 128 (Dec.) 1931.

24. Riley, W. A. and Scheffley, C. H. Trichinosis of Man a Common Infection. *J. A. M. A.* 102: 1217 (April 14) 1934.

intestinal wall, whence, by means of the lymphatics, they gain the thoracic duct and the blood stream. The majority of the larvae reach the voluntary muscles, where they initiate an inflammatory reaction, which leads to their encystment. They have been found in many parts of the body. Their presence in the blood was first remarked by Herrick and Janeway²⁵ in 1909. In the year 1906 Frothingham²⁶ discovered trichinellae in the brain. Van Cott and Lintz²⁷ in 1914 found the parasite in the cerebrospinal fluid. Von Herrenschiwand²⁸ in 1927 described large numbers of trichinellae in the external ocular muscles. Horlick and Bicknell²⁹ in 1929 found larvae in the heart muscle. In addition, larvae have been observed in the gallbladder bile,²⁹ in liver,²⁰ in a pleural effusion, in the milk of a lactating woman, in the pus from a furuncle,³¹ in the pancreas, in the kidneys and in the intestinal wall.³⁰

In the absence of an epidemic the variable symptoms of trichinosis may suggest other diseases. The diarrhea and vomiting have been designated food poisoning, a condition that is occasionally associated with trichinosis. The unexplained fever has been called influenza. Abdominal pain may lead one to suspect an inflammatory disease of the appendix, intestine or gallbladder, or a peptic ulcer.⁸ Edema of the eyelids has suggested acute nephritis or frontal sinusitis.³⁰ The eye symptoms include photophobia, swelling of the conjunctiva and subconjunctival hemorrhages, so that the ophthalmologist may be the first physician to see the patient.³¹ Diarrhea, somnolence and fever suggest typhoid,⁸ this suspicion may be strengthened by the finding of typical rose spots or splenomegaly. Urticaria may be observed. A positive Kernig sign and absent knee reflexes have raised the question of meningitis.³² Larvae have been demonstrated in the brain in cases of encephalitis.³³ Pain and tenderness in the muscles has been designated peripheral neuritis. Extreme hypotension may be the presenting sign.³⁴ Pneumonia and myocarditis are the most serious common complications. Marked muscle weakness, which lasts for many weeks or months into convalescence, is a not uncommon sequel and denotes a severe infestation.

REPORT OF OUTBREAK

Mrs Anna F, an Italian housewife aged 45, admitted to the Medical Service of the Maine General Hospital, Feb 17, 1935, had become ill eleven days previously with epigastric pain, diarrhea and vomiting. The admission temperature was 100 F and the blood pressure 70 systolic, 52 diastolic. She was lethargic and moderately dehydrated. No knee jerks were

obtained. The urinalysis was negative except for 5 mg of albumin. The blood Wassermann and Kahn tests were negative and the blood urea nitrogen was 17 mg per hundred cubic centimeters. The leukocyte count was 17,500, with 84 per cent neutrophils and 3 per cent eosinophils. A surgical consultant found only mild tenderness in the gallbladder area and believed that it was not a surgical case. The vomiting disappeared but she continued to have several daily stools and complained of abdominal pain. The stool examination showed occult blood. Cultures of the urine, stools and blood were negative for the typhoid group.

February 23 the husband, Ralph F, was admitted. He had suddenly become ill with diarrhea and black stools one week before admission. The diarrhea had improved but he had grown weak, nervous and sleepless. The urine once showed a slight trace of albumin and once a few hyaline casts. The white blood count was 14,400, with 75 per cent neutrophils and 1 per cent eosinophils. He had a low grade fever. On the fourth hospital day, rose spots developed and the laboratory reported that cultures from the stool had yielded an organism resembling *Bacillus typhosus*. March 1, Widal tests on the blood of both husband and wife were positive in 1:80 dilution. The following day it was found that Mrs F had a white blood count of 23,100 with 38.5 per cent eosinophils, Mr F showed 21,000 leukocytes with 44 per cent eosinophils. Mrs F seemed more toxic that afternoon, the next morning she presented signs of pneumonia in the right lower lobe, and on March 4 she died. At autopsy many trichinellae were found in the striated muscles.

Investigation of this family yielded the information that three of the seven children had been admitted to the Farrington Hospital with unexplained fever and swollen eyelids, all these patients were found to have eosinophilia and positive intradermal tests for trichinosis. Furthermore, Dominico Di D, an Italian, aged 40, had been admitted to the same institution on March 2 with fever, marked weakness, a positive Kernig sign, and absent knee reflexes. Lumbar puncture gave negative results. The leukocyte count was found to be 12,000, with 24 per cent eosinophils. The muscular weakness increased and it became impossible for him to swallow any but liquid food. Cough and respiratory embarrassment appeared and he was transferred to the Maine General Hospital, where he died with pulmonary edema. Autopsy showed a severe infestation with trichinellae and a focal leukocytic infiltration of the heart muscle.

The search for further cases was continued and a coherent story of the epidemic was obtained. Soon after New-Year's Rocco A had journeyed to the neighboring countryside and purchased two pigs. The animals were brought to his home in the city and were fed on corn and milk. Their recent rations had been garbage collected from a nearby FERA camp. January 19 they were slaughtered at the Portland Abattoir, one of the animals was sold on shares to two Italians, one of them our patient, Ralph F. Home-made sausage was manufactured from the latter animal. The sausages were allowed to dry and were widely distributed to friends. Their consumption was begun early in February, they were eaten raw or after very little cooking. Seventy-one persons are known to have eaten of the sausages and fifty-six individuals showed signs of infection with trichinosis.

The nine members of the F family were all ill with the disease. Ralph F was discharged from the hospital, in spite of marked muscle weakness, March 15. A month later he was readmitted because of a return of diarrhea, and trichinellae were found for the first time in his stools, two months after the onset of his illness. His strength has not been entirely regained in five months from the beginning of the disease. Nicholas M, a boy of 14, showed hypotension and marked weakness, so that no hand grips were obtained and he turned himself in bed with difficulty, he has not entirely recovered after five months. Specimens obtained by biopsy on Nicholas M and Ralph F showed leukocytic infiltration of the muscle, but no trichinellae were found. One patient showed urticaria while recovering from trichinosis.

Trichinellae were found in the pork, some of which had been used in the manufacture of the sausage. No parasites were discovered in the carcass of the remaining pig.

25 Herrick, W W and Janeway T C. Demonstration of Trichinella Spiralis in the Circulating Blood in Man. Arch Int Med 3:263 (April) 1909.

26 Frothingham Channing. The Lesions Caused by Trichina Spiralis in Man. J M Res 15:483 1906.

27 Van Cott J M and Lintz, William. Trichinosis. J A M A 62:680 (Feb 28) 1914. Bloch Leon. Trichinosis. Larvae in Spinal Fluid. ibid 66:2140 (Dec 18) 1915. Lintz William. Trichinosis. ibid 66:1856 (June 10) 1916. Cummings, W T, and Carson G R.

A Case of Trichinosis with Embryo in Spinal Fluid. ibid 66:1856 (June 10) 1916. Elliott A R. Trichinosis. Report of a Case with Larvae in the Spinal Fluid. ibid 66:504 (Feb 12) 1916.

28 von Herrenschiwand F. Arch f Ophth 119:374 1927.

29 Horlick S S and Bicknell R E. Trichinosis with Widespread Infestation of Many Tissues, New England J Med 201:816 (Oct. 24) 1929.

30 Pratt E L. Trichinosis Simulating Frontal Sinusitis. Report of Three Cases. J A M A 65:1277 (Oct 9) 1915.

31 Carter L F. Trichinosis and Its Ocular Manifestations. J A M A, 95:1420 (Nov 8) 1930.

32 Meyer Jacob. Trichinosis. Report of Three Cases Simulating Meningitis with Finding of Trichinae Larvae in Spinal Fluid. J A M A 70:588 (March 2) 1918.

33 Hassin G B and Diamond I B. Trichinosis Encephalitis. Arch Neurol & Psychiat 15:34 (Jan.) 1926. Pund E R, and Mosteller Ralph. Trichinosis. Demonstration of Parasites in Brain. J A M A 102:1220 (April 14) 1934.

34 Cheney Garnett. Sporadic Trichinosis with Extreme Hypotension. J A M A 86:1004 (April 7) 1926.

The criteria used in determining positive cases were the clinical manifestations of trichinosis, eosinophilia, and a positive intradermal test. Twenty-six persons were definitely ill, all this group showed eosinophilia and positive skin tests, except the two fatal cases. The intradermal test was not attempted in the case of Mrs Anna F. A test was applied to Dominico Di D, but through error it was not read for twenty-four hours. A total eosinophil count in excess of 500 per cubic millimeter was considered as constituting eosinophilia. Spink and Augustine⁹ set 400 eosinophils as the upper limit of normal. This figure was arrived at by taking 10,000 as the upper limit of the normal leukocyte count and 5 per cent as the maximum of normal differential eosinophil count. Fifty-one individuals presented total eosinophil counts above this limit. As a rule, elevated white counts were found with high differential eosinophil counts, this was not invariably so, since one boy who was ill with trichinosis showed a leukocyte count of 9,400, with 51 per cent eosinophils. The highest differential eosinophil count was 74 per cent. The greatest total eosinophil count was 23,800, this represents a leukocyte count of 34,000, with 70 per cent eosinophils, and was the result of the first examination of the 2½ year old son of Ralph F. The child was afebrile and apparently well on the day of this test. Two days later he was admitted to the pediatric service of the Maine General Hospital with a cough and a rectal temperature of 104, the admission leukocyte count was 31,600 and the eosinophil count only 8 per cent, a drop in total eosinophil count from 23,800 to 2,528 per cubic millimeter. A rapidly falling eosinophil count has been held to indicate the presence of some serious complication. The original white count of Dominico Di D was 12,000, with 24 per cent eosinophils. The day of his death the leukocyte count was 16,800 and the eosinophils had dropped to 1 per cent, this represents a fall in total eosinophil count from 2,880 to 168 per cubic millimeter. Nevertheless, Mrs Ralph F died with a total eosinophil count of 8,894 per cubic millimeter (23,100 leukocytes, with 38.5 per cent eosinophils).

Twenty-five of the seventy-one persons who had eaten the infected meat showed eosinophilia without signs or a history of illness. Since there is no natural immunity to trichinosis in man, the degree of infestation must determine the severity of the disease. It is believed that these cases represent latent infections, which were mild so far as disabling symptoms go. They should, however, show encysted trichinellae in their muscles.

COMMENT

In the past there has been no specific test for trichinosis, other than the actual demonstration of the parasites. Bachman³⁵ in 1927 described a precipitin test in infected laboratory animals and in 1928 an intradermal reaction, the antigen used being prepared from trichinellae larvae. Augustine and Theiler³⁶ in 1932 showed that both these tests were positive in hogs and human beings who had been infected with trichinosis, the skin reaction was found to be immediate rather than delayed, as is the case with guinea-pigs. The following year McCoy, Miller and Friedlander³⁷ reported that the intradermal reaction was positive in 90 per cent of eighty-eight known cases of trichinosis. All but one of the thirty-four cases of trichinosis tested by Spink and Augustine⁹ gave positive skin tests. Several other observers³⁸ have described positive reactions in a small number of patients. Kilduffe³⁹

after performing the skin test in thirty-three cases during an epidemic, concluded that the test possessed no advantage over eosinophil counts, but his conclusion is hardly fair, as pointed out by Friedlander,⁴⁰ since the reactions were not read at once.

The dried larva powder used as antigen for the skin tests in this epidemic was furnished by Dr Benjamin Schwartz of the U S Department of Agriculture. Dilution was made with physiologic solution of sodium chloride to which had been added 0.25 per cent of tricresol, 0.1 cc of a 1:10,000 solution was used. Skin tests were applied to sixty-eight individuals who had eaten the infected meat and the results were read in from five to ten minutes. All persons who had been definitely ill showed positive intradermal reactions. Two others were called questionably ill because of histories of sore throat and feverishness after eating the sausage. Both these patients were found to have subsequent eosinophilia but failed to react to the skin test on two occasions. They probably represent mild cases of trichinosis with negative skin reactions. There are twelve other persons who were not ill who displayed eosinophilia but did not show conclusive intradermal reactions. This means that half of the previously mentioned twenty-five persons with eosinophilia but no history of illness did give positive skin tests. Five persons who were not clinically ill and did not show eosinophilia at the time of examination are included in the fifty-six positive cases because of marked skin reactions.

Six hospital patients with various diseases were tested with the antigen as controls. Five failed to show an intradermal reaction, a child who was recovering from burns gave a strongly positive skin reaction both with the antigen and with the diluting fluid.

There is no specific in the treatment of trichinosis. Antimony and potassium tartrate has been suggested but has not stood the test of time.⁴¹ In 1916 Salzer reported⁴² that serum therapy cured trichinosis, his claims were disproved the next year by Schwartz.⁴ Miller, McCoy and Bradford⁴³ treated infected laboratory animals with intravenous acriflavine, gentian violet, metaphen and iodine, they concluded that no concentration of any drug used was effective in killing the trichinellae without serious injury to the host. Catharsis appears to be useful in the initial diarrhea, but it is seldom possible to recognize trichinosis at this stage. Prophylaxis might be of great value, this consists in the proper cooking or refrigeration of pork, education of the public in the dangers of eating uncooked meat, and possibly in the use of the intradermal reaction in hogs or improvement in the examination of pork by means of the trichinoscope, which is in use in Germany.⁴⁴

SUMMARY

1 The first epidemic of trichinosis to be recorded in the state of Maine, so far as we have been able to determine, is the largest epidemic to be reported in the United States.

35 Bachman G W. Precipitin Test for Experimental Trichinosis. *Proc Chicago Inst. Med* 7:240 (1927). Precipitin Test in Experimental Trichinosis. *J Prev Med* 2:35 (Jan) 1928. An Intradermal Reaction in Experimental Trichinosis. *ibid* 2:169 (March) 1928.
36 Augustine D L and Theiler Hans. Precipitin and Skin Tests as Aids in Diagnosing Trichinosis. *J Parasitology* 24:60 (March) 1932.
37 McCoy O R, Miller J J Jr, and Friedlander R D. Use of Intradermal Test in Diagnosis of Trichinosis. *J Immunol* 24:1 (Jan) 1933.
38 Stoll H F. Trichinosis. *J A M A* 92:791 (March 9) 1929.
39 Swineford Oscar Jr and Waddell W W Jr. Trichinosis. Five Cases in One Family with Results of Skin Tests. *Virginia M Monthly* 59:28 (April) 1932.
40 Goldschlager A I. Trichinosis. *Ann Int Med* 8:939 (Feb) 1935.
41 Kilduffe R A. Bachman Intradermal Reaction in Human Trichinosis. *Am J M Sc* 186:802 (Dec) 1933.

40 Friedlander, R D. The Present Status of the Diagnostic Intradermal Test for Human Trichinosis. *Am J M Sc* 188:121 (July) 1934.

41 Grove, J S. Use of Antimony and Potassium Tartrate in Trichinosis. *J A M A* 85:349 (Aug 1) 1925.

42 Schwartz Benjamin. Serum Therapy for Trichinosis. *J A M A* 69:1884 (Sept 15) 1917.

43 Miller J J Jr, McCoy O R, and Bradford W L. Intravenous Treatment in Experimental Trichinosis. *J A M A* 98:1242 (April 9) 1932.

44 Berdel. From the Microscope to the Trichinoscope. *Ztschr f Fleisch u Milchhyg* 37:381 (Aug 1) 1927. Seel E. On the Use of the Trichinoscope. *ibid* 38:111 1927.

2 Infection in the present instance came from eating improperly cooked, home-made pork sausages, all persons, with a single exception, were Italians

3 Trichinellae were found in the infected meat and in the striated muscles of the two fatal cases at autopsy

4 Seventy-one individuals are known to have eaten the sausage, and fifty-six showed signs of infection

5 Twenty-six persons were ill with probable trichinosis, satisfactory skin tests were applied to twenty-four of these patients and in all instances the intradermal reaction was positive. Two other individuals, who gave a history of infection of the upper respiratory tract, showed eosinophilia but gave negative skin tests

6 Twenty-five of the seventy-one who had eaten meat from the diseased hog gave no history of illness but were found to have eosinophilia, twelve of this group reacted to the skin test and thirteen did not

CONCLUSIONS

1 Individuals who eat small quantities of trichinous meat may present subsequent eosinophilia without definite illness, it is believed that these persons represent latent cases of trichinosis

2 Bachman's intradermal reaction is positive in individuals who are or who have recently been ill with trichinosis, the test may give negative results in latent cases

58 Deering Street

STUDIES OF GALLBLADDER FUNCTION

VI THE COMPOSITION OF THE GALLBLADDER BILE IN PREGNANCY

CECILIA RIEGEL, PH D

I. S. RAVDIN, MD

PHILIP J. MORRISON, B.A.

PHILADELPHIA

AND

MILTON J. POTTER, MD

BUFFALO

The frequency with which gallbladder disease follows pregnancy¹ cannot be considered a mere coincidence but must be the result of some altered condition in the biliary system in pregnancy, which predisposes to gallstone formation. The relationship is well illustrated in the data of Fallon,² who in 1927 analyzed 1,100 operations on the gallbladder and bile ducts and found that 700 of the patients were women who had borne children.

We³ have shown that alterations in the chemical composition of the bile accompany biliary tract disease. Our earlier studies demonstrated that damage to the gallbladder wall is accompanied by profound changes in the composition of the gallbladder bile.⁴ Not only is this true of gallbladder damage but the liver bile may be altered in its composition by damage to the liver parenchyma.⁵ One must, in addition, take into account the possibility that either gallbladder bile or liver bile

may be altered in composition by factors primarily non-resident in the biliary tract, since gout, tuberculosis, diabetes, vitamin deficiency and thyroid disorders are frequently associated with gallstone disease.

Studies in this laboratory⁶ and elsewhere⁶ have shown that the majority of biliary calculi consist in large part of cholesterol. This fact, taken in conjunction with the hypercholesteremia nearly always found in the latter months of pregnancy,⁷ would indicate that there may be a direct relationship between the two con-

The Composition of Gallbladder Bile from Pregnant Women

| Patient | Chloride Milli equiva lents per Liter | Calcium Milli equiva lents per Liter | Total Phos phorus Mg per 100 Cc | Bile Salt Mg per 100 Cc | Choles terol Mg per 100 Cc | Ratio of Bile Salt to Choles terol |
|---------|---|--|---|----------------------------------|-------------------------------------|--|
| Mo | 11.8 | 31 | 195 | 3.610 | 1.000 | 3.6 |
| Fl | 17.5 | 15 | 89 | 3.610 | .616 | 5.8 |
| Co | 18.0 | 15 | 180 | 4.400 | | |
| Ba | 18.2 | 18 | 137 | 4.690 | | |
| Pa | 30.6 | 11 | 114 | 3.810 | 483 | 7.9 |
| Cl | 30.8 | 17 | 140 | 2.920 | 580 | 5.0 |
| Wa | 22.4 | 12 | 84 | 2.600 | 330 | 6.0 |
| Bu | 33.5 | 14 | 114 | 4.000 | 540 | 7.4 |
| Fl | 35.0 | 11 | 94 | 3.600 | 404 | 8.9 |
| Ha | 36.9 | 12 | 96 | 2.370 | 201 | 11.5 |
| Mu | 37.3 | 11 | 92 | 2.250 | 896 | 5.7 |
| DeL | 30.4 | 21 | 100 | 2.360 | 272 | 8.6 |
| Ho | 40.8 | 12 | 107 | 3.120 | 235 | 10.9 |
| Tu | 44.1 | | | 2.220 | 343 | 6.6 |
| Ga | 45.7 | 9 | 80 | 2.280 | 276 | 8.2 |
| Br | 46.3 | 12 | 92 | 1.640 | | |
| Ro | 47.5 | 18 | 101 | 2.590 | 520 | 4.9 |
| Ec | 50.0 | 16 | 80 | 2.000 | 357 | 5.6 |
| Ea | 50.8 | 11 | 110 | 2.230 | 533 | 4.2 |
| Wi | 50.8 | 18 | 103 | 1.980 | 245 | 8.0 |
| Vo | 52.8 | 14 | 92 | 2.280 | 400 | 4.0 |
| Do | 54.7 | 6 | 77 | 4.400 | 422 | 10.4 |
| Ho | 56.1 | 11 | 98 | 2.680 | 400 | 5.3 |
| Ho | 57.5 | 5 | | 1.960 | | |
| Di | 57.5 | 10 | 80 | 3.600 | 400 | 9.0 |
| Do | 61.2 | 6 | 84 | 1.000 | 130 | 7.6 |
| Sw | 61.2 | 7 | 60 | 2.980 | 328 | 9.0 |
| Fe | 61.8 | 7 | 59 | 2.000 | 2.3 | 7.9 |
| MI | 64.3 | 9 | 57 | 2.220 | 181 | 12.2 |
| Ta | 60.0 | 8 | 69 | 2.560 | 270 | 10.3 |
| Wi | 73.8 | 18 | 54 | 1.520 | 220 | 6.9 |
| Li | 80.8 | 8 | 34 | 1.430 | 160 | 8.9 |
| Pa | | | 89 | 1.900 | 410 | 4.6 |
| We | | | | 2.300 | 220 | 10.4 |

ditions. The opportunity presented itself of obtaining for study thirty-four specimens of gallbladder bile removed at term during cesarean section in patients with no previous history of gallbladder disease. Chemical analysis of this material forms the basis of the present report.

RESULTS

In every instance the gallbladder wall was reported as normal in appearance, although the viscus was as a rule found to be distended at operation. The bile was analyzed for chloride, calcium, bile salt and cholesterol by the methods reported in our earlier papers. The total phosphorus was determined by the method of the Youngburs⁸ after digestion by the method of McCay.⁹

In the accompanying table the data are arranged according to the chloride concentrations. A few of the specimens show a chloride concentration within the range of normal gallbladder bile, while in the remaining specimens the chloride concentration is similar to the mean concentration found in the bile from a diseased noncalculous gallbladder. The calcium concentration varied from 5 to 31 milliequivalents per liter. The

5 Ravidin I. S., Riegel Cecilia and Morrison P. J. Unpublished data.

6 Andrews Edmund, Surg. Gynec. & Obst. 57:36 (July) 1933. Fowweather F. S. and Collinson G. A. Brit. J. Surg. 14:583 (April) 1927.

7 Boyd E. M. J. Clin. Investigation 13:347 (March) 1934.

8 Youngburg G. E. and Youngburg Mamie V. J. Lab. & Clin. Med. 16:158 (Nov.) 253 (Dec.) 1930.

9 McCay C. M. J. Biol. Chem. 80:497 (Feb.) 1931.

Aided by a grant from the Josiah Macy Jr. Foundation.
From the Laboratory of Research Surgery, University of Pennsylvania School of Medicine.
1 Bruckbank E. M. On Gallstones in Cholelithiasis. London J. & A. Churchill 1896.
2 Fallon M. F. Boston M. & S. J. 196:171 (Feb. 3) 1927.
3 Ravidin I. S., Riegel Cecilia and Johnston, C. G. Studies in Biliary Tract Disease. J. A. M. A. 103:1504 (Nov. 17) 1934.
4 Johnston C. G., Ravidin I. S., Riegel Cecilia, and Allison C. L. J. Clin. Investigation 12:67 (Jan.) 1933.

lowest concentration is approximately the same as that for hepatic bile, while the higher figures are similar to the concentrations of calcium in normal gallbladder bile. The mean concentration is similar to that found in patients with chronic noncalculous cholecystitis.⁵ Total phosphorus varied from 34 to 195 milliequivalents per liter.

The bile salt concentration, expressed as sodium cholate, varied from 1,000 to 4,690 mg per hundred cubic centimeters. In every instance the concentration of bile salt was below the concentration found in normal gallbladder bile, the highest concentration in the pregnancy group being about one-half the concentration that we have found to be present in normal gallbladder bile.

The cholesterol concentrations varied from 130 to 1,000 mg per hundred cubic centimeters. All but three were above 200, and eighteen of the thirty were above 300. Ten specimens were analyzed by a digitonin method¹⁰ for the presence of cholesterol esters, and in each instance no ester was present.

COMMENT

In an earlier paper of this series we reported on the chloride, calcium and bile salt concentrations of normal human gallbladder bile obtained from two living patients.⁴ They showed a close similarity to the normal gallbladder bile of the dog. Because of the small quantity of bile available it was not possible to make cholesterol analyses.

The data here presented represent the only analyses of gallbladder bile from pregnant women in which the bile was obtained during life.

Only a few data are available in the literature on the concentration of cholesterol in normal human gallbladder bile. Much of the material termed normal cannot be so considered.¹¹ The only figures that approximate the normal are those given by Fowweather and Collinson⁶ on bile from patients who died accidental deaths and from whom bile was obtained within three to four hours after death. The values given by them range from 200 to 280 mg per hundred cubic centimeters, with a mean of 230 mg. Frerichs (cited by Hammarsten¹²) gives two analyses on bile from patients who died from accidents, the values being 160 and 260 mg per hundred cubic centimeters. Four analyses for bile salt concentration in supposedly normal gallbladder bile (cited by Hammarsten) are 7,220, 9,140, 10,790 and 5,660 mg per hundred cubic centimeters.

In general, the specimens of bile that we obtained from pregnant women were higher in the chloride and cholesterol concentrations and lower in the calcium and bile salt concentrations than is normal gallbladder bile.

The high values found for cholesterol in the majority of instances, which confirm the high values found post mortem by McNee, indicate either that the liver bile in pregnancy contains an increased concentration of cholesterol or that cholesterol is added to the bile while it is in the gallbladder. Several of the highest cholesterol values were found in specimens showing the closest approach to normal gallbladder bile with regard to the chloride and calcium concentration. This would seem to indicate that the hepatic bile entering the gallbladder must be abnormally high in cholesterol.

The high bile cholesterol also indicates that hypercholesteremia is not, as Bacmeister and Havers¹³ suggested, due to the retention of cholesterol in the blood as a result of a decreased output in the bile but indicates rather that the cholesterol in the blood is higher because of overproduction. An interesting feature of this aspect of the problem is that, although the cholesterol of the normal blood consists of approximately 40 per cent esters and 60 per cent free cholesterol, a relationship which, according to Boyd,⁷ is not disturbed in pregnancy, ten specimens of bile analyzed by us for ester content contained no esters.

The high chloride and low calcium values found in a number of the specimens indicate that there is often in pregnancy a disturbance in the absorptive function of the gallbladder, since the normal gallbladder removes chloride and concentrates calcium.

The low bile salt concentrations may be due to several factors. Since bile salts are synthesized in the liver any impairment of liver function may result in a decrease in bile salt production. The data indicating an impairment of functional activity of the gallbladder wall would also suggest that the decrease in bile salt concentration may at least in part be due to increased absorption of the bile salt such as occurs when the gallbladder wall is damaged.

The bile salt-cholesterol ratio was found to vary widely, but in every instance the ratio was below the normal as given by Newman.¹⁴ The data as a whole show a wide spread in the results of analysis for the various constituents studied. They indicate that in pregnancy the composition of the liver bile is altered in respect to the cholesterol and bile salt concentrations. The data on chloride and calcium strongly suggest, in view of our earlier studies, that the gallbladder wall is affected so that it cannot remove chloride and concentrate calcium to the same degree as previously. The low bile salt-cholesterol ratios are in the direction of those found in the more severely damaged calculous gallbladders.

CONCLUSIONS

Data from the study of thirty-four specimens of gallbladder bile removed from living women at term indicate that in pregnancy both the composition of the liver bile and the absorptive function of the gallbladder are changed from the normal. In general, the cholesterol concentration of the gallbladder bile is increased. In every instance the bile salt concentration is below the normal for gallbladder bile. The changes in these two constituents in pregnancy bile are in the direction that one would expect in the precursor stage of calculus formation.

13 Bacmeister and Havers. *Deutsche med. Wchnschr.* 40: 385, 1914.
14 Newman, C. E. *Beitr. z. path. Anat. u. z. allg. Path.* 86: 187 (Jan. 3) 1931.

Energy in One Gram of Protein.—Within fairly wide limits proteins are interchangeable with carbohydrates as a source of energy in the sense that 1 gram of either yields 4 calories when burned in the body, but it is not good physiological or pecuniary economy to use too much protein merely as fuel, for this involves, as has been independently emphasized by Chittenden and by Folin, the constant overcharging of the body fluids with waste nitrogenous matter. Good judgment neither makes a fad of seeking a minimum protein intake nor attempts to rationalize among sedentary people the highly carnivorous habits which may be natural and harmless under frontier conditions.—Sherman, H. C. *Food and Health*, New York: Macmillan Company, 1934.

10 Riegel, Cecilia, and Rose, H. J. Unpublished data.

11 Pearce, S. J. S. *Deutsches Arch. f. klin. Med.* 106: 337, 1912.
McNee, J. W. *Quart. J. Med.* 7: 221, 1913, 1914.

12 Hammarsten, Olof. *Textbook of Physiological Chemistry*. New York: John Wiley and Sons, p. 413.

Clinical Notes, Suggestions and New Instruments

PREVENTION OF SKIN DIGESTION IN HIGH INTESTINAL FISTULAS

FRANCIS HOWE STRAUS M D CHICAGO

The treatment of high intestinal fistulas is a serious problem because of the interference with fluid and mineral balance and because the distressing digestion of the wound margin and skin surface delays healing, interferes with the patient's rest and causes him to refrain from eating. He soon learns that ingestion of food is followed by secretion of digestive juices, which reach the abdominal surface and cause intolerable distress. The problem to be discussed here is not the replacement of the lost fluid and solutes, although that may be vital in cases in which the loss is almost complete.¹

Efforts to control the digestion of the abdominal wall have been only partly successful. They have been based on three main principles:² (1) the chemical neutralization of tryptic ferments by combining them with an excess of peptone powder, protein and fat,³ (2) adsorption of the ferments by finely divided charcoal or kaolin,⁴ and (3) removal of the ferments from the fistula by continuous irrigation⁵ or continuous suction.⁶ All these methods are ingenious and, to a varying extent, useful, but even in careful hands any of them will allow some contact of ferment and skin and thus permit further distress to the patient and destruction of the abdominal wall. Attempts to protect the skin by waterproofing with petrolatum and ointments have done more harm than good because the drainage seeped between skin and ointment where it could not be interfered with by the efforts at chemical protection.

In a number of recent cases of high intestinal fistula in which skin digestion was an important factor, I have been able to control it by coating the skin with a thin film of rubber. Properly applied, and applied early enough, latex will adhere to the skin surface and will not allow ferments to seep beneath it. It will not interfere with the simultaneous use of chemical combination or adsorption or suction to prevent the ferments from acting within the sinus. The film is soothing and protecting to the skin and is comfortable and pliable. It does not require replacement except at infrequent intervals.

Latex is the juice of the rubber tree. It is a milky substance with an alkaline reaction. It is readily obtained and is inexpensive. It dries readily and when dried on the skin leaves adherent to the skin a transparent film of rubber. If the solution is acidified with dilute acetic acid the rubber will promptly precipitate out of it as a similar film. (One of the manufacturers of surgical supplies sells under a trade name small collapsible tubes of a substance resembling latex, which leaves a similar film of rubber and can be used in the same way.)

Care must be taken that the application is made on a clean dry surface, or it will not adhere. It should stop at the margin of the fistula and should be made early enough so that skin digestion has not rendered the entire surface raw and weeping. In recent cases I have applied the latex as a prophylactic dressing to the skin when I anticipated the possibility of trypsin reaching it instead of waiting for the digestion to occur. The film of latex must be spread thinly with a wooden applicator, so that it will dry readily, or else be precipitated with an acid.

From the Department of Surgery Rush Medical College of the University of Chicago

¹ Haden R L and Orr T G. Obstruction of the Jejunum. Arch Surg 11: 859 (Dec) 1925. Erdman S. Transactions of the New York Surgical Society Ann Surg 73: 793 1921.

² Colp R. External Duodenal Fistula. Ann Surg 78: 725 (Dec.) 1923. Cameron A L. Treatment of Duodenal Fistula. Gynec & Obst 37: 599 (Nov.) 1923.

³ Potter Caryl. Treatment of Duodenal Fistula. J A M A 88: 899 (March 19) 1927. Treatment of Duodenal and Fecal Fistula. ibid 92: 359 (Feb 2) 1929.

⁴ Petersen W F. A Note on the Intestinal Action of Adsorptive Agents. J A M A 68: 1234 (April 28) 1917. Smith J F and Christensen H H. Method of Preventing Skin Excoriation in Intestinal Fistula. Surg Gynec & Obst 43: 701 (Nov.) 1926. CoTui F. Kaolin in the Treatment of Intestinal Fistula. Ann Surg 81: 123 (Jan) 1930.

⁵ Erdman S. Cheever David. Concerning Traumatic Rupture of the Duodenum and Duodenal Fistula. Boston M & S J 173: 454 (Sept 23) 1915.

⁶ Lahey, F H. Treatment of Duodenal Fistula by Suction. S Clin North America 4: 1489 (Dec) 1924.

wash. If a gauze dressing is to be applied over it, the rubber surface should be powdered. I have ordinarily used this technique combined with the heaped up kaolin dressing described by CoTui,⁴ in which case the kaolin serves as a powder to prevent the rubber from adhering to the outer gauze dressing. Patients are very comfortable with this dressing, and repair of the fistula is rapid.

122 South Michigan Avenue

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS ADOPTED THE FOLLOWING REPORT
HOWARD A CARTER Secretary

BARR ULTRA-SHORT WAVE RADIOTHERMY UNIT MODEL SW-5 ACCEPTABLE

Manufacturer Barr Laboratories, Inc New York

This unit is recommended by the manufacturer for medical and surgical diathermy. It includes attachments for tissue cutting, coagulation and desiccation, all are of a monopolar type.



Fig 1—Barr Ultra Short Wave Radiothermy Unit Model SW 5

The standard machine is a one tube, self-excited oscillator designed to oscillate at 9 meters, but the firm is prepared to offer a unit of any wavelength from 4 to 30 meters. The input power is about 680 watts. Since there is no acceptable method for measuring the output power of diathermy machines, this value is not stated. The shipping weight is about 175 pounds. Operating the unit under full

load for two hours indicated that the temperature rise of the transformer and of the cabinet was within the limits of safety established by the Council. (Figure 2 is a schematic diagram of the circuit.)

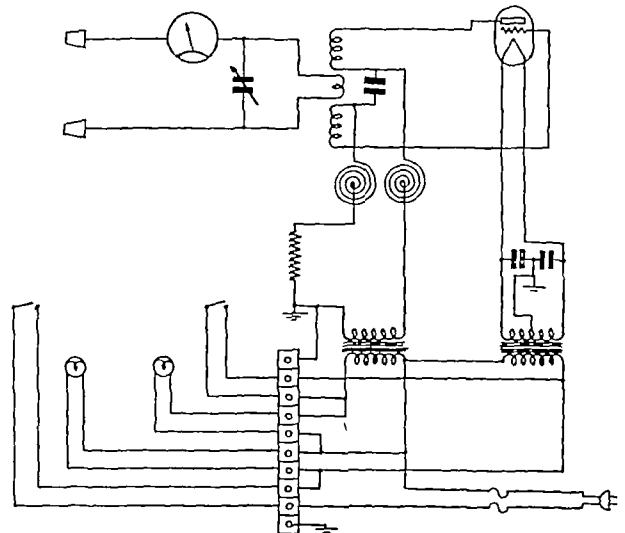


Fig 2—Schematic diagram of the circuit

The tissue heating ability of the machine was investigated in a clinic acceptable to the Council. Cuff electrodes, about 25 cm in diameter and about 50 cm long, were used. When applied to the patient, the cuffs were separated from the skin by about one inch of felt. Thermocouples were introduced into the subcutaneous and deep lying tissues (quadriceps extensor) of the human thigh. While the machine was being operated at the patient's tolerance, the temperature rise (average

of eight tests) observed at the beginning and end of twenty minute periods, the thermocouples being removed during the time of treatment. According to the results submitted, the temperature rise of the deep-lying tissues of the thigh was higher than that obtained with conventional diathermy—the criterion for evaluating short wave machines which the Council had adopted. The Council's investigator reported that the machine supplied sufficient energy to heat the body tissues whenever such treatment is indicated and gave satisfactory service for tissue cutting.

Burns may be produced by this machine but, with ordinary care, they may be avoided, it is highly probable that they will not occur and the danger is much less than with conventional diathermy.

In view of the foregoing report, the Council on Physical Therapy voted to include the Barr Ultra-Short Wave Radio-thermy Unit Model SW-5 in its list of accepted apparatus.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
RAYMOND HERTWIG Secretary

NOT ACCEPTABLE

- 1 LOEB'S GLUTEN FLOUR
- 2 FARWELL & RHINES CRISS CROSS BRAND GLUTEN FLOUR

Manufacturers—(1) Loeb's Dietetic Food Co., New York.
(2) Farwell & Rhines Co., Watertown, N. Y.

Description—Gluten flour prepared from wheat flour by removal of part of the starch, containing not more than 10 per cent moisture and, calculated on the water-free basis, not less than 71 per cent nitrogen nor more than 56 per cent nitrogen-free extract (the protein factor 57 being used) and not more than 44 per cent of starch (as determined by the diastase method).

Uselessness as a Special Purpose Food—These gluten flours are manufactured specially for use in diets restricted in dextrose formers. To be eligible for acceptance, such type of flour shall contain dextrose formers yielding dextrose in an amount not greater than 33 Gm. per hundred cubic centimeters (the dextrose equivalence being computed as the carbohydrate, plus 58 per cent of the protein, plus 10 per cent of the fat content of the food). Dextrose formers of these gluten flours, however, yield approximately 50 Gm of dextrose per hundred cubic centimeters.

There is authoritative evidence that commercially prepared special diabetic foods are of limited usefulness to the diabetic patient and that the availability of insulin makes them no longer necessary. Artificial substitutes for ordinary foods are not to be favored, it is much better for the diabetic patient to learn how to plan his diet with foods in common use and readily available. The diet should be exactly prescribed in carbohydrate, protein and fat, and total calories.

The designation of a food as a "diabetic food" merely because it is low in carbohydrates is now unwarranted and misleading and gives the erroneous impression either that the food taken in unrestricted quantities in diabetes is harmless or that it has remedial action. Except for the necessity of restricting foods to avoid overstepping the food tolerance, there are no special diabetic nutritional requirements. The exploitation of starch-free or low carbohydrate foods containing an excess of protein for use by diabetic patients is unwarranted. Protein may be tolerated almost as poorly, if not quite as poorly, as starch in diabetes.

Because Loeb's Gluten Flour and Farwell & Rhines Criss Cross Brand Gluten Flour are adjudged without usefulness or special adaptability for inclusion in diets restricted in dextrose formers, they will not be listed among the accepted foods of the Committee on Foods.

Gluten flours of other manufacturers, for the reasons stated are not eligible for acceptance.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.



RAYMOND HERTWIG Secretary

- 1 MARY'S BEST BRAND GOLDEN TABLE SYRUP
- 2 SHURFINE BRAND GOLDEN SYRUP
- 3 SHURFINE BRAND WHITE SYRUP

Distributors—1 Domanik Wholesale Grocery Company, Racine, Wis. 2 and 3 National Retailer Owned Grocers, Chicago.

Packer—D. B. Scully Syrup Company, Chicago.

Description—1 and 2 Table syrup, corn syrup flavored with refiners' syrup. The same as Banner Blue Syrup (THE JOURNAL, March 5, 1932, p. 817).

3 Table syrup, corn syrup sweetened with rock candy syrup flavored with vanilla and coumarin. The same as White Crystal Table Syrup (THE JOURNAL, April 15, 1933, p. 1174).

MELLOW BRAND MILK—HOMOGENIZED, PASTEURIZED

Distributor—Brown's Creamery Co., Detroit.

Description—Bottled, pasteurized, homogenized milk.

Preparation—Milk obtained from tuberculin tested herds, government and company inspected, is pasteurized by the holding method (61 C for thirty minutes), homogenized, cooled and bottled, by the usual procedure (THE JOURNAL, Sept. 1, 1934, p. 681).

Analysis—Standardized to contain not less than 35 per cent of milk fat.

Calories—07 per gram, 20 per ounce.

Claims of Distributor—The cream does not separate. The curd formed in the stomach is softer than that from unhomogenized milk.

RED & WHITE BRAND UNSWEETENED HAWAIIAN PINEAPPLE JUICE

Distributor—Red & White Corporation, San Francisco.

Packer—Alexander & Baldwin, Ltd., San Francisco.

Description—Canned unsweetened pineapple juice retaining in high degree the natural vitamin C content. The same as Greetings Brand Pineapple Juice (Unsweetened) (THE JOURNAL, Aug. 17, 1935, p. 513).

OUR LADY'S BRAND MUSHROOMS

BUTTONS (FANCY—FIRST CHOICE—MINIATURE)—SLICED—SLICED STEMS AND PIECES

Packer—Michigan Mushroom Co., Niles, Mich.

Description—Cooked mushrooms, whole, sliced, or sliced pieces and stems, with added water and salt the same as Excelsa Mushrooms, Fancy Buttons, Pieces and Stems, and Sliced (THE JOURNAL, Aug. 4, 1934, p. 342).

PURINA BRAND WHOLE WHEAT BREAD

Manufacturer—Frank's Hot Shops, Inc., Little Rock, Ark.

Description—A whole wheat bread made by the straight dough method (method described in THE JOURNAL, March 12, 1932, p. 889), prepared from whole wheat flour, water, powdered skim milk, sugar, hydrogenated cottonseed oil, yeast, salt malt extract and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate.

PHYSICIANS SPECIALIZING IN PATHOLOGY AND CLINICAL PATHOLOGY

PREPARED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

The Council on Medical Education and Hospitals has maintained lists of approved clinical laboratories and physicians specializing in pathology and clinical laboratory work since 1926. The list of approved clinical laboratories was discontinued in 1931 and replaced by the list of physicians specializing in pathology and clinical pathology.

The Council has always held that the practice of pathology and clinical pathology is a part of the practice of medicine. In many states the law does not specifically prohibit the interpretation of laboratory observations by others than licensed physicians, so that laymen have entered upon this field of practice. Through the activities of non medical clinical laboratories the interests of the patient are jeopardized and frequently the true source, nature and progress of the disease are not ascertained. There is satisfactory evidence of the salutary influence of the Council on Medical Education and Hospitals in the gradual decrease in the number of lay-supervised hospital and independent clinical laboratories. Physicians everywhere have been constantly reminded of the importance of the medical laboratory and have been encouraged to patronize only such clinical laboratories as are directed by physicians listed by the Council or eligible for such recognition.

After nine years of experience with the clinical laboratory situation results, no less satisfactory than the supervision established over medical schools and hospitals, are being realized through the Council's endeavors.

The following list contains the names of 852 physicians who were found to meet the "Essentials" and were recommended by the Council's advisers. Those engaged in teaching, research and other activities are admitted, as well as those in active practice. For the list of pathologists in government service, see page 1351.

LIST OF PATHOLOGISTS

| NAME | ADDRESS | NAME | ADDRESS | NAME | ADDRESS |
|---|--------------------------|-----------------------|------------------------|-----------------------------|------------------------------------|
| ALABAMA | | | | | |
| Birmingham | | Olive View | | Williams George Z | 227 16th St |
| Graham Geo S | 1023 S 20th St. | Bogen Emil | Olive View Sanatorium | Williams Wm. W | 209 16th St. |
| Fairfield | | Pasadena | | Pueblo | |
| Jones Walter C | | Foord Alvin G | Pasadena Hospital | Dunlop J N | Corwin Hospital |
| Tennessee Coal Iron and Railroad Hospital | | Sturdivant B Frank | St Luke's Hospital | Maynard C W | 702 N Main St. |
| Montgomery | | Pomona | | CONNECTICUT | |
| Trumper Abraham | 201 Montgomery St. | Caso Lucius W | 1798 N Garey St. | Hartford | |
| ARIZONA | | Johnson Barton W | 353 N Gibbs St. | Allen Wilmar M | 20 S Hudson St. |
| Phoenix | | Redlands | | Hastings Louis P | 370 Collins St. |
| Hartgraves Thos A | 10th St and McDowell Rd. | Taltavall Wm A | 47 E Vine St | Kendall Ralph E. | 20 S Hudson St. |
| Mills H P | 15 E Monroe St. | Sacramento | | Middletown | |
| Tucson | | Christman Paul Wm | 1027 10th St | Beauchemin Joseph A | Connecticut State Hosp |
| Hicks Robert Alan | 1800 E Speedway | Guttmann Paul H | 1127 11th St. | Fisher Jessie W | 28 Crescent St |
| ARKANSAS | | San Diego | | New Haven | |
| Hot Springs | | Ball Howard A | San Diego Co Gen Hosp | Bartlett Chas J | Grace Hospital |
| Lee Deo C. | 236 Central Ave | Elliott Frances P | 233 A St. | Norwalk | |
| Little Rock | | Pickard Rawson J | 520 E St. | Murray Archibald | Norwalk General Hospital |
| Hoge S F | 215 E 6th St. | Sumerlin Harold S | 2001 4th Ave | Stamford | |
| Thatcher Harvey S | 300 W Markham St. | Thompson Harold A | 233 A St. | Weaver Bruce S | 77 South St |
| Pine Bluff | | San Francisco | | Waterbury | |
| Pittman Wm. G | 202 Pine St | Bolin Zera E | 480 Post St. | Collins Joseph O | 64 Robbins St |
| CALIFORNIA | | Carr Jesse L | 51 San Andreas Way | DELAWARE | |
| Berkeley | | Lippman Marion H | 135 Stockton St | Wilmington | |
| Relch Wm. W | 2236 E Durant Ave | McNaught James B | 2398 Sacramento St | Gay Douglas M | Delaware Hospital |
| Hollywood | | Oliver Harry R | 490 Post St | DISTRICT OF COLUMBIA | |
| Andrews Vernon L. | 1322 N Vermont Ave | Perry Isabella Hester | Univ of Calif Med. Sch | Washington | |
| Loma Linda | | Smith Elmer W | 2200 Hayes St | Cajigas Tomas | 1801 Eye St. N W |
| Cutler O I. | | Smith Pearl M | 3700 California St. | Cholders Roger Morrison | 1335 H St N W |
| Long Beach | | Stowe W Parker | St Luke's Hospital | Dardinski Vincent J | Georgetown Univ School of Medicine |
| Mikels Benjamin M | Seaside Hospital | Victors Ernst A | 450 Sutter St | Kelly Robert A | 1801 Eye St N W |
| Shackford B C | 117 E 8th St | Wood David A | 2398 Sacramento St | Langenstraas K H | St. Elizabeths Hospital |
| Los Angeles | | Wyckoff Harry A. | Stanford Univ Hosp | Lindsay Janvier W | 1726 Eye St. N W |
| Betha Mona E. | 727 W 7th St | San Jose | | Neuman Lester | 1835 Eye St N W |
| Bonyng Chas W | 1930 Wilshire Blvd | Campbell Lenore D | 990 E Santa Clara St. | Rice E Clarence | 1726 Eye St N W |
| Brem Walter V | 657 S Westlake Ave. | Santa Ana | | Sellinger Maurice A. | 1726 Eye St. N W |
| Butt Edward M | 1930 Wilshire Blvd. | Martell B S | 115 Owens Dr | FLORIDA | |
| Evans Newton | 1200 N State St | Santa Monica | | Jacksonville | |
| Hall Ernest M | 3551 University Ave | Kosky Alfred A. | 1250 16th St | Dyrenforth L Y | 1022 Park St |
| Hamnuck Roy W | 657 S Westlake Ave | McLean Wm. J | 958 24th St | Kirk Wm. W | 208 Laura St. |
| Henken Louisa | 3551 University Ave | Stockton | | Royce Clayton E | 1022 Park St. |
| Hill Robt. B | 511 S Bonnie Brae | Holliger Chas D | 242 N Sutter St | Miami | |
| Hyland Clarence M | 4614 Sunset Blvd | COLORADO | | Youmans Ira C | 553 S W 2d St. |
| Kimball Theodore S | 1200 N State St. | Colorado Springs | | Mills Herbert R | 706 Franklin St. |
| Lindberg Ludwig | 1407 S Hope St. | Ryder Charles T | 1626 Wood Ave | GEORGIA | |
| Llaner Geo D | 657 S Westlake Ave | Staines M Ethelyn | 23 E Pikes Peak Ave | Atlanta | |
| Pratt Orlyn B | 312 N Boyle Ave | Denver | | Ayers A J | 384 Peachtree St |
| Seltzer Geo B | 1052 W 6th St. | Black William C | 4200 E 9th Ave | Bishop, Everett L | 384 Peachtree St |
| Zeller A. H | 657 S Westlake Ave. | Carson Paul C. | Presbyterian Hospital | Klugh Geo F | 139 Forrest Ave N E |
| Oakland | | Dobos E I | 1818 Humboldt St. | Norris Jack C. | 50 Armstrong St. |
| Glenn Robt. A | Samuel Merritt Hospital | Freshman A W | 227 16th St. | | |
| Michael Paul | 434 30th St | Hilkowitz Phillip | 227 16th St. | | |
| Moore Gertrude | 2404 Broadway | Jones Rodney H | 227 16th St | | |
| | | Kingry Charles B | 1616 Tremont Pl. | | |
| | | Mugrage Edward R | 4200 E 9th Ave | | |
| | | Queen Frank B | 4200 E. 9th Ave | | |
| | | Thorness Edwin T | Denver General Hosp | | |

| NAME | ADDRESS | NAME | ADDRESS | NAME | ADDRESS |
|-------------------------|------------------------------|---------------------------------------|---------------------------------|-----------------------------|-------------------------------|
| Augusta | | Clinton | | Schlesinger Monroe J | 330 Brookline Ave. |
| Pound Edgar R | Univ of Ga Sch of Med | Boyer Edward E H | 114 32d Ave N | Steele Albert E | 23 Bay State Rd. |
| Emory University | | Davenport | | Ulrich Helmuth | 30 Huntington Ave. |
| Kracke Roy R | Emory University Hospital | Lamb Frederick H | 220 Main St | Warren Shields | 190 Pilgrim Rd. |
| Macon | | Des Moines | | Bradford | |
| Saye Ernest B | 820 New St | Weingart Julius S | 406 6th Ave | Bartlett Bernice A | 11 Haseltine St. |
| Bloomington | ILLINOIS | Dubuque | | Brookline | |
| Markowitz Benj | 210 N Main St | McNamara Frank P | 1598 Delhi St | Dalrymple S C | 233 Walnut St. |
| Chicago | | Iowa City | | Fall River | |
| Arkin Aaron | 55 E Washington St | Herrmann Walter W | University of Iowa | Pearley Elmus D | 1820 Highland Ave |
| Benjamin Eustace L | 185 N Wabash Ave | Smith Harry P | 132 Medical Laboratory Bldg | Walsh James H | 338 Prospect St. |
| Brown Seth E | 533 Grant Pl | Warner Emory D | 124 Medical Laboratory Bldg | Lowell | |
| Croy C Churchill | 25 E Washington St | Ottumwa | | Rodger James Y | 226 Central St |
| Davidsohn Israel | 3750 W 10th Pl | Hecker Friedrich A | 130 E Maple Ave | New Bedford | |
| Delaney P Arthur | 8114 Euclid Ave | St Louis City | | Wason Isabel Mary | 14 Rotch St |
| Dwyer Thomas L | 232 W 63d St | Starry Allen C | St Joseph's Mercy Hosp | Pittsfield | |
| Fishback Hamilton R | 303 E Chicago Ave | KANSAS | | Crischello Modestino | 8 Bank Now |
| Gardner Stella M | 30 N Michigan Ave | Kansas City | | Scoville Helen M | 741 North St |
| Hennemeyer R J | 1305 E 63d St | Wahl Harry R | Bell Memorial Hosp | Springfield | |
| Hill Lewis R | 1120 Leavitt St | Wells Arthur H | Bethany Methodist Hosp | Dwyer John F | 146 Chestnut St |
| Hirsch Edwin F | 1430 S Michigan Ave | Moses Howard N | 100 S Santa Fe St | Jones Fred D | 20 Maple St |
| Howell Katharine M | 29th and Ellis Ave | Topeka | | Westboro | |
| Jaffe Richard H | 533 Grant Pl | Lattimore John L | 901 Kansas Ave | Pierce Lydia Baker | Westboro State Hosp |
| Kearns Jerry Joseph | 4458 Madison St | Wichita | | Worcester | |
| Kirschbaum Jack D | Cook County Hospital | Hellwig C Alexander | 928 N Emporia Ave | Elliot William J | 119 Belmont St |
| Kremer Rudolph J | 333 Belden Ave | KENTUCKY | | Freeman William | P O Box 479 |
| Levine Victor | 6104 Woodlawn Ave | Lexington | | Goodale Raymond H | Worcester City Hosp |
| Levinson Samuel A | 1817 W Polk St | Maxwell Elmer S | 190 N Upper St | Looney Joseph M | Worcester State Hospital |
| Lewis Julian H | 4750 Champlain St | Louisville | | MICHIGAN | |
| Lincoln Mary C | 30 N Michigan Ave | Allen John D | 608 S 4th St | Ann Arbor | |
| Matthies M M | 33 N Wabash Ave | Gordon Harold | Univ of Louisville | Bugher John C | Dept of Path. Univ of Mich. |
| Moore Josiah J | 55 E Washington St | McNeill Clyde | 321 W Broadway | Howard S C | 326 N Ingalls St. |
| Murphy Leonard J | 4753 Broadway | Miller Aura J | 323 E Chestnut St | Wanstrom Ruth C | Dept of Path Univ of Mich. |
| Nelman Benj H | Cook County Hospital | Wester Harry M | 332 W Broadway | Battle Creek | |
| Nicoll Homer K | 122 S Michigan Ave | Pewee Valley | | Humphrey Arthur L | Post Montgomery Hospital |
| Petersen A S J | 45 67 W 11th St | Peters John R | Pewee Valley Sanit & Hosp | Lella Y | Battle Creek Sanitarium |
| Potorsen Wm F | 1817 W Polk St | LOUISIANA | | Lewis Welcome B | Battle Creek Sanitarium |
| Pilot Isadore | 185 N Wabash Ave | Baton Rouge | | Roth Paul | Battle Creek Sanitarium |
| Ribrum Ernest | 4458 Malden St | Beven John L | Our Lady of the Lake Sanitarium | Bay City | |
| Rosenthal Sol Roy | 1853 W Polk St | Lake Charles | | Gamble Wm G Jr | 2010 5th Ave |
| Rukstnat George J | 1758 W Harrison St | Hebert Louis A | 834 Ryan St. | Detroit | |
| Saphir Otto | 29th and Ellis Ave | Monroe | | Amolech Arthur L | Wayne Univ Coll. of Med. |
| Simonds James P | 303 E Chicago Ave | Pracher John | 301 Jackson St. | Beaver Donald C | Woman's Hospital |
| Swan Mary H | 55 E Washington St | New Orleans | | Bines Osborne A | Receiving Hospital |
| Sweeney Henry C | 5001 N Crawford Ave | Bowden Margaret P H | 210 Baronne St | Clark Harry L | 5037 Woodward Ave. |
| Thalhimer Wm | 29th and Ellis Ave | Court Maurice J | 2000 Tulane Ave | Cope Henry E | 1551 Woodward Ave. |
| Weiss Emil | Univ of Ill Coll of Med | Friedrichs Andrew V | 921 Canal St | Davis James F | 1512 St Antoine St. |
| Wells H Gideon | Dept of Path Univ of Chicago | Hauser George H | 927 Canal St | Hartman Frank W | Henry Ford Hosp |
| | | Hosol Kiyoshi | Tulane Univ Sch of Med | Kasper Jos. A | 1151 Taylor Ave. |
| | | Johns Foster M | 927 Canal St | King Walter E | Research & |
| | | Lanford John A | 3000 Prytanis St | Biological Laboratory | Parke Davis & Co |
| | | Lawson Edwin H | 2700 Napoleon Ave | Morse Plinn F | Harper Hospital |
| | | Maher Aida | 228 St. Charles St | Owen Clarence I | 4180 John R St. |
| | | Ogden M A | 2226 Ursuline Ave | Owen R C | 1351 Woodward Ave |
| | | Shreveport | | Stanford Frank W | 1111 Griswold St. |
| | | Butler Willis P | 941 Margaret St | Eloise | |
| | | Ellis Fredk G | 624 Travis St | Gould Sylvester E | Eloise Hospital and Infirmary |
| | | MAINE | | Flint | |
| | | Bangor | | Backus Glenn R | 901 Beale St. |
| | | Thompson H E | 250 State St. | Grand Rapids | |
| | | Lewiston | | Bond Geo L | 114 Fulton St E |
| | | Belliveau Romeo A | St Mary's General Hosp | Gorman Wm M | Blodgett Memorial Hospital |
| | | Gottlieb Julius | 49 Central Ave | Grosse Pointe | |
| | | Portland | | Gruhlit Oswald M | 580 Hampton Rd |
| | | Warren Mortimer | 22 Arsenal St. | Kalamazoo | |
| | | MARYLAND | | Prentice Hazel R | 3404 Oakland Dr |
| | | Baltimore | | Pontiac | |
| | | Acton Conrad | 101 W Read St | Olsen Richard E | 900 Woodward Ave |
| | | Collenberg Henry T | 3 W Read St | Saginaw | |
| | | Glocher Manuel G | 2426 Eutaw Pl | Lohr Oliver W | 302 S Jefferson St. |
| | | Maldels Howard J | 104 W Madison St | MINNESOTA | |
| | | Spencer Hugh R | University of Maryland | Duluth | |
| | | Hampstead | | Berdex George Louis | St Mary's Hospital |
| | | Bringman Gladys H | | Minneapolis | |
| | | MASSACHUSETTS | | Baker Loos | 1111 Nicollet Ave |
| | | Boston | | Drake Charles R | 900 Nicollet Ave |
| | | Belding David L | 80 E. Concord St. | Grave Floyd | 823 Nicollet Ave |
| | | Branch Chas F | 80 E. Concord St | Lutkin Nathaniel H | 424 W Diamond Lake Rd. |
| | | Burnett Francis L. | 205 Beacon St | Merkert Geo L | 1412 E 24th St |
| | | Flashman David H | 37 Schuyler St | Smith Margaret I | 2627 Chicago Ave |
| | | Hinton Wm A. | 25 Bennet St | Rochester | |
| | | Hooker Sanford B | 80 E Concord St. | Kernohan J W | Mayo Clinic |
| | | Leary Olga Cushing | 43 Bay State Rd | MacCarty Wm C | Mayo Clinic |
| | | Leary Timothy | 43 Bay State Rd | Magath Thos B | Mayo Clinic |
| | | Mallory Tracy B | | Robertson H E | Mayo Clinic |
| | | Massachusetts General Hospital | | Rosenow E C | Mayo Clinic |
| | | Oslin J Edwin | 30 Huntington Ave | Sanford Arthur H | Mayo Clinic |
| | | Rooney James Stewart | 53 Parker Hill Ave | Wellbrock Wm. L. A | Mayo Clinic |
| | | | | Wilson Louis B | Mayo Foundation |
| | | | | St. Cloud | |
| | | | | Stangl Fred H | 101 7th Ave S |
| Cedar Rapids | | | | | |
| Mulsow Fredk. W | 120 3d St S E | | | | |
| Cherokee | | | | | |
| Pope John M | | | | | |

| NAME | ADDRESS | NAME | ADDRESS | NAME | ADDRESS |
|---|---------|--|---------|--|---------|
| St Paul | | Paterson | | Newburgh | |
| Ikeda Kano 125 W College Ave | | Davis A Hobson Paterson General Hosp | | Wescott A. M 231 Liberty St | |
| Noble John Franklin Ancker Hospital | | Klm Gay B 703 Main St. | | New Rochelle | |
| MISSISSIPPI | | | | Brooks Henry T 35 Woodland Ave | |
| Greenville | | Plainfield | | McIlroy P T 421 Burguenot St | |
| White E T 301½ Washington Ave | | Borow Louis S 934 Park Ave. | | New York | |
| Meridian | | Teaneck | | Aronoff Rosa Metropolitan Hospital | |
| Krauss William 818, 22d Ave | | Markley Luther A Holy Name Hospital | | Aronson Wm 150 E 182d St | |
| Vicksburg | | Toms River | | Block Nathan 2280 Andrews Ave | |
| Lippincott Leon S 920 Crawford St. | | Halbach Robert McC 802 Main St | | Brown Chester R 150 W 87th St | |
| MISSOURI | | | | Cochau Lindsay F 205 E 69th St | |
| Columbia | | Trenton | | Curphey Theodore J 116 E 61st St | |
| Ncal M Plnson Dept of Path Univ of Mo | | Boughton Thos H 446 Bellerue Ave | | Darlington Charles G 209 E 23d St | |
| Jefferson City | | Rogers Wm N 1255 Brunswick Ave | | Dolgopol Vera B 131 W 110th St | |
| Adams Charles T Mo State Board of Health | | NEW MEXICO | | Donnet J Victor 57 W 57th St | |
| Kansas City | | Albuquerque | | DuBois Phebe L 150 E 73d St | |
| Duncan Ralph Emerson 306 E 12th St | | Beam M P 221 W Central Ave | | Eggston Andrew A 653 Park Ave | |
| Hall Frank J 306 E 12th St | | NEW YORK | | Ehrlich Joseph C Lebanon Hospital | |
| Helwig Ferdinand C St Lukes Hospital | | Albany | | Fisar Wm J 525 E 68th St | |
| Johnson Emsley T St Joseph Hospital | | Clemmer John J 136 S Lake Ave | | Ewing James 2 W 106th St | |
| Kortischoner Robt 4949 Rockhill Rd | | Cilbert Ruth 116 N Allen St | | Felsen Joseph 667 Madison Ave | |
| Narr Frederick C Research Hospital | | Horner Henrietta Calhoun 171 S Main Ave | | Ferraro Louis R 711 E 230th St | |
| Stewart Edward L 1115 Grand Ave | | Kilneck Gustavus H Jr Albany Med Coll | | Foot Nathan Chandler 525 E 68th St | |
| Trimble Wm K 1103 Grand Ave | | Wright A W Albany Med Coll | | Fraser Alexander 153 W 11th St | |
| St. Louis | | Binghamton | | Frosch Herman L 1882 Grand Concourse | |
| Allen Holitt N 634 N Grand Blvd | | Berkstrom V W Binghamton City Hosp | | Geiger Jacob 25 Central Park West | |
| Buhman Rudolph 539 N Grand Blvd | | Gregory Hugh S Binghamton State Hosp | | Gerber Isadore E 1 E 100th St | |
| Gradwohl R D H 3514 Lucas Ave | | Brooklyn | | Gonzales Thomas A 56 E 87th St | |
| Harris D L 508 N Grand Blvd | | Baker Margaret V 437 Orvington Ave | | Graef Irving 477 First Ave | |
| Ires Geo 3720 Washington Blvd | | Black F A 80 Hanson Pl | | Grauer Frank 226 W 71st St | |
| Katz Samuel D 3720 Washington Blvd | | Dorby Irving Marsh 681 Clarkson Ave | | Hadjopoulos L G 6 E 78th St | |
| Klenk Chas I 508 N Grand Blvd | | Feln M J 50 Greene Ave | | Holtzmann Louis 38 W 90th St | |
| McCordock Howard A Washington Univ | | Franklin William Z 955 Eastern Pkwy | | Helpern Milton 975 Park Ave | |
| McFerry Chas. Wm 529 N Whittier St | | Grainick Abraham 110 Sumner Ave | | Hillman Oliver S 140 E 54th St | |
| Siebert Walter J Washington Univ | | Greeley Horace 140 Clinton St | | Hochman Charles H 2715 Grand Concourse | |
| Thompson Ralph L 607 N Grand Blvd | | Halpert Béla 555 Prospect Pl | | Jacobson Sheldon A 1910 Madison Ave | |
| Walsh L S Newman 5535 Delmar Blvd | | Kantrowitz Abraham R 475 Ocean Ave | | Jaffe Henry L 1919 Madison Ave | |
| Springfield | | Lederer Max 555 Prospect Pl | | Jeffries Ferdinand M 18 E 41st St | |
| Stone Murray C. 200 E Pershing St. | | Marten M Edward 515 Ocean Ave | | Jessup D S D 411 W 114th St | |
| MONTANA | | Moltrier Wm Jr 1219 Dean St. | | Kallaki David J 70 E 83d St | |
| Butte | | Morrison Maurice 250 Ocean Pkwy | | Klemperer Margit Freund 385 Central Park West | |
| Peterson Raymond P 57 W Quariz St. | | Nidish Edward H 1272 Bergen St. | | Klemperer, Paul 385 Central Park West | |
| Great Falls | | Polnyes Sllik H 425 Prospect Pl | | Knox Lella Charlton St Lukes Hospital | |
| Hitchcock E D Grant Falls Clinic | | Wlener Alexander S 520 Crown St | | Kopel Moses 1454 Grand Concourse | |
| Walker Thos F 503 1st Ave N | | Buffalo | | Larimore L D 750 Riverside Dr | |
| Poplar | | Bentz Charles A 126 W Humboldt Pkwy | | Lefkowitz Louis L 1051 Tiffany St | |
| Dahlstrom Arthur W U S Indian Hosp | | Hanan Ernest B 463 Grider St. | | Levine Jacob 1345 Shakespeare Ave | |
| NEBRASKA | | Jacobs William F 408 Richmond Ave | | Lisa James R New York City Hospital | |
| Omaha | | Rosedale Raymond S 270 Norwalk Ave | | Macheal W J 303 E 20th St. | |
| Eggers Harold E Univ of Nebr. Coll of Med | | Vaughan Stuart L 100 High St | | Manbelms Perry J 27 W 96th St. | |
| Manning E T 107 S 17th St | | Warwick Margaret 875 Lafayette Ave | | McNell Archibald 18 E 41st St | |
| Moody W B 105 S 17th St | | Williams Herbert U 30 Arlington Pl. | | Meeker Louise H 303 E 20th St | |
| Rubnitz A S 107 S 17th St | | Central Islip | | Moolten Sylvan E 60 E 66th St | |
| Russman B Carl 306 N 14th St | | Trygstad Reidar Central Islip State Hosp | | Olcott Charles T 1300 York Ave | |
| Tollman James P 42nd and Dewey Ave | | Clifton Springs | | Pincus Julius 250 W 75th St. | |
| NEVADA | | Thomas Walter S 42 Kendall St. | | Price Aaron S 337 W 50th St. | |
| Reno | | Corning | | Rabson S Milton 166 W 72d St | |
| Parsons Lawrence 235 W 6th St. | | Shaffer Rudolph J 163 E 1st St. | | Rohdenburg G L 111 E 76th St | |
| NEW HAMPSHIRE | | Cortland | | Rosenthal Nathan 51 E 90th St. | |
| Hanover | | Wall Wm A 134 Homer Ave | | Rous Peyton Rockefeller Institute for Medical Research | |
| Miller Ralph E 9 Downing Rd | | Elmira | | Rubensteln Morris 1475 Walton Ave | |
| NEW JERSEY | | Bleyer Leo F 555 E Market St. | | Saccone Andrea 334 E 116th St | |
| Arlington | | Munch Otto Louis Arnot Ogden Memorial Hospital | | St George Armin V 400 E 29th St | |
| Gillman C M B 59 Seeley Ave | | Stuart Anna M 658 Park Pl | | Seecof David P 1970 Daly Ave | |
| Asbury Park | | Far Rockaway | | Shuster Mitchell 30 E 40th St | |
| de Pons Isabel S C 501 Grand Ave | | Handelman Klnshnikoff Pauline 536 Beach 22d St. | | Smith Lawrence W Willard Parker Hospital | |
| Pons C A 501 Grand Ave | | Glens Falls | | Sondern Frederic E 20 W 55th St | |
| Atlantic City | | Mason Morris 191 Glen St. | | Sophian L H 428 W 59th St | |
| Kilduffe Robt A Atlantic City Hosp | | Ithaca | | Stanford Addie D 450 E 64th St | |
| East Orange | | Hauensteln B F Tompkins Co Memorial Hospital | | Stillman Ralph G 525 E 68th St | |
| Milner Carl L 157 Harrison St | | Jackson Heights | | Taub Jacob 1574 Leland Ave | |
| Elizabeth | | Angrist Alfred 37 35 74th St | | Taylor Ewing 27 W 44th St | |
| Casilli A R 618 Newark Ave | | Jamaica | | Thro William C 1300 York Ave | |
| Englewood | | Buxbaum Edward J 8711 105th St | | Wallerstein Harry 585 West End Ave | |
| Halpern Herman 143 Engle St. | | Campbell N H M 89 18 139th St. | | Weintraub Solomon 240 E 79th St | |
| Graystone Park | | Werne Jacob 89 04 148th St. | | Wells M. Arthur 235 W 76th St | |
| Christian Thos B | | Kings Park | | Whitcher Burr R 305 E 20th St. | |
| Jersey City | | Preitman Gordon | | Ogdensburg | |
| Alter Nicholas M 410 Fairmount Ave | | Kingston | | Porro Francis W A Barton Hepburn Hosp | |
| Hemsath Fredk A 176 Palisade Ave | | Taylor James Spottiswood City of Kingston Laboratory | | Ossining | |
| Mount Holly | | Little Neck | | Goalline Harold I 275 Spring St | |
| Viteri Luis E 137 High St | | Van Nostrand Hobart S 45 06 Little Neck Pkwy | | Ozone Park | |
| Newark | | Long Island City | | deYeer J Arnold 101 32 97th St | |
| Autopol Wm Beth Israel Hosp | | Hala Wm W 30 20 29th St. | | Poughkeepsie | |
| Brown Lewis W 160 Roseville Ave | | Marcy | | Carpenter H P Hudson River State Hospital | |
| Echikson Joseph I 845 S 12th St | | Bower George C Marcy State Hospital | | Peckham A L Vassar Brothers Hosp | |
| Goldberg Samuel A 27 S 9th St | | Middletown | | Rochester | |
| Gray John W 142 Clinton Ave | | Kelly Wm E Middletown State Homeopathic Hosp | | Brown Herbert R 224 Alexander St | |
| Yaguda Asher 88 Clinton Ave | | Newark | | Gáspár István A 501 W Main St | |
| Orange | | Baumgartner E. A Newark State School | | Hawkins William B 260 Crittenden Blvd | |
| Cline Benj F 264 Central Ave | | | | Kennedy Robert P 176 S Goodman St | |
| | | | | Lindsay Saml T 900 W Main St. | |
| | | | | O Grady Geo W 277 Alexander St. | |
| | | | | Rye | |
| | | | | Loder M M | |
| | | | | Saranac Lake | |
| | | | | Gardner L U 7 Church St. | |
| | | | | Schenectady | |
| | | | | Kellert Ellis Ellis Hospital | |
| | | | | Syracuse | |
| | | | | Ferguson J Howard 309 S McBride St | |
| | | | | Welskotten H. G 309 S McBride St | |

| NAME | ADDRESS |
|---------------------|------------------------|
| Troy | |
| Curry A Hazel | 467 Pawling Ave |
| Curtis Stephen H | Leonard Hospital |
| Jacobsen V C | 51 1st St |
| Utloa | |
| Gallagher C D | 1676 Sunset Ave |
| Russell Clarence L | 1125 Court St. |
| Valhalla | |
| Dalkdorf Gilbert J | Grasslands Hospital |
| Springer, Joyce M | Grasslands Hospital |
| Watertown | |
| Walker Thomas T | 11 Public Sq |
| Westfield | |
| Field Cyrus W | 88 N Portage St. |
| White Plains | |
| Russell Hollis K | 82 Concord Ave |
| Yonkers | |
| Cook Ward H | Bureau of Laboratories |
| Weedon Frederick R | Bureau of Laboratories |

NORTH CAROLINA

| | |
|--------------------|---------------------------|
| Asheville | |
| Crump Curtis | 36 Grove St |
| Chapel Hill | |
| Bullitt James B | |
| Charlotte | |
| Barret Harvey P | 403 N Tryon St |
| Todd Lester C | 403 N Tryon St |
| Durham | |
| Baker Roger D | Duke Hospital |
| Byrnes Thomas H | Watts Hospital |
| Forbus Wiley D | Duke Hospital |
| Sprunt Douglas H | Duke Hospital |
| Wake Forest | |
| Carpenter C. C | Wake Forest School of Med |
| Wilmington | |
| Barefoot Graham B | 404 N 3d St |

NORTH DAKOTA

| | |
|--------------------|-----------------------|
| Bismarck | |
| Larson L W | 221 5th St. |
| Grand Forks | |
| Saiki A K | Univ of N Dak Med Sch |
| Minot | |
| Breslich Paul J | Trinity Hospital |

OHIO

| | |
|--------------------|-------------------------------|
| Akron | |
| Hathaway Burr M | Children's Hospital |
| Potter Frederick C | 236 W Cedar St |
| Saylor, Edward L | 525 E Market St |
| Cincinnati | |
| Faller Albert | 19 W 7th St |
| Herzberg Mortimer | Jewish Hospital |
| Patterson James N | Univ of Cincinnati |
| Zeek Pearl M | Cincinnati Gen Hosp |
| Cleveland | |
| Dominguez Rafael | 2272 S Taylor Rd |
| Goldblatt Harry | 2085 Adelbert Rd |
| Karsner Howard T | 2085 Adelbert Rd |
| Kline Benjamin S | 1800 E 105th St |
| Moritz Alan R | 2085 Adelbert Rd |
| Columbus | |
| Coonts J J | 370 E Town St. |
| Fidler Roswell S | 700 N Park St. |
| Hoffman Ralph W | 1542 W 1st Ave |
| Reinhart Harry L | 1711 Essex Rd |
| Shilling Ellis Ray | 345 E State St |
| Dayton | |
| Payne Foy C | 201 S Main St |
| Simpson Walter M | 134 Apple St. |
| Dover | |
| Shawaker Max | Reeves Bank Bldg |
| Elyria | |
| Rosenzweig Maurice | 630 E River St. |
| Lorain | |
| Donaldson John B | 700 Broadway |
| Newark | |
| Mitchell Louis A | 28 E Locust St |
| Springfield | |
| Oesterlin Ernest J | Springfield City Hosp |
| Toledo | |
| Crumrine Ralph M | Lucas County General Hospital |
| Hindman S S | 315 Michigan St. |
| Ramsey, Thomas L | 315 Michigan St. |
| Rucker James B | 630 W Central Ave |
| Schade August H | 320 Michigan St. |
| Steinberg Bernhard | Toledo Hospital |
| Zbinden Theodore | 706 Madison Ave. |
| Youngstown | |
| Kramer G B | Youngstown Hospital |

OKLAHOMA

| | |
|---------------------|---------------------------------|
| Bartlesville | |
| Chamberlin E M | Washington County Memorial Hosp |

| | |
|----------------------|------------------------|
| El Reno | |
| Muzzy Wm J | 212 S Evans St |
| Oklahoma City | |
| Bailley Wm H | 300 W 12th St. |
| Jeter Hugh C | 1200 N Walker St |
| Keller W F | 110 N Broadway |
| Tulsa | |
| Nelson I A | 108 W 6th St. |
| Venable Sidney C | 420 S Main St |
| OREGON | |
| Eugene | |
| Purser Emil D | 130 E. Broadway |
| Portland | |
| Foskett H H | 1058 S W Taylor St |
| Hunter Warren C | Univ of Oregon Med Sch |
| Lawrence H J | 322 Alder St |
| Manlove Chas H | 2266 Marshall St N W |
| Menna Frank R | Univ of Oregon Med Sch |
| Robertson Thomas D | 1025 N W 24th Ave |

PENNSYLVANIA

| | |
|---------------------|------------------------------------|
| Abington | |
| Edman, John | Abington Memorial Hosp |
| Allentown | |
| Hodgens Helen W | Allentown State Hospital |
| Millstead J C | 4th and Chew Sts |
| Wenner John J | 941 Hamilton St |
| Altoona | |
| Brumbaugh A S | 1312 11th St. |
| Ardmore | |
| Boik William P | Times Med Bldg. |
| Bethlehem | |
| Rothrock Henry A Jr | St Luke's Hospital |
| Chester | |
| Sickel Geo B | 525 Welsh St |
| Danville | |
| Hunt Henry F | |
| Easton | |
| Calnes Carl | 170 N 3d St |
| Zillesen F O | 250 Bushkill St |
| Erie | |
| Armstrong E L | 2d and State Sts |
| Fortyfort | |
| Janjigian R R | 1043 Wyoming Ave |
| Gettysburg | |
| Stewart Henry | |
| Greensburg | |
| Mayhew J Morgan | 332 W Pittsburgh St. |
| Harrisburg | |
| Denison Charles W | Harrisburg State Hospital |
| Moffitt George R | Harrisburg Hospital |
| Van Horn Herman H | 3d St and Polyclinic Ave |
| Huntingdon | |
| Reiners Charles R | 741 Washington St. |
| Johnstown | |
| Anderson Horace B | 218 Franklin St |
| McCloskey B J | 10-0 Franklin St. |
| Kingston | |
| Daley D F | 214 Chestnut St |
| Wenner Thos J | 562 Wyoming Ave |
| Lancaster | |
| Keasbey Louisa E | Lancaster Gen Hosp |
| Lansdowne | |
| Kennedy Patrick J | 65 Fairview Ave |
| Mayview | |
| Fetterman George H | Pittsburgh City Home and Hospitals |
| McKeesport | |
| Menlowe P M | 1231 Evans Ave |
| Sandblad A. G | 1701 Union St. |
| New Brighton | |
| McLaren Harold J | 541, 11th Ave |
| Norristown | |
| Laubach Charles A | Norristown State Hospital |
| Simpson John C | 920 Swede St. |
| Philadelphia | |
| Aanis Eugene J | 1524 Chestnut St. |
| Bartmaier O F | 2303 W Lehigh Ave. |
| Bauer John T | 8th and Spruce Sts |
| Becker Carl Emil | 2341 N College Ave |
| Brown Claude P | 1830 Chestnut St. |
| Bucher Carl Joseph | 271 S 15th St |
| Case Eugene Allen | 1818 Lombard St. |
| Clark J H | 3701 N Broad St. |
| Corson-White L P | 1820 Pine St. |
| Crawford Baxter L | Jefferson Med Coll. and Hosp |
| Custer Richard P | 4035 Chestnut St |
| de Rivas Damaso | 1831 Chestnut St |
| Fisher H Russell | 226 W Gorgas Lane |
| Fowler Kenneth | Presbyterian Hospital |
| Fox, Herbert Pepper | Laboratory Univ of Pa. |
| Gault Edwin S | Temple Univ. Sch. of Med. |
| Ginsburg Gershon | 1936 N 7th St. |

| | |
|---------------------------|------------------------------------|
| Hastings Willard S | Jeanes Hosp |
| Hopp George A | 20th and Chestnut Sts. |
| Konzelmann F W | Broad and Ontario Sts. |
| Krumhaar E B | Univ of Pa. Sch of Med. |
| Long Esmond R | Henry Phipps Institute |
| Lucké Balduin | Univ of Pa Sch of Med |
| Lynch Frank B Jr | Germantown Disp and Hosp |
| McFarland Joseph | |
| McManes Laboratory | Univ of Pa. |
| Meranza David R | 31t Sinal Hosp. |
| Moon V H Jefferson | Med Coll and Hospital |
| Rees William T | 3763 N 18th St. |
| Reimann S P | Lankenau Hospital |
| Richardson Russell | 320 S 16th St. |
| Rose S Brundt | 4035 Chestnut St. |
| St. John E Quintard | 1833 Chestnut St. |
| Soloff Louis A | St Joseph's Hospital |
| Spaeth William L C | 5000 Jackson St |
| Steinberg Wm | 1818 Pine St. |
| Stewart Harold L | Jefferson Med Coll and Hospital |
| Tuft Louis | 1530 Locust St. |
| Zeckwer Isolda Therese | Univ of Pa Sch of Med |
| Pittsburgh | |
| Baker Moses H | 121 University Pl. |
| Bruecken A J | St Francis Hospital |
| Cohen Mortimer | Univ of Pittsburgh Med. Sch. |
| Crauer Robert C | 2001 Murray Ave. |
| Gross Paul | 4800 Erienship Ave |
| Hamilton Robt C | Passavant Hospital |
| Maythorn Samuel R | 210 F Park Way N 8 |
| Joyce Francis W | 4001 California Ave. |
| Lacy George Rufus | Univ of Pittsburgh Med Sch. |
| McClellan Robt H | 260 46th St. |
| McMeans J W | Pittsburgh Hospital |
| Mellon Ralph R | 6055 Bunkerhill Dr |
| Moyer Ray P | 1021 Portland St |
| Permar, Howard H | Mercy Hospital |
| Ray Henry M | 500 Penn Ave. |
| Rockman Jacob | 2117 Carson St. |
| Ross Elizabeth | 5230 Centre Ave. |
| Wallhauser Andrew | Univ of Pittsburgh |
| Willets Ernest W | 429 Penn Ave |
| Yardman K | Montefiore Hospital |
| Pottsville | |
| Moll Francis K | 809 Mahantongo St |
| Reading | |
| Elton Norman W | 2340 Perkiomen Ave |
| Funk Erwin Dexterly | Reading Hospital |
| Sayre | |
| DeVan Chas H | Robert Packer Hosp |
| Soranton | |
| Clark Geo A | 129 Washington Ave. |
| Cooper Harold B | 633 E Market St. |
| Sewickley | |
| Feltwell Myrtle R | |
| Sharon | |
| Hartman Geo O | 740 E State St. |
| Torrance | |
| Wiseman John Ignatius | |
| Warren | |
| Eaton H. C. | Warren State Hospital |
| Washington | |
| Ramsey G W | Washington Hospital |
| West Chester | |
| Hollingsworth I P P | 411 N Walnut St. |
| Wilkes Barre | |
| Jamieson Howard M | Wilkes Barre General Hospital |
| York | |
| Pusch Lewis C | York Hospital |
| RHODE ISLAND | |
| Howard | |
| Crank Hawser P | State Hospital for Mental Diseases |
| Providence | |
| Clarke B Earl | 593 Eddy St |
| Hamilton James | 349 Hope St |
| Schradlack C. E | 825 Chalkstone Ave |
| SOUTH CAROLINA | |
| Charleston | |
| Johnson Francis D | 16 Lucas St. |
| Lynch Kenneth M | 16 Lucas St |
| Columbia | |
| Plowden Henry H | 2020 Hampton St. |
| Smith Herbert M | State Office Bldg. |
| Greenville | |
| Wilson Thos R W | 109 Memminger St. |
| Spartanburg | |
| Mosteller Ralph | 855 N Church St. |
| SOUTH DAKOTA | |
| Vermillion | |
| Ohlmacher, Joseph C | 309 Lewis St. |

| NAME | ADDRESS | NAME | ADDRESS | NAME | ADDRESS |
|--------------------|-------------------------------------|----------------------|-----------------------------|---------------------------|-----------------------------|
| TENNESSEE | | | | | |
| Chattanooga | | San Antonio | | Charleston | |
| Crowell Tolbert C | 544 McCaillie Ave | Moore John M | 700 E Houston St. | Beck James S P | Charleston General Hospital |
| Knoxville | | Scott Raymond E | 700 E Houston St | Gillies McLeod | 812 Beech Ave |
| DePue Ray V | 601 Walnut St | Stout Beecher F | 700 E Houston St | Clarksburg | |
| Monger Ralph H | 603 W Main Ave | Temple | | Light Frederick W | St Mary's Hospital |
| Memphis | | Phillips Charles | 1302 N 5th St. | Huntington | |
| Jones, Maurice J | Pathological Institute Univ of Tenn | Robinson James E | 304 S 22d St | Hodges Frank C | 955 4th Ave |
| Leake Nolan E | 300 Madison Ave | Wichita Falls | | Morgantown | |
| McIntosh J A Jr | 251 Jackson Ave | Clover Milton H | 900 8th St. | Fenton C. C | West Virginia Univ |
| Moss Thomas C | 1265 Union Ave | Venable Douglas R | 2010 Garfield St. | Wheeling | |
| Schmittou L V | 130 Madison Ave | Ogden | | Little Harold G | 2000 Loft St |
| Nashville | | Schelm Geo W | | WISCONSIN | |
| Jones Robt. L | 700 Church St | Thomas D | Dec Memorial Hospital | Eau Claire | |
| Rigdon Raymond H | Vanderbilt Hosp | Salt Lake City | | Scullard Garner | 219 Roosevelt Ave |
| TEXAS | | Flood Thos A | 8 E 3d South St. | LaCrosse | |
| Austin | | Ogilvie O A | 50 E South Temple St. | Thurston Eric W | St Francis Hospital |
| Bolts Sidney W | 410 E 5th St | Burlington | | Madison | |
| Graham G W | 110 W 7th St | Buttles Ernest H | Mary Fletcher Hospital | Bayley William E | 1300 University Ave |
| Jackson J Warren | 110 W 7th St | Norfolk | | Bunting C. H | 426 N Charter St |
| Beaumont | | Motycia Lawrence J | Norfolk Protestant Hospital | McGary Lester | 925 Mound St |
| Lewis Seaborn J | 308 Pearl St | Roche Mary E | 229 W Dute St | Pessin S B | 720 S Brooks St |
| Willford H B | 505 Orleans St | Richmond | | Ritchie Gorton | 420 N Charter St |
| Dallas | | Decl Hegena C | 1103 W Franklin St | Stovall Wm D | Service Memorial Institute |
| Bell Marvin D | 1719 Pacific Ave | Broders A C | Medical College of Va | Milwaukee | |
| Black J Harvey | 1719 Pacific Ave | Budd Saml W | 1000 W Grace St. | Barta Edward F | 2706 N 40th St |
| Brandes W T | Baylor University Hospital | Shaw Frederick W | Medical College of Va | Enzer Norbert | 425 E Wisconsin Ave |
| Caldwell Geo T | Baylor Univ Coll of Med | WASHINGTON | | Fernan Nunez Marcos | 561 N 15th St |
| Carter Chas F | 1719 Pacific Ave | Seattle | | Grill John | 561 N 15th St |
| Gorforth John L | 3121 Bryan St | Cofalu Victor | 508 Olive St. | Hansmann G H | 3321 N Maryland Ave |
| Hill Joseph M | Baylor University Hospital | Magnusson G A | 509 Olive St. | Seelman John J | 205 E Wisconsin Ave |
| Sanders C. H | Ont Lawn and Maple Aves | Nickson D H | 803 Summit Ave | Thuringer E L | 231 W Wisconsin Ave. |
| Wallace Stuart A | 3301 Junius St | Sedro Woolley | | Oshkosh | |
| El Paso | | West P C | Northern State Hospital | Dickelmann Lorin E | 46 Washington Blvd |
| Dutton Loralne Orr | 114 Mills St | Spokane | | CANAL ZONE | |
| Turner Geo | 100 N Oregon St | Edgar James D | 733 W 4th Ave. | Ancon | |
| Walte Willis W | 114 Mills St | Patton Frank R | 407 Riverside Ave. | Bates Lewis B | Gorgas Hospital |
| Fort Worth | | Patton Matthew M | 407 Riverside Ave | Hawaii | |
| Hulsey Slim | 600 W 10th St | Stier Robt F E | 407 Riverside Ave. | Honolulu | |
| Owen May | 600 W 10th St | Tacoma | | Fennel Eric A | |
| Terrell Truman C | 600 W 10th St | McColl Charles R | 1812 S Eye St. | The Clinic | Young St. at Thomas Sq |
| Galveston | | Terry Benjamin T | Tacoma General Hospital | Larsen Nils P | Queen's Hospital |
| Brindley Paul | 900 Avenue B | Bluesfield | | Koloa | |
| Marr William L | 900 Avenue B | Grant Margaret S | 1710 Bland St. | Ecklund Archibald M. | |
| Houston | | Sinclair M W | 204 Ramsey St. | PHILIPPINE ISLANDS | |
| Bradon Albert H | 1010 Crawford St | WEST VIRGINIA | | Manila | |
| Braun Harry E | Jefferson Davis Hospital | | | de Leon Walfrido | 609 Kansas Ave |
| Wood Martha A | 1215 Walker Ave | | | Puerto Rico | |
| Jacksonville | | | | San Juan | |
| Sory Wm. H | Nan Traxis Memorial Hospital | | | Costa Mandry Oscar | Department of Health |

PHYSICIANS SPECIALIZING IN PATHOLOGY IN GOVERNMENT SERVICE

| | | | | |
|-----------------------------|----------------------------------|-----------------------------------|--|--|
| UNITED STATES ARMY | | | Richmond Paul Comdr | U S Naval Hospital Bremerton Wash |
| Abb J Earle Maj | Letterman General Hospital | San Francisco | Rohow Fred M Lt Comdr | Navy Department Washington D C |
| Bibb Lewis B Maj | Station Hospital | Fort McPherson Ga | Satterlee Richard C Lt Comdr | U S Naval Hospital Mare Island Calif |
| Candler George R Lt Col. | | | Sledge Robert F Lt Comdr | U S Naval Med. School Washington D C |
| Cornell Virgil H Maj | Army Medical Research Board | Ancon Canal Zone | Smith E E Comdr | Navy Department Washington D C |
| Dart Raymond O Maj | 2d Corps Area Laboratory | 39 Whitehall St. New York City | Wildman Otis Comdr | U S Naval Hospital Philadelphia |
| DeCoursey Elbert Capt | Army Medical Museum | Washington D C | UNITED STATES PUBLIC HEALTH SERVICE | |
| Fallal J Vincent Maj | Army Medical Museum | Washington D C | Fitzsimmons Charles E | U S Marine Hospital San Francisco Calif |
| Leutkow C J Maj | % Department Surgeon | Manila P I | Harmos Oscar | U S Marine Hospital Norfolk Va |
| Grant Brooks Collins Maj | Medical School | Washington D C | Lake Gleason C | U S Marine Hospital Seattle Wash |
| Kinberger Albert G Maj | Schofield Barracks | Honolulu Hawaii | Lillie R D | National Institute of Health Washington D C |
| Sinclair Charles G Maj | Station Hospital | Fort Benning Ga | Neujean Victor A | U S Marine Hospital Ellis Island New York City |
| Tasker A N Col | Station Hospital | Fort McPherson Ga | VETERANS ADMINISTRATION | |
| Thomas Alfred R Jr Maj | % Adjutant General | Washington D C | Blumberg Alfred | Oteen N C |
| UNITED STATES NAVY | | | Carhart William G | St Cloud Minn |
| Adamkiewicz L L Comdr | U S Naval Hospital | San Diego Calif | Daukays Joseph | Excelsior Springs Mo |
| Alden George A Lt Comdr | U S Naval Medical School | Washington D C | Elledge Lloyd C | Augusta Ga |
| Behrense Charles F Lt Comdr | U S Naval Hospital | Newport R I | Finley Walter G | San Fernando Calif |
| Bennett John T Comdr | U S S Arkansas | % Postmaster | Fulwider Robert M | Veterans Administration Home Kan |
| Brown Ernest W Capt | U S S California | % Postmaster | Hallman Edward Leo | Tucson Ariz. |
| Butler Charles S | Rear Admiral | Medical Supply Depot Brooklyn N Y | Henderson Richard C | 130 W Kingsbridge Rd. New York City |
| Chambers John H Comdr | Navy Department | Washington D C | Latta Jefferson B | Fort Bayard N Mex |
| Clark G F Capt | U S Naval Hospital | Chelsea Mass | Lederer Arthur | Jefferson Barracks Mo |
| Cookey George F Lt | % Bureau of Medicine and Surgery | Washington D C | Matz Philip B | |
| Dickens Paul F Lt Comdr | U S Naval Medical School | Washington D C | Research Subdivision | Medical and Hospital Service Washington D C |
| Dowling George B Lt Comdr | U S Marine Barracks | Quantico Va | McNamara William L | Los Angeles Calif |
| Hall W W Lt Comdr | U S S Relief | % Postmaster | Mestre Ricardo | Atlanta Ga |
| Johnson F S Comdr | U S Naval Medical School | Washington D C | Moorehead Matthew T | Tuscaloosa Ala |
| Kelly Frank L Lt Comdr | U S Naval Hospital | Brooklyn N Y | Nolan Lewis E | Minneapolis Minn |
| Kunkel Edward P Lt | U S Naval Hospital | San Diego Calif | Prince Linnaeus H | Hines Ill |
| McCants John M Lt Comdr | % Bureau of Medicine and Surgery | Washington D C | Rapp Edwin W | Memphis Tenn |
| Moloney James B Lt. Comdr | U S Naval Training Station | San Diego | Rueggerger Franklin M | Alexandria La |
| Patton Henry W Lt. | U S Naval Hospital | Great Lakes Ill. | Smith Wm Adams | Batavia N Y |
| Ragle Harold E Comdr | U S Naval Medical School | Washington D C | Terry M C | Palo Alto Calif |
| | | | Vermilye John H | Fort Harrison Mont |
| | | | Willemeyer Fred J | Muskogee Okla |
| | | | Wynne Walter R | Des Moines Iowa |
| | | | Younans Corren P | Bay Pines Fla |
| | | | Ziegler, Edwin E | San Francisco Calif |

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO, ILL.

Cable Address

Medic Chicago

Subscription price

Seven dollars per annum in advance

Please send in promptly notice of change of address giving both old and new always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, OCTOBER 26, 1935

RESEARCH ON THE ELEMENTARY BODIES IN VIRUS DISEASE

Among the serious diseases that affect man and still engage the curiosity of medical research are those believed to be caused by viruses. Some of these have prevailed as world wide epidemics. Others through frequent localized outbreaks have taken the lives of countless children and left others permanently injured. Our knowledge of methods of prevention of some of the virus diseases has advanced more rapidly than the knowledge of their causes.

In 1904, Borrell observed enormous numbers of minute bodies in scrapings from the lesions of fowl-pox. Two years later, Paschen observed similar minute bodies in material from vaccinia and smallpox. Little attention was given to these observations for about twenty-five years for the simple reason that these minute bodies were thought likely to be artefacts or protein aggregates. Recently, however, intense research has been focused on the minute elementary bodies in virus diseases by numerous investigators. Like others, Ledingham¹ of the Lister Institute of London entered this field with prejudice against the importance of the elementary bodies. Finally he became satisfied that such bodies were present in suitably stained material, and he followed their variations in number and location as the virus disease progressed. In 1931 he reported that the elementary bodies of Paschen were demonstrable in large numbers on the second or third day in material from the rabbit lesion, while on subsequent days they decreased in number, with a tendency to congregate in the neighborhood of cells of the lesion, especially the polymorphonuclear cells. The next objective was to obtain these bodies from the raw material in pure suspension. With the use of ether and the centrifuge it was possible to separate sharply the epithelial and the degenerated polymorphonuclear cells from the other constituents of the raw material, leaving an opalescent fluid below. When centrifugated again this fluid yielded a deposit extremely rich in

elementary bodies. By continuing the process of fractional centrifugation, he obtained a fairly pure suspension of Paschen elementary bodies. Then it was shown that an animal injected with a single dose of virus intradermally developed, about the fifth or sixth day, agglutinins in the blood serum, which rose to a maximum and then slowly declined, exactly as agglutinins do in response to a dose of bacteria.

When pure suspensions of elementary bodies are wanted for infectivity tests on animals, a somewhat different technique must be followed to avoid contact with ether. Instead, the raw virus-containing material from the lesion is roughly centrifugated, then filtered through a Berkefeld V filter, and the filtrate centrifugated at high speed (15,000 revolutions per minute) for at least half an hour. The great mass of elementary bodies will thus be thrown down. With this technique, Ledingham and his associates obtained suspensions of the elementary bodies in vaccinia and carried out infection experiments. They showed that a powerfully infective vaccinia filtrate could be completely depleted of its infective power by means of the high speed centrifuge, furthermore, that the deposit of elementary bodies thrown down by the centrifuge alone proved to be infective. These experiments have been repeated and confirmed by other investigators. The conclusion seems warranted that the elementary bodies are almost surely the virus agents of vaccinia.

This method of experimentation has been applied in research on variola, varicella and herpes zoster, and probably it will be extended to more of the virus diseases. Amies, a colleague of Ledingham, has conducted serologic tests with the elementary bodies. The material from variola minor was inoculated into the skin of the monkey, and a suspension of the elementary bodies from the lesion was prepared, a suspension was prepared also from the dermal reaction in the rabbit in response to variola virus. It was found that the serums of animals experimentally infected with variola minor produced little or no agglutination of the elementary bodies prepared from vaccinia lesions, whereas in a high proportion of the experiments these serums agglutinated the elementary bodies obtained from variola material. Singularly, monkeys infected with variola developed agglutinins for the elementary bodies of variola but not for vaccinia, whereas rabbits inoculated with material from these monkeys developed agglutinins both for variola and for vaccinia. Some common antigen, therefore, is shared by variola and vaccinia. The precise change that takes place in the antigen when variola assumes by passage the attenuated form of vaccinia, however, must be left to future research by means of absorption experiments.

Amies also studied the elementary bodies in varicella. Fluid from the earliest vesicles was placed in a citrated saline solution and cleared by centrifugation at low speed, the supernatant fluid was then centrifuged

¹ Ledingham J. C. G. Studies on Virus Problems. Bull. Johns Hopkins Hosp. 57: 32 (July) 1935.

gated at high speed and the elementary bodies thrown down. To get sufficient elementary bodies many vesicles had to be pricked, as only those which gave clear fluid could be used. Since in varicella the agglutinins that appear about five days after the onset of the eruption persist for some time, it may be possible by means of agglutination tests with suspensions of varicella and variola elementary bodies to decide doubtful cases of smallpox when varicella is suspected.

Some intimate connection between varicella and herpes zoster has been indicated for years by clinical and epidemiologic evidence. It is not unusual for varicella to occur among contacts of a case of zoster, and there appear to be authentic records of zoster following exposure to varicella. By the foregoing methods of isolation of elementary bodies and the agglutination test, Ames obtained agglutination of the corresponding elementary bodies in all but two of thirty-two cases of herpes zoster, while in nineteen of them the serums also agglutinated varicella elementary bodies.

Since similar results have been secured by others, there is at last some agreement that many viruses are represented by visible and workable elementary bodies. There lies ahead the goal to add much more knowledge of the behavior of each virus in the host and, if possible, its cultivation in more artificial conditions outside the host. The present available knowledge of viruses is indeed limited. At the moment, for example, where do we stand on the most crucial question, Are these viruses really independent living agents?

TRAUMATIC SHOCK

A large volume of literature has accumulated on the subject of traumatic shock¹ and numerous theories concerning its etiology have been advanced. The obvious picture of prime importance among the phenomena attending shock is the low arterial pressure, two theories for the explanation of this condition have generally received the most attention. One suggests a traumatic toxemia, with the absorption of metabolic toxins from the traumatized areas, followed by a secondary generalized vasodilatation and augmented permeability of the capillaries. The other hypothesis that has been emphasized supports the contention that the condition of shock is caused by the local loss of blood and/or plasma, resulting in a marked decrease in the volume of circulating blood. Hemorrhage is the simplest and most direct method of reducing blood volume, and the similarities between traumatic shock and the results of serious hemorrhage have led observers to remark that the conditions of hemorrhage and shock are identical. This statement is in agreement with the evidence now available. In addition to the factors mentioned in the production of traumatic shock, it seems highly probable that certain nervous influences are of importance. There is the possible

inhibition of vasoconstrictors and stimulation of vasodilators in acute circulatory collapse and, what is even more likely, a prolonged activity of the sympathetic system when circumstances arise which bring that system into operation.²

Although the evidence supporting the circulatory theory of traumatic shock is in general in good agreement, much confusion exists with respect to efforts designed to support the "toxic theory" of the etiology of traumatic shock. The carefully controlled work of Cannon and Bayliss³ produced data which suggest that a toxic factor is of importance in shock experimentally induced in cats. However, there is considerable evidence against the theory of traumatic toxemia.² The evaluation of the experimental results is made quite difficult because they have been obtained with a variety of animal species and with the use of many diverse methods for the preparation of extracts containing the blood volume-reducing toxic factor. In fact, it is possible to produce from a wide variety of normal tissues extracts which contain both pressor and depressor substances.⁴ There has been a lack of convincing, positive evidence that a vasodepressive toxin derived from dying tissues induces shock or, on the other hand, conclusive proof that such toxic material could not exist.

Efforts to obtain results of the latter type have recently been reported by Roome and Wilson.⁵ A careful study was made of the effects on the blood pressure of extracts from traumatized limbs. As previous experiments of this type frequently have employed tissue extracts obtained by chemical and nonphysiologic methods which might alter materials present in an extract, the University of Chicago investigators have used a rapid and entirely mechanical method for extraction of traumatized muscle. The latter tissue was used, since the cases of large injuries to muscles are those in which shock most commonly occurs. Precautions were taken to purify the extracts by centrifugation, thus removing particles of fat and tissue which might cause sudden death by pulmonary embolism. Furthermore, the animals used for the injections were heparinized to vitiate possible blood-coagulating properties of the extracts. The latter were administered by a viviperfusion method which prevented alterations in the volume of circulating blood. With this experimental technic it was observed that intravenous injection of the extracts caused no sustained depression in blood pressure. In fact, in some instances rises in blood pressure occurred. These results are good evidence for the nonexistence of a toxic material in traumatized tissue. Further controlled investigations of this type will place the burden of proof on the school of thought that supports the toxemia theory of trauma-

² Cannon W B. *Ann Surg.* 100:704 (Oct.) 1934

³ Cannon W B and Bayliss W M. Report on Shock Commission Medical Research Council no 26 pp 19 and 27 1919

⁴ Collip J B. *J Physiol.* 66:416 (Dec.) 1928

⁵ Roome N W and Wilson Harwell. *Experimental Shock Arch. Surg.* 31:361 (Sept.) 1935

¹ Cannon W B. *Traumatic Shock*, New York D Appleton & Co. 1923

matic shock. In addition, they should do much to clarify other experiments that have been conducted to determine the possible functional role of a toxic factor in certain traumatic conditions.

VITAMIN D IN COMMON FOODS

The sources of vitamin D or vitamin D effects are now so easily available and so widely distributed that the question of an adequate supply would hardly seem to concern greatly any average American. Nevertheless, pediatricians who see constantly the effects of an inadequate supply of vitamin D are inclined to deprecate the manner in which vitamin D is made available and in which it is used by the vast majority of people.

The child is taught in school that the most potent food sources of vitamin D are egg yolk and butter, yet actually there is little vitamin D in these common foods. The amounts present in egg yolk and butter vary as much as 500 per cent during the year. A recent survey of the topic by Coffin¹ points out the erroneous conceptions that prevail in the minds of many parents. There is some belief that the fresh vegetables provide adequate vitamin D, yet the vegetables contain but little vitamin D at the time of picking and Bills has shown that even a slight amount of artificial overirradiation of ergosterol will destroy acquired potency after a maximum vitamin D potency is reached. One difficulty lies in our methods of testing for the presence of vitamin D. Biologic methods in the past have not been as accurate as they are today. No doubt many a record appeared in the periodical literature that is not sustained by reinvestigation with more modern methods. Mr. Coffin has duplicated some of the earlier work with the various vegetables and other foods. His results indicate that, with the exception of egg yolk and butter, none of the ordinary foods contain any substantial amount of vitamin D. By the use of eggs and butter alone, any attempt to obtain a daily protective amount of this vitamin would probably lead to digestive disturbances if not to an unbalanced diet.

Modern man has greatly changed the conditions of his environment. Few human beings in large Northern cities obtain any substantial amount of sunshine except possibly in summer. The main source of vitamin D must therefore come to the human being from exposure to ultraviolet rays, from natural sources of this vitamin or from extra vitamin D obtained through materials that have been enhanced in their vitamin D potency. Nutritional authorities believe that man has been deprived of the vitamin D that he used to get by natural methods and that insistence on an additional source of this vitamin will be for the benefit of mankind. Certainly, so far as the growing child is concerned, some additional vitamin D is necessary everywhere.

Quite recently the thought that an oversupply of vitamin D would be developed in this manner and that

the eventual effects of this oversupply would be toxic has been reemphasized in various places. Experiments along these lines thus far reported do not warrant this belief. Clouse reported as long ago as 1932 that disastrous results from an oversupply of vitamin D did not occur in animals until the oversupply had reached at least 25,000 to 50,000 times the minimum antirachitic dose. Of course, figures are not yet available on the effects of long continued large doses for human beings. Presumably the human body possesses wide factors of safety in relationship to the assimilation of these essential substances. Thus far the evidence seems to indicate not only for vitamin D but for all the vitamins more harm in the direction of an insufficiency than in relationship to an oversupply.

Current Comment

ADDICTION TO ENDOCRINE GLAND PRODUCTS

After careful consideration of the available terms Patterson¹ feels that, with the possible exception of the French word "manie," addiction most nearly expresses some unusual manifestations that may result from the continued use of certain endocrine gland extracts. Though most of the cases of the misuse of endocrine gland extracts quoted by him are properly an "abuse," some are comparable in their psychologic content with instances of overmastery by morphine, diacetylmorphine and alcohol, for which the term "addiction" is used. In the use of thyroid gland products, which he considers first, instances of ill effects from prolonged or poorly supervised administration are numerous. The development of symptoms of hyperthyroidism is the most common of these complications. The especial danger of this is in prolonged self administration, usually aimed at the treatment of obesity. There are, however, cases in which the psychologic factor is the predominant influence. The effect of thyroid extract is to speed up metabolism and rate of energy transformation in the body, and it is easily understandable that there should be a certain tonic effect or increased feeling of well being. This appeared to be the factor influencing three of the author's patients in whom toxic symptoms of overdosage were produced. The frequency of misuse of adrenal extracts is in some ways more important because of the injection route of administration of the latter. Thus a person having asthma may develop the habit of taking large amounts of epinephrine at frequent intervals, even though he experiences little relief from the drug. The periodicity of the injections, moreover, is often striking. Also relatively small doses may be effective if given by the physician, but larger ones administered by the patient or his family may fail to give relief. A number of cases are cited to support the hypothesis that psychic factors may be largely responsible for the habitual use of epinephrine. Among them is that of

1 Coffin, Joseph. The Lack of Vitamin D in Common Foods. *J. Am. Dietet. A.* 11: 119 (July) 1935.

1 Patterson, S. W. Addiction to Endocrine Gland Extracts. *Brit. M. J.* 2: 442 (Sept. 7) 1935.

an asthmatic patient who, when deprived of his injection, committed suicide. Another case is cited in which the patient had become accustomed to giving himself from 200 to 240 injections in the twenty-four hours of the serum of Heckel, which contains epinephrine. The fear of an attack was enough to call for the injection, and the need for injection survived the cure of the asthma.² Patterson believes that physicians should be fully aware of the psychologic state and often neurotic condition of their asthmatic patients and should supervise and keep control of the treatment and instruct their patients in cleanliness and technic of injection. In the case of the gonads, the psychologic repercussions have been noted in the literature of the world from the earliest times. The attempt to regain youth has always been a favorite wish of mankind. But the knowledge of failure or lack of manly or womanly potentiality may have far-reaching psychologic effects. Such was apparently the situation in a case cited, that of a woman who for years had weekly injections of an ovarian extract. This she was accustomed to give herself, she was miserable without it, and substitution by other newer and presumably more potent extracts was stated by the patient to have no useful effect. Over the observation period of eight years she continued weekly injections but did not increase the dose or show any tendency to use other drugs. In other respects she seemed normal. The tendency to habit formation is on the whole a relatively rare complication of glandular therapy and may at times involve more the effect of the needle puncture than that of the drug. It is, however, the duty of medical men prescribing glandular extracts to exercise proper supervision and control of their use by patients. Physicians should be aware of the possible dangers so that the drug may be stopped at once if ill effects arise.

Association News

RADIO BROADCASTS

The American Medical Association broadcasts over the Blue network and certain additional stations of the National Broadcasting Company at 5 p. m. eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time) each Tuesday, presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers a toast "Ladies and gentlemen, your health!" The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

The next three programs are as follows:

| | | | |
|-------------|------------------------------|-----------------|------|
| October 29 | Poisonous Plants and Animals | W. W. Bauer | M.D. |
| November 5 | Hemorrhage | Morris Fishbein | M.D. |
| November 12 | Infection | Morris Fishbein | M.D. |

This program is broadcast also on the short waves through KDKA, Pittsburgh, over station W8XK, 11870 and 12,210 kilocycles.

² Flandin M. Bull. et mém. Soc. méd. d. hop. de Paris 46:116 (Feb. 3) 1930. (This case seems almost unbelievable but is correctly quoted.)

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Society News—Dr. H. Earle Conwell, Fairfield, presented a paper recently on the treatment of fractures before the Franklin County Medical Society in Russellville. Dr. Conwell addressed a joint meeting of the Elmore and Tallapoosa county medical societies at Camp Dixie on Lake Martin, recently, on "Fractures About the Elbow, Especially in Children."

Personal—Dr. Edwin P. Moon has recently been appointed state physician for prison number 1 and the tuberculosis hospital in Wetumpka.—Dr. Hampton E. Barker, Haleyville, has been named health officer of Bullock County, succeeding Dr. Leslie G. Cole, who has resigned to accept a similar position in Wetumpka.—Dr. Julius E. Dunn, Covington, Ky., has been appointed health officer of DeKalb County.

CONNECTICUT

Changes in Health Officers—Dr. Samuel Green has been appointed health officer of Southbury and Dr. Julian G. Ely, health officer of Lyme, succeeding Dr. Matthew Griswold. Dr. Jacob Edward Waldman, Middletown, has been named town health officer of Haddam.

Society News—A special dinner meeting of the radiologic section of the Connecticut State Medical Society was held September 18 during the eleventh clinical congress of the society. By-laws were discussed for adoption and other matters pertaining to the cooperation of the radiologists in the state were presented. Dr. Charles W. Perkins, Norwalk, is chairman of the section, and Dr. Max Cluman, Hartford, secretary.

ILLINOIS

Personal—Dr. Francis N. Orr has resigned from the staff of the Lincoln State School and Colony, Lincoln, after four years' service, to engage in private practice.

Society News—Dr. Edward Lee Dorsett, St. Louis, addressed the Madison County Medical Society at Madison, October 4, on "Conservative Treatment of Eclampsia."—At a meeting of the La Salle County Medical Society at Ottawa, September 26, speakers were Drs. Edward L. Cornell, Chicago, on "Fundamentals of Obstetrics", Charles E. Galloway, Evanston, "Timely Pointers on Obstetrical Delivery", and Irving F. Stein, Chicago, "Lipiodol as an Aid in Gynecologic Diagnosis."

Chicago

Personal—Dr. Jacob P. Greenhill has been elected head of the department of obstetrics at the American Hospital.—Dr. Leo M. Czaja has been appointed general superintendent of the Municipal Tuberculosis Sanitarium.

Lead Poisoning from Burning Storage Batteries—Lead fumes from a kitchen stove where storage battery casings were being burned as fuel caused the death of two children and the serious illness of five others in a family of eleven persons, the Chicago Tribune reported October 20.

Pathologic Conferences—Dr. Richard Jaffe opened a series of pathologic conferences at the Cook County morgue, October 18, on current material from the children's department of Cook County Hospital. Conferences are scheduled for November 15, December 13, January 10, February 7, March 6, April 3, May 1 and May 29.

Hospital News—The Iroquois Memorial Hospital was opened, October 17, as a branch of the Municipal Tuberculosis Sanitarium; it will be devoted exclusively to collapse therapy of tuberculosis. The hospital, which has been closed since January 1 for lack of funds, was built in 1910 as a memorial to those persons who died in the Iroquois Theater fire in December 1903.

Society News—Speakers before the Chicago Neurological Society, October 17, included Drs. Isidore Finkelman and William Mary Stephens, Elgin, Ill., on "Heat Regulation in Chronic Encephalitis."—The staff of the Sarah Morris Hospital for Children of the Michael Reese Hospital presented the program of a clinical meeting before the Chicago Pediatric Society, October 15.—At a meeting of the Chicago Society of Allergy,

October 21, Dr Samuel M Feinberg discussed "A Study of Molds and Their Relation to Allergic Diseases," and Dr Francis L Foran opened a discussion on the 1935 hay fever season

Fund for Dental Research—An anonymous contribution has made possible the establishment of a foundation for dental research in the Chicago College of Dental Surgery, the dental division of Loyola University, which will have available annually \$25,000 as a minimum. The major part of the work will be carried on in the laboratories of the dental school, while another part will be undertaken at the John McCormick Institute for Infectious Diseases. Some of the problems to be investigated will be a study of the bacteriology and histopathology of dental caries and the diseases that involve the supporting structures of the teeth as well as their effects on general health

INDIANA

Personal—Dr Joseph W Strayer, for several years resident physician at the Boehne Tuberculosis Hospital, Evansville, has been appointed superintendent of the Smith-Esteb Memorial Tuberculosis Hospital, Richmond.—Dr Werner W Duemling, Fort Wayne, has been made chief physician of the city's public schools, succeeding Dr Charles R Dancer, who held the position twenty-six years

Society News—Dr John MacMillan Townsend, Louisville, Ky, addressed the Wayne-Union Counties Medical Society in Richmond, September 19, on recent advances in urology.—At a meeting of the Floyd County Medical Society in New Albany, September 26, Dr Charles P Emerson, Indianapolis, presented a paper entitled "Why So Much Surgery in America?"—Dr Frazier N Cloyd, Danville, Ill, spoke on "Care of Common Fractures of the Arm and Leg" before the Fountain-Warren Counties Medical Society in Covington, October 3.—Dr Burrill B Crohn, New York, conducted a gastroenterologic clinic before the Indianapolis Medical Society, October 15, in the auditorium of the University of Indiana School of Medicine, in the evening he spoke at the Athenaeum on "Differential Diagnosis of Diarrheas"—Dr Edward A Oliver, Chicago, discussed treatment of cancerous lesions of the skin before the Elkhart County Medical Society, Elkhart, October 3

IOWA

Rocky Mountain Spotted Fever—Six cases of Rocky Mountain spotted fever have been reported in Iowa thus far in 1935, all in the southern part of the state. The two cases reported in September were from Lee and Linn counties, other counties involved are Poweshiek and Union. No cases were reported during August

Society News—Speakers before the Boone-Story County medical societies in Ames, September 18, included Drs Philip H Kreuscher, Chicago, on "Treatment of Fracture of the Larger Joints," and Newton D Smith, Rochester, Minn, "Fistulae and Hemorrhoids"—The Calhoun County Medical Society was addressed in Rockwell City, September 26, by Dr Johann Erwin von Graff, Des Moines, on "Miscarriages, Diagnosis, Complications and Treatment"—The Cerro Gordo County Medical Society approved the establishment of a county tuberculosis society at its meeting in Mason City, September 10. Dr Elexious T Bell, Minneapolis, spoke on "Clinical Diagnosis of Tumors of the Breast"—Dr William Wayne Babcock, Philadelphia, addressed the Johnson County Medical Society in Iowa City, October 5, on "Common Errors in Surgical Practice"—At a meeting of the Wapello County Medical Society in Ottumwa, September 17, Dr William C Newell, Ottumwa, discussed "Diseases of the Liver and Biliary Tract."—Dr Edward Jackson, Denver, will discuss "Practical Ophthalmology for Physicians and Surgeons" before the Linn County Medical Society, November 14, in Cedar Rapids

KANSAS

Physicians Needed in Civilian Conservation Corps—There are a few vacancies on the medical staff of the Kansas District, Civilian Conservation Corps. All physicians who are interested are requested to write the surgeon of the district, Fort Riley, for details

Society News—Dr Howard L Alt, Chicago, addressed the Shawnee County Medical Society in Topeka, October 6, on "Origin and Morphology of Blood Cells with Application to Disease."—The Sedgwick County Medical Society was addressed, October 1, among others, by Drs Wilbur G Gillett, Wichita, on "Foreign Protein in the Treatment of the Eye" and Willard J Kiser, Wichita, on "Pulmonary Embolism."—At a meeting of the Golden Belt Medical Society in McPherson October 3, speakers included Dr Noble E Melen-

camp, Dodge City, on "Changing Concepts Regarding the Endometrium and Their Significance"—The Tri County Medical Society, composed of Sumner and Cowley counties, Kan, and Kay County, Okla, was addressed in Winfield, September 19, by Dr Howard H Bradshaw, Boston, among others, on "Anesthesia and Surgery as Applied to Collapse Therapy in Tuberculosis"

KENTUCKY

Changes in Health Departments—Dr Fred W Caudill, Georgetown, has resigned as health officer of Scott County to become epidemiologist of the state health department. Dr Robert J Griffin Louisville, succeeds Dr Caudill in Scott County. A new health unit has been established in Lyon County with Dr Neale M Atkins, Eddyville, in charge. Dr Charles M Moore, Glasgow, who has been health officer of Barren County, has been appointed city health officer of Lexington.

MARYLAND

Personal—Dr Hosea W McAdoo, superintendent of the Springfield State Hospital, Sykesville, has resigned to accept a position at Cambridge, Mass

Dr Gunn to Give Dohme Lectures—Dr James A Gunn, professor of pharmacology and director of the Nuffield Institute of Medical Research, University of Oxford, will deliver the Dohme Lectures at Johns Hopkins School of Medicine, Baltimore, November 6-8. The titles of the lectures are "Pharmacologic and Therapeutic Properties of the Harmala Alkaloids and Their Derivatives," "Reactions of Uterine Muscle" and "Pharmacologic Syndromes"

Society News—The first fall meeting of the Baltimore City Medical Society, October 4, was designated "house officers' night," with the following speakers: Drs Thomas M Brown, Johns Hopkins Hospital, "Epidemic Meningococcus Meningitis", Harry C Hull, University Hospital, "Primary Carcinoma of the Small Intestine", Philip D Flynn, Mercy Hospital, "A Case Report of Rocky Mountain Spotted Fever", Joseph I Ostergren, Kernan's Hospital, "Xanthomatosis, Schüller-Christian Type," and Harold C Dix, Maryland General Hospital, "End Results of Complete Hysterectomy"

Visit to Home of First Medical Graduate—The memory of John Archer, M.B., who had the distinction of being the first graduate of an American medical school, was honored during the semiannual meeting of the Medical and Chirurgical Faculty of Maryland in Bel Air, Harford County, October 10. About 200 members of the faculty visited Medical Hall, seven miles from Bel Air, the birthplace and home of Dr Archer, and Churchville Cemetery, where Dr Armfield F Van Bibber, a descendant of the physician, placed a wreath on his grave. Dr Archer was born May 5, 1741, near the present village of Churchville. He received the degree of bachelor of medicine in 1768 from the University of Pennsylvania Medical Department, returning to Harford County in July 1769, where he practiced forty years. During the Revolution he was a member of the local committee from November 1774 and in December of the same year was captain of a militia company, becoming major in January 1776. In August of the same year he was a member of the convention that framed the Maryland constitution and bill of rights. He was one of the founders of the Medical and Chirurgical Faculty of Maryland in 1799 and served as a member of Congress from 1801 to 1807. He died in 1810.

MASSACHUSETTS

Personal—Dr Henry M Pollock, superintendent, Massachusetts Memorial Hospitals, has been reappointed associate commissioner of the state department of mental diseases.—Dr James G Bruce has been appointed surgeon for the police and fire departments of Springfield.

Changes in Medical Examiners—Dr John A Huffmire, Huntington, has been appointed associate medical examiner of the second Hampshire District. Dr John V Gallagher, Milford, has been named medical examiner of the sixth Worcester District, to succeed the late Dr George F Curley.

Dinner in Honor of Dr Edsall—The Harvard Medical School Alumni Association held a dinner in honor of Dr David L Edsall at the Harvard Club of Boston, October 23. Dr Edsall recently retired as dean of Harvard Medical School. James B Conant LL.D., president of Harvard University, presided at the dinner, and speakers included A Lawrence Lowell, LL.D., president emeritus of Harvard, and Dr Charles S Burwell, dean of the medical school. At a meeting preceding the dinner, addresses on "The Development of Medical

Education in the United States Since the World War" were made by Walter A. Jessup, LL.D., New York, president, Carnegie Foundation for the Advancement of Teaching, Dr. Eugene F. Du Bois, professor of medicine, Cornell University Medical School, New York, and Dr. Lawrence J. Henderson, professor of biological chemistry at Harvard. Dr. Walter B. Cannon, George Higginson professor of physiology at Harvard, presided at this meeting.

Medical School Lectures—Dr. Walter C. Alvarez, Rochester, Minn., addressed the William Harvey Society of Tufts College Medical School, October 25, on "Functional Digestive Disorders." Other meetings of the society will be addressed by the following:

- Dr. Harold E. B. Pardee, assistant professor of clinical medicine, Cornell University Medical School, New York, Arteriosclerotic Heart Disease, November 8.
- Dr. Martin H. Dawson, assistant professor of medicine, Columbia University College of Physicians and Surgeons, New York, Rheumatoid Arthritis and Osteoarthritis, December 13.
- Dr. Hiram Houston Merritt, instructor in neurology, Harvard Medical School, Boston, Syphilis of the Nervous System, January 10.
- Dr. Luther Emmett Holt Jr., associate professor of pediatrics, Johns Hopkins University School of Medicine, Baltimore, Significance of Fats in Nutrition, February 14.
- Dr. Alexander Lambert, formerly professor of clinical medicine, Cornell University Medical School, New York, Therapeutics of Drug Habits, March 13.
- Dr. Elliott C. Cutler Moseley, professor of surgery, Harvard Medical School, Boston, War Surgery, April 10.

MICHIGAN

Antimeningococcus Serum Available—The Michigan Department of Health announces that therapeutic doses of antimeningococcus serum are available to any physician on request. The new product will be handled by the regular distributors of biologic products manufactured by the department. The serum is put up in vials of 20 cc. each.

Dr. Stapleton Named Acting Dean—At the regular meeting of the Detroit Board of Education, August 27, it was decided not to appoint a dean of Wayne University College of Medicine at present. Dr. William J. Stapleton, who was appointed assistant dean at the June meeting of the board, was named acting dean until the end of the year.

Memorial to Dr. Harison—A tablet is to be mounted in a public park in Sault Ste. Marie in honor of the late Dr. Beverly Drake Harison, with the following inscription:

BEVERLY DRAKE HARISON
1855-1924

Prominent Sault Ste. Marie physician. Foremost in Michigan medical registration. One of the founders of the Upper Peninsula Medical Society—President of the Michigan Medical Society 1904.

Personal—Dr. Clarence H. Westgate, Morenci, has been appointed medical director of the Lenawee County Tuberculosis Sanatorium, Adrian, succeeding Dr. Wellington B. Huntley, now chief of the medical staff at the Southern Michigan Prison at Jackson.—Dr. Louis A. Schwartz, Detroit, has been appointed consulting psychiatrist for the Social Service Federation of Toledo, Ohio.—Dr. George W. Robinson, Detroit, has been appointed chief of the obstetrical department of St. Mary's Hospital, succeeding the late Dr. James W. Cunningham.—At the opening exercises of the University of Michigan Medical School, Ann Arbor, the honorary degree of master of arts was conferred on Dr. Andrew P. Biddle, Detroit, in recognition of a life devoted to the advancement of education and ethics in the medical profession.—Dr. Lowell S. Selling, Detroit, has been named psychiatrist in the recorder's court, succeeding the late Dr. Isaac L. Polozker.

MINNESOTA

Personal—Honorary membership in the Minneapolis Clinical Club was conferred on Dr. Adolph M. Hanson, Faribault, at a meeting, October 10. Dr. Hanson gave an address entitled "Some Aspects of the Thymus and Pineal Problems."—Dr. Clifford T. McEnaney, Owatonna, has been named physician and surgeon for the Minnesota State Public School, succeeding Dr. Allan B. Stewart, who resigned after many years' service.

Violation of Basic Science Law—Arthur N. Alexander, St. Paul, a licensed chiropractor, pleaded guilty, September 19, to a charge of practicing healing without a basic science certificate. Evidence was produced to show that Alexander had performed an abortion. Because he was unable to raise \$5,000 bail, he was confined in the Ramsey County jail. Following his plea of guilty he surrendered his chiropractic license. In view of this and of the fact that he had been in jail since his arrest, Judge Boerner imposed a suspended sentence of one year.

Society News—Dr. Melvin S. Henderson, Rochester, presented a case of atrophy of both bones of the forearm before the Minnesota Academy of Medicine, October 9, in Minneapolis. Dr. Ernest M. Hammes, St. Paul, spoke on "Spinal Cord Injuries," and Dr. Franklin R. Wright, Minneapolis, reported a case of Reflex Urinal Frequency.—Dr. Hobart A. Reimann discussed "Progress in Infectious Diseases" before the Hennepin County Medical Society, Minneapolis, October 16, and Dr. Frank H. Krusen, Rochester, spoke, October 23, on "Present Trends in Physical Therapy." The society will be addressed, October 30, by Drs. Nathaniel H. Lufkin and Henry W. Quist on "Island Tumors of the Pancreas" and "Acute Intestinal Obstruction," respectively. Dr. William Boyd, Winnipeg, will speak, November 7, on "The Decalcifying Diseases of Bone."—At a meeting of the Scott-Carver County Medical Society, September 10, at Mudbadon, speakers were Drs. Owen H. Wangenstein, Minneapolis, on acute conditions of the abdomen, Frederic E. B. Foley, St. Paul, improved operation for ureteral stone, and John F. Briggs, St. Paul, achlorhydric anemia.

MISSISSIPPI

Society News—The Adams County Medical Society was addressed recently by Dr. Jacob S. Ullman, Natchez, on "Menstruation and the Hormones."—The Jones County Medical Society was organized at the South Mississippi Charity Hospital in Laurel, recently, with Dr. Alcius J. Carter, Ellisville, president, Dr. James B. Jarvis, Laurel, vice president, and Dr. Eugene A. Bush, Laurel, secretary.

MISSOURI

University News—Dr. Theodore L. Waddle, associate director of the St. Landry Parish Health Unit, Louisiana, has been appointed assistant professor of physiology at the University of Missouri School of Medicine, Columbia, to succeed Dr. Robert W. Siddle. Dr. Robert M. Moore, instructor in bacteriology and pathology, University of Tennessee School of Medicine, has been named assistant professor of pathology to succeed Dr. Clarence C. Pfaff.

New Home for County Society—New headquarters for the Jackson County Medical Society will be included in a building to be erected soon on "hospital hill" in connection with the Kansas City General Hospital, between the present main structure and the isolation hospital. An auditorium and adjoining small rooms for committee meetings will be at the disposal of the society. The new quarters will be maintained by the city in recognition of the services of the profession to the community.

Society News—At a meeting of the St. Louis Medical Society, October 1, Dr. Sigismund S. Goldwater, New York, discussed "Handicapped Hospitals—Public and Private" and Dr. Nathaniel W. Faxon, Boston, "Voluntary Hospital Insurance." The society devoted its meeting, September 17, to a consideration of anterior poliomyelitis. Drs. Emanuel Sigoloff discussed epidemiology, Jean V. Cooke, diagnosis and treatment of the acute stage, and Clarence H. Crego Jr., the orthopedic treatment. At this meeting the name of the code and contract board was changed to the medical economics board by unanimous vote.—Dr. Louis L. Tureen, St. Louis, discussed "Pathology of Air Embolism," among other speakers before the Trudeau Club of St. Louis, October 3.—Dr. Lynn M. Garner, Tusculumbia, was chosen president-elect of the Missouri Public Health Association at its joint session with the Missouri Tuberculosis Association in Kansas City, September 5-7. Dr. Joseph F. Bredeck, St. Louis, is president. Dr. Irl B. Krause, Jefferson City, was reelected president of the Missouri Tuberculosis Association.

NEW JERSEY

Society News—The program of the Bergen County Medical Society, October 8, in Hackensack, was devoted to ophthalmologic subjects of interest to the general practitioner, speakers were Drs. Charles Littwin, Englewood, Samuel T. Hubbard, Raynold N. Berke and Arcangelo Liva.—Dr. Cornelius P. Rhoads, New York, addressed the Hudson County Medical Society, Jersey City, October 1, on "Treatment of Anemias."—Dr. Bernard I. Comroe, Philadelphia, addressed the Gloucester County Medical Society, Woodbury, September 19, on abdominal pain.—Dr. Chevalier Jackson, Philadelphia, addressed the Burlington County Medical Society, September 12, on "Bronchoscopy as an Aid to the General Practitioner."

State Board Activities—Within the past few months the State Board of Medical Examiners of New Jersey has reported the following activities, among others, in enforcing the medical practice act

Michael Jaroslaski was found guilty of practicing medicine without a license

Charles W. Remboy, an herb doctor of Butler, was found guilty of practicing medicine without a license and sent to jail for thirty days

Cleon E. Shields, Newark, pleaded guilty to practicing without a license and paid the penalty. Shields claimed to improve impaired hearing by the use of a machine called 'Auratone' which he said measures the capacity to hear and furnishes in correct volume the tones that are 'blocked out' by the impairment

Julian Cyzykowski, Englishtown, was found guilty of practicing with out a license

Among other offenders prosecuted were five druggists, one osteopath, two chiropractors, two naturopaths and two masseurs

NEW YORK

Milk-Borne Bacillary Dysentery—One hundred and thirty-one persons in a village of 500 were attacked by bacillary dysentery between August 25 and September 15 in an outbreak that was traced to the use of raw milk. The suspected dairy supplied about three fourths of the raw milk used in the village. Among 339 users of both the milk and the village water supply, ninety-three became ill, and the other cases were among those using the milk but not the water and those which could be considered contact cases. The original source of the infection is not known, according to *Health News*. Among twelve persons on the dairy farm, four were ill, but their illness occurred during the outbreak and not before it. In addition, dysentery bacilli were isolated from two other members of the household, one of whom was found to be a healthy carrier

New York City

Personal—Dr. John C. Gordon, formerly epidemiologist of the Detroit Department of Health who joined the staff of the Rockefeller Foundation in 1934, has gone to Rumania, where with a staff of laboratory and field workers he will make a study of scarlet fever

Society News—Dr. William Goldring gave a Friday afternoon lecture before the Medical Society of the County of Queens, Forest Hills, October 4, on 'Clinical Aspects of Nephritis and Hypertension'. Dr. Benjamin M. Bernstein spoke, October 18, on 'Ulcerative Colitis'.—Dr. Henri Coutard, chief of the department of roentgen therapy for cancer, Curie Institute of the University of Paris, addressed the New York Roentgen Society and the section of otolaryngology of the New York Academy of Medicine, October 16, on 'Roentgen Therapy of Epitheliomas of the Tonsillar Region, Hypopharynx and Larynx'.—Drs. Edward W. Peterson and Louise H. Meeker addressed the New York Surgical Society, October 9, on 'Tumors of the Carotid Body'.—Dr. Reuben Ottenberg addressed the Bronx Pathological Society, October 15 on 'Sepsis Arising from Trauma'.—Drs. Meyer Rosensohn and Samuel H. Geist will address the Bronx Gynecological and Obstetrical Society, October 28, on 'Toxemias of Pregnancy' and 'Gynecological Surgery,' respectively.—Drs. Edward J. O'Brien, Detroit, and Foster Murray, Brooklyn, addressed the Medical Society of the County of Kings, October 15, on 'Design for Management of Pulmonary Tuberculosis'.

Dr. Sabin to Receive Bryn Mawr Award—Dr. Florence R. Sabin, member of the Rockefeller Institute for Medical Research, has been announced as the third recipient of the M. Carey Thomas Prize of \$5,000, which is given at intervals by Bryn Mawr College, Bryn Mawr, Pa., to an American woman in recognition of eminent achievement. The presentation will be made November 2 at the college as the climax of a two day program celebrating the fiftieth anniversary of its founding. The award was founded by the alumnae association in honor of Miss Thomas and presented to her in 1922, when she retired as president of Bryn Mawr. The second presentation was to the late Jane Addams of Hull House, Chicago, in 1931. Dr. Sabin, a native of Colorado, took her medical degree at Johns Hopkins University School of Medicine, Baltimore, in 1900, and was a member of the faculty from 1902 to 1925 when she went to the Rockefeller Institute. She was professor of anatomy for twelve years and professor of histology for the next eight years. She was the first woman to be admitted to and to graduate from Johns Hopkins, the first woman intern at Johns Hopkins Hospital, the first woman member of the National Academy of Sciences and the first woman member of the Rockefeller Institute. She has received various honorary degrees and in 1929 was awarded the *Pictorial Review* Prize of \$5,000 for distinguished achievement.

NORTH CAROLINA

Personal—Dr. James Allen Whitaker, Mount Airy, has resigned as health officer of Surry County to take charge of the health department of Rocky Mount.—Dr. Clarence H. White, Kenansville, has been appointed district health officer in charge of Avery, Yancey and Watauga counties

Campaign Against Hookworm—The International Health Division of the Rockefeller Foundation, New York, has made available \$12,000 to the state board of health to finance a campaign against hookworm. Dr. Alvin E. Keller, Nashville, Tenn., will direct the work, which will include a survey and campaign of prevention and prophylaxis.

OHIO

Changes at University of Cincinnati—Dr. John H. Foulger, associate professor of pharmacology at the University of Cincinnati College of Medicine, has resigned to join the staff of the Haskell Laboratory for Toxicological Research, Wilmington, Del. Dr. Norman A. David, assistant professor of pharmacology, University of West Virginia School of Medicine for the past three years, has been appointed assistant professor in the department at Cincinnati.

Personal—Dr. Carl Watson, Findlay, has been appointed works progress administrator for Ohio.—Dr. James F. Busby, Northville, Mich., has been appointed superintendent of the Licking County Tuberculosis Sanatorium, Newark, succeeding Dr. Donald E. Yochem, who resigned to enter private practice.—Dr. Harry W. Wertz, Montpelier, was appointed health officer of Williams County to succeed the late Dr. William A. Held, West Unity.—Dr. Will M. Hoyt, Hillboro, has been appointed health officer of Highland County to succeed Dr. John L. Walker.

Henry Hoffman Arrested—Dayton, Ohio, newspapers of October 9 report that Henry Hoffman of Rosewood, Ohio, was arrested at Tippecanoe City, October 9, on an indictment charging him with practicing medicine illegally. A bond of \$100 with one Christopher Metzgar as surety, was furnished by Hoffman and he was released. It is reported that Hoffman accepted a fee for medical service and also prescribed certain medicines, although the man is not a physician. The paper states, also, that Hoffman was convicted on the same charge at Laton a year ago and fined \$50. It is claimed that in writing prescriptions for medicines, Hoffman makes a prescription in such a form that it cannot be filled at a drug store, but the patient—or victim—must go to an alleged agent of Hoffman. According to the report, the agent selling Hoffman's nostrums in Tippecanoe City is Metzgar, the man who put up the \$100 bond. The files of the Bureau of Investigation of the American Medical Association contain a clipping from a Greenville, Ohio, newspaper of June 1934, reporting plans for a retrial in the state's case against one Henry Hoffman of Verona, an alleged faith healer.

OKLAHOMA

Personal—Dr. John T. Looney, Tishomingo, has been appointed health officer of Johnston County.—Dr. Max H. Grow has been appointed physician to the Oklahoma Agricultural and Mechanical College at Stillwater.

Society News—At a meeting of the Southern Oklahoma Medical Association at the Central State Hospital, Norman, September 3, speakers included Drs. Carl T. Steen of the hospital staff, on 'Sterilization as Applied to the Insane', Wann Langston and Bert E. Mulvey, Oklahoma City, 'Symposium on the Heart and Interpretation of the Electrocardiogram', and Ray M. Balyeat, Oklahoma City, 'Use of Iodized Oil in Treatment of Asthma'.—Dr. Samuel R. Cunningham, Oklahoma City, addressed the Cleveland County Medical Society, Norman, October 1, on 'Fractures of the Knee and Elbow: Their Diagnosis and Treatment'.—Dr. E. Rankin Denny, Tulsa, addressed the Tulsa County Medical Society, October 14, on 'Significance of Blood Cholesterol Determinations in Hypometabolism'.

PENNSYLVANIA

Society News—A graduate conference was held at Wilkes-Barre General Hospital recently with clinics in the morning and lectures in the afternoon. Guest speakers were Drs. George W. Crile, Cleveland, Emanuel Libman, New York, and Emil Novak, Baltimore.—Dr. Francis C. Grant, Philadelphia, addressed the Cambria County Medical Society, Johnstown, October 10, on 'Diagnosis and Surgical Treatment of Brain Tumors'.—Dr. Milton H. Cohen, Lewistown, addressed the Mifflin County Medical Society, Lewistown, September 5,

on Female Sex Hormones and Their Clinical Application"—Drs Arthur M Shipley and Maurice C Pincoffs, Baltimore, conducted the annual fall clinic of the Fayette County Medical Society, Uniontown, October 21

Philadelphia

Faculty Changes at the University—Dr Carl Edwin Bachman, Montreal, Canada, has been appointed assistant professor of obstetrics and gynecology at the University of Pennsylvania School of Medicine. Dr Bachman is a native of Pennsylvania and a graduate of the university. Drs Edward H Campbell and Harry P Schenck have been promoted to be assistant professors of otolaryngology.

Society News—Among speakers at a meeting of the Philadelphia Academy of Surgery, October 7, were Drs John O Bower, Newlin F Paxson and Harold A K Mengle, who presented "A Preliminary Report of the Presence of Clostridium Welchii Antitoxin in the Blood of Patients Who Have Recovered from Peritonitis, the Result of a Perforated Appendix."

Opening of Woman's College—Dr Chevalier Jackson, recently elected president of the Woman's Medical College of Pennsylvania, and Dr Louise Pearce, New York, made addresses at the opening of the new session, September 26. The following appointments were announced:

Dr Esther M Greisheimer formerly associate professor of physiology, University of Minnesota professor of physiology

Dr Hartwig Kuhlbeck formerly professor of anatomy at the University of Breslau Germany acting professor of anatomy

Ben King Harned Ph.D. formerly chief of the division of pharmacology University of Tennessee College of Medicine Memphis professor of pharmacology

Versa Viola Cole Ph.D. formerly research assistant Ohio State University College of Medicine Columbus assistant professor of pharmacology

Marion Fay Ph.D. formerly lecturer of chemistry University of Texas School of Medicine professor of physiological chemistry

Marie Anderach Ph.D. formerly of the pathological chemistry laboratory University Hospitals State University of Iowa assistant professor of physiological chemistry

Dr Mary Bickings Thornton, formerly part time professor of anatomy at the college was made professor emeritus. To improve the facilities of the library a full time librarian has been appointed. Dr Jackson succeeds Mrs James Starr who resigned as president to devote more time to the financial problems of the institution as chairman of the executive committee.

SOUTH CAROLINA

Society News—At the annual meeting of the Seventh District Medical Association in Manning, September 19 speakers included Drs Verling K. Hart and George Aubrey Hawes, Charlotte N.C. on 'Bronchoscopic and Clinical Observations in Bronchial Obstruction and Bronchiectasis' and 'Urologic Symptoms Resulting from Pathologic Conditions of the Female Urethra,' respectively, and Edgar F Fincher Atlanta "Tumors of the Brain"—Drs George T McCutchen and Lucius E Madden addressed the Columbia Medical Society September 9, on "Hyperinsulinism" and "Pulmonary Aneurysm" respectively

TENNESSEE

Infant Mortality—In an effort to reduce the high infant mortality rate in Memphis, the city health department has increased the number of its clinics for well infants under the direction of a full time pediatrician, Dr Beulah M Kittrell, formerly of Knoxville. The rate of 112 per thousand live births in 1934 was the highest in the United States for cities of 30,000 population and over, it was said. For the first five months of 1934 the rate was 121.6 and for the same period of 1935 it was 94.7

Health at Nashville—Telegraphic reports to the U.S. Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended October 12 indicate that the highest mortality rate (19.4) appears for Nashville and that the rate for the group of cities as a whole was 10.5. The mortality rate for Nashville for the corresponding week of last year was 16.5 and for the group of cities was 10.2. The annual rate for the eighty-six cities for the forty-one weeks of 1935 was 11.4 and the same rate appears for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

Society News—Dr Louis Levy addressed the Memphis and Shelby County Medical Society recently on 'Vincent's Angina.'—Drs Jesse B Swafford and Edward E Reisman addressed the Hamilton County Medical Society Chattanooga,

October 3, on "Dementia Praecox" and "Diagnostic Observations on Ectopic Pregnancy," respectively.—At a meeting of the Hardin, Lawrence, Lewis, Perry and Wayne county medical societies in Hohenwald recently, speakers were Drs William C Boyce, Flat Woods, on "Mechanism and Management of Normal Labor", William R. Cate, Nashville, "Clinical Diagnosis and Significance of Irregularities of the Heart" and Ernest W Goodpasture, Nashville, "Value of Vaccine in Poliomyelitis"—Dr Richard A Barr, Nashville, addressed the Gibson County Medical Society recently on "Abdominal Operations on Children."—Drs Roy H Ruble, Limestone, and Edward T West, Johnson City, addressed the Washington County Medical Society, Johnson City, September 5, on "Diabetes Mellitus" and "Carcinoma of the Cervix," respectively

VIRGINIA

New Building for Medical College—Through an anonymous gift of \$300,000 and a federal grant of \$239,850, the Medical College of Virginia, Richmond, will shortly begin construction of a new outpatient clinic and laboratory building seven stories high. The first four floors will be for clinics and the upper floors for laboratories in pathology, bacteriology, biochemistry, public health and preventive medicine. It is expected that a hospital will be built later adjoining the clinics.

Society News—At the quarterly meeting of the Augusta County Medical Association in Staunton, recently, speakers were Drs Lemuel Nelson K. Bell, Waynesboro on 'Medical and Surgical Problems in China', Clarence P Obenchain, Staunton 'Relief of Suffering During Confinement,' and Kenneth Maxcy, University, 'Infantile Paralysis'—Drs Otis T Amory and Edward L Alexander, Newport News, addressed the Mid-Tidewater Medical Society, Gloucester Courthouse, recently, on 'Indigestion' and 'Antigens and Vaccines and Their Uses,' respectively—Dr Collins D Nofsinger, Roanoke, addressed the Montgomery, Floyd and Giles county medical societies at a joint meeting in Saint Albans, recently, on 'Diagnosis and Treatment of Myocarditis'—At the quarterly meeting of the Southside Virginia Medical Association in Burkeville, September 10, speakers included Drs Thomas F Wheeldon, Richmond, on "Value of the Cystine Content Determination in the Treatment of Arthritis", Wilkins J Ozlin, South Hill, 'Diagnosis in Diseases of the Chest', and Roy K. Flannagan, Richmond, "Medical Economics"

WASHINGTON

Society News—Dr Henry Schmitz, Chicago addressed the King County Medical Society, October 21, on 'Early Diagnosis and Indications for Treatment of Carcinoma'—Dr Alfred A Strauss, Chicago, addressed a special meeting October 25, on 'Surgical Diathermy for Treatment of Carcinoma of the Rectum and Stomach'—At a meeting of the Klickitat County Medical Society, September 27, Dr Dmitry V Ogievsky, Klickitat was elected president and Dr Frank G LeFor, Goldendale, secretary. A woman's auxiliary was organized with Mrs Allen Bonebrake, Goldendale, as president. Plans were made for an active campaign for control of diphtheria and smallpox—Dr John C Lyman, Walla Walla, was elected president of the Walla Walla Valley Medical Society at a meeting in Walla Walla October 10, Rudolf A Clemen, president of Whitman College, made an address

WISCONSIN

Society News—Dr Maurice Brodie, New York delivered the Lippitt Memorial Lecture of the Medical Society of Milwaukee County, October 11, on "Poliomyelitis: Its Transmission, Prevention and Treatment," and Dr Walter P Blount spoke on 'After-Care of Paralytic Poliomyelitis'—Speakers at a meeting of the Ninth Council District Medical Society at Wisconsin Rapids recently were Drs William F Wilker, Iola, on 'Complete Avulsion of the Scalp', James K Trumbo, Wausau 'The Incidence of Allergy in the Etiology of Nasal Polyps,' and Norbert Enzer, Milwaukee, "Relation of Pathology to the Practice of Medicine."

State Society Awards—The Council of the State Medical Society of Wisconsin at the annual session in Milwaukee, September 19, presented its award for distinguished service to the society, the medical profession and public health to Edward Asahel Birge, LL.D. Madison president emeritus of the University of Wisconsin, and to Dr Arthur Jackson Patek Milwaukee, founder and for several years editor of the *Wisconsin Medical Journal*. Dr Birge now 84 years old was for fifty years associated with the university as instructor in natural history, professor of zoology, dean of the college of arts and

sciences (1891 to 1918) and president (1918 to 1925). Dr Patek is a former president of the Medical Society of Milwaukee County and the State Medical Society of Wisconsin and was originator and for twenty-six years secretary of the medical defense fund of the state society.

GENERAL

Examinations in Dermatology—The American Board of Dermatology and Syphilology will hold oral examinations, May 11-12, 1936, in Kansas City, Mo., during the annual session of the American Medical Association. The written examination for Group B will be held on Saturday, March 14, in various cities throughout the country, applications for this examination should be filed before Jan. 15, 1936 with the secretary, Dr. Clarence Guy Lane, 416 Marlborough Street, Boston.

Report of National Research Council—During the past year the National Research Council has made 116 grants totaling \$50,359.50. The largest single amount, \$12,600, was expended for medical sciences. Ninety-six postdoctorate fellowships have been supported at a total expenditure of \$221,927.73. Among these, ten were in the medical sciences. The principal enterprises aided in the medical field were research on problems of sex, in which emphasis will now be laid on synthetic production of hormones, investigations on narcotic drugs at the universities of Michigan and Virginia, a survey of research in the United States on the gonococcus and gonococcal infections, now nearing completion, and a world survey of tropical diseases and facilities for studying them, now in process of publication.

Annual Meeting of Dietitians—At the eighteenth annual meeting of the American Dietetic Association in Cleveland, October 27-31, the program will include addresses by the following physicians:

Dr. William P. Murphy, Boston, Deficiency States—Anemia
Dr. Wingate Todd, Cleveland, Food for Fitness
Dr. Henry J. John, Cleveland, Treatment of Diabetic Children
Dr. Charles H. Eyermann, St. Louis, Allergy and Its Relation to the Dietitian
Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, Food Fads and Fallacies
Dr. Charles C. Higgins, Cleveland, Dietary Management of Urinary Lithiasis
Dr. Donald J. Barnes, Detroit, Newer Developments in the Treatment of Rickets
Dr. Victor G. Heiser, New York, World Wide Adventures in Nutrition

Society News—Dr. Daniel C. Patterson, Bridgeport, Conn., was elected president of the New England Surgical Society at its annual meeting in Manchester, N. H., September 27-28. Dr. David W. Parker, Manchester, vice president, Dr. John M. Birnie, Springfield, secretary, and Dr. James R. Miller, Hartford, Conn., treasurer. The next meeting will be held in Bridgeport.—Dr. Charles M. Griffith, Washington, D. C., was elected president of the Association of Military Surgeons of the United States at its annual meeting in New York, October 5. Dr. Harold D. Corbuser, Plainfield, N. J., was elected one of the five vice presidents to fill the vacancy left by Dr. Griffith's advancement to the presidency. Among other speakers at the meeting, Dr. Dean Lewis, Baltimore, read a paper on the history of military surgery.

Western States Have Highest Automobile Fatality Rates—With a 15 per cent increase over 1933, automobile fatalities reached a new high point in 1934, when 33,980 persons were killed in or by motor cars, causing a death rate of 26.9 per hundred thousand of population. In addition, 1,789 persons were killed in collisions between automobiles, railroad trains and street cars. These figures compare with 29,323 deaths in 1933 and a rate of 23.3 per hundred thousand of population. Nevada's automobile death rate of 73.4 was the highest in the nation. Wyoming was second, 45.25, Arizona third, 44.85, and California fourth, 42.62. The bureau of the census directs attention to the fact that the states with the highest rates are in the West rather than the thickly populated Eastern states. While this situation may be brought about by the deaths of transients, there are no statistics at present to prove this point. The lowest rate in the United States (14.6) was for Rhode Island. Only three states, Kansas, Delaware and New Hampshire, showed a decrease in the death rate last year compared with 1933. Gains over 1933 in the remaining states ranged from Connecticut's 2.07 per cent to Montana's 72.13 per cent. With the exception of Vermont the percentage of gain was greatest in the Middle West, Far West and South. New Mexico's gain of 42.12 per cent was the second largest in the nation. Mississippi was third, with an increase of 41.02 per cent. Vermont had a gain of 38.52 per cent, in contrast to New Hampshire's decrease of 23.14 per cent. In Illinois fatalities increased 17.04 per cent last year compared with 1933. The gain in New York was only 3.49 per cent.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept 28, 1935

A Survey of Health Services During the King's Reign

The report of the ministry of health for 1935 contains a review of the health services during the twenty five years of the king's reign. The ministry was established in 1919 to take over the functions of national health insurance and the local government board. National health and pensions insurance is pronounced one of the most memorable developments of public health. In England and Wales 16,450,000 persons are insured, and in the last ten years more than \$750,000,000 has been distributed in sickness and maternity benefits and more than \$450,000,000 in medical benefits. The provision of pension benefits has steadily expanded and now includes 664,000 old age pensions to persons between the ages 65-70, 657,000 widows' pensions (supplemented by 271,000 additional allowances with respect to children) and 15,000 orphans' pensions.

The expansion of local government services is shown by the fact that the total expenditure has risen from \$735,000,000 in 1911 to \$2,535,000,000 in the last completed year of the account. The London County Council alone expended \$190,000,000, a sum comparable to the budget of some nations. Thus expenditure on health is defended as a long term investment. The standardized death rate from all causes has fallen from 13.2 per thousand in 1910 to 9.3 in 1934. Some changes in mortality, which may be attributed in part to the operation of public preventive and clinical services, are shown in the accompanying table.

Changes in Mortality

| | 1910 | 1933 |
|---|-------|-------|
| Infant mortality per 1000 live births at ages 0-1 years | 10.5 | 6.4 |
| Death rates per million children living at ages 5-15 | 2,491 | 1,882 |
| Standardized death rates per million from tuberculosis | | 9 |
| Respiratory | 888 | 63 |
| Nonrespiratory | 434 | 160 |
| Standardized death rates per million from typhoid | 53 | 5 |

Systematic services for the prevention and treatment of tuberculosis and for maternity and child welfare have come into being, and schemes to aid the blind are now operating all over the country. In 1910 there was no mental deficiency service. In 1913 accommodation was provided for severe cases, the training and employment of defectives, and the treatment of early mental illness. Other advances noted are the provision of postgraduate medical training facilities and the promotion of medical research. Nineteen thirty-four was a record year in two respects: the death rate from all forms of tuberculosis and the infant mortality were the lowest on record. But there was no decline in the maternal mortality rate, and measures are now being taken by the ministry to grapple with this problem. The continued decline in the incidence of smallpox (variola minor) became still more marked in 1934, when the number of cases was fewer than in any year since 1918. For the first time in six years London was free from smallpox on July 12, 1934, so that the smallpox hospital could be closed.

Postgraduate Medical Study in London

The facilities for postgraduate study in London, whether by physicians in general practice or by those who want to cultivate some special branch, are considerable. The twelve undergraduate medical schools are almost entirely devoted to the teaching of students but at times provide a postgraduate course, in some cases confined to their old students and in others open to the profession. At five of the medical schools an intensive

week-end course of lectures for graduates is now in progress and takes place every year at the opening of the medical session in October. In the main, graduate teaching is done at the general hospitals that are not undergraduate medical schools, and at the special hospitals. Most important is the recently established British Postgraduate Medical School which was opened in May by the king. It contains 388 beds, which are being rapidly increased to 534 by the erection of a new block. The school has no special departments, since it was thought best that graduates who require instruction in the specialties should obtain it at the numerous special hospitals of London. There are four departments—medicine, surgery, obstetrics and gynecology—each under the control of a professor appointed by the University of London, assisted by readers, also appointed by the university, and assistants appointed by the school. It is hoped to include on the staff the leading teachers and authorities available in London and the provinces and also some from other parts of the world. Refresher courses of an intensive character are provided for physicians in general practice. They last a fortnight and are generally held in the summer months. But the most important part of the teaching is that provided for graduates from all parts of the world. In this a departure has been made. Graduate instruction has usually consisted almost entirely of courses and lectures covering a set syllabus. This will form part of the instruction, but more importance is attached to providing the students with a large amount of clinical material at which they can work under instructors, all of whom have special experience. Carefully prepared clinical lectures are given from time to time. The students also attend regular pathologic and radiologic conferences and discussions between the different departments. The department of pathology not only takes part in the clinical work but provides demonstrations on laboratory procedures. The fees for the ordinary hospital practice, including tuition, are \$26 for one month, \$52 for three months and \$78 for six months. For the fortnight refresher courses the fee is \$26.

Unlike the British Postgraduate Medical School, in which almost all the teaching is done in one hospital the Fellowship of Medicine and Postgraduate Medical Association arranges for teaching in some fifty general and special London hospitals. Regular courses, lasting from one to four weeks, are arranged in general medicine and surgery. Courses in pediatrics, diseases of the chest, heart or nervous system, gynecology, obstetrics, ophthalmology, dermatology, proctology, orthopedics, fractures, psychiatry, urology, physical therapy, venereal diseases, and anesthetics are given at the special hospitals devoted to these specialties. In addition, various special hospitals make arrangements for courses.

The West London Postgraduate College has been established since 1895. The work is carried on at the West London Hospital, which is entirely devoted to postgraduate teaching. Graduates are appointed clinical assistants for three or six months without extra charge. A special clinic for the treatment of venereal diseases (male and female) is held all day. Operations at which graduates are allowed to assist take place daily at 2 p. m. The fees for hospital practice, including all ordinary demonstrations and lectures are \$10 for one week, \$30 for one month, \$45 for two months and \$60 for three months. Instruction in the administration of anesthetics is given at the rate of \$15 a month.

The North-East London Postgraduate College is attached to the Prince of Wales's General Hospital, which contains 228 beds and is entirely devoted to graduate teaching. Facilities are afforded to graduates for general hospital work or for work in special branches. The fee for general hospital practice is \$10 for one month, and \$25 for three months. For the special departments the fee is \$15 for one month and \$30 for three months.

A postgraduate school of radiotherapy was established in 1930. It is held at the Radium Institute and at the Mount Vernon Hospital. The Institute of Medical Psychology holds courses in psychotherapeutic theory and method. A five-week introductory course of twenty lectures, for which the fee is \$15, is now in progress. The London School of Hygiene and Tropical Medicine holds a six months course for the Diploma in Tropical Medicine and Hygiene, which lasts from October to June. It consists of instruction in clinical and laboratory work and in tropical hygiene. The fee is \$200.

The Treatment of Casualties of the Quetta Earthquake

The appalling disaster of the Quetta earthquake has been reported in a previous letter to *THE JOURNAL*. As the medical authorities decided that recovery of the bodies buried beneath the debris would have been dangerous, the exact number killed is not known, but it is estimated at 40,000 in the whole country-side involved, a district of 130 by 20 miles. In Quetta itself out of a population of 45,000 between 20,000 and 30,000 were killed. The government took prompt and efficient measures for succoring the survivors. Supplies were sent and refugee camps were established. The treatment of the many cases of serious fracture was excellent. At the Mayo Hospital, Lahore, the organization was of the standard of the highly specialized fracture clinics of Europe or America. All cases of fracture of the spine, pelvis or femur were treated in wards allotted to each kind of fracture. Balkan frames fitted with adjustable pulleys, weights and traction cable were available for all cases. Several dozens of fractured femurs were treated by stainless steel pins transfixing bone. Cases of fractured pelvis were treated by pin or wire traction applied to both lower limbs. The cases of fractured spine were reduced on a special table and given the best possible chance. Old-fashioned padded splints were conspicuous by their absence. This work was carried out under the directions of Lieut-Col. V. R. Mirajkar, professor of operative surgery, King Edward Medical College, and superintendent of the Mayo Hospital.

PARIS

(From Our Regular Correspondent)

Sept. 23, 1935

Changes in Social Insurance Law

In a recent letter attention was called to the many complaints regarding the administration and the deficits in some of the primary disbursement offices of the social insurance organization. To balance its budget, the French government has attempted to make economies in all its departments. Although only in existence since 1930, the social insurance law, which combines sickness and maternity compensation and invalidity and old age pensions, has been modified a number of times. The question of social insurance had been carefully studied for ten years before being made compulsory. The practical application of the principle has revealed many defects. One of the chief differences between the law in France and the laws of other European countries is that the insured sick individual can choose his own medical adviser, who is paid directly by the insured. The latter then presents his statement of expenditures for physicians, dentists, drugs and apparatus to the primary *caisse* or bureau to which he belongs and is reimbursed to the extent of about 85 per cent. Owing to dissatisfaction on the part of both the insured and the medical profession a complete revision of the law has been ordered by the secretary of labor, to whose department the execution of the law is assigned. To understand some of the important changes, a brief outline of the present organization will precede the list of changes proposed by M. Froissard as outlined in the September 15 issue of the *Siècle médical*.

The premiums from the insured and those from their employers are forwarded every three months by the latter to

a central office in the capital of each department, there being eighty-six departments in France. The insured and the employer each pay a sum based on the average total earnings of the insured. There are four classes of premiums, varying according to the annual wages of the insured. Every insured person who earns 15,000 francs (about \$1,000) and has no children is included in the social insurance law. If there is one dependent child, the limit is higher (20,000 francs) and this rises to 25,000 for those with three or more children. Thus about 60 per cent of all workers are subject to the law.

The departmental receiving office divides its receipts into two parts. One of these is sent to the primary caisses or disbursement centers, which pay sickness, death and maternity claims. Any money left over is sent to another bureau, which up to the present time formed a union with other similar caisses of the corresponding department, to act as a reinsurance company if there should be a deficit in one of its constituent primary caisses. It was the original intention of the law's sponsors that any excess of receipts over expenditures of the primary caisses should be expended for public hygiene purposes, but this has never been done.

The second half of all receipts by the central departmental bureau is sent to primary saving centers, to be paid out for invalidity and old age benefits. Since a large percentage of the insured will not reach the old age limit (60 years) for many years to come, the excess of receipts over expenditures has been placed in a government guaranty fund, to which the state itself has also added 540 million francs (about 36 million dollars), so that as old age pensions become due in future years there may be ample funds to meet the demand. One of the cuts in force since August is to diminish this sum contributed to the guaranty fund (for invalidity and old age pensions) from 540 to 140 million francs. There has been considerable criticism about the manner in which the rapidly accumulating guaranty funds have been invested in unprofitable enterprises. The fact that it will be many years before the majority of those now insured will reach the age of retirement has been one of the defects of the present law.

One of the first reforms proposed by the committee of experts chosen to suggest changes in the law was to cut down the government's contribution to the guaranty fund from 540 to 140 million francs. A reduction in the amount of the annual premiums paid by the insured and the employers was found to be impossible because the diminished receipts would not suffice to pay the various kinds of benefits.

Instead of having so many central receiving offices for each department with a corresponding large number of officials, there will be only one office of this kind for each postal region. This will be a vast saving in administrative costs. An effort to limit the number of primary distributing centers or caisses was unfortunately abandoned, so that many remain each with only a few hundred insured. The unions for reinsurance of the primary caisses or disbursement centers have been discontinued and the money formerly sequestered for these organizations will be devoted to public hygiene work. The reinsurance will in the future be the duty of the central guaranty fund. Thus about 30 per cent of the receipts for sickness, death and maternity benefits can now be utilized in preventive work. This figure (30 per cent) is somewhat chimerical, because many of the primary caisses or disbursement bureaus for sickness, death and maternity will probably have a deficit during the present year and surely will next year.

The discontinued reinsurance bureaus exercised an important control over the expenditures of these primary disbursement offices, because the reinsurance bureau guaranteed the lower bureaus' finances. A control will now be lost, hence this modification of the law has been vigorously criticized. Allowance for pharmaceutical specialties, of which there are

thousands in France, have been reduced from 85 per cent to 50 per cent. This will be a great saving for the disbursement offices.

Many simplifications of the now cumbersome paper work have been ordered.

Death benefits, instead of being paid by the same office which reimburses sickness and maternity claims, will now be paid by the savings fund.

The unemployed will be considered as regularly insured provided they have registered for work as soon as the latter can be obtained.

The method of remittances of premiums has consisted in purchasing special social insurance stamps at a postoffice. This will be dispensed with. One needs only to read the list of changes in the present social insurance law to realize that although it may be of benefit to those whose earnings do not provide for sickness, maternity, death, invalidity and old age, the execution of such a law demands an incalculable amount of paper work ("paperasserie" in French) and a very large staff of officials.

Energetic Antinoise Campaign in Paris

Continuing his energetic efforts to suppress unnecessary noise, the prefect of police has just issued instructions regarding the treatment of the city's inveterate radio sinners. If one's neighbor's radio shrieks at an hour when sleep is, or should be, the chief task of quiet-loving citizens, the police can be informed by telephone and an officer will be sent at once. After investigation, a report will be made and legal proceedings commenced to suppress further radio sinning. Much has already been accomplished here, by restricting the hours during which automobile horns can be used. The chief offender is still the motorcycle, but this question is being studied and soon Paris will seem like a village at night.

First Brucellosis Congress Held in France

The growing importance of *Brucella* infections has led to the formation here of a society, composed of clinicians, bacteriologists, hygienists and veterinary surgeons. The first meeting of this society was held at Avignon, in the south of France, in June. It is well known now that Malta fever, now commonly called undulant fever or brucellosis, and contagious abortion in cattle are caused by the same etiologic agent, *Brucella*. In human beings, brucellosis is commonly transmitted through raw cow's milk or unpasteurized dairy products. Among the latter are to be especially mentioned, in France, cheese made from the milk of goats.

In addition to members of the French medical and veterinary professions, there was a relatively large number of Italian and English visitors.

The first day was devoted to the clinical aspects of undulant fever. Cannavo of Libya reported his own case of this form of infection, characterized by the appearance on the fiftieth day, of a choroiditis. Chantegreil added three cases all verified by a positive seroreaction, complicated by a phlebitis in one case. Meerseman observed an acute encephalitis confirmed at necropsy, the inflammatory lesions being chiefly situated in the subcortical tissues.

Bruschettini of Genoa, Italy, has found that an egg medium is the simplest to employ in the bacteriologic diagnosis. He had been able to confirm the existence of two types of *Brucella* infection. Barbary and Faure-Brac of Nice strongly advocated the more widespread use of the intradermal reaction. Undulant fever is the most serious disease that threatens the raising of cattle, sheep and hogs. Every prophylactic measure must be employed, in the form of the intradermal reaction, to prevent spread of the infection to human beings and among animals.

Guign of Bologna, Italy, was enthusiastic about the use of a specific vaccine containing from 5 to 10 million bacteria per injection, which is followed in the majority of cases by a rapid regression and cure of human brucellosis. Picard of Arles (France) was not so enthusiastic, as he had had only a large number of failures.

Cambessedes of Paris believed that anaphylactic shock reaction in the form of vaccination therapy and chemotherapy were strongly indicated in the treatment of human brucellosis. A number of other speakers were of the opinion that such a form of treatment is not to be recommended, because it is apt to cause exacerbations of a most serious character.

Dubois and Sellier of France have used as a prophylactic measure a polyvalent antibrucellosis vaccine during the past five years in 5,000 people exposed to animal infection. This form of prophylaxis ought to be used by every butcher, veterinarian and cattle raiser.

Julien of France warmly advocated centers like the one at Joyeuse, in which those suffering from undulant fever can be isolated. Many of these patients live in mountainous regions, are difficult to get to and thus cannot be given the daily observation, which is needed.

Every small community should be provided with a diagnostic and prophylactic center. These stations would have an important educational effect on the rural population in showing how the disease is recognized and treated. The economic loss in regions where undulant fever exists is enormous. If the infected individuals can be returned to work in twenty-five days, as is now possible at the Joyeuse center, the money spent in such a direction will be amply repaid.

Louis Roux, a bacteriologist of Lausanne, called attention to the association of brucellosis and tuberculosis. In seven mammary cases this combination was present. The Bang bacillus seems to be the primary invader.

Finzi of Italy does not believe that dead vaccines are of any value and uses only living ones. Preventive vaccination of cattle is the only way of checking the spread of brucellosis.

Hayat of Tunis found that in laboratory animals infected with brucellosis a superadded tularemia might occur. He had observed agglutination reactions toward both infections in the blood of such animals.

Julien of Paris stated that in cases of prolonged fever one ought always to take into account the possible presence of kala-azar, which is far more widespread in southeastern France and Mediterranean countries than is brucellosis.

In resolutions passed at the close of the congress, the establishment of an international bureau for the study of human and animal brucellosis was decided on.

The Birth Rate and Mortality in Some European Countries

According to Moine's statistics reported at the July 23 meeting of the Academy of Medicine, the decreased ratio of births to deaths dates back as far as to the decade 1811-1820, when there were only 318 births to 10,000 inhabitants. This figure gradually decreased to 281 from 1851 to 1870, during which most other European countries registered an increase in their natality, which continued to the end of the nineteenth century. From 1871 to 1880 there were only 254 births to 10,000 inhabitants, as compared to 308 in Switzerland, 323 in Belgium, 354 in England, 362 in Spain, 369 in Italy and 391 in Germany. Since 1880 there has been a decrease in the number of births in all these countries, so that in 1933 the last places in the list were occupied by England (144) and Germany (147). Only Spain and Italy showed a relative increase to 262 and 232 respectively. The number of births since 1880 has decreased by 23.5 per cent in Spain, 35.8 per cent in France and Italy, 46.8 per cent in Switzerland, 48.9 per cent in Belgium, 59.3 per cent in England and 62.5 per

cent in Germany. The coefficients of fecundity for each 10,000 women between the ages of 15 and 49 years was 868 in 1901 for France, 1,040 for England and 1,440 for Germany. These figures show a marked decline in 1933. The coefficients of fecundity in 1933 as compared to those of 1901 show a decrease of 64.6 per cent for Germany, 50.2 per cent for England, 44.2 per cent for Switzerland, 35.5 per cent for Italy and only 29.1 per cent for France. This improvement in France is the result of the work of various organizations that have encouraged the raising of larger families. As to the number of deaths for each 10,000 inhabitants in 1933, the percentage for France was 158, Germany 112, Italy 137, England 123, Spain 164, Belgium 134 and Switzerland 114. If one considers the mortality of each country according to the population distributed according to the type (city and country), France between 1920 and 1922 had only 149 deaths, against 165 in Germany, 226 in Spain and 156 in Italy.

If the age of those who have died is taken into consideration, one finds a marked decrease in the mortality at certain ages since 1900 in France. This diminution of mortality has been in part due to a smaller number of deaths from tuberculosis. In 1880 there were 500 deaths from this disease per hundred thousand inhabitants in Paris. At the present time there are only 176, a decrease of 66 per cent as compared to that of the general mortality of 48 per cent. As a result of the fight against venereal diseases in France, more than 20,000 new-born infants are saved annually.

Two problems the solution of which will be aimed at in the future are first, to increase the natality by decreasing the mortality, and, secondly, to struggle against infant mortality.

BERLIN

(From Our Regular Correspondent)

Sept 2, 1935

Treatment and Prognosis of Severe Gastric Hemorrhages

The "Treatment and Prognosis of Severe Gastric Hemorrhages" was discussed at a recent session of the Berlin Medical Society. Professor Umber emphasized that few clinical reports with detailed statistics have been published. This accounts for the discrepancy between the German opinion, supported by Morawitz, Bergmann and others, to the effect that death from a severe bleeding induced by an ulcer is rare, and the English statistics that give a mortality of from 18 to 23 per cent. Umber therefore had statistics prepared on the cases occurring in his clinic during the past fifteen years, which disclose that, in 1,852 gastric and duodenal ulcers, 433 severe manifest hemorrhages occurred, associated with vomiting of blood and tarry stools. In forty-one cases death occurred as a result of excessive hemorrhages. Thus it appears that the mortality from hemorrhages was 9.5 per cent and the mortality from hemorrhages associated with ulcers was 2.2 per cent. Hence Umber considers the mortality from severe hemorrhages due to ulcer as much higher than is commonly supposed. A large percentage of the fatal cases occurring in his clinic presented severe hemorrhages due to erosion of the walls of the gastroduodenal artery, the gastrica sinistra or the gastrica dextra. If the hemoglobin drops to from 20 to 30 per cent serious danger for the patient arises. From the standpoint of treatment, rest and narcotics are indicated, also hemostatic, hypertonic solutions of sodium or calcium salts. If the stomach is full of blood, and a tendency to vomit arises, gastric lavages with ice-water are advisable, since they not only give the patient subjective relief but have also a hemostatic effect. Nutrition should be ample, for long continued undernutrition furthers the hemorrhagic tendency. For this purpose iced butter pellets are recommended, in addition, doses of vitamin C twice daily. Rectal clysmas of high caloric content are however, rejected as they increase the secretion of

gastric juice In pronounced anemia, blood transfusions are advisable, sometimes repeated on several successive days No more than 500 cc should be injected, since, as a result of an increase in pressure, thrombi may easily develop A blood transfusion should be compulsory before every operation When the hemorrhage has been checked, iron preparations should be given to combat the anemia Of 433 cases of gastric hemorrhage, an operation was performed in thirty-nine, resulting in seven fatalities, in three of these patients it was found later that a carcinoma had been present As the source of hemorrhage, Umber found much more frequently a gastric ulcer than a duodenal ulcer, which agrees with the statements of others Severe hemorrhages due to ulcer should be treated first internally, in recurrences and in ulcer hemorrhages that show no tendency to thrombose (suspicion of arterial hemorrhage) an operation is indicated.

From the surgical point of view, Professor Reschke likewise found hemorrhages due to ulcer more frequent than is generally supposed A hemorrhage may be regarded as grave when it is doubtful whether a patient can be saved by internal treatment. Reschke had good success with surgery and only a slight mortality from pneumonia and peritonitis The mortality from hemorrhage due to ulcer is higher in men than in women The normal method of operation is resection If a blood transfusion is allowed to precede an operation, the intervention is not dangerous It is his observation, however, that blood transfusion often does not check the hemorrhage but, on the contrary, makes the next hemorrhage worse Danger of a recurrence of a hemorrhage is especially great two days after the transfusion The operation should not be undertaken until the patient has recovered his strength as the result of a large transfusion of from 1,000 to 1,500 cc., together with a like amount of solution of dextrose If the patient does not recover his strength, the transfusion should be allowed to suffice. Early operation during the first twenty-four to forty-eight hours, as proposed by Finsterer, does not appear necessary

In the discussion, Professor von Bergmann emphasized the difficulty of distinguishing between mild and severe hemorrhage He is opposed to morphine because it retards the gastric motility and through collection of blood in the stomach leads to vomiting, it also increases nausea He has not observed that the tendency to hemorrhage is accentuated by hunger The fewer remedies that are given to promote circulation in connection with hemorrhage, the easier it is to check the flow of blood Since the introduction of the preoperative blood transfusion, von Bergmann is no longer inclined to oppose an operation. Professor Kalk presented statistics of his hospital department in Berlin It appears that, in ten years, of 157 severe hemorrhages, thirteen, or 8.3 per cent, ended fatally, but only in six of the thirteen fatal cases was hemorrhage the sole cause

The Physiology of Work

Professor Basler, an authority on the physiology of work, who has been appointed to a chair at the University of Breslau, spoke recently on the "Tasks of the Physiology of Work" As the two chief tasks of the physiology of work he designated (1) the determination of the most favorable, least fatiguing work method, and (2) the discovery of the persons who are best adapted for a certain form of activity To perform these tasks adequately, and particularly to measure the amount of effort necessary to do a certain piece of work, requires more than ordinary care in research The most universal type of work is walking The principal movements are those of the sole of the foot and of the hip The movements in the intermediate joints needed to round out the principal movements are of secondary importance. In walking, the lifting of the body about 4 cm. brings about a frictional resistance

of the joints The energy consumption, measured by respiratory metabolism, varies with the number and length of the steps The optimum is 35 calories (body weight 80 Kg) with the number of steps at 87.5 and the length of step 58.7 cm. The most practical load under the most favorable conditions is 43 per cent of the body weight The most favorable load is that of the back, whereas the exertion, without corresponding increase of the energy consumption, is greater, the greater, in any activity, the static component becomes (for example, carrying a weight in the hand) The work to be performed may become thereby absolutely impossible. There is as yet no perfectly reliable method for the objective measurement of fatigue The unconscious shortening of the length of step after a long march is of considerable value as a criterion of fatigue. This is determined by counting the number of steps taken in a specified stretch The second method is based on the "decrease in the physiologic height" of a person The examinee is allowed to walk past a board on which are pasted a number of horizontal strips 1 cm. wide The examiner with a field-glass notes the strip that is in line with the crown of the head of the examinee at the highest point while the examinee is walking

With regard to utensils, for example, the wheelbarrow commonly used in Europe is much less practicable than the Chinese wheelbarrow, in which the center of gravity of the load lies directly over the axis of the wheel

Basler called attention to a certain test of fitness for a given type of labor which he considered important, namely, a test of the ability to stand on one's feet for long periods of time. To determine quickly the resistance of the vascular apparatus of the legs of an examinee, the examiner measures, instead of the increase in volume, the increase in the girth of the lower leg using for the purpose a flexible tape, which is fastened about the leg and which a special device keeps at a uniform tautness The girth of the leg can be read from a scale. If the leg of an examinee increases unduly in size after he stands for one hour, he is advised to avoid those occupations which require a workman to stand for long periods

AUSTRALIA

(From Our Regular Correspondent)

Sept. 3, 1935

Sixth Australian Cancer Conference

The influence of the fourth International Congress of Radiology held at Zurich in July 1934 was felt at the sixth Australian Cancer Conference at Canberra, May 14-17 Another feature of the conference was the more active part played by the Royal Australasian College of Surgeons This is a significant development, as there was a danger that the element of bureaucracy was playing too large a part in the proceedings Cancer of the breast was discussed from the surgical and radiotherapeutic aspects but no finality was achieved owing to difficulties of comparing the statistics

RECOMMENDATIONS REGARDING STANDARDIZATION

1 It is desirable to introduce in Australia, wherever it is not already in use, the international method of measuring x-rays in terms of the roentgen unit, as prescribed by the International Congress of 1934

2 There should be provision for the testing of x-ray equipment in all the characteristics essential for its effective operation

3 There should be in Australia a single primary standard for the measurement of the international roentgen unit.

4 There is urgent need in Australia for facilities for the testing, examination and calibration of scientific apparatus and instruments used in radiotherapy, and for the carrying out of scientific investigations connected with (a) the purely physi-

cal aspects of radiotherapy, (b) the biophysical aspects of radiotherapy, and (c) the performance of x-ray equipment

5 Such facilities should exist in several centers and in particular in the two largest cities—Sydney and Melbourne—where provision should be made for the continuance and extension of existing physical services

6 In order to secure the best results, provision should be made for close coordination and for the dissemination of relevant information

7 The federal government should subsidize these activities financially

8 The work should be coordinated and controlled by a special board, the constitution of which should be arranged by the Commonwealth Department of Public Health and the Council of Scientific and Industrial Research in consultation

Professor Laby of Melbourne in support of the recommendations drew attention to the remarkable developments in the physics of cancer treatment that had taken place abroad. In England, France, America, Germany, Sweden and other countries a number of physical research laboratories to serve cancer clinics have been set up. These laboratories carry out roentgen and radium measurements and investigate the use of x-rays of higher voltage than those hitherto used and the possibilities of artificially produced radioactivity

He stressed the necessity of obtaining some degree of accuracy in the measurement of x-rays and gamma rays from radium used therapeutically and to introduce into Australia the international method of measuring x-rays in the terms of the roentgen unit. This involves (a) the measurement of the quantity (dosage) of x-rays by air ionization methods, (b) the determination of their quality according to rule 5 of the International Recommendations, and (c) measurement of radium, radon and gamma rays

He drew attention to the fact that precision of physical measurements cannot be made by methods that can be specified for all time, and they must be in the control of those who are engaged in original research in the branch of physics to which the standards relate, and who are leaders in that branch of physical research. This principle is fully accepted in the national physical laboratories referred to. If Australia is not to be behind these countries, it will need to do the same.

Rule 5 of the international recommendations states "The specification of dosage shall include a statement of the quality of the radiation. For exact physical measurements the quality of the radiation may be specified in terms of the complete absorption curves in copper or aluminum. For most practical purposes the quality may be expressed by the first and second half value layers of the same materials

Activities of Commonwealth Radium Laboratory

The increase in the use of radon can be gaged by the quantities issued by the laboratory at Melbourne (table 1)

Ninety two per cent of the radon issued during 1934 was mounted in the form of needles. Of the remainder, 7 per cent was issued in tubes for gynecologic use and 1 per cent in small gold implants. Of the radon issued in needles 66 per cent was issued in needles of 0.8 mm platinum filter, 25 per cent in needles of 0.5 mm platinum filter and 1 per cent in needles of 0.4 mm platinum filter. The tendency toward the use of the more heavily filtered needles is evident from these figures. At the Melbourne Hospital and St Vincent's Hospital radon needles of 0.8 mm platinum filter are used exclusively

Protection arrangements have been intensified by the following

(a) All lead screens behind which radium or radon is handled are to be increased in thickness to 4 inches of lead

(b) Experiments are being carried out with a semiautomatic radon purification plant, which, if found satisfactory will

replace the existing plant. Such a semiautomatic plant would greatly reduce the exposure received by the operator, and if the plant can be made sufficiently compact, it could be surrounded by several inches of lead

(c) A device is being installed whereby any leakage of radon into the air of the laboratory will automatically cause the

TABLE 1—Increase in Use of Radon

| | Milllicuries |
|-------------------|--------------|
| 1929 (six months) | 3 720 |
| 1930 | 11,530 |
| 1931 | 17 030 |
| 1932 | 14 400 |
| 1933 | 18,390 |
| 1934 | 23,210 |

ventilating fan to be set in operation. Such a device should assist in keeping the laboratory free from radioactive contamination

Pernicious Anemia in Australia

It is interesting to note in the Australian Year Book the death rate from pernicious anemia and the effect thereon of the introduction of liver therapy

Prior to 1928 deaths from pernicious anemia were not recorded separately in the Australian Year Book. Consequently, prior to that date the total includes other anemias as well as chlorosis

In that year Minot and Murphy announced their discovery. It is interesting also to note the dates on which the work of Minot and Murphy appeared. Preliminary observations had been published in *THE JOURNAL* (Aug 14, 1926, p 470, Sept 3, 1927 p 759) but the work on the reticulocyte response was published in 1928 in the *American Journal of the Medical Sciences* (175 581 [May] 1928). That the death rate should have been almost halved the same year is an indication of the ready acceptance of the new treatment by Australian physicians

One effect noted in Australia is the quickening of interest in the anemias generally, their more complete investigation and

TABLE 2—Yearly Deaths from Pernicious Anemia

| Year | Males | Females | Total | Other Anemias and Chlorosis |
|------|-------|---------|-------|-----------------------------|
| 1920 | 161 | 192 | 353 | — |
| 1921 | 168 | 212 | 370 | — |
| 1922 | 192 | 160 | 352 | — |
| 1923 | 244 | 246 | 490 | — |
| 1924 | 186 | 232 | 418 | — |
| 1925 | 208 | 225 | 433 | — |
| 1926 | 220 | 230 | 450 | — |
| 1927 | 151 | 240 | 391 | — |
| 1928 | 102 | 116 | 218 | 43 |
| 1929 | 119 | 110 | 228 | — |
| 1930 | 94 | 141 | 235 | 50 |
| 1931 | 121 | 169 | 290 | 52 |
| 1932 | 133 | 153 | 286 | 30 |

their more thorough classification for treatment purposes. It is possible that this has accounted for the apparent rise in the figures for the late years shown in table 2

International Union Against Cancer

Correspondence had passed between the commonwealth government and the international union in connection with the suggested adhesion of Australia to it. The commonwealth government had decided to defer any action regarding adhesion to the International Union or the nomination of official representatives on the council of direction until the matter had been discussed by the Australian Cancer Conference, and the president of the international union had been informed accordingly

The conference, after discussing the matter, expressed the opinion that the question of joining the International Union Against Cancer was a matter for the cancer organization in each state to decide on individually, and that it be left in the hands of each state organization to take such action as it considered desirable in this respect

RIO DE JANEIRO

(From Our Regular Correspondent)

Sept 15, 1935

The First Reported Case of Undulant Fever

Dr Jose Guilherme Lacorte, head of the laboratories of the Instituto Oswaldo Cruz, in a lecture before the Academia Nacional de Medicina of Rio de Janeiro reported bacteriologic and serologic studies in a case of undulant fever, the first one seen in Rio de Janeiro. The bacteria developed on a solid culture medium placed in an atmosphere overcharged with carbon dioxide. The medium was prepared according to Huddleson's technic. The bacteria were not motile in broth cultures of twenty-four or forty-eight hours examined by the hanging drop method, except for exaggerated brownian movement. They are rod shaped with round ends varying between 0.2 and 0.4 micron in width and 0.5 and 1 micron in length and are gram negative. Colonies that develop in petri dishes containing ordinary gelose after forty-eight hours resemble pin heads between 0.2 and 0.4 mm in diameter, they are convex, transparent, humid, shining and smooth, with complete and regular contours and a center darker than the rest of the colony. As they grow older they turn brown and their borders become irregular. The bacteria, when placed in simple broth, produce slight turbidity after twenty-four hours and intense turbidity and precipitation after forty-eight hours, in gelatin at 20 C they produce moderate proliferation without liquefaction, on potato medium they grow poorly and turn the medium dark, they fail to form indole and to reduce nitrates to nitrites and they do not form acid or gas. The organism proliferates well in Huddleson medium, when it contains fuchsin in the proportion of 1 to 25,000, thionine in the proportion of 1 to 30,000 or methyl violet in the proportion of 1 to 100,000. The speaker concluded that the organism was *Brucella melitensis*, however, the patient was a hog slaughterer, a fact that would make more plausible, his infection with *Brucella suis*. The fact that the bacteria grew in a medium placed in an atmosphere overcharged with carbon dioxide, which is a characteristic of *Brucella abortus*, is also surprising. However, the bacteria isolated by the speaker behave as *Brucella melitensis* with respect to the formation of hydrogen sulphide and in not taking certain stains.

Local Insulin Therapy in Pleural Thickening

Dr Santos Fortes reports satisfactory results with local insulin therapy in about 100 cases of pleural thickening. The treatment consists of subcutaneous injections of insulin in doses varying from 0.2 to 1 cc, associated with the administration of sugar, either in water or in candies. The injections are made at the level of the pleural lesions and are given every other day in a number varying from twelve to ninety. Satisfactory results were obtained in thirty of a group of thirty-four cases. The treatment was discontinued in the remaining four because of hypersensitivity to insulin. Hypoglycemia, which appeared in some cases during the course of the treatment, was controlled by the administration of sugar. The treatment gives the best results in postpneumonic pleural thickening of the type described by Morquio and also in some cases similar to those described by Bacmeister as chronic pneumonia, the prognosis of which has been considered as fatal. The speaker, with Argerich, believes that the local action of insulin therapy is probably due to a trophic action of insulin on the tissues by which glycoexis in the tissues is promoted.

JAPAN

(From Our Regular Correspondent)

Aug 29, 1935.

Vital Statistics

In its recent report, the statistical bureau of the cabinet states that according to the census of 1930 the death rate of the nation was less than 20 per thousand of population. The death rate of infants was highest, having been 140 for boys and 124 for girls per thousand babies. When boys grow to be 16 or 17 years old and girls 17 or 18 years old, only three fourths of them have survived their contemporaries. Just half the number of men of 54 or 55 and women of 55 or 56 have died, and one fourth of the men of 69 or 70 and women of 73 or 74 survive. The average span of life is roughly estimated to be 50 years, but the average span of life of babies under 1 year old was 44.82 years in boys and 46.54 years in girls. When they were 3 years old their life expectancy was the longest, that is, 52.54 years for boys and 53.59 years for girls. As the age advances the expectancy gradually grows less and at the age of 20 men had 40.18 years and women 42.12 years more to live. When men were 32 years old and women were 33 or 34 the figures showing their ages and their life expectancy was just the same. At the age of 50 men had 18.49 years more to live, and women 21.67 years.

The death rate by age groups is shown in the following table

| Ages | Male | Female |
|------|-------|--------|
| 0 | 140.1 | 124.1 |
| 1 | 43.1 | 42.1 |
| 2 | 22.4 | 22.7 |
| 6 | 6.4 | 7.1 |
| 10 | 2.6 | 3.0 |
| 15 | 6.0 | 7.3 |
| 18 | 9.1 | 10.1 |
| 20 | 9.8 | 10.6 |
| 25 | 9.3 | 10.2 |
| 24 | 9.0 | 9.9 |
| 30 | 7.4 | 8.9 |
| 40 | 9.6 | 10.1 |
| 50 | 17.5 | 12.6 |
| 60 | 80.7 | 24.2 |
| 70 | 80.4 | 57.7 |
| 80 | 170.2 | 133.5 |
| 90 | 341.4 | 322.7 |
| 100 | 004.8 | 024.8 |

Junior Nurses

The government believes that expenses incurred by patients should be lessened. Patients now generally have to pay the nurses almost as much as the hospital charges and sometimes even more. Sometimes an expert nurse is not required and a cheaper nurse will do. The home office sees much demand for a practical nurse and will train "junior nurses," who will be able to attend the sick in place of the licensed nurses for a much smaller fee. Junior nurses will be trained for three months in the government institute, while the licensed nurses will be required to take a course of training for two years.

Nearsightedness in Japanese Students

The results of the annual physical examination at the various schools for 1933 has been a matter of great surprise. In the middle grade schools, attended by boys and girls from 12 to 18 years of age, the percentage of the nearsighted has increased in the last twenty years to 36.35 from 15.97 in boys and to 34.56 from 10.40 in girls. In the vocational schools the increase shows almost the same percentage. In colleges and universities about 35,000 students are nearsighted that is, fifty students out of a hundred. The cause of this increase has been investigated by various medical and educational bodies, such as the school physicians' society, the health bureau of the educational office and the Japan Ophthalmologic Association. They say the cause is, in part the small type used in dictionaries and textbooks, which children are obliged to read to prepare for

the entrance examinations to the various schools. They are burdened daily by the keen competitive examinations after they reach the age of 10 because of the surplus population all over the country. Secondly, modern students have weaker constitutions than the previous generations. Thirdly the old fashioned buildings are poorly lighted. School buildings now have improved lighting, but the dwelling houses often are far from being well lighted. A sensation was thus created in Tokyo and the authorities have set about to prevent this condition in future generations. On the other hand, some are of the opinion that the children's eyes are weakened in infancy because most of the Japanese children are carried on the backs of maid servants, often facing the strong rays of the sun. With such a vital problem, a general movement for prevention is expected to be undertaken soon by the nation as a whole.

Medical Economics

In the prefecture of Shizouka, with a population of about 1,700,000, reports were made Oct 1 1930 by medical practitioners on various topics. According to this report about twenty nine patients visit a practitioner daily in cities and about thirty four patients in rural districts, giving an average of 30.5 patients. This includes the old and the new cases at the ratio of 69 old cases to 1 new case. Therefore, on an average, about four new patients come to a practitioner each day. The number of the practitioners in this prefecture is 1,013 in all, including 167 general practitioners, 536 physicians, ninety-eight surgeons and sixty one obstetricians. Of these patients 88 per cent could not afford to pay a fee. Out of every thousand patients there were 132 between 15 and 19 years old, and they comprised the largest number.

Marriages

WILLIAM E. DAWSON Hookerton N C, to Miss Winnie Davis Reel of Morehead City, at Kinston, August 25

WILLIAM MORGAN CHEW Waynesboro Va, to Miss Katharine L Salmon of New York, August 14

EMILE E. THERRIEN, West Vancouver, B C, to Miss Bernice McCartney of Langley Prairie, July 24

HERMAN HARRISON BRAYTON, Chase City Va, to Miss Anne Norfolk Grimm of Baltimore, June 22

FREDERICK SIDNEY HOBBS, Vancouver, B C, to Miss Catherine Bridgman of Calgary, Alta, July 13

EDWIN J. DEALY, Valhalla, N Y, to Miss Esther Elizabeth Hinman at New Castle, August 26

ADAM TYREE FINCH JR. to Mrs Anne Reynolds Geoghegan, both of Chase City, Va, August 5

EVERARD T W NASH, Vancouver B C, to Miss Truda Harvey of Mission City, recently

ROLAND SMITH CLINTON Gastonia N C to Mrs Gertrude Kohn Keller of Charlotte, July 12

HARRY CARTER DUNSTONE, Ypsilanti, Mich, to Miss Ruth Vogel of Chelsea, August 19

JOHN B. COUSAR Bishopville S C to Miss Helen McMillan of McRae, Ga, June 12

CRAIG C WALES, Fairfield, Ohio to Miss Glendora Barnes of Westerville, June 20

PAUL E. PIFER, Kenosha Wis, to Miss Phyllis Marie McCue of Cleveland, June 29

RICHARD J. DIETZ to Miss Evelyn A Tobin both of Milwaukee, July 27

ARCHIE D. EREHART to Miss Mary Herzog both of Anderson, Ind, July 3

RALPH B. DAVIS McComb, Miss to Miss Gileroy Porter of Ripley, July 17

JOHN A. ENRIGHT to Miss Cecilia Wocasek, both of Milwaukee, July 6

SAMUEL SOLOMON to Miss Estelle Suffin both of Brooklyn, August 16

Deaths

August Caille * New York Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, Germany, 1877. College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1881, emeritus professor of pediatrics, New York Post-Graduate Medical School of Columbia University, fellow of the American College of Physicians, past president of the American Pediatric Society, delegate to the International Medical Congress in Berlin, aged 81, at various times on the staffs of the Convalescent Home for Babies Sea Cliff, N Y, New York Post Graduate Hospital, Isabella Home and Hospital and the Lenox Hill Hospital, where he died, October 10, of cerebral hemorrhage.

Simeon Edward Joseph * Portland, Ore, University of California Medical Department, 1877, dean emeritus, emeritus professor of nervous and mental diseases, and one of the founders of the University of Oregon Medical School, past president of the Portland Medical Society and the Portland Academy of Medicine, at one time member of the state legislature medical superintendent of the Oregon State Hospital for Insane, 1881-1883, and the Oregon State Hospital, Salem, 1886-1887, for many years on the staff of the Good Samaritan Hospital, aged 85, died, August 23.

Alvin Walter Klein * Stockbridge, Mass, Cincinnati College of Medicine and Surgery, 1889, member of the American Psychiatric Association served during the World War physician to the Austen Riggs Foundation, at one time chairman of the board of health of Greenwich, Conn, and on the staff of the Greenwich (Conn) Hospital, aged 67, died suddenly, September 27, of coronary occlusion.

Willis Newton Smith, Phoenixville, Pa., Western Pennsylvania Medical College, Pittsburgh, 1892, member of the Medical Society of the State of Pennsylvania, past president of the Chester County Medical Society, on the staff of the Phoenixville Hospital aged 77 died, September 6, in the Chester County Hospital, West Chester, of nephritis.

Peter John Zeglio * Plainfield, N J, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1882, fellow of the American College of Surgeons on the staffs of the Muhlenberg Hospital, Plainfield and the Somerset Hospital, Somerville, aged 75, died, August 3, of chronic myocarditis and arteriosclerosis.

Neil McLean * Devils Lake, N D, Minneapolis College of Physicians and Surgeons, medical department of Hamline University 1906, past president of the Devils Lake District Medical Society, served during the World War, aged 57 died September 3, in a hospital at Livingston, Mont, of pneumonia and cerebral hemorrhage.

Walter J. Leach * New Albany, Ind., Louisville (Ky) Medical College, 1897, president of the Indiana State Medical Association and formerly councilor of the Third District, past president and secretary of the Floyd County Medical Society, on the staff of St. Edward's Hospital aged 73, died, September 29, of heart disease.

John E. Nevill, Bonham, Texas, Memphis (Tenn) Hospital Medical College, 1900, member of the State Medical Association of Texas, past president of the North Texas District Medical Society and the Fannin County Medical Society, aged 66 died, August 31 in a sanatorium in Paris, of amyotrophic lateral sclerosis.

James Donald McKinnon, Port Chester, N Y, McGill University Faculty of Medicine, Montreal, Que., Canada, 1924 at one time instructor and professor of pathology at the University of Wisconsin Medical School, Madison, aged 36, died September 5, at the United Hospital, of an accidental overdose of paraldehyde.

Henry Herbert Healy, Grand Forks, N D, Rush Medical College Chicago 1892 member of the North Dakota State Medical Association, fellow of the American College of Surgeons surgeon to St Michael's Hospital and the Deaconess Hospital aged 65, died September 1, of carcinoma of the prostate.

Franklin Elijah Spear * Woodsville, N H, University of Vermont College of Medicine 1903, past president of the Grafton County Medical Society, served during the World War, aged 62, on the staff of the Cottage Hospital, where he died September 5, of acute hemorrhagic pancreatitis.

The conference, after discussing the matter, expressed the opinion that the question of joining the International Union Against Cancer was a matter for the cancer organization in each state to decide on individually, and that it be left in the hands of each state organization to take such action as it considered desirable in this respect.

RIO DE JANEIRO

(From Our Regular Correspondent)

Sept. 15, 1935

The First Reported Case of Undulant Fever

Dr Jose Guilherme Lacorte, head of the laboratories of the Instituto Oswaldo Cruz, in a lecture before the Academia Nacional de Medicina of Rio de Janeiro reported bacteriologic and serologic studies in a case of undulant fever, the first one seen in Rio de Janeiro. The bacteria developed on a solid culture medium placed in an atmosphere overcharged with carbon dioxide. The medium was prepared according to Huddleson's technique. The bacteria were not motile in broth cultures of three-four or forty-eight hours examined by the hanging drop method, except for exaggerated brownian movement. They are rod shaped with round ends varying between 0.2 and 0.4 micron in width and 0.5 and 1 micron in length and are gram negative. Colonies that develop in petri dishes containing ordinary gelose after forty-eight hours resemble pin heads between 0.2 and 0.4 mm in diameter; they are convex, transparent, humid, shining and smooth, with complete and regular contours and a center darker than the rest of the colony. As they grow older they turn brown and their borders become irregular. The bacteria, when placed in simple broth, produce slight turbidity after twenty-four hours and intense turbidity and precipitation after forty-eight hours in gelatin at 20 C they produce moderate proliferation without liquefaction, on potato medium they grow poorly and turn the medium dark, they fail to form indole and to reduce nitrates to nitrites and they do not form acid or gas. The organism proliferates well in Huddleson medium, when it contains fuchsin in the proportion of 1 to 25,000, thionine in the proportion of 1 to 30,000 or methyl violet in the proportion of 1 to 100,000. The speaker concluded that the organism was *Brucella melitensis*; however, the patient was a hog slaughterer—a fact that would make more plausible his infection with *Brucella suis*. The fact that the bacteria grew in a medium placed in an atmosphere overcharged with carbon dioxide which is a characteristic of *Brucella abortus*, is also surprising. However, the bacteria isolated by the speaker behave as *Brucella melitensis* with respect to the formation of hydrogen sulphide and in not taking certain stains.

Local Insulin Therapy in Pleural Thickening

Dr Santos Fortes reports satisfactory results with local insulin therapy in about 100 cases of pleural thickening. The treatment consists of subcutaneous injections of insulin in doses varying from 0.2 to 1 cc, associated with the administration of sugar, either in water or in candies. The injections are made at the level of the pleural lesions and are given every other day in a number varying from twelve to ninety. Satisfactory results were obtained in thirty of a group of thirty-four cases. The treatment was discontinued in the remaining four because of hypersensitivity to insulin. Hypoglycemia, which appeared in some cases during the course of the treatment, was controlled by the administration of sugar. The treatment gives the best results in postpneumonic pleural thickening of the type described by Morquio and also in some cases similar to those described by Bacmeister as chronic pneumonia. The prognosis of which has been considered as fatal. The speaker, with Argerich, believes that the local action of insulin therapy is probably due to a trophic action of insulin on the tissues by which glycopexis in the tissues is promoted.

JAPAN

(From Our Regular Correspondent)

Aug. 29, 1935

Vital Statistics

In its recent report, the statistical bureau of the cabinet states that according to the census of 1930 the death rate of the nation was less than 20 per thousand of population. The death rate of infants was highest, having been 140 for boys and 124 for girls per thousand babies. When boys grow to be 16 or 17 years old and girls 17 or 18 years old, only three-fourths of them have survived their contemporaries. Just half the number of men of 54 or 55 and women of 55 or 56 have died, and one-fourth of the men of 69 or 70 and women of 73 or 74 survive. The average span of life is roughly estimated to be 50 years, but the average span of life of babies under 1 year old was 44.82 years in boys and 46.54 years in girls. When they were 3 years old their life expectancy was the longest, that is, 52.54 years for boys and 53.59 years for girls. As the age advances the expectancy gradually grows less and at the age of 20 men had 40.18 years and women 42.12 years more to live. When men were 32 years old and women were 33 or 34 the figures showing their ages and their life expectancy was just the same. At the age of 50 men had 18.49 years more to live, and women 21.67 years.

The death rate by age groups is shown in the following table.

| Ages | Male | Female |
|------|-------|--------|
| 0 | 140.1 | 124.1 |
| 1 | 43.1 | 42.1 |
| 2 | 22.4 | 22.7 |
| 3 | 0.4 | 7.1 |
| 10 | 2.0 | 3.0 |
| 15 | 6.0 | 7.3 |
| 18 | 0.1 | 10.1 |
| 20 | 0.8 | 10.6 |
| 23 | 0.3 | 10.2 |
| 24 | 0.0 | 0.9 |
| 30 | 7.4 | 8.9 |
| 40 | 0.0 | 10.1 |
| 50 | 17.5 | 12.6 |
| 60 | 80.7 | 24.2 |
| 70 | 80.4 | 57.7 |
| 80 | 170.2 | 138.5 |
| 90 | 341.4 | 322.7 |
| 100 | 004.8 | 021.2 |

Junior Nurses

The government believes that expenses incurred by patients should be lessened. Patients now generally have to pay the nurses almost as much as the hospital charges and sometimes even more. Sometimes an expert nurse is not required and a cheaper nurse will do. The home office sees much demand for a practical nurse and will train "junior nurses" who will be able to attend the sick in place of the licensed nurses for a much smaller fee. Junior nurses will be trained for three months in the government institute, while the licensed nurses will be required to take a course of training for two years.

Nearsightedness in Japanese Students

The results of the annual physical examination at the various schools for 1933 has been a matter of great surprise. In the middle grade schools, attended by boys and girls from 12 to 18 years of age, the percentage of the nearsighted has increased in the last twenty years to 36.35 from 15.97 in boys and to 34.56 from 10.40 in girls. In the vocational schools the increase shows almost the same percentage. In colleges and universities about 35,000 students are nearsighted—that is, fifty students out of a hundred. The cause of this increase has been investigated by various medical and educational bodies, such as the school physicians' society, the health bureau of the educational office and the Japan Ophthalmologic Association. They say the cause is, in part, the small type used in dictionaries and textbooks, which children are obliged to read to prepare for

the entrance examinations to the various schools. They are burdened daily by the keen competitive examinations after they reach the age of 10 because of the surplus population all over the country. Secondly, modern students have weaker constitutions than the previous generations. Thirdly, the old fashioned buildings are poorly lighted. School buildings now have improved lighting, but the dwelling houses often are far from being well lighted. A sensation was thus created in Tokyo and the authorities have set about to prevent this condition in future generations. On the other hand, some are of the opinion that the children's eyes are weakened in infancy because most of the Japanese children are carried on the backs of maid servants, often facing the strong rays of the sun. With such a vital problem, a general movement for prevention is expected to be undertaken soon by the nation as a whole.

Medical Economics

In the prefecture of Shuzouka, with a population of about 1,700,000, reports were made Oct. 1, 1930 by medical practitioners on various topics. According to this report about twenty nine patients visit a practitioner daily in cities and about thirty four patients in rural districts, giving an average of 305 patients. This includes the old and the new cases at the ratio of 69 old cases to 1 new case. Therefore on an average, about four new patients come to a practitioner each day. The number of the practitioners in this prefecture is 1,013 in all, including 167 general practitioners, 536 physicians, ninety-eight surgeons and sixty-one obstetricians. Of these patients 88 per cent could not afford to pay a fee. Out of every thousand patients there were 132 between 15 and 19 years old, and they comprised the largest number.

Marriages

WILLIAM E. DAWSON, Hookerton N. C., to Miss Winnie Davis Reel of Morehead City, at Kinston, August 25.

WILLIAM MORGAN CHEW, Waynesboro, Va., to Miss Katharine L. Salmon of New York, August 14.

EMILE E. THERRIEN, West Vancouver, B. C., to Miss Bernice McCartney of Langley Prairie, July 24.

HERMAN HARRISON BRANTON, Chase City, Va., to Miss Anne Norfolk Grimm of Baltimore, June 22.

FREDERICK SIDNEY HOBBS, Vancouver, B. C., to Miss Catherine Bridgman of Calgary, Alta., July 13.

EDWIN J. DEALY, Valhalla, N. Y., to Miss Esther Elizabeth Hinman at New Castle, August 26.

ADAM TYREE FINCH JR. to Mrs. Anne Reynolds Geoghegan, both of Chase City, Va., August 5.

EVERARD T. W. NASH, Vancouver, B. C., to Miss Truda Harvey of Mission City, recently.

ROLAND SMITH CLINTON, Gastonia, N. C., to Mrs. Gertrude Kohn Keller of Charlotte, July 12.

HARRY CARTER DUNSTONE, Ypsilanti, Mich., to Miss Ruth Vogel of Chelsea, August 19.

JOHN B. COUSAR, Bishopville S. C., to Miss Helen McMillan of McRae, Ga., June 12.

CRAIG C. WALES, Fairfield, Ohio, to Miss Glendora Barnes of Westerville, June 20.

PAUL E. PIFER, Kenosha, Wis., to Miss Phyllis Marie McCue of Cleveland, June 29.

RICHARD J. DIETZ to Miss Evelyn A. Tobin both of Milwaukee, July 27.

ARCHIE D. EREHART to Miss Mary Herzog both of Anderson, Ind., July 3.

RALPH B. DAVIS McComb, Miss., to Miss Gileroy Porter of Ripley, July 17.

JOHN A. ENRIGHT to Miss Cecilia Wocasek, both of Milwaukee, July 6.

SAMUEL SOLOMON to Miss Estelle Suffin both of Brooklyn, August 16.

Deaths

August Caille * New York. Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, Germany, 1877, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1881, emeritus professor of pediatrics, New York Post-Graduate Medical School of Columbia University, fellow of the American College of Physicians, past president of the American Pediatric Society, delegate to the International Medical Congress in Berlin, aged 81, at various times on the staffs of the Convalescent Home for Babies Sea Cliff, N. Y., New York Post Graduate Hospital, Isabella Home and Hospital and the Lenox Hill Hospital, where he died October 10, of cerebral hemorrhage.

Simeon Edward Joseph * Portland, Ore., University of California Medical Department, 1877, dean emeritus, emeritus professor of nervous and mental diseases, and one of the founders of the University of Oregon Medical School, past president of the Portland Medical Society and the Portland Academy of Medicine, at one time member of the state legislature, medical superintendent of the Oregon State Hospital for Insane, 1881-1883, and the Oregon State Hospital, Salem 1886-1887 for many years on the staff of the Good Samaritan Hospital, aged 85, died, August 23.

Alvin Walter Klein * Stockbridge, Mass., Cincinnati College of Medicine and Surgery, 1889, member of the American Psychiatric Association, served during the World War, physician to the Austen Riggs Foundation, at one time chairman of the board of health of Greenwich, Conn., and on the staff of the Greenwich (Conn.) Hospital, aged 67, died suddenly, September 27, of coronary occlusion.

Willis Newton Smith, Phoenixville, Pa., Western Pennsylvania Medical College, Pittsburgh, 1892, member of the Medical Society of the State of Pennsylvania, past president of the Chester County Medical Society, on the staff of the Phoenixville Hospital, aged 77, died, September 6, in the Chester County Hospital, West Chester, of nephritis.

Peter John Zeglio * Plainfield, N. J., College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1882, fellow of the American College of Surgeons on the staffs of the Muhlenberg Hospital, Plainfield, and the Somerset Hospital, Somerville, aged 75, died, August 3, of chronic myocarditis and arteriosclerosis.

Neil McLean * Devils Lake, N. D., Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1906, past president of the Devils Lake District Medical Society, served during the World War, aged 57, died September 3, in a hospital at Livingston, Mont., of pneumonia and cerebral hemorrhage.

Walter J. Leach * New Albany, Ind., Louisville (Ky.) Medical College, 1897, president of the Indiana State Medical Association and formerly counselor of the Third District, past president and secretary of the Floyd County Medical Society, on the staff of St. Edward's Hospital, aged 73, died, September 29, of heart disease.

John E. Nevill, Bonham, Texas, Memphis (Tenn.) Hospital Medical College, 1900, member of the State Medical Association of Texas, past president of the North Texas District Medical Society and the Fannin County Medical Society, aged 66, died, August 31, in a sanatorium in Paris, of amyotrophic lateral sclerosis.

James Donald McKinnon, Port Chester, N. Y., McGill University Faculty of Medicine, Montreal, Que., Canada, 1924, at one time instructor and professor of pathology at the University of Wisconsin Medical School, Madison, aged 36, died September 5, at the United Hospital, of an accidental overdose of paraldehyde.

Henry Herbert Healy, Grand Forks, N. D., Rush Medical College, Chicago, 1892, member of the North Dakota State Medical Association, fellow of the American College of Surgeons, surgeon to St. Michael's Hospital and the Deaconess Hospital, aged 65, died, September 1, of carcinoma of the prostate.

Franklin Elijah Spear * Woodsville, N. H., University of Vermont College of Medicine, 1903, past president of the Grafton County Medical Society, served during the World War, aged 62, on the staff of the Cottage Hospital where he died September 5, of acute hemorrhagic pancreatitis.

John B Kouwenhoven ⊕ Yonkers, N Y, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1895, at one time member of the city health department, for many years on the staff of St John's Riverside Hospital, aged 64, died, August 27, at Dorset, Vt

John S Jackson ⊕ Alpena, Mich, Detroit College of Medicine, 1905, also a dentist, past president and secretary of the Alpena County Medical Society, aged 63, on the staff of the Donald McRae Hospital, where he died, August 24, of diabetic acidosis complicated by a carbuncle on the neck

David T Smith ⊕ Omer, Mich, Detroit College of Medicine, 1903, past president of the Bay County Medical Society, formerly mayor of Omer, medical director and owner of a hospital bearing his name, aged 54, died, September 8, of coronary thrombosis and cerebral embolus

Alexander Bell, Toronto, Ont, Canada, Queen's University Faculty of Medicine Kingston, 1865, medical health officer of the city of Peterborough and county coroner for many years, Civil War veteran, at one time clerk and chief municipal officer of Lakefield, aged 91, died, September 1

Joseph Anthony Stockler ⊕ Reading Pa, University of Pennsylvania School of Medicine, Philadelphia, 1909 member of the American Academy of Ophthalmology and Oto-Laryngology, aged 51, on the staff of St Joseph's Hospital, where he died, September 9, of heart disease

Monroe Clayton Sapp ⊕ Cameron, Texas, Tulane University of Louisiana Medical Department, New Orleans, 1907, past president of the Milam County Medical Society, on the staff of the Cameron Hospital, aged 70, died suddenly, August 5, of heart disease

Vergil Alvin Ross ⊕ Champaign, Ill, Rush Medical College, Chicago 1917, served during the World War, assistant health officer and senior medical adviser to men at the University of Illinois aged 42, was found dead in bed, August 26, of coronary thrombosis

Frederick Burke Carron, Brockville, Ont, Canada, McGill University Faculty of Medicine, Montreal Que, 1896, M R C S England and L R C P, London, 1898, served with the Canadian Army during the World War, aged 64, died, August 25

Nathan Hunt, National City, Calif, State University of Iowa College of Medicine, Iowa City 1872 Civil War veteran formerly health officer of San Diego County aged 88 died, August 23, at Sawtelle, of arteriosclerosis and thrombosis

John Rudd Mahone, Shafter, Texas, Tulane University of Louisiana Medical Department, New Orleans, 1905, at one time member of the state board of health, health officer of Hidalgo County and Cameron County, aged 57, died in August

Dickson Gillespie Thompson, Waxahachie, Texas, University of Louisville (Ky) Medical Department 1877, member of the State Medical Association of Texas aged 78, died, August 29, of carcinoma of the gastro intestinal tract

Edward Augustus Willis, New York, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1902, served during the World War aged 61, died, September 25, in the Mount Sinai Hospital, of cirrhosis of the liver

Oscar O'Bannon Martin ⊕ San Antonio, Texas, University of Texas School of Medicine Galveston, 1930, aged 31, died August 26, at the Station Hospital, Fort Sam Houston, of injuries received in an automobile accident

Caspar William Letzerich, Harlingen, Texas, Tulane University of Louisiana Medical Department New Orleans 1899 member of the State Medical Association of Texas, aged 60 died, September 1, of coronary occlusion

William Lewis Peck, Coalwood, W Va, University of Louisville (Ky) Medical Department 1912 member of the West Virginia State Medical Association, aged 61, died suddenly, August 30, of myocarditis

Murray Emmet Swinehart, Columbus, Ohio Starling Medical College, Columbus 1906, member of the Ohio State Medical Association, aged 59 died, September 9, of idiopathic hypoplasia of the bone marrow

Henry Johns Owens, Hazleton, Pa Jefferson Medical College of Philadelphia 1896, member of the Medical Society of the State of Pennsylvania, aged 63, died, August 29 in a local hospital, of pneumonia

Hermann Mond ⊕ New York, Medizinische Fakultät der Universität Wien, Austria, 1920, for many years on the staff of the Mount Sinai Hospital, aged 43 died suddenly, September 17, of coronary thrombosis

Edward Preston Hale, Lenox Mass, Bellevue Hospital Medical College, New York, 1881, member of the Massachusetts Medical Society, bank president, aged 75, died, September 9, of heart disease

Oliver Edmund Snodgrass, Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1886, aged 71, died, August 27, in Ocean City, N J, of chronic nephritis and arteriosclerosis

Minnie James Cantelo Nicholson, Haverhill, Mass, College of Physicians and Surgeons, Boston, 1915, member of the Massachusetts Medical Society, aged 59, died, August 31, in the Gale Hospital

Claire Ella Armstrong Russ, Cincinnati, Laura Memorial Woman's Medical College, Cincinnati, 1896, aged 69 died, September 5, of lymphoblastoma with exfoliative dermatitis and toxic nephritis

Thomas Dana Jacobs, Grandmound, Iowa, State University of Iowa College of Medicine, Iowa City, 1913, served during the World War, aged 54, died, September 2, of coronary thrombosis

Ned J Malloy, Gagetown, Mich, Marquette University School of Medicine, Milwaukee, 1914, member of the Michigan State Medical Society, aged 51, died, August 30, of coronary thrombosis

Herbert Arthur Wildman ⊕ Sterling, Ill, Rush Medical College, Chicago, 1926, on the staff of the Public Hospital, aged 39, died, September 22, as the result of an automobile accident

John Cadwallader Lewis ⊕ Lexington, Ky, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1895, aged 66, died, September 4, of heart disease

George P Brice, Flowery Branch, Ga., Atlanta Medical College, 1885, member of the Medical Association of Georgia, aged 75 died, September 1, of pancreatic abscess

Charles Walden Vandiver, Fort Myers, Fla., University of Alabama Medical Department, Mobile, 1904, aged 65, died, August 20, in the Lee Memorial Hospital, of embolism

Clayton M Mann, East Detroit, Mich Western Reserve University Medical Department, Cleveland, 1892, aged 68, died suddenly, September 1 of cerebral hemorrhage

George Harlan Heilman, Frankfort, Ky, University of Louisville Medical Department 1909, aged 56, died, August 24, of cirrhosis of the liver and chronic nephritis

Frank B Morgan, Dallas Texas, Medical College of Indiana, Indianapolis, 1888, aged 68 died, August 27, of hypertrophy of the prostate and arteriosclerosis

Hugh L Taylor ⊕ Denver Denver College of Medicine, 1891, fellow of the American College of Surgeons, aged 65, died in July at the Mercy Hospital

Thomas Jefferson Rice, Tipton, Tenn, University of Nashville Medical Department 1868, Confederate veteran, aged 94, died, August 29, of uremia

Lewis Scott Knisely, Fort Sumner, N M, University of Kansas School of Medicine 1934, aged 29 died, September 29, at Clinton, Mo, of tuberculosis

Joseph D Sullivan, Milwaukee, Marquette University School of Medicine Milwaukee, 1914, aged 56 died suddenly, September 4, of heart disease

Charles Jay Logan, Socorro, N M, University of Vermont College of Medicine, Burlington, 1888, aged 68, died, July 22, of coronary thrombosis

William Edgar Kessinger, Pomona, Calif Kentucky School of Medicine, Louisville, 1885, aged 79, died, August 9, of coronary occlusion

William Robert Welch, Denver, Hahnemann Medical College and Hospital Chicago, 1889, aged 78, died, July 19, of angina pectoris

John H Tompkins, Baltimore, Leonard Medical School, Raleigh, N C, 1896, aged 67, died, July 19, of chronic nephritis

CORRECTION

The statement in the obituary of Dr George Frederick Stericker of Springfield, Ill in THE JOURNAL, October 19, page 1288, that he was "past president and secretary of the Sangamon County Hospital" was an error A son, Dr George B Stericker of Springfield, was formerly secretary of the Sangamon County Medical Society

Bureau of Investigation

HAINES' GOLDEN TREATMENT

A Long-Lived Medical Swindle Debarred from the Mails

A particularly heartless swindle that has been operated through the United States mails for over fifty years has finally had the mails closed to it. On August 26 1935, the Postmaster General, on evidence satisfactory to him, declared that the Dr J W Haines Company, the Golden Specific Company and their officers and agents as such of Cincinnati, Ohio, were engaged in conducting a scheme for obtaining money through the mails by means of false and fraudulent pretenses, and that in view of this, the postmaster at Cincinnati was instructed to stamp 'Fraudulent' and return to the writers all letters addressed to the concerns named and refuse to pay any postal money order drawn to the order of the concerns or parties involved.

The "Dr Haines Golden Treatment" used to be known as the "Golden Specific" before lying on or in the trade package carried with it a risk of prosecution. For over half a century mothers, wives and sisters have been led to believe that they can cure their loved ones of the drink habit by the secret administration of the Haines Golden Treatment. Never in all this period has a case of drunkenness been cured by such means. But swindlers who exploit "liquor cures" know full well that in the very nature of the case the victims who learned that they had been defrauded would never complain because of the publicity that is inseparable from such complaints. Next to the vampires who used to sell narcotic mixtures under the specious claim that they would cure the drug habit the most heartless swindlers in the "patent medicine" field are the exploiters of preparations sold under the claim that the drugs may be administered without the knowledge of the patient and yet will cure the patient of the drink habit.

Eighteen years ago—October 27, 1917—there was published in this department of THE JOURNAL an article on the Haines Golden Treatment in which it was characterized as "a cruel humbug." In the article there were given the results of an analysis made by the A M A Chemical Laboratory, showing that the alleged cure was essentially a mixture of milk sugar and starch, with a small amount of red pepper and a minute amount of ipecac.

A year previously (1916) the state chemists of North Dakota analyzed the same preparation and reported that the stuff consisted of about 75 per cent of milk sugar, 15 to 20 per cent of wheat starch, with ipecac, capsicum and cascara present. There was no cascara found by the chemists of the American Medical Association but the composition of nostrums is notoriously variable.

In November, 1929, the National Better Business Bureau issued a special bulletin to periodical publishers on the Haines Golden Treatment, pointing out the fraudulent claims made for the product and stating that the exploitation of the Golden Treatment was contrary to the public welfare. In the same year the Federal Trade Commission ordered a complaint against the Dr J W Haines Company, because the concern was advertising that its compound would cure a person of the liquor habit without the patient's knowledge. The Commission proceeded against the Haines concern, charging that the representations and claims made were false and misleading and deceived and misled the purchasing public. Two years later the Haines concern entered into a stipulation with the Federal Trade Commission to correct and revise its advertising copy, its literature and form letters so as to eliminate all the objectionable material. The Commission reported that the concern had agreed that it would not at any time in the future publish or distribute such objectionable representations or "any statement representation or implication that is equivalent or similar in form or in substance to those eliminated" from the advertising material. Of course, a quackish concern of this type could hardly be expected

to keep its word, and, in fact, it was still making the fraudulent claim that the Commission had objected to up as late as the time that the Post Office Department proceeded against them.

The Haines preparation could not be reached under our present inadequate Food and Drugs Act, because the exploiters were shrewd enough not to make false or fraudulent claims on or in their trade package. They confined their lying to the newspapers and cheap magazines that would accept their advertisements—and the Pure Food and Drugs Act does not penalize fraudulent newspaper advertising.

The Hon. Karl A Crowley, Solicitor of the Post Office Department in his memorandum to the Postmaster General recommending the issuance of a fraud order, brings out some interesting facts regarding this long-lived swindle. According to the memorandum, the sole owner of the business at the present time is one Richard J Goettle, Jr. The fraud was "first launched in 1882 at Cincinnati, Ohio, by J M Boyle and Dr Haines, who later sold out his interest to Mr Boyle." As far as we have been able to find out, there never was a Dr J W Haines in Cincinnati.

It seems that in 1913 Boyle sold the business to the father of the present owner. Richard J Goettle, Jr., has operated the fraud since his father's death in 1931.

The Solicitor's memorandum states further that, according to Goettle's own claim, the annual gross receipts have approxi-

DRUNKENNESS CURED

It is Now Within the Reach of Every Woman to Save the Drunkard

By a new discovery which can be given in tea, coffee or food. It does its work so silently and surely that while the devoted wife, sister or daughter looks on, the drunkard is reclaimed even against his will and without his knowledge or co-operation. Send your name and address to Dr J W Haines, 1012 Glenn Bldg., Cincinnati, Ohio, and he will mail enough of the remedy free to show how it is used in tea, coffee or food and that it will cure the dreaded habit quietly and permanently. Also full directions how to use it, books and testimonials from hundreds who have been cured and everything needed to aid you in saving these men and dear to you from a life of degradation and ultimate poverty and disgrace.

MISS MARY ROBERTS.
The above is a picture of Miss Mary Roberts, 1012 Golden Gate Ave., San Francisco, Cal., who successfully cured her brother after he had led a drunkard's life for years. She most heartily recommends Golden Specific to every woman and wants to do everything in her power to help others save the drunkard.

advertisements. The one on the left appeared about thirty six years ago (Cosmopolitan December 1899) the one on the right was published in 1935.

No More Whiskey Drinking

Home Treatment That Costs Nothing To Try



Odorless and Tasteless
Any Lady Can Give
It Secretly at Home in
Tea, Coffee or Food.

If you have a husband, son, brother, father or friend who is a victim of liquor it should be just the thing you want. All you have to do is to send your name and address and we will send absolutely FREE, in plain wrapper, a trial package of Golden Treatment. You will be thankful as long as you live that you did it. Address Dr J W Haines Co., 383 Glenn Building, Cincinnati, Ohio.

For fifty years this fraudulent cure has been advertised. Here is a reproduction (reduced) of two typical

dated \$78,000! Of this, 95 per cent was derived from mail-order sales and about 5 per cent from drug store sales. The mail-order sales were promoted by advertisements that were published in about a hundred daily newspapers and about fifty magazines—publications that were willing to share the profits of this fraud in order that the contact could be made between the victims and the swindler. A typical advertisement read in part as follows:

HE HATES WHISKEY NOW

AN ODORLESS AND TASTELESS TREATMENT DID IT

'Any lady can give it secretly at home in tea, coffee or food and it costs nothing to try. If you have a husband, son, brother, father or friend who is a victim of whiskey, beer or wine, send your name and address to Dr J W Haines Co., 490 Glenn Bldg., Cincinnati, Ohio, and they will send you absolutely free in plain wrapper a trial package of this wonderful treatment. What it has done for others is an example of what it should do for you when used as directed. Write today and be thankful all your life.'

Those who answered the advertisements were sent the so-called trial package and a form letter, together with a pamphlet. The form-letter stated that the powder could be given secretly, but that even if the liquor addict knew that he was getting it, the result would not be changed, because this treatment does not affect his wish, since the purpose of the

preparation is to relieve the craving for liquor " The same letter emphasized

No one in your family need know the victim is being given Golden Treatment. The victim himself should never know it but allowed to believe that he quit of his own free will Remember that the passion for drink may be handed down by heredity Aid not only the living man but those who may live after him

The pamphlet that accompanied the form-letter purported to show the injurious effects of alcohol on the brain, heart, stomach, liver, nose, eyes and kidneys. Lurid colored pictures such as used to be published in the common-school textbooks of the 90's were scattered through the pamphlet.

A question blank also accompanied the form-letter, pamphlet and trial package, which called for the answers to several questions as to age, weight, sex, occupation and habits of the addict. The blank carried a statement that the questions should be carefully answered "in order that we may fully understand condition of patient." The facts were, however, that no attention whatever was paid to the symptom blank and, in fact, there was no one connected with the Haines outfit who was qualified to express an opinion, for, as the memorandum to the Postmaster General brings out, neither Goettle nor anyone connected with the enterprise had any medical training. The memorandum states that the so-called Golden Specific or Golden Treatment contained the following ingredients in powder form:

| | |
|---------------|------------------|
| Milk sugar | Prickly ash bark |
| Pleurisy root | Angelica root |
| Bayberry | Red pepper |
| Ginger | |

The so-called treatment came in three strengths—"Mild," "Regular" and "Extra-Strong." They all contained the same ingredients, but the proportions varied. Milk sugar made up the bulk of all of them, but whereas the "Mild" treatment contained about 11.5 grams of milk sugar in the 15-grain powder, the "Extra-Strong" contained 8 grains, while the Mild contained 1 grain of ginger, the Extra-Strong contained 2 grains, and whereas the Mild contained $\frac{1}{40}$ of a grain of red pepper, the Extra-Strong contained $\frac{1}{80}$ of a grain.

Richard J. Goettle, Jr., the sole owner of this fraud, did not appear at the hearing. He was represented by an attorney and the hearing lasted two days. Goettle's attorney offered no testimony with respect to the efficacy of the so-called treatment. The government called on two physicians, both of whom had had extensive experience in dealing with chronic alcoholics and dipsomaniacs. Both physicians testified, of course, that, in their opinion, the so-called Golden Treatment would not cure the liquor habit or cause drunkards to stop the immoderate use of alcoholic beverages, nor would it make any drinker grow to abhor the very sight or odor of liquor, as Goettle had claimed. Furthermore, they testified that this preparation of ginger, red pepper and other substances would not soothe an inflamed stomach or relieve ulcerations, nor would it steady the nerves or restore the vital organs to normal conditions. The physicians naturally brought out the definite relationship between the mental condition of the liquor addict and his addiction. Goettle's lawyer, in cross-examining one of the medical experts who were testifying for the government, endeavored to establish that while the dosage of drugs in the Golden Treatment was less than the recognized "allopathic" dosage, they were homeopathic dosages. The physicians testimony established that the treatment was based upon neither homeopathic nor scientific dosages. Furthermore, as the Solicitor's memorandum brings out, dosages of drugs must be adapted to individual requirements at the time of administration, a fact that Goettle was undoubtedly familiar with if he had investigated the subject to the extent which his attorney's brief indicated. Nevertheless the Golden Treatment was sold in three arbitrarily-fixed strengths to all, without any regard to individual needs.

A brief that Goettle's attorney filed subsequent to the hearing, and which was given due consideration by the Solicitor of the Post Office Department, stated that many testimonials had been received by Goettle from physicians. It appears that some half-dozen letters of this character were submitted at the hearing but perusal of the letters showed that some were

from practitioners who were not physicians but osteopaths or others having little or no training in the use of drugs, and none of the persons apparently was familiar with the formula or the ingredients of the so-called treatment. Still others were evidently anxious to obtain a profit from resale of the treatment to patients. Two of the alleged physicians whose testimonials were submitted were confessed morphine addicts, as well as drunkards. Mr. Crowley states that most of the letters indicated a "serious lack of education on the part of the writers."

Goettle's excuse for producing no witnesses to testify in his behalf was that it was impossible to present medical expert testimony, due to the unwillingness of physicians to testify because, as he put it, they "are fearful of blacklisting and criticism by a certain minority in their profession who profess to act as their brother's keeper." This charge has always been made by fakery in the medical field. While it is certainly a fact that decent medical men will not sell their services to medical fakery, it is also a fact, as unfortunate as it is notorious, that there are a few renegades in the medical profession who can be counted on to testify for a price for even the most notorious of quacks. In discussing Goettle's charge just quoted, the Solicitor for the Post Office Department states that if Haines' Golden Treatment really possessed the merits claimed for it, Goettle would have had no difficulty in getting medical men to testify. Furthermore, Mr. Crowley states that members of the medical profession frequently testify before the fraud order hearings in cases involving medical questions.

Goettle's case consisted chiefly in what purported to be quotations from various medical textbooks, with argumentative interpretations thereof by Goettle's attorney. As Solicitor Crowley pointed out in his memorandum, aside from the fact that Goettle's lawyer was not qualified to interpret such medical texts on a scientific basis, the arguments that were contained in his brief were in many instances based on incomplete and misleading excerpts from the works of medical writers.

The postal authorities are to be commended for having put out of business one of the most despicable forms of fraud in the medical field.

Correspondence

WISCONSIN LAW ON BLOOD TESTS

To the Editor—In March 1935 Governor Lehman signed a bill granting authority to the courts of New York State to order blood tests in certain cases, such as those involving alleged paternity and interchange of babies. A similar bill in the state of Wisconsin, sponsored by myself, passed both houses and was signed by Governor La Follette in August 1935 (758A, chapter 351, Laws of 1935).

My object in this communication is to put on record in the columns of THE JOURNAL certain features of the Wisconsin law that may prove helpful to those interested in sponsoring similar legislation in other states.

In the first place, this bill distinctly states that in cases of disputed paternity the court may order that "the complainant, her child, and the defendant submit to one or more blood tests to determine whether or not the defendant can be excluded as being the father of the child." This makes it clear that the present value of these tests is only to exclude the possibility of paternity rather than to provide positive proof thereof. In order to prevent further the court, jury and district attorney from wrongly interpreting these tests as proof of paternity, the Wisconsin bill states that "the result of the test shall be receivable in evidence but only in cases where definite exclusion is established."

The Wisconsin law allows tests to be made not only by "duly qualified physicians" but also "by other duly qualified persons." Obviously the bacteriologist or serologist most qualified to perform these tests need not necessarily be trained as a physician.

The law provides that "whenever the court orders such blood tests to be taken and one of the parties shall refuse to submit

to such test, such fact shall be disclosed upon the trial unless good cause is shown to the contrary." The significance of this part of the law is quite evident.

The present Wisconsin law makes provision for the use of the blood tests not only in cases in which the state or the community is a party to the action but also in civil actions in which paternity or maternity is in question, for instance, cases in which the problem is to exclude a false claimant to an estate or to detect alleged interchange of babies.

However, no provision yet is made to grant authority to the courts for the use of these tests in criminal cases. This aspect was advisedly omitted since it was felt that successful legislation was more assured with a bill not too involved. Of course, this can be readily corrected by further legislation. The suggestion is here made that workers in other states in framing the proposed bill provide in it also for criminal cases, since in the future a more comprehensive bill is not apt to suffer in its chance for passage, in view of the recent successful legislation in New York and Wisconsin.

PHILIP LEVINE, M.D.,
Beth Israel Hospital,
Newark, N. J.

BISMUTH IN OIL

To the Editor—In the September issue of the *Journal of the American Pharmaceutical Association* I published an article describing a procedure for evaluating "Bismuth in Oil" preparations and reported in a general way the results obtained on several products. No figures were given nor were the names of any firms mentioned. Recently there has come to my attention an advertisement of the Loeser Laboratory, 22 West Twenty-Sixth Street, New York, in which this article has been reproduced in its entirety, and the implication is made that this is evidence of the superiority of their product. "We offer the following reprint as corroborating evidence of our claim", then follows the article then "It is obvious that in Loeser's Bismuth in Oil a new and higher standard has been established for bismuth suspensions" is part of the language employed.

This article was reproduced without my consent or knowledge and without the consent or knowledge of the editor of the *Journal of the American Pharmaceutical Association*. A vigorous protest on my part brought a profuse apology and a statement that their advertising would be confined to isolated paragraphs. A specimen of this mailed to me still retains all the objectionable features. In fairness to all concerned, and particularly to physicians who may have received an incorrect impression, I wish to make it clear that neither the Maryland State Health Department nor I endorse, by implication or in any other manner, the superiority claims of this firm. On the other hand, we deplore the rather questionable and certainly unethical means employed to further this product.

WILLIAM F. REINDOLLAR, Baltimore
Assistant Chief, Bureau of Chemistry, State
of Maryland Department of Health

GONOCOCCIC TENOSYNOVITIS

To the Editor—In THE JOURNAL, September 28, is an article on "Acute Suppurative Gonococcic Tenosynovitis" by Walter Birnbaum and C. Latimer Callander. In the bibliography no reference is made to the case described by Isadore Zadek in THE JOURNAL of June 15, on "Gonorrheal Tenosynovitis of the Long Head of the Biceps Brachii." Although in the latter case the diagnosis was not made on the pus the tissue examined showed numerous pus cells with intracellular gram-negative biscuit shaped diplococci.

ABRAHAM S. ROTHBERG, M.D., New York

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address but these will be omitted on request.

USE OF POISON GAS BY THE U. S. ARMY

To the Editor—In an article entitled "Air Raid Precautions" on page 358 of the August 24 issue of the *British Medical Journal* I note the following statement: "It is notorious too that the U. S. A. favors poison gas as an instrument of warfare considering it not more inhumane than high explosive and constantly using it in cases of civil riot." To the best of my knowledge it is tear gas which is favored for such use as being temporarily incapacitating but nontoxic. It occurs to me that the statement of the American Medical Association to the editors of the *British Medical Journal* might bring about a correction of a misstatement which seems unfortunate. ANNA M. WALLACE, M.D., Elizabeth, N. J.

ANSWER—The assertions quoted from the *British Medical Journal* are incorrect in that they represent that the United States favors poison gas as an instrument of warfare and that the United States uses poison gas in cases of civil riot.

Actually the United States has been obliged to reconcile itself to the likely use of gas in future warfare, following the failure of efforts (in which the United States took prominent part) to proscribe such use by universal agreement.

The use of poison gas in domestic disturbances has never been resorted to within the United States. Chemicals used in riot duty are carefully selected from the group of nonlethal agents. Regrettable misuse of the term "poison gas" results frequently in its application to chloracetophenone and diphenylaminechlorarsine, neither of which is a casualty producer. An attempt to clarify this point was made by the British delegation before the Preparatory Disarmament Commission in 1930, supported by the American representative, Mr. Hugh Gibson, who noted the inconsistency of banning from warfare types of chemicals that were freely and advantageously used in suppressing civil disturbances. However, this attempt by British and American representatives to find a satisfactory solution to a complicated political-technical problem can in no sense be interpreted as committing the United States in favor of the general use of poison gas.

The British Draft Convention, submitted to the General Disarmament Conference, and to which the support of the United States was pledged by President Roosevelt, May 16, 1933, provided for the abolishment of chemical warfare in toto.

PARKINSONISM AND DIABETES

To the Editor—In the early part of 1929 I detected that I had sugar in the urine 10 per cent. I immediately put myself under a very strict diet and high dosage of insulin using sometimes 60 units once a day. Within about a month the sugar and acetone disappeared; however, I continued the treatment for about seven months. Since then I have kept the sugar under control on a moderate diet and the periodic use of insulin. Insidiously with the sugar, a nervous condition in my left foot and arm gradually and imperceptibly crept along such as paresthesia in the left foot, edema in the left ankle and dull pain in the left arm, together with a labored movement, heaviness and slow execution in the movements in these limbs. On exertion and effort there is a tremor; there is also muscular pain and stiffness. I attributed this to the sugar neuritis and muscular rheumatism. Recently I have consulted some specialists on nervous diseases. They made the diagnosis of parkinsonism (not Parkinson's disease). What is the etiology of parkinsonism? Is there any relation in the causative factor of sugar and parkinsonism or is the relation merely incidental in my case? Has a severe strict diet or the continued high dosage of insulin anything to do with parkinsonism? What is the difference between Parkinson's disease and parkinsonism? What is the best line of treatment in parkinsonism? Is hormone therapy of any use? M. D. Egypt

ANSWER—Parkinson's disease (paralysis agitans) may be defined as a chronic progressive disease of the central nervous system, characterized by muscular rigidity, weakness, slowness of movement, and rhythmic, spontaneous tremor. This seldom occurs before the fiftieth year of age and, while no definite pathologic changes have been established, it is believed to be due to degenerative vascular changes affecting the lenticular nucleus.

Parkinsonism refers to a similar syndrome, which may occur at younger age periods and which is due to other causes. The description is consistent with this diagnosis. There are no treatises confined to this subject, but there is a large body of literature on epidemic encephalitis and carbon monoxide poisoning, both of which may be followed by parkinsonism.

There is no established relationship between diabetes and parkinsonism, although, in view of the newer work on the relation

of the hypophysis to diabetes, it might be worth while seeking for a common cause that might affect the nervous ganglions and this gland. It does not seem likely that either the strict diet or insulin dosage could have anything to do with parkinsonism. No hormone therapy for parkinsonism is known. The usual treatment is entirely symptomatic. The tinctures of hyoscyamus, stramonium or scopolamine are frequently employed, as well as calcium and parathyroid.

STREPTOCOCCIC PNEUMONIA

To the Editor—A physician aged 42 was taken ill April 19 while making a call. He had a chill followed by a temperature of 103 F and pain of the lower lobe of the left lung with coughing and expectoration of blood stained mucus. He continued to grow worse. There were daily chills, severe sweats and an increase in temperature with signs of cyanosis. Pain of the lower lobe of the left lung continued with pain more severe over the heart. I was called to see him on the afternoon of April 21. Examination of the chest showed consolidation of the left lower lobe with a spreading of infection into the bronchial tubes and the left and right lungs. The pulse was 108, the temperature was 101, and respirations numbered 24. At this time he had not had his daily chill with increase in temperature. Blood and sputum cultures were positive for *Streptococcus viridans* and a hemolytic staphylococcus infection. No pneumococcus was found. Examinations were made by the state laboratory. Each afternoon between 2 and 4 the patient would have a severe chill, increase in temperature and an attack with pain over the heart and cyanosis. The cough and expectoration of blood and mucus continued to grow worse. On the night of April 22 all treatment was discontinued and he was placed in an oxygen tent sent out by the Ohio Chemical Company. A mixture of oxygen 93 per cent and carbon dioxide 7 per cent was given for ten hours. From this time he was given a mixture of straight oxygen 12 liters a minute and morphine for pain and showed some improvement. In addition to this I advised 1,000 cc of 10 per cent dextrose and physiologic solution of sodium chloride intravenously daily and a blood transfusion if the infection continued to spread. White blood count April 23 showed 17,500 polymorphonuclears, 90 per cent, temperature 97.6. He died on the morning of the 26th following acute dilatation of the stomach. He received only 1,500 cc of dextrose and saline solution. He did not receive a blood transfusion. Please advise me as we are having a sporadic epidemic of this type of pneumonia here. Would you have advised a blood transfusion? If so how soon after the diagnosis was made? Would you have advised daily 1,000 cc of dextrose and saline solution intravenously? If so how soon? Would you have advised some form of streptococcus serum or a nonspecific serum? What other treatment would you have advised in addition to the foregoing if any? Please omit name.

M D Alabama

ANSWER.—Obviously the patient had an overwhelming streptococcal pneumonia with bacteremia. It is unlikely that it would have terminated favorably as a result of any known type of management. There is no known serum or vaccine available the use of which would have materially influenced the outcome. The prompt administration of oxygen is to be commended. To place the patient in an atmosphere supersaturated with oxygen (from 60 to 70 per cent), preferably by means of an oxygen chamber, but lacking that, an oxygen tent carefully adjusted, or the nasal catheter method, is the most effective clinical procedure available. Morphine is indispensable. Intravenous dextrose solution, from 5 to 10 per cent, given slowly, may well be administered daily in amounts of from 1,000 to 2,000 cc unless contraindicated. Continuous gastric siphonage and blood letting are frequently of great benefit in acute pneumonia. Blood transfusions would probably be of little avail in an acute overwhelming pneumonia, such as is related in this case, and is probably not to be recommended. The use of nonspecific serums and vaccines in acute pneumonia is a question not settled as yet. There are those who enthusiastically recommend and use them, citing prompt temporary and occasionally permanent remissions in clinical manifestations. In a pinch, lacking other means better supported by clinical observation, such procedures may be and often are used. There can be no criticism of so doing when employed under such circumstances.

TREATMENT OF STERILITY

To the Editor—Two young married women have been married several years and have never been pregnant. Both are anxious to have children. One of them has a decided acid vaginal secretion which I am trying to neutralize partly. There is no history of tubal inflammation and they are as passionate as the normal woman. Is there anything in the realm of glandular therapy that would help them? I get a bewildering number of pamphlets extolling the different products. If there is anything worthy of trial will you kindly let me know? Please omit name.

M D West Virginia.

ANSWER.—The answer to these questions is not to be found in the advertisements of pharmaceutical concerns but may be revealed after a thorough investigation of the matings in question. A scientific inquiry into the fecundity of each partner and the performance of accepted tests for fertility will doubtless uncover the cause or causes of the reproductive failure.

A plan for making such a study of apparently infertile couples will be found in recent books on sterility and in the current literature.

Acidity of the vaginal secretion is the normal reaction and as such requires no treatment.

Glandular therapy may be beneficial to one or the other partner, but a valid indication for its use must first be established. Following are references.

- Meaker S R Human Sterility Baltimore Williams & Wilkins Company 1934
Stein I F and Leventhal M L Infertility and Sterility THE JOURNAL Feb 20 1932 p 621
Bland P B First Arthur and Goldstein Leopold The Clinical Investigation of Functional Sterility in the Female THE JOURNAL Oct 19 1935 p 1231
Titus Paul Sterility THE JOURNAL Oct 19 1935 p 1237

GRATING NOISE IN CERVICAL VERTEBRA

To the Editor—An unmarried white woman aged 42, complains of a grating noise which she believes comes from the region of the upper cervical vertebra and base of the brain. This is noticed particularly when she rotates her head from side to side but does not bother her when she moves her head in the up and down direction. The noise can be heard without the aid of a stethoscope when the examiner places his ear near the occipital and mastoid regions of the head. This noise is much like that which is heard on bending a knee that has long been afflicted with a chronic hypertrophic type of arthritis. The patient dates the beginning of this disturbance back to four years ago following a course of sweat baths for a hypertension. Except for this hypertension which varies from 160 to 190 systolic with a diastolic pressure of 90 mm. of mercury her physical condition is excellent. There is no evidence of any condition of arthritis in any other part of the body and so far as I can ascertain, there are no foci of infection. Anteroposterior and lateral roentgenograms of the cervical spine are negative. This disturbance has become quite an annoyance to the patient and any suggestions you may have to offer in the way of therapy will be greatly appreciated.

HARVEY L JORGENSEN M D Marinette, Wis

ANSWER.—This patient should be treated as though she had arthritis. There are practically always two factors involved in this lesion viz, trauma (either a single severe one or multiple minimal ones), and infection especially of the teeth, throat, sinuses, gastro-intestinal and genito urinary tracts and lymphatic system.

Has her neck ever been treated by an osteopath or chiropractor?

If the condition is sufficiently annoying, the following treatment is outlined:

- 1 Rest on a hard mattress, in a bed with its head elevated from 6 to 8 inches, with
 - 2 Application of head traction
 - 3 Immobilization in a plaster-of-paris cast or a Schrock type of brace, followed by a special collar like the collars of H O Thomas, Schanz or Wallace
 - 4 Physical therapy consisting of radiant heat, massage and either diathermy or short wave diathermy
- Foci of infection and metabolic or endocrine disturbances should be investigated. Vaccine may be considered.

TREATMENT OF AMENORRHEA

To the Editor—A white girl nearly 18 years old has not yet menstruated. She complains of occasional pains in the back, headaches and fatigue. The past history is negative. She weighs 125 pounds (56.7 Kg.), is 5 feet 5 inches (165 cm) tall and is of normal development. The thyroid is not palpable. The blood count is normal. The basal metabolism is normal. What is the cause and what treatment should be given? I have given her four injections of antuitrin S 100 rat units each time. Is it advisable to use theelin simultaneously and for how long a period? Should the dose be gradually increased and in what intervals? Rectal examination does not reveal anything abnormal. Vaginal examination is impossible. Please omit name and address in case of publication.

M D New York.

ANSWER.—Primary amenorrhea is usually difficult to overcome. In some instances menstruation sets in spontaneously, especially in those under 20 years of age. In many cases of amenorrhea, bleeding may be induced by giving huge amounts of estrogenic substance, this may be followed (but not necessarily) by corpus luteum hormone (progestin). However, these bleedings will recur only as long as the former or both hormones are administered. If the hormones are not given, the so called menstrual periods cease. Since ovulation is not produced, there is generally no use in giving this treatment even to married women, because pregnancy cannot possibly be brought about by it. In the case cited undoubtedly the patient has a hypoplastic uterus. While such a uterus can be enlarged by means of hormone therapy and develop a functioning endometrium, it will retrogress as soon as the hormone therapy is stopped. Not infrequently desiccated thyroid is much more helpful in such cases than other hormone therapy.

The only value there is to the bleeding induced by hormones is a psychic one. If women who have amenorrhea are convinced that they are as healthy as women who do menstruate, there is usually no need to treat them for the amenorrhea.

If the physician would like to try hormone therapy he may administer 50,000 international units of estrogenic substance (Amniotin, theelin and so on) on the first, fourth, seventh, tenth and thirteenth day of a course and then give 15 rabbit units of progestin on the seventeenth, eighteenth, nineteenth, twentieth and twenty-first days. If bleeding is to follow, it will usually take place within ten days after the last injection of progestin.

Anterior pituitary-like gonadotropic hormone of the urine of pregnant women may be administered in place of progestin, but it is doubtful whether the result obtained is equivalent. This hormone should be injected intramuscularly in doses of from 150 to 200 rat units daily for five or six injections. In order to produce successive periods of bleeding, these courses of treatment will have to be repeated.

ARTHRITIC ANKLE

To the Editor—A man aged 74 married came to me with the complaint of aching ankle joints of about three months duration aggravated by walking but present during rest as well. The ache or a weakness in the ankles is localized in the ankle joints. Examination of the feet did not disclose anything significant. The dorsalis pedis and posterior tibial arteries were palpable; there was no cyanosis or trophic changes of any kind. There was no evidence of arthritic changes; the motion of the joint was unimpeded and no crepitus was elicited. The longitudinal and transverse arches were apparently normal. He used arch supports owing to the fact that his occupation necessitates his standing nearly all day. The general physical examination revealed a blood pressure of 180 systolic 88 diastolic, temperature 98.2 F, pulse 50, respirations 18. His hearing was impaired. The tympanic membrane showed retraction and there was distortion of a cone of light. The pupils were equal and regular and reacted to light and in accommodation. Examination of the fundus revealed tortuosity and irregularity of the caliber of the vessels. The teeth were all removed and supplanted by plates. The tonsils were atrophic. The sinuses were apparently normal by transillumination. The lungs were essentially normal. The heart was enlarged downward and outward and auscultation revealed accentuation of the second pulmonary sound. No murmurs were noted; the rhythm was normal except for occasional extrasystoles and the slow rate already noted. The abdomen was essentially normal as were the reflexes. Undoubtedly the patient's occupation has much if not everything to do with his complaint. For economic reasons he cannot give up his work. He has consulted several physicians in the last few months without relief. Besides the arch support that he is using at present he has used for longer or shorter intervals ankle supports, diathermy and strapping. Roentgenograms which I have not seen have not revealed any pathologic changes in the involved joints. Your comments and suggestions for further treatment would be greatly appreciated.

S J Wojcik M D Paw Paw Ill

ANSWER—While the lesion seems to be in the ankle joint proper it may be in the subastragal joint. One may have an arthritic joint without positive pathologic changes in the roentgenogram.

The patient's weight is not stated, nor is mention made of the basal metabolic rate or his dietary habits.

The various factors that have to be eliminated in this case are mechanical, circulatory, traumatic, infectious, myogenic, neurogenic, metabolic and endocrine. The chief traumatic factors may be occupational.

A few days of absolute rest in bed with the application of an anodyne lotion and fomentations may be helpful. Proper high laced shoes and resilient supports with a slightly raised inner heel border may be all that is required to give the man comfort. In addition, massage and contrast sprays should improve the circulation. If unsuccessful, a plaster cast and crutches for a short period would be indicated.

MULTIPLE SCLEROSIS

To the Editor—What is the latest treatment for multiple sclerosis? Sodium cacodylate, quinine and injection of whole blood intramuscularly were used with no evidence of benefit.

M D, Michigan

ANSWER—The latest treatment for multiple sclerosis remains as yet empirical. Any disease that has spontaneous remissions usually boasts of multiple and variegated types of treatment. In a number of cases, remissions do not occur at all. The following is suggested: Absolute bed rest for a period of from six to ten weeks for an acute case, this rest includes no reading. During the chronic period abstention from all forms of severe exercise together with solution of potassium arsenite in doses of from 0.2 to 0.6 cc three times a day nearsphenamine intravenously once a week or quinine hydrochloride starting with 0.03 Gm three times a day, gradually increased until about 0.3 Gm three times a day is taken. For acute retrobulbar neuritis, in addition to absolute rest one should give foreign

protein intravenously (typhoid paratyphoid) for at least six or seven injections. The most important part of any regimen in the management of a case of multiple sclerosis is absolute rest and more rest.

COMPLICATIONS IN PNEUMONIA

To the Editor—Please inform me as to the proper treatment of the following complications in an otherwise typical case of lobar pneumonia. A toxic hepatitis (manifested by persistent and gradually increasing jaundice of skin and sclerae, stupor and other nervous manifestations accompanying jaundice). The liver apparently not enlarged or tender to palpation. Persistent exhausting and uncontrollable hiccups. The patient died but the heart and circulation remained good almost to the end. Several years ago I am informed by the patient's relatives the patient had a rather severe case of malaria. Do you think that the malaria could have so injured the liver that it failed to function normally when obliged to take care of the toxin due to the pneumonia? In other words, how much of a part would malaria play as an etiologic factor in the causation of a toxic hepatitis accompanying lobar pneumonia? Dextrose intravenously was given every day once a day 50 cc of concentrated solution and toward the last three or four times a day. Please omit name and address.

M D North Carolina

ANSWER—Jaundice is not a rare complication in pneumonia especially in severe infections. In the case described the toxic hepatitis and stupor strongly suggest pneumococcal bacteremia, a frequent finding in fatal cases of pneumonia. The hiccups may have been another expression of severe toxemia or possibly the result of diaphragmatic irritation (diaphragmatic pleurisy). It is doubtful whether the attack of malaria several years before the pneumonia played any part in the development of the jaundice.

TREATMENT OF LATENT SYPHILIS

To the Editor—What plan of treatment would you advise for a 53 year old patient with a 4 plus Wassermann reaction (during a routine test) with no symptoms or physical anomalies? He has had no treatment whatever and the history of infection dates back eighteen years. Kindly omit name and address.

M D Chicago

ANSWER—In the absence of definite signs of cardiovascular disease or neurosyphilis, the case may be treated as one of latent or asymptomatic syphilis. The patient should receive alternating courses of one of the arsphenamines intravenously and an insoluble bismuth compound intramuscularly with iodides between courses. Treatment should be continued with short periods of rest for at least a year and then intermittently until the positive reaction is reversed.

VENT DISEASE OF RABBITS

To the Editor—Can you tell me what vent disease is in a rabbit? It is communicable from male to female and vice versa and is characterized by excoriated genitalia and a discharge green in character. Is the micro organism known? What can be done to treat it?

EDWARD N TURKUS M D Long Beach Calif

ANSWER—Vent disease, or treponemiasis, is caused by the spirochete *Treponema cuniculi*. This organism is regularly transmitted through the process of breeding from male to female and vice versa. In commercial rabbitries where valuable breeding animals are maintained detailed systematic treatment may be justified. Local applications on the genitalia of a 2 per cent solution of copper sulphate, zinc ointment, or mercurial ointment is recommended. The use of nearsphenamine for subcutaneous injection in doses varying from 0.05 to 0.15 Gm, according to the size of the animal may result in a permanent cure if used in conjunction with local applications. Apparently the same line of treatment as is used for the treatment of syphilis in human beings is effective, but recovery may be expected in a shorter time. In ordinary rabbits used for laboratory experimental work such procedures are not justifiable, and it is more economical to dispose of the affected stock and after a thorough cleansing and disinfection of the hutches to replace them with healthy animals.

FORMULA FOR ECZEMA OF AUDITORY CANAL

To the Editor—On page 496 (February 9) of THE JOURNAL is the following formula for the treatment of eczema of the auditory canal.

| | |
|-------------------|--------------------------|
| Oil of birch tar | 0.8 cc |
| Resorcinol | 0.4 cc |
| Liquid petrolatum | sufficient to make 16 cc |

Our druggist states that he has tried to mix this but that the tar and the resorcinol will not go into solution. Can you advise?

M D Minnesota

ANSWER—An expert pharmacologist has wrestled with this problem and says that the only method he can suggest is to dissolve resorcinol 0.4 Gm in glycerin 5 cc, dissolve the oil of birch tar 0.8 cc in liquid petrolatum 11 cc, then mix the two solutions, and label them "Shake well immediately before using."

BURNING PAIN DURING INTERCOURSE

To the Editor—A man aged 55, in perfect health as far as I can find out lives on a farm. He is 5 feet 11 inches (180 cm) tall and weighs 200 pounds (90 Kg). The heart and lungs are normal. The teeth are very bad. The blood pressure is 115 systolic, 60 diastolic. The Wassermann reaction is negative. The blood count is normal. The kidneys are normal. Urinalysis gives negative results. He has some lancinating pains in the lower limbs and vitiligo of the dorsal surface of both hands. He states that during sexual intercourse the semen burns like a red hot poker and if a drop of it touches his wife anywhere on the vaginal mucous membrane it burns her just like fire. I would be glad to know the cause of this if possible. Please omit name.

M D, Illinois

ANSWER—Burning pain during ejaculation is not a rare condition and is generally due either to an intense congestion of the prostatic urethra or to ulcerations or granulations or similar pathologic conditions in that region. Treatment consists in getting rid of the pathologic condition, which is usually accomplished by gentle prostatic massage and instillations of weak (from 1,300 to 1,500) silver nitrate solutions into the prostatic urethra with the Bangs sound syringe.

There is no condition of the ejaculatory fluid that could possibly cause any burning when brought in contact with the vaginal mucous membranes. There may of course be present an intense vaginitis or increased sensibility of the vaginal mucous membrane, but, what is more likely, the symptoms in the wife are either psychic or suggestive.

DEAFNESS AFTER TETANUS ANTITOXINS

To the Editor—A patient became deaf after receiving tetanus antitoxin. Can tetanus or tetanus antitoxin cause deafness? Kindly do not use my name.

M D Michigan

ANSWER—A moderately extensive but not exhaustive search of sources of information does not disclose any report in which deafness has been caused by tetanus. Optic neuritis and peripheral neuritis have been noted as occasional complications, and it would accordingly appear not impossible for deafness also to occur after tetanus.

Other possibilities must be considered. Tetanus may occur in a patient who already has auditory changes that have escaped notice of the patient previous to his acute illness. Coexistent disease of the central nervous system, such as cerebrospinal syphilis, also must be considered.

Serum disease frequently follows the injection of foreign serum, especially when large doses, usually required in tetanus, are used. Urticaria as well as hemorrhages in various parts of the body, including joints and internal organs, are frequent, and if such a lesion occurred in the ear, deafness either temporary or permanent might result.

EFFECTS OF SCARLET FEVER TOXIN WHEN SWALLOWED

To the Editor—A physician's son aged 6 years was discovered by his mother playing with a box containing 100 vials of Squibb's scarlet fever toxin. She suspects that the vials were full of solution originally but has no way of being sure. If the child did swallow the contents of all or part of these vials what may develop and what would you suggest? Please omit name.

M D, Vermont.

ANSWER—If the child was previously susceptible to scarlet fever and swallowed such an amount of toxin he has partially or completely immunized himself against the disease. It will do no harm. No treatment is indicated.

EFFECTS OF AMYTAL

To the Editor—Please tell me whether the prolonged use of sodium amytal from 12 to 15 grains (0.8 to 1 Gm) daily, (1) has a cumulative toxic effect (2) affects the eyes (3) results in a habit formation that is difficult to break or (4) is apt to cause skin manifestations. Please omit name.

M D New York.

- ANSWER—1 It may have.
2 There is apt to be dilatation of the pupil.
3 Yes.
4 It is.

LIGHT RAYS IN TUBERCULOSIS

To the Editor—Are actinic rays artificially produced (such as those generated by a quartz burner of the Hanovia Chemical Company) contra indicated in pulmonary tuberculosis? Would a gradual tanning of the skin of the chest be detrimental or beneficial?

J PHILLIPS EDMUNDSON M D Kansas City Mo

ANSWER—No it is not contraindicated but found to be of no value and may do harm in overdosage.

Gradual tanning of the skin of the chest would have no action at all either detrimental or beneficial.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country March 14. Oral examination for Group A and B applicants will be held in Kansas City Mo. May 11-12. Applications for written examination should be filed with the secretary before Jan 15. Sec. Dr. C. Guy Lane 416 Marlboro St. Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada Dec. 7. Applications must be filed not later than Nov. 1. Sec. Dr. Paul Titus 1015 Highland Bldg. Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY St. Louis Nov. 18. Asst. Sec. Dr. Thomas D. Allen 122 S. Michigan Ave. Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St. Louis Jan. Sec. Dr. Fremont A. Chandler 180 N. Michigan Ave. Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY Kansas City Mo. May 9. Sec. Dr. W. P. Wherry 1500 Medical Arts Bldg. Omaha.

AMERICAN BOARD OF PEDIATRICS St. Louis Nov. 20. Sec. Dr. C. A. Aldrich 723 Elm St. Winnetka Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY New York Dec. 30. Sec. Dr. Walter Freeman 1726 Eye St. N. W. Washington D. C.

AMERICAN BOARD OF RADIOLOGY Detroit Dec. 12. Sec. Dr. Byrl R. Kirklin Mayo Clinic Rochester Minn.

ARKANSAS Basic Science Little Rock Nov. 4. Sec. Mr. Louis E. Cebauer 701 Main St. Little Rock. Medical (Regular) Little Rock Nov. 12. Sec. State Medical Board of the Arkansas Medical Society Dr. A. S. Buchanan Prescott Medical (Eclectic) Little Rock Nov. 12. Sec. Dr. Clarence H. Young 207 1/2 Main Street Little Rock.

CALIFORNIA Reciprocity Los Angeles Dec. 4. Sec. Dr. Charles B. Pinkham 420 State Office Bldg. Sacramento.

CONNECTICUT Medical (Regular) Hartford Nov. 12-13. Endorsement Hartford Nov. 26. Sec. Dr. Thomas P. Murdock 147 W. Main St. Meriden. Medical (Homeopathic) Derby Nov. 12. Sec. Dr. Joseph H. Evans 1488 Chapel Street New Haven.

FLORIDA Tampa Nov. 11-12. Sec. Dr. William M. Rowlett, Box 786 Tampa.

KANSAS Topeka Dec. 10-11. Sec. Board of Medical Registration and Examination Dr. C. H. Ewing 609 Broadway Larned.

KENTUCKY Louisville Dec. 3. Sec. Department of Health Dr. A. T. McCormack 532 W. Main St. Louisville.

MAINE Portland Nov. 12-13. Sec. Board of Registration of Medicine Dr. Adam P. Leighton Jr. 192 State St. Portland.

MARYLAND Medical (Regular) Baltimore Dec. 10-13. Sec. Dr. John T. O'Mara 1211 Cathedral St. Baltimore. Medical (Homeopathic) Baltimore Dec. 10-13. Sec. Dr. John A. Evans 612 W. 40th St. Baltimore.

MASSACHUSETTS Boston Nov. 12-14. Sec. Board of Registration in Medicine Dr. Stephen Rushmore 413 State House Boston.

NATIONAL BOARD OF MEDICAL EXAMINERS Part III Boston Nov. 5-7. Ex. Sec. Mr. Everett S. Elwood 225 S. 15th St. Philadelphia.

NEBRASKA Lincoln Nov. 19-20. Dir. Bureau of Examining Boards Mrs. Clark Perkins State House Lincoln.

NEVADA Carson City Nov. 4. Sec. Dr. Edward E. Hamer Carson City.

OHIO Columbus Dec. 3-5. Sec. State Medical Board, Dr. H. V. Platter 21 W. Broad St., Columbus.

OKLAHOMA Oklahoma City Dec. 11. Sec. Dr. James D. Osborn Jr., Frederick.

OREGON Basic Science Portland Nov. 16. Sec. Mr. Charles D. Byrne University of Oregon Eugene.

SOUTH CAROLINA Columbia Nov. 12. Sec. Dr. A. Earle Boorer 505 Saluda Ave. Columbia.

TEXAS Houston Nov. 18-20. Sec. Dr. T. J. Crowe 918 Mercantile Building Dallas.

VIRGINIA Richmond Dec. 11-13. Sec. Dr. J. W. Preston, 28 1/2 Franklin Rd. Roanoke.

WEST VIRGINIA Huntington Oct. 28. State Health Commissioner Dr. Arthur E. McClue Charleston.

West Virginia July Report

Dr. Arthur E. McClue, state health commissioner, reports the oral and written examination held at Clarksburg, July 8-10, 1935. The examination covered 11 subjects and included 110 questions. An average of 80 per cent was required to pass. Twenty-five candidates were examined, all of whom passed. Fourteen physicians were licensed by reciprocity and 1 physician was licensed by endorsement. The following schools were represented:

| School | PASSED | Year Grad | Per Cent |
|--|--------|-----------|----------|
| College of Medical Evangelists | (1934) | 86 | |
| Howard University College of Medicine | (1934) | 85 | |
| Emory University School of Medicine | (1934) | 86.5 | |
| Rush Medical College | (1935) | 86 | |
| Indiana University School of Medicine | (1934) | 85.2 | |
| University of Louisville School of Medicine | (1934) | 84.9 | |
| 86.3, 86.5, 87.2 | (1934) | 89.1 | |
| Johns Hopkins University School of Medicine | (1934) | 84.7 | |
| University of Maryland School of Medicine and College of Physicians and Surgeons | (1929) | 88.4 | |
| Tufts College Medical School | (1934) | 86.7 | |
| New York University University and Bellevue Hospital Medical College | (1933) | 86.1 | |
| University of Tennessee College of Medicine | (1931) | 81.4 | |
| Medical College of Virginia | (1934) | 85.8 | |
| 87.5, 87.5, 89.4, 89.6 (1935) | 86.7 | | |
| University of Virginia Department of Medicine | (1934) | 87.5 | |
| Dalhousie University Faculty of Medicine | (1935) | 86.7 | |

| School | LICENSED BY RECIPROCITY | Year Grad | Reciprocity with |
|--|-------------------------|-----------|------------------|
| Northwestern University Medical School | | (1929) | Illinois |
| University of Illinois College of Medicine | | (1933) | Illinois |
| University of Indianapolis Medical Department | | (1902) | Indiana |
| State University of Iowa College of Medicine | | (1931) | Iowa |
| University of Maryland School of Medicine and College of Physicians and Surgeons | | (1933) | Maryland |
| Med College of Virginia (1930) (1932), (1933), (1934) 2 | | | Virginia |
| University of Virginia Department of Medicine (1929), (1932), (1934) Virginia | | (1927) | |

| School | LICENSED BY ENDORSEMENT | Year Grad | Endorsement of |
|---|-------------------------|-----------|----------------|
| University of Louisville School of Medicine | | (1933) | N B M Ex |

Arizona April Report

Dr J H Patterson, secretary, Arizona State Board of Medical Examiners, reports the oral and written examination held in Phoenix, April 2-3, 1935. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. One candidate was examined and passed. Four physicians were licensed by reciprocity and 1 physician was licensed by endorsement. The following schools were represented:

| School | PASSED | Year Grad | Per Cent |
|---|--------|-----------|----------|
| School of Medicine of the Division of the Biological Sciences | | (1935) | 80.7 |

| School | LICENSED BY RECIPROCITY | Year Grad | Reciprocity with |
|--|-------------------------|-----------|------------------|
| University of Arkansas School of Medicine | | (1927) | Arkansas |
| College of Medical Evangelists | | (1930) | California |
| Stanford University School of Medicine | | (1929) | California |
| State University of Iowa College of Medicine | | (1931) | Iowa |

| School | LICENSED BY ENDORSEMENT | Year Grad | Endorsement of |
|---|-------------------------|-----------|----------------|
| St. Louis University School of Medicine | | (1933) | N B M Ex. |

Book Notices

Diseases of the Thyroid Gland. By Arthur E Hertzler M.D. Professor of Surgery University of Kansas. With a chapter on Hospital Management of Goiter Patients by Victor E Chesky M.D. Chief Resident Surgeon Halstead Hospital. Third edition. Cloth. Price, \$7.50. Pp. 348 with 181 illustrations. St. Louis: C. V. Mosby Company 1935.

This book includes chapters under the classifications of etiology, normal morphology, goiter in childhood, nontoxic colloid goiter, toxic colloid goiter, toxic diffuse goiter, atypical toxic goiter, degenerating goiter and constitutional effects, tumors of the thyroid gland, goiters in unusual places, thyroiditis, hypothyroidism, hospital management, topographic anatomy and surgical technic. Hertzler begins with a premise that goiter is a lifetime disease, which, "once fully established," when persisting beyond adolescence or resisting medical treatment, does not afterward regress. His statements that the thyroid is "pretty much a useless organ and may be cast aside with advancing age" and that severe hypothyroidism, following complete removal, occurs only in adolescents and not adults" are open to serious argument. True it is that a number of surgeons with extensive experience with goiter prefer a definite postoperative hypothyroidism to a mild hyperthyroidism, because of the danger of secondary surgery for residual hyperthyroidism, basing their contention on the fact that it is easier to feed thyroid than to dissect a definite scar for tiny thyroid remnants. Nevertheless the present conception of adequate removal of toxic goiter is becoming more and more radical—that there is a tendency to leave less and less thyroid tissue after operation. Individual chapters devoted to nontoxic colloid goiter, goiter in childhood, toxic diffuse goiter and atypical toxic goiter are excellently presented as to pathology and symptomatology. One gets the feeling that the author has "surgical intentions" toward every goiter, colloid or otherwise, persisting beyond childhood. However, reading closely, one finds such a balancing statement as this: "The majority of operative failures come from trying to cure family rows by removing a simple colloid goiter." In proportion to the detailed thoroughness of the remainder of the book, the chapter on technic is rather thin. On the other hand no one will ever learn thyroid surgery from a book or at all. The uniform use of local anesthesia for toxic goiter is not a

generally accepted procedure, even though in Hertzler's clinic the surgeons here wear no mask, but they keep their mouths shut." In general the technic described and illustrated is that practiced by most goiter surgeons. Barring such criticisms as those here outlined, which after all represent merely a difference of opinion, this textbook represents a noteworthy contribution to surgery of the thyroid gland.

Précis de thérapeutique et de pharmacologie. Par A. Richaud et R. Hazard. Préface de A. Desgrez. Seventh edition revised by R. Hazard. professeur agrégé à la Faculté de médecine de Paris. Cloth. Price 100 francs. Pp. 1257 with 34 illustrations. Paris: Masson & Cie 1935.

It is a pleasure to see a book on this subject come from the institution where François Magendie and Claude Bernard did so much for experimental pharmacology and medicine. Since their time however, pharmacology in France has been in a great depression. Professor Richaud died some time ago and by his own wish the work of revision fell to Professor Hazard. In a short preface Professor Desgrez points out that since the appearance of the sixth edition ten years ago the advance in synthetic chemistry, chemical therapy, serotherapy, vaccine therapy, vitamins and general pharmacology makes such a revision necessary.

The task of renovating an old book, and especially one that has been successful is difficult indeed. It is extremely difficult for a pharmacist to discard drugs that have long been and that are still prescribed, although critical work may have shown their use questionable or worthless. Consequently this book, while it adopts the new hesitates to bury the dead. This is a universal failure in textbooks of pharmacology and therapeutics. As a "precis" it is quite large. The subject matter is divided into three parts. Part I is devoted to general pharmacology and occupies about one fourth of the whole. Part II is devoted to special pharmacology and occupies 845 pages. This is subdivided into (1) inorganic drugs, (2) synthetic organic chemicals, (3) products of vegetable origin, and (4) products of animal origin. Part III deals briefly with pharmacy, the prescription, dosage and allied subjects.

The general pharmacology is too brief to be considered adequate in our best medical schools. However, it is supplemented to a large extent in the special part, and the whole is satisfactory. There are no original tracings, but instead a few diagrammatic representations. This perhaps is not a drawback, since it is not the tracings per se but a knowledge of how they are obtained and individual work in obtaining them that is most valuable to the student. In a book of this size, one might expect some references to the original literature but there are none. Instead, a few names are mentioned. The authors explain this omission on the ground that it often is difficult to determine the paternity of an experimental fact or discovery.

In part II the method of discussion may be illustrated by mentioning a few of the important drugs. The discussion of iodine occupies twenty pages, covering its preparation characteristics, reactions, occurrence in nature, in water, in air, in sea water, in vegetables, in animals, under physiologic effects, its local action, general action and therapeutic applications and preparations. Ergot is disposed of in two pages. While digitalis gets nine, opium and its alkaloids occupy twenty-seven pages. Some of the work of the last two years is not mentioned, e. g., copper in hemoglobin formation or the excretion of morphine, but from a practical point of view the omissions are neither numerous nor serious.

Part III which discusses the pharmacy and prescription writing, strikes one as being somewhat backward, modern prescription writing emphasizes simplicity, and, while Professor Hazard is in the main conservative he gives an example of the complete prescription, which includes a base, an adjuvant, a corrective, a corrective adjuvant, an intermediate and an excipient. While he hastens to say that these are not always used, it is not sufficient. Such mixtures are unscientific, unnecessary and often detrimental. Worse still, they disorient and confuse the student, often beyond recovery in the time devoted to the subject. If they are mentioned at all, it should be to condemn them.

The book as a whole contains the essentials of pharmacology and therapeutics but is weak in pharmacology and contains an excessive number of drugs or therapeutics, many more than are needed. An excessive number paves the way to weakness in therapeutics. It is no condemnation to say that English

speaking people would gain little by a translation of this book. It can be recommended, however, to students and others who wish practice in reading French and who wish to get a view of French pharmacology and therapeutics at first hand.

Abnormal Arterial Tension By Edward J. Stieglitz M.S. M.D. F.A.C.P. Assistant Clinical Professor of Medicine Rush Medical College of the University of Chicago. Edited by Morris Fishbein M.D. Cloth Price \$4 Pp 261 with 66 illustrations. New York: National Medical Book Company Inc. Doubleday Doran 1935.

In this little volume the author succeeds in covering a good deal of ground, even if he does not go into considerable detail. He discusses the methods of taking blood pressure measurements and their symptoms. The factors that alter blood pressure within normal variations and cause elevation or depression are considered fairly well under various headings. It is interesting to note that in the discussion of the symptoms of hypertension the author classifies them as cardiac, neurologic and renal. He succeeds fairly well in giving an acceptable description of the subject. Coronary sclerosis he considers as part of chronic hypertension. Under the subject of acute hypotension the author has an opportunity to describe the condition of shock. The states of chronic hypotension, as Addison's disease and those resulting from disturbed nutritional states or chronic infections, are given some space. The subjects of prognosis and treatment are fairly good. There are many illustrations, charts, diagrams and reproductions of roentgenograms. This book can be recommended highly to the general practitioner and student.

Die Haut und Geschlechtskrankheiten Eine zusammenfassende Darstellung für die Praxis Herausgegeben von Prof. Dr. Leopold Arzt und Prof. Dr. Karl Zieler. Lieferung 21/22. Band II. Hautkrankheiten entzündlicher Natur I. Teil. Von Prof. Dr. Gabor Nobl. Hautkrankheiten entzündlicher Natur II. Teil. Von Prof. Dr. Oscar Niggel. Hautkrankheiten entzündlicher vorwiegend beruflicher Natur und ihre Stigmata. Von Priv. Doz. Dr. Alfred Perutz. Paper. Price 16 marks. Pp 235. 540 with 173 illustrations. Berlin and Vienna: Urban & Schwarzenberg 1935.

Die Haut und Geschlechtskrankheiten Eine zusammenfassende Darstellung für die Praxis Herausgegeben von Prof. Dr. Leopold Arzt und Prof. Dr. Karl Zieler. Lieferung 23/24. Band II. Die Hypertrophien der Epidermis. Von Prof. Dr. M. Oppenheim. Die Hypertrophien des Pigmentes. Von Prof. Dr. M. Oppenheim. Blindegebebi hypertrophien. Pachydermien. Von Prof. Dr. Eduard Neuber. Atrophien. Von Priv. Doz. Dr. Stefan Robert Brünauer. Neurosen der Haut. Von Priv. Doz. Dr. Alfred Perutz. Paper. Price 18 marks. Pp 541. 828 with 95 illustrations. Berlin and Vienna: Urban & Schwarzenberg 1935.

In the volume devoted to a consideration of the inflammatory dermatoses are included chapters on the toxic erythemas, urticaria, prurigo, neurodermitis and the varicose symptom complex, a section on the papulosquamous dermatoses, and a thorough discussion of industrial dermatoses. Discussion of these subjects is detailed and well organized and is greatly aided by the liberal use of excellent reproductions of photographs in black and white and plates of moulages in colors.

The same thoroughness of discussion marks the volume devoted to a consideration of the hypertrophies and atrophies of the skin and pigment and to the cutaneous neuroses. The numerous illustrations tend to make these volumes a veritable atlas. While the books are obviously intended for the specialist in this field, the readability of the text and the excellence of the illustrations make them a valuable source of information for all physicians.

Dial Away Your Fat. Vest Pocket Calorie Calculator Does It! Paper. Price 25 cents. Pp 32. Los Angeles: The Health Builders 1935.

This pocket-size booklet consists essentially of a series of alphabetically arranged and indexed tables of 100 calorie portions of foods. It derives its name from a dial, attached to the front cover, with which the user is able to keep a tally of the number of calories eaten during the day. Space is provided in the back of the booklet for recording the daily total caloric intake and the daily weight. The tables are preceded by a brief discussion of the principles of weight reduction and a criticism of some commercially exploited nostrums. An initial diet of from 1,200 to 1,400 calories is advised followed by an increase "if you are losing weight too rapidly" until "the weight loss is satisfactory." The booklet is an honest attempt to extract a profit from the obesity problem. The problem is properly presented as a balance between energy intake and energy expenditure and the information is sold as such and not as an inert powder or bath salt.

The ready reference and recording features are commendable. However, this commercial venture is subject to the same serious objections as all similar projects. It assumes that the individual who attempts to use it will be normal except for overweight, and that he or she is capable of adjusting the diet both qualitatively and quantitatively so as to avoid the injurious effects of improper dieting. The experienced physician knows that these assumptions are not valid in a large percentage of cases. These booklets would have a much greater claim for recommendation if distributed only through physicians in conjunction with proper medical supervision.

Kings and Some Kings Men Being a Record of The Medical Department of King's College London from 1830 to 1909 and of King's College Hospital Medical School from 1909 to 1934 By H. Willoughby Lyle M.D. F.R.C.S. Fellow of King's College London Consulting Ophthalmic Surgeon to King's College Hospital. Cloth Price \$9. Pp 613 with 18 illustrations. New York & London: Oxford University Press 1935.

This is a delightfully written account of the alma mater of many of the medical giants, past and present, in the British empire. To lovers of tradition this intimate narrative of steady progress, honest effort and scientific achievement should prove most instructive and illuminating. "Traditions," writes the author, "are made up chiefly of unwritten doctrines, customs, practices, and the endeavors of those who have 'gone before' and are transmitted from one generation to another. Traditions are in all probability the most valuable assets which a medical school and hospital possess, and they impart to it a personality which goes to make both respected and even beloved." In the United States the Massachusetts General Hospital, Boston, can point to such love and veneration for tradition. Lord Lister, Watson, Cheyne, Lenthal Cheatle, Thomas Percy Legg and Hutchinson Roy Bell are names familiar to all who can truly call themselves surgeons in the United States. The list of internists and other specialists is equally imposing. Many amusing incidents and anecdotes of more than local interest are recounted, among them the uncalled for antagonisms on the part of members of the nursing staff who objected to Lord Lister's operating on a young boy for acute osteomyelitis of the leg and sought forcibly to prevent the patient's being carried from the ward to the operating room. Also significant is the fact that Lister would accept the chair of surgery at King's only on condition that four men whom he had trained in Edinburgh be allowed to come with him. One learns that Cheyne became a surgeon-rear-admiral during the World War, that hundreds of King's graduates served their country, fifteen of them being killed in action. Of purely "alma mater" interest are the histories of the various King's clubs and societies, from cricket to tennis, but their achievements make one realize how close a corporation was this combination of school and hospital. A list of the teaching staffs, medical associates, scholarships and prizes won by King's men and an excellent index complete the volume. One of the illustrations shows King's College Hospital as it was in the year 1839.

Diseases of the Nervous System A Text Book of Neurology and Psychiatry By Smith Ely Jelliffe M.D. Ph.D. and William A. White M.D. Superintendent of St. Elizabeth's Hospital Washington D.C. Sixth edition. Cloth Price \$9.50. Pp 1175 with 510 illustrations. Philadelphia: Lea & Febiger 1935.

This is the most modern and thorough textbook of its kind. In addition to having all the good qualities of the preceding edition, the present one may rightly boast of containing descriptions of the most recent methods and tests and discussions of present-day thought and investigations in relation to neuropsychiatry and general medicine. The specific changes made in addition to the careful revision of the entire work are the addition of new methods of examination, recent metabolic studies in relation to the pathways of the hypothalamus, surgery of the sympathetic nervous system, an entirely new chapter on the endocrine entities, revision of the chapter on spinal cord lesions, addition of some of the less common peduncular and midbrain lesions, new thoughts in cerebral neoplastic localization, and considerable addition of new material to the psychic or symbolic systems with explanatory interpretation of what one finds in these various psychic entities. There is a good bibliography, and the illustrations are excellent. The text and the printed type are easy to read. This book is highly recommended for use by students, practitioners and neuropsychiatrists.

Commoner Diseases of the Skin By S. William Becker M.S. M.D. Associate Professor of Dermatology School of Medicine, University of Chicago. Edited by Morris Fishbein M.D. Cloth. Price \$4. Pp. 283 with 83 illustrations. New York: National Medical Book Company Inc. Doubleday Doran & Co. 1935.

This book presents, in lecture style, full discussions of the more common skin diseases. Underlying principles are emphasized so that, while not encyclopedic in the sense of a textbook, it covers the field of general dermatology fairly well. The physiologic and biologic approach is used in describing the etiology. The field of allergy is related to the skin is well covered and up to date. The chapters on the neurodermatoses and pigmentary dermatoses of the skin are especially good. In treating neurodermatoses, the author has stressed the necessity of treating the nervous exhaustion that occurs so frequently in patients suffering from this disease. The treatment of certain forms of dermatoses are illustrated by case histories. The photographic illustrations are excellent and well selected in connection with the text. The author has limited the therapy to one or two well chosen and accepted forms of treatment for each disease. There is also a separate chapter devoted to pharmaceutical details and prescriptions. The value of psychotherapeutic measures in dermatology is discussed. The volume covers the field of dermatology adequately for the general practitioner and student.

Medicolegal

Workmen's Compensation Acts Physician's Right to Initiate Proceedings Before Industrial Board—Medical treatment to an injured employee was rendered by Dr. Meherin, on authorization of the employer. Later, being unable to collect his fees, Dr. Meherin filed an original application with the industrial accident commission of California, naming himself as applicant and the injured employee and his employer and its insurance carrier as defendants and asking an adjustment of his claim. A hearing was had on the application, at which the employee did not appear. Subsequently, at the invitation of the referee, he joined in the proceedings and submitted his claim on the record as it then stood. Thereupon the commission awarded him compensation and included in it an award for medical treatment, payable directly to Dr. Meherin. The state insurance commissioner, as liquidator of the insurance carrier, petitioned the Supreme Court of California for a review and annulment of the award.

The chief objection to the award was based on the facts that the original application for adjustment of the claim was filed not by the injured employee but by Dr. Meherin, and that within the time limited by the statute no proper application was filed by either the employer or the employee. There can be no question, said the Supreme Court, that if Dr. Meherin was not entitled to file the application, no proper application was timely filed and the whole award must be annulled. On the other hand, if Dr. Meherin was entitled to file the original application the employee could be brought in by the industrial accident commission at any time during which the commission had continuing jurisdiction and was entitled to the same consideration as if he had initiated the proceedings. The physician in this case named as defendants all parties having any possible interest in the subject matter. In effect, he filed an application not alone for himself but also on behalf of the injured employee. The basis of the proceeding was not an alleged independent right of the physician against the employer but the liability of the employer to the employee, to which the incidental liability of the employer to the physician was a necessary concomitant. If the employee was properly a party to the proceeding, said the court, no difficulty arose with reference to making an award in his favor and impressing thereon a lien in favor of the physician.

The workmen's compensation act of California authorizes the filing of an application by any party in interest. Although a physician's right to payment for medical services is incidental to the employee's right to compensation, concluded the court, nevertheless a physician who has rendered medical services to an injured employee has an interest in the subject matter of the controversy sufficient to bring him within the class design-

nated by the act as "parties in interest" who may file an application. The award of the industrial commission was consequently affirmed.—*Independence Indemnity Co. v. Industrial Accident Commission (Calif.)*, 41 P. (2d) 320, *Same*, 41 P. (2d) 327.

Malpractice Needle Left in Abdomen—Sugaya was referred by his attending physician to the physician-defendant for an appendectomy. At operation the appendix was found to be perforated and was removed. The incision was closed, except where provision was made for drainage. The physician-defendant attended the patient during the critical period following the operation. Thereafter the attending physician managed the case and made the necessary changes in the surgical dressings. About three and one half months after the appendectomy a straight needle was located in the abdomen by roentgenograms and was surgically removed from the psoas muscle by a third physician. The patient then sued the physician-defendant. From a judgment of the trial court in favor of the patient the physician defendant appealed to the district court of appeal, first district, division 2, California.

The only question to be decided, said the district court of appeal, is whether the indirect evidence, in the absence of direct evidence, was sufficient proof that the needle removed from the patient's psoas muscle entered the patient's abdomen during the appendectomy. A medical witness testified that the needle might have arrived at the location from which it was removed (1) through swallowing, (2) during the operation or (3) during the after-treatment by the attending physician. The patient testified that to his knowledge he had not swallowed the needle nor had he had a previous operation. The attending physician testified that he used no needle in the treatment after the operation. And the physician-defendant testified that, while straight needles were carried on the nurse's tray during the operation, he himself had used only curved needles. Assuming this testimony to be true, said the court, then the needle must have arrived in the patient's abdomen through inadvertence and without any actual knowledge on the part of any one. The only time when needles similar to the one described in the evidence were in close proximity to the patient's abdomen was during the operation. The jury could properly conclude, said the court, that it was more probable that the needle entered the abdomen through inadvertence during the operation and while the wound was fully open than at any time before or after. The judgment of the trial court in favor of the patient was affirmed.—*Sugaya v. Morton (Calif.)*, 40 P. (2d) 581.

Typhoid Fever Liability of Municipality for Typhoid Fever Contracted from Municipal Water Supply—The defendant city of Helena, a municipal corporation, owned and operated a water supply system from which it furnished water for drinking and domestic purposes on a rental basis. A sewer line installed by the city passed above the Eureka water main through which the city furnished water to the plaintiff. As early as July depressions in the street were noticed over the site where the water main and the sewer crossed. On September 30 the city discovered a break in the sewer line within a few feet of the point of crossing. A fluorescein and salt test to determine whether sewage was entering the water main was negative. Samples of water taken between August 6 and August 20, however, were reported by the state board of health as showing the presence of colon bacilli. On August 20 the first case of typhoid fever was discovered, but seven days later the mayor and the city health officer assured the inhabitants of the city, through the medium of a newspaper, that the water supply was safe and that it was unnecessary to boil drinking water. On or about September 15 the plaintiff, a consumer of water from the city's Eureka water supply system, showed symptoms of typhoid fever. Chlorination was begun on September 14 or 16 and continued until September 26 when the Eureka water supply was discontinued. Following this the outbreak of typhoid fever was promptly controlled. The plaintiff sued the city and from a judgment in his favor the city appealed to the Supreme Court of Montana.

That the water supplied by the city contained typhoid fever germs, said the Supreme Court, is fairly inferable from the facts that after the sewer was repaired the water was shown by tests to be pure and that after the water was chlorinated

there was a sharp decrease in the number of typhoid fever cases and shortly thereafter no more cases developed. The evidence supported a finding by the jury that the city had failed to use reasonable care to safeguard the purity of its water supply. The city cannot furnish water to its inhabitants which it knew, or in the exercise of reasonable care should have known, was polluted with sewage escaping from a defective sewer pipe, without assuming liability for damages occasioned thereby.

Judgment in favor of the plaintiff was affirmed.—*Safransky v City of Helena (Mont.)*, 39 P (2d) 644

Society Proceedings

COMING MEETINGS

American Academy of Tropical Medicine St. Louis, Nov. 20-21 Dr. Earl B. McKinley 1335 H Street N.W. Washington, D. C. Secretary
American Association of Railway Surgeons Chicago November 13-15 Dr. Louis J. Mitchell 86 E. Randolph St. Chicago Secretary
American College of Surgeons San Francisco October 28-November 1 Dr. George W. Crile 40 East Erie St. Chicago
American Society of Tropical Medicine St. Louis November 19-22 Dr. Alfred C. Reed 350 Post Street San Francisco Secretary
Association of American Medical Colleges Toronto, Canada Oct. 28-30 Dr. Fred C. Zapffe 5 South Wabash Avenue Chicago Secretary
Central Society for Clinical Research Chicago Nov. 1-2 Dr. Lawrence D. Thompson 3720 Washington Boulevard, St. Louis, Secretary
Clinical Orthopedic Society, Indianapolis and Louisville Nov. 15-16 Dr. J. E. M. Thomson 1307 N. Street, Lincoln Neb. Secretary
Medical and Surgical Association of the Southwest El Paso, Texas Nov. 21-23 Dr. W. Warner Watkins, 15 East Monroe Street Phoenix, Ariz., Secretary
National Society for the Prevention of Blindness New York Dec. 5-7 Dr. Lewis H. Carris 50 West 50th Street New York, Managing Director
New York State Association of Public Health Laboratories Albany Nov. 1 Miss Mary B. Kirkbride New Scotland Avenue Albany Secretary
Omaha Mid West Clinical Society Omaha Oct. 28-Nov. 1 Dr. J. D. McCarthy 107 South 17th Street Omaha Secretary
Pacific Coast Society of Obstetrics and Gynecology Los Angeles Nov. 6-9 Dr. T. Floyd Bell 400 29th Street Oakland Calif. Secretary
Radiological Society of North America Detroit, Dec. 2-6 Dr. Donald S. Childs 607 Medical Arts Building Syracuse N. Y. Secretary
Society of American Bacteriologists, New York Dec. 26-28 Dr. I. I. Baldwin College of Agriculture University of Wisconsin Madison Wis. Secretary
Southern Medical Association, St. Louis November 19-22 Mr. C. P. Loran Empire Building Birmingham Ala. Secretary
Southern Surgical Association, Hot Springs Va., Dec. 10-12 Dr. E. W. Alton Ochser 1430 Tulane Ave. New Orleans Secretary
Western Surgical Association, Rochester Minn. Dec. 6-8 Dr. Albert H. Montgomery 122 South Michigan Boulevard Chicago Secretary

AMERICAN ASSOCIATION FOR THE STUDY AND CONTROL OF RHEUMATIC DISEASES

Fourth Conference on Rheumatic Diseases

Report of Proceedings at Atlantic City N. J. June 10, 1935

In the last fifteen years there has been a marked increase in the interest taken by physicians in the care of patients with arthritis. Fifteen years ago there were perhaps twenty American "rheumatism specialists." Now there are more than a hundred physicians in this country aside from spa physicians whose major concern is the arthritides. The American Committee for the Control of Rheumatism has had a large share in stimulating this interest by holding demonstrations and conferences at the time of annual sessions of the American Medical Association. Two years ago the increasingly large unorganized audience took matters into its own hands and formed the American Association for the Study and Control of Rheumatic Diseases. Last June at Atlantic City, the Fourth Rheumatism Conference was held on the occasion of the second meeting of the association. The modest room, of a size previously quite ample, was completely filled, many standing even in the adjacent hall. In eight hours nineteen papers and seventy-six discussions were presented.

The conception of chronic arthritis as a general and not a local disease is gaining ground. Therefore Dr. Ernest E. Irons of Chicago president of the association emphasized that studies on arthritis must be diverse and include research not only on the joints but on all body tissues and functions in

order to envision the patient as a whole and to study the soil in which arthritis thrives. Although the majority of arthritic patients must be cared for by general practitioners, it may eventually be necessary for the proper study of arthritis to establish hospitals where research may be highly developed by investigators qualified in its medical, orthopedic, bacterial, chemical and metabolic aspects. A few such clinics already exist at certain medical centers. Dr. Irons felt that they will be more successful if developed as part of a large general clinic. Clinics for the treatment of arthritis alone, established apart from other medical projects, may offer superior custodial advantages for patients needing prolonged hospitalization, but such clinics, Dr. Irons thought, are likely to suffer from lack of stimulation from other departments of a general clinic, and the relation of arthritis to medicine as a whole might be jeopardized.

The division of chronic arthritis into two great common types, atrophic (infectious, proliferative, rheumatoid) and hypertrophic (senescent, degenerative, osteo-) arthritis, is serviceable. There is still disagreement as to whether they represent separate entities. Although the majority believe they are Irons reiterated the suggestion that each may not have one different specific cause but that an articular disease may assume this or that course, with the production of one or another type of arthritis by reason of the kind, age and resistance of affected tissues rather than the nature of the initial insult.

Analyzing forty-nine roentgenologic characteristics, Ferguson Kasabach and Taylor of New York concluded that, although varieties of bone atrophy, lipping and zones of erosion are common to the roentgenograms of different types of arthritis (atrophic, hypertrophic, gouty, gonorrheal, and others), each type has its characteristic picture or combination of roentgenographic alterations, which are best seen in roentgenograms of the hands, feet and knees. Key of St. Louis insisted that the clinical observations are more important in diagnosis than roentgenograms, and that a clinical diagnosis cannot be ventured by the roentgenologist unless he knows the approximate duration of the arthritis and whether the part has been in use. Otherwise, an interpretation of the probable type of atrophy of bone, for example, is impossible. Ferguson agreed that this was true and that in some cases of acute gonorrheal arthritis of short duration the roentgenogram may resemble that of old tuberculous arthritis a differentiation possible only if the duration of the disease is known to the roentgenologist. Most roentgenologists who see any overgrowth of bone in a case of articular disease make a diagnosis of 'hypertrophic arthritis,' and if overgrowth is absent the diagnosis becomes 'atrophic arthritis.' Pemberton of Philadelphia felt that radiologists must exhibit a more informed type of scrutiny and must interest themselves in the variable clinical and pathologic aspects of the disease in order that roentgenograms might be interpreted more correctly.

Atrophic (Infectious, Proliferative, Rheumatoid) Arthritis

Organisms, generally green-producing streptococci but occasionally hemolytic streptococci, were found in the blood of 6 per cent of controls and in that of 21 per cent of patients with atrophic arthritis by McEwen, Bunim and Alexander of New York. Agglutinins and precipitins for hemolytic streptococci were found in the blood of 88 and 80 per cent respectively of thirty-seven patients with atrophic arthritis. Precipitins were also found frequently in other types of arthritis, even gonorrheal. Antistreptolysins and antifibrinolysins were found only occasionally by McEwen, but as Dawson of New York said these tests are indexes of recent acute hemolytic streptococcus infection and one would not expect to find them in cases of chronic atrophic arthritis, although they are sometimes found in early acute cases. Cecil of New York felt that these observations favored the infectious theory of the disease and the streptococci so isolated are not contaminants, although it is not yet known how they get into the blood stream. The bacteriologic terminology of the different workers must not lead to confusion, for many streptococci undergo mutation and what one investigator calls *Streptococcus viridans*

may under varying conditions become slightly or frankly hemolytic. Whether a high or low percentage of positive blood cultures and agglutination tests are obtained depends on the selection of cases of atrophic arthritis, whether they are acutely active or smolderingly chronic. Key has been unable to isolate streptococci from articular tissues but finds staphylococci in about a third of the joints so studied.

In cases of atrophic arthritis the sedimentation rate of erythrocytes is generally rapid and in cases of hypertrophic arthritis it is generally normal or but slightly elevated. The rate of sedimentation is believed to depend largely on the concentration of plasma fibrinogen and globulin and on cell volume. To determine the reasons for altered sedimentation rates in cases of atrophic arthritis, Davis of New York studied the various blood proteins. The total protein content of the blood is normal in both atrophic and hypertrophic arthritis but in atrophic arthritis there is an increase in the plasma fibrinogen, a rise in the globulin fraction, and a fall in the albumin fraction. The greatest increase is in the euglobulin fraction. The albumin globulin ratio is frequently less than 1. As the patient recovers, the ratio tends to return to normal. The estimation of the sedimentation rate is therefore a simple way of roughly detecting any alteration in the globulin or fibrinogen content of the blood, provided a correction is made for cell volume. These changes are not found in cases of hypertrophic arthritis and they suggest again that atrophic and hypertrophic arthritis are quite different diseases. The rise in plasma globulin suggested to Davis that atrophic arthritis is an infectious disease, as rises often occur in such diseases. The fall in albumin suggests a factor of malnutrition or vitamin deficiency, or both. In cases of atrophic arthritis, if the plasma albumin is quite low, considerable edema may appear. Restriction of protein may thus be harmful and a generous intake of protein may lessen edema in such cases.

Discussing the possible significance of these alterations, Haden of Cleveland said that he had found somewhat similar changes in cases of hyperthyroidism, a disease presumably not infectious. These observations complete the cycle of reported or reputed metabolic abnormalities in cases of atrophic arthritis. Physicians have long been warned of alterations in the utilization of carbohydrates, apparently present in many cases of atrophic arthritis. At last year's conference alterations in blood fats were stressed, and now alterations in protein fractions. Since the metabolism of purines, several minerals and vitamins have previously been incriminated, one is now at liberty to suspect abnormalities in the whole metabolic spectrum. In any event these interesting observations illustrate how profound and widespread are the disturbances that constitute the syndrome of this disease.

TREATMENT

The value of a generous protein diet in cases of atrophic arthritis with edema has been mentioned. A diet low in carbohydrate has long been considered by some to be the standard diet for patients with atrophic arthritis. To determine whether excess carbohydrate is harmful for such patients, Bowen and Lockie of Buffalo included about 500 Gm of carbohydrate in the diet of eight patients who were observed for from fifteen to sixty-five weeks. The nutrition of the majority improved steadily and they gained from 24 to 50 pounds (11 to 23 Kg). The arthritis was not materially affected and in general no exacerbations were noted. Insulin given to some did not increase the appetite or augment the effect of the diet. No changes in respiratory metabolism were noted. Some workers in discussion interpreted these remarks as the launching of a new diet for the already overdieted arthritic patient. They merely indicated that a fairly generous supply of carbohydrate was obviously not harmful to the arthritic patient and that Bowen and Lockie felt that restrictions in carbohydrate were of no particular merit either. It was mentioned that in patients whose atrophic arthritis was temporarily inactivated completely by intercurrent jaundice the administration of from 400 to 600 Gm of carbohydrate daily for many weeks did not counteract the analgesic effect of jaundice or bring out symptoms of arthritis.

Bauer of Boston was doubtful that vitamin deficiency plays an important part in the production of atrophic arthritis. No

different results were obtained by a group of his patients who for from three to five years adhered to a special high vitamin diet than were obtained by a group who did not.

Hartung of New York believed that the hematopoietic and leukopoietic functions of the body do not respond properly in the presence of the toxemia or infection causing atrophic arthritis. The infection may be so low in virulence that bone marrow is not stimulated, or there may be a fundamental hormone deficiency somewhat like that in pernicious anemia. Since nucleic acid, one of the disintegration products of leukocytes, is known to stimulate the myelopoietic function of bone marrow, Hartung decided to administer a concentrated extract of leukocytes intragluteally to ten patients daily for long periods. Six patients showed prompt symptomatic and constitutional improvement. There was, however, no change in the appearance of the blood cells or in the sedimentation rate. The effect was not specific and may have resulted from a nonspecific protein reaction, but it was obtained more quickly, was more lasting and was superior to that obtained by him with any other foreign protein.

Snyder of New York and his colleagues were of the opinion that cinchophen, a very useful drug, has been condemned unjustly. Reviewing all reported cases of cinchophen toxicity, they concluded that in only a few was cinchophen unmistakably responsible. After having administered cinchophen to 2,560 patients in ten years, they observed but one case of catarrhal jaundice. Urticaria developed in a few cases but severe jaundice or atrophy of the liver in none.

Physical therapy is perhaps the most helpful form of treatment, but it is used inadequately. Coulter of Chicago was of the opinion that, to supplement the limited sessions of professional physical therapy which patients could afford, the intelligent ones and their relatives should be fully instructed in simple methods of physical therapy that could be applied in the home. Thus the cost of the patient's care could be reduced and the physician could control the patient over the long periods necessary for treatment. By demonstrations and mimeographed instructions Coulter teaches his patients the optimal types and amounts of heat, massage and exercise, the use of cheap but effective electric "bakers" whirlpool baths, and a simple machine for the production of sinusoidal-faradic current, and various appliances for specific, harmless exercises. In Massachusetts alone there are about twenty-two arthritic patients for every physician, and according to Ober of Boston about 70,000 patients receive no treatment whatever. But before home physical therapy can be safely prescribed physicians themselves must learn its principles and methods. A visiting team of physicians, nurses and physical therapists skilled in the management of arthritis should go among local physicians. Ober felt that only under the supervision of the local physician should a visiting physical therapist teach and prescribe home physical therapy. He mentioned that 75 per cent of his arthritic patients have previously sought the services of cultists, who gave them cheap sometimes pain-relieving treatments for which, generally, no substitute had been given by the physician. Unless the better forms of professional and home physical therapy are utilized more fully, patients will continue to flock to the spine and foot twisters.

After summarizing the results from various parts of the country, Ober found that fever therapy, which has proved so helpful in cases of gonorrheal arthritis, does not cure chronic atrophic arthritis. Of a total of 315 patients so far treated in different clinics only 5 per cent became symptom free. Twenty-five per cent were notably relieved. The remainder received little or no benefit. Results are somewhat better in cases of acute atrophic arthritis. Of twenty-one patients so treated 10 per cent seemed completely relieved, 40 per cent notably helped. Stansby of New York and Bauer of Boston agreed that remissions are occasionally induced but that fever therapy should not be used to the exclusion of other measures.

Simpson of Dayton, Ohio, and Shands of Durham N. C., felt that fever therapy given just before or after orthopedic manipulations augmented the benefits of the latter. The recognition of impending deformities is the responsibility of the attending physician who according to Swaim of Boston should early seek the full cooperation of an orthopedic colleague.

Hypertrophic (Senescent, Degenerative, Osteo-) Arthritis

From the roentgenologic point of view, as Haden pointed out, there are several types of "hypertrophic arthritis," including that seen in traumatized joints and in certain stages of gout, gonorrheal, atrophic and other forms of arthritis. "Primary hypertrophic arthritis" represents an entity and results from degeneration of joint cartilage, with proliferation of subchondral bone, incident to physiologic aging and the wear and tear of continued use. Analyzing fifty such cases to determine the accelerating factors of the disease, Haden concluded that infection is a minimal factor and that obesity and an altered metabolic rate (low in 84 per cent of cases) are the common provocatives, the correction or prevention of which may do much to lessen the incidence and disability of hypertrophic arthritis. Bauer and Bennett studied the knee joints of persons from the first to the ninth decade of life. Beyond the second decade the degenerative changes that lead to hypertrophic arthritis were found with increasing frequency, so that by the fifth decade all knee joints were so affected. Some persons inherit better cartilage than others. The poorer the inheritance and the greater the endogenous and exogenous trauma to which the cartilages are subjected, the earlier will hypertrophic arthritis develop. Davis, as noted, found little or no changes in the sedimentation rate or in blood proteins in hypertrophic arthritis, and Dawson found no agglutinins to hemolytic streptococci. In a discussion on fever therapy it was stated that patients with hypertrophic arthritis were not particularly benefited by it.

Gonorrheal Arthritis

The gonorrheal fixation test is of great aid in confirming a clinical diagnosis of gonorrheal arthritis, according to McEwen and his colleagues. It was positive in 98 per cent of forty-three cases. Dawson also felt that the test is of great value, but Key warned that in a case of chronic nongonorrheal arthritis associated incidentally with acute gonorrheal urethritis a positive complement fixation test might lead to error regarding the etiology of the arthritis.

In a summary to the conference on the results to date in various parts of the country of fever therapy in the treatment of gonorrheal arthritis it was noted that 80 per cent of 151 patients with acute gonorrheal arthritis have apparently been cured and that an additional 10 per cent have been markedly relieved. The results in chronic gonorrheal arthritis (of more than six weeks' duration) are less striking but also good. Of thirty-two such patients treated, 35 per cent were cured and 30 per cent markedly relieved. The joints are apparently sterilized rapidly by the bacteriolytic effect of several hours of fever at 106 to 107 F. Bauer and Simpson both reported excellent results and considered fever therapy the treatment of choice and almost specific for gonorrheal arthritis. No untoward reactions were reported except by Snyder, who noted progressive uncontrollable and fatal hyperpyrexia induced by fever therapy in one case of gonorrheal arthritis.

Rheumatic Fever

A review by Nichol of Miami of the available data again indicates that there is much less rheumatic fever in southern than in northern states. During the past five years, for example, the admission rate of patients with rheumatic fever, rheumatic carditis and chorea in a general hospital in Miami was only a tenth of what it was in Boston. Levine of Boston stated that in New Orleans the incidence of mitral stenosis was a twentieth of that in Boston, and he concluded that there is either much less rheumatic fever in the South or that it does not affect the heart as it does in the North.

Of 342 rheumatic children observed by Shapiro of Minneapolis over a period of eight years 52 per cent had only one attack, 48 per cent had recurrences generally within the first four years after the initial attack. This is probably the normal expectancy of recurrences. The majority of "growing pains" of children are not rheumatic. Shapiro distinguished the latter from rheumatic growing pains as follows: The "norrheumatic variety" are usually diffusely and vaguely located in the legs, appear or are worse at night are not associated with fever, and produce no limping or significant stiffness during the day.

The "rheumatic variety" are less diffuse, are more commonly articular, are generally better at night if the patient is warm and worse in the daytime and on walking, particularly during the first hour of the day, and are often associated with a little fever, articular swelling, and heat. Children with growing pains of the latter variety are in danger of rheumatic carditis.

Swift of New York reviewed current ideas on the nature of rheumatic fever. The tissues of patients with this disease apparently are unusually vulnerable to certain injurious agents, especially streptococci or their derivatives. Although it has not been proved that streptococci or a virus are the cause of the disease, the rheumatic patient must be protected, particularly from streptococcal infections, in order to prevent or diminish relapses. McEwen found streptococci, chiefly *Streptococcus viridans*, in the blood of 24 per cent of patients with rheumatic fever and in 6 per cent of controls, agglutinins to hemolytic streptococci were found only occasionally. Precipitin tests were positive in 50 per cent of cases, and antistreptolysin and antifibrinolysin titers were generally, though not always, high.

Rinehart of San Francisco advanced the idea that rheumatic fever may be the result of the combined influence of deficiency in vitamin C and infection. He reported that in guinea pigs on a diet devoid of vitamin C, which were inoculated with a guinea-pig strain of hemolytic streptococci or other organisms, cardiac and articular lesions developed with considerable frequency, notably resembling those of rheumatic fever. Guinea pigs infected with these organisms but on an adequate diet did not show such lesions, and those treated with a deficient diet alone showed only slight lesions. In the discussion of this paper, doubts were expressed as to whether the articular lesions were rheumatic or scorbutic. Swift agreed that lesions of some sort were thus experimentally produced, but he stated that clinical proof was lacking that there was any difference in the metabolism of vitamin C between rheumatic and nonrheumatic patients. Patients with the active and quiescent rheumatic fever were treated with cevitamic acid. Patients with the active form were not benefited and those with the quiescent form later had the usual number of recurrences.

TREATMENT

Kaiser of Rochester, N. Y., urged tonsillectomy for every rheumatic child. According to his large statistics the child who has had his tonsils out is less likely to have rheumatic manifestations and, if he does have them, serious cardiac complications are less likely to develop. Although the incidence of recurrent attacks is not influenced by tonsillectomy, the mortality among 600 rheumatic children was about twice as high as for those who had tonsils at the time of the initial attack, as for those whose tonsils had been removed. Kaiser stated that tonsillectomy, however, does not influence the incidence of chorea or muscular rheumatism. The most definite indication for tonsillectomy in children is a history of repeated attacks of tonsillitis.

Vaccine seemed of little value to Stroud of Philadelphia. As many recurrences occurred among his patients who were treated with vaccine as among a control group.

Chorea

Fever reactions to typhoid vaccine given daily for several days were found by Sutton and Dodge of New York to shorten attacks of chorea an average of thirty-six days, as compared with results when physical therapy, drugs and diets were used. The average duration of the attacks of 150 patients treated by vaccine reactions was 85 days, that of 150 patients treated otherwise 426 days. By means of one or two sessions of fever therapy at 105 to 106 F for five hours, results as good as with vaccine were obtained in sixteen cases. Fever therapy is preferable, as foreign protein shock is avoided, the fever is controllable, and only two sessions instead of several daily reactions are necessary. An associated, active rheumatic carditis does not interfere with such therapy. Indeed, in several cases in which such treatment was employed signs of carditis diminished. It was noted that Sutton and Dodge's results with fever therapy in the treatment of chorea are similar to those reported in twenty-five cases at the Fifth Fever Therapy Conference and in ten cases at the Mayo Clinic.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below

American Journal of Public Health, New York

25: 897 988 (Aug.) 1935

- Permanent Type of Ditch Construction A H Fletcher Memphis Tenn—p 897
- Measles Scarlet Fever and Whooping Cough in Los Angeles County Health Department Area Ten Year Study H O Swartout Los Angeles—p 907
- Teaching of Epidemiology by Applicatory Problems E L Munson San Francisco—p 913
- Eosin Methylene Blue Agar for Rapid Direct Count of Endamoeba Coli H W Gehm and H Heukelekian New Brunswick N J—p 920
- Diseases of Peasants of Haiti C Lhérisson—p 924
- Sewage Contaminated Irrigation Water Major Public Health Program in West E N Chapman Colorado Springs Colo—p 930
- Outbreak of Food Poisoning Probably Due to Staphylococcus Aureus A Corpening and Elsie P Foxhall Richmond Va—p 938
- Development of Adult Type Pulmonary Tuberculosis Following Recognition of Childhood Form H R Edwards New Haven, Conn—p 941
- Bacteria on Fresh Fruit Marion M Johnston and Mildred J Kaake Toronto—p 945
- Diphtheria in Grays Harbor County Washington Ruth R Laue Aberdeen Wash—p 948
- Flipping Device for Flange Rubber Stoppers V T Schuhardt and J H Brewer Austin Texas—p 951
- Neglected Opportunity for Control of Respiratory Disease H N Calver New York—p 953

Eosin Methylene Blue Agar for Count of Endamoeba Coli—Gehm and Hueckeleian compared eosin methylene blue agar with and without crystal violet (1 100 000) and found that although the presence of crystal violet cuts down the contaminants, it also cuts the colon numbers to an extent that would prohibit its use as a direct counting medium. Eosin methylene blue agar is prepared according to the standard method except that the use of 2 per cent rather than the usual 15 per cent of agar gives a firmer surface for smearing. Plates are poured to a depth of about 3 mm. One cc of the inoculum is run on the surface of the medium and smeared with the pipet so that the entire surface is covered. The plate is then tilted back and forth several times so that a more even distribution is obtained. The plate is placed in a 37 C incubator and the cover is removed. Drying of the inoculum occurs in about one hour. To obtain perfect distribution it is necessary to tilt the plate, as done at the start when the plate is about half dry. When the surface is thoroughly dry, the plate is closed, inverted and incubated twenty-four hours and characteristic colonies are counted. Contamination from leaving the agar surface exposed in the incubator was practically nil in incubators that were not particularly clean. The dyes present in the medium evidently inhibit bacteria that may be deposited on the agar surface with the dust from the air. Plates containing between thirty and 100 Endamoeba coli colonies give the most consistent counts. As the authors were interested in applying this method to sewage in various stages of treatment and heavily polluted waters, comparative counts were made against the brilliant green bile broth count. The results show a close agreement of the counts by the two methods. In thirteen cases out of nineteen the counts by the eosin methylene blue agar method were higher than those by brilliant green broth bile. They found the method particularly adaptable to sewerage plant control and sewerage research. Application of this method to river waters not heavily polluted appears possible. In this work a comparison should be made with lactose broth with eosin methylene blue confirmation to see whether the inaccurate, cumbersome enrichment count may be omitted entirely.

Archives of Dermatology and Syphilology, Chicago

32: 363 544 (Sept.) 1935

- Systematized Amyloidosis of Skin and Muscles H E Michelson Minneapolis and F W Lynch, St Paul—p 363
- Pachyonychia Congenita Report of Case A W Sohrweide Syracuse N Y—p 370
- *Xanthoma Tuberosum Report of Familial Occurrence with Probable Cardiac Lesions C G Lane Boston and J Goodman Jr Baltimore—p 377
- Clinical Spectroscopy Advantages and Physical Principles of Spectrograph and Technic in Taking Specimen for Biospectrometric Analysis L E Gaul and A H Staud New York—p 385
- LXVIII State and Localization of Inorganic Salts in Skin as Revealed by Extraction and Micro-Incineration D J Kooyman St Louis—p 394
- *Role of Iodine in Therapy of Syphilis Discussion of Its Relationship to Lipids E T Burke Salford England—p 404
- *Dermatophytosis Its Treatment with Trichophytin E F Traub and J A Tolmach New York—p 413
- Treatment of Arsenical Hepatitis with Sodium Dehydrocholate Experimental and Clinical Studies in Cases of Arspenamine Poisoning B Appel and I R Jankelson Boston—p 422
- Epidemiology of Yaws C S Butler Brooklyn—p 446
- Evolution of Atopic Dermatitis L W Hill Boston and M R Sulzberger New York—p 451
- Acid in Blood as Cause of Diseases of Skin J E Ginsberg Chicago—p 464
- Familial Occurrence of Xanthoma Tuberosum**—Lane and Goodman report two cases of generalized xanthomatosis in a father and daughter both with cardiac lesions, one with a history of an acute rheumatic attack and the other with a history of repeated sore throat and tonsillitis. Rheumatic scarring may result in secondary xanthomatous deposits on the endocardium just as trauma results in deposits on the skin. A third case is reported occurring in a child in the same family with an elevated value for serum cholesterol but without cutaneous lesions. This child may have had the underlying fault in metabolism, but the various lipid values may have risen in such proportion that the equilibrium was maintained and no deposits resulted.

Iodine in Therapy of Syphilis—Burke states that *Spirochaeta pallida* is rich in lipids—lecithin and globulin. The essence of the interaction between the parasite and the host is the setting free into the circulation of dead lipoprotein material. The plasma cells are the carriers of a lipoproteolytic ferment. The richer the lipid constitution of the parasite, the greater is the affinity of the ferment for it. The lipoproteolytic ferment has an attraction toward the lipid-rich tissues of the host. In the patient whose system is producing a satisfactory amount of lipoproteolytic ferment, the affinity between the remedial agents and the lipid body tissues becomes reduced, because there has become interposed between the two a barrier consisting of the ferment. There is, thus more of the arspenamine or bismuth available to attack the parasites which have been repelled to the tissues not so well protected. The Wassermann and other serologic tests are simply means of detecting the presence and the amount of lipoproteolytic ferment in the serum. Iodine possesses the property of being able to link itself with or to saturate the lipoids that are present in the blood of a syphilitic person. When these lipoids are saturated, they are no longer able to combine with the natural ferments and so neutralize them. From the beginning of the syphilitic infection there is a tendency for the essential lymphocyte and plasma cell reaction to progress in the direction of fibrosis. It is prudent, then, to neutralize from the earliest moment the power of the lipoids by saturating them with iodine. As a prophylactic measure iodine should be given in every case of acute syphilis concurrently with arspenamine or a bismuth compound, for it has no spirocheticidal effect of its own. Iodine acts not directly but indirectly on abnormal fibrous deposits by reactivating or liberating the normal autolytic ferments of the blood. If these ferments are active there can be no excessive fibrosis, and hence the iodides are inert. They can exert their power only when the fibrosis is excessive and for that reason no amount of iodine therapy can cause the disappearance of ordinary scar tissue, no matter what may be its origin. Such scars are reparative and not of syphilitic origin in spite of the fact that the agent that gave rise to them was *Spirochaeta pallida*. In the stage before a scar is formed however, iodine and the iodides are most assuredly indispensable. No agent other than iodine possesses

the same power of rapidly causing the disappearance of gummas and gummatous infiltration. The mode of action of the spirocheticidal drugs and of iodine differs entirely, although the end results may be similar so far as fibroblastic lesions are concerned. Short of complete scarring, the denser the fibrous tissue the more need there is for the iodides to open the way for the assault by the spirocheticidal drugs. The usual manner in which iodine is administered in the treatment of syphilis is orally in the form of the potassium or the sodium salt. The author's experience has shown that the most satisfactory mode of administering iodine in the treatment of syphilis is in the colloidal form concurrently with arsphenamine or a bismuth compound.

Treatment of Dermatophytosis with Trichophytin—Traub and Tolmach gave 135 patients having dermatophytosis intradermal injections of trichophytin. Apparent cures were obtained in fourteen cases, but some of the patients showed early recurrence. Varying degrees of improvement were noted in fifty-eight cases. Many of these patients returned showing either no further progress or exacerbation of symptoms. In sixty-three cases no change was observed or the patient's condition was made worse by the treatment. In their experience trichophytin apparently had little if any effect on the course of dermatophytosis. In view of the publicity that this treatment has attained among general physicians the authors believe that the comparatively small percentage of cases in which definite benefit was obtained hardly warrants such a tedious and relatively expensive course of treatment in the average case. They used two different preparations of trichophytin and did not note any difference in the results obtained. Of all their patients for whom a diagnosis of dermatophytosis had been made clinically, 21 per cent showed a negative reaction to intradermal injections of trichophytin. The value of injections of trichophytin cannot be accurately determined if effective local treatments are given concomitantly. It is well known that the use of boric acid alone can be of great help in some cases of dermatophytosis. In view of the fact that a patient with dermatophytosis frequently shows periods of remission and relapse, they feel that the reporting of cures and good results in cases of this disease should be more conservative.

Archives of Neurology and Psychiatry, Chicago

34:1 481 698 (Sept.) 1935

- Functional Changes in Brain of Dog After Reduction of Cerebral Blood Supply. 1. Cerebral Circulation and Development of Anastomosis After Ligation of Arteries. L. A. Andreyev. Moscow. U. S. S. R.—p. 481.
- Peculiar Cells of Pick's Disease. Their Pathogenesis and Distribution in Disease. H. W. Williams. Schenectady, N. Y.—p. 508.
- Hemiplegia with Leg Flexion. O. R. Langworthy, E. Highberger and Ruth Foster. Baltimore.—p. 520.
- Cerebral Circulation. VLI. Vascular Responses to (A) Hypertensive Solutions and (B) Withdrawal of Cerebrospinal Fluid. H. S. Forbes and Gladys I. Nason. Boston.—p. 533.
- Chordoblastoma of Basilar Plate of Skull and Echinodermosis Physaliphora Sphenoopticus. Suggestions for Diagnosis and Surgical Treatment. W. P. Van Wagenen. Rochester, N. Y.—p. 548.
- Cerebrospinal Hydrodynamics. VI. Correlations of Pressure of Cerebrospinal Fluid with Age, Blood Pressure and Pressure Index. J. H. Masserman. Chicago.—p. 564.
- Tumors in Region of Pineal Body. Clinicopathologic Report of Three Cases. H. Zeitlin. Chicago.—p. 567.
- Psychogenic Loss of Personal Identity. Amnesia. M. Abeles and P. Schilder. New York.—p. 587.
- Tumors of Frontal Lobe. Anatomic and Pathologic Study. H. C. Voris, J. W. Kernohan and A. W. Adson. Rochester, Minn.—p. 605.
- Effect of Endemic Malaria on Incidence of Neurosyphilis. R. J. Needles. Detroit.—p. 618.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

16 449 512 (Aug.) 1935

- The Condenser Field. Improved Method of Application. F. Nagel. Schmidt. London, England.—p. 457.
- Histamine Iontophoresis in Rheumatic and Peripheral Circulatory Disturbances. D. H. Kling. Los Angeles.—p. 466.
- Newer Technic of Colon Therapy. Cora Smith King. Hollywood, Calif.—p. 474.
- Short Radio Waves and Fever Therapy. W. R. Whitney and A. B. Page. Schenectady, N. Y.—p. 477.
- Evaluation of Hyperpyrexia. Methods and Treatment. D. Kobak. Chicago.—p. 481.
- Development of Fever Therapy in Santa Barbara Cottage Hospital. R. F. Atsatt and Luella E. Patterson. Santa Barbara, Calif.—p. 488.

Archives of Surgery, Chicago

31 345 506 (Sept.) 1935

- *Slipping of Capital Epiphysis of Femur in Adolescence. C. J. Sutto. New York.—p. 345.
- Experimental Shock. Effects of Extracts from Traumatized Limbs on Blood Pressure. N. W. Roome and H. Wilson. Chicago.—p. 361.
- Bactericidal Effect of Heparin and Heparin II. Growth of Organisms in Blood Rendered Incoagulable with Heparin. H. R. Mahorner and A. Ochsner. New Orleans.—p. 371.
- Purulent Pericarditis. Report of Five Cases in Which Treatment Was by Pericardiotomy and Review of Literature from April 30, 1917, to Jan. 1, 1934. A. M. Shipley and N. Winslow. Baltimore.—p. 375.
- Effect of Carbon Arc Radiation on Healing of Bone. H. M. Sweetney and H. Laurens. New Orleans.—p. 395.
- Clinical Aspects of Struma Lymphomatosa (Hashimoto). H. M. Clute. E. B. Eckerson and S. Warren. Boston.—p. 419.
- Chronic Thyroiditis. R. K. Gilchrist. Chicago.—p. 429.
- *Pharyngeal Hematogenous Streptococcal Peritonitis. J. Felsen and A. G. Osofsky. New York.—p. 437.
- Carcinoma of the Cervix Uteri. Clinical Study of Nine Hundred and Forty Cases. E. Henriksen. Baltimore.—p. 461.
- Review of Urologic Surgery. A. J. Scholl. Los Angeles. E. S. Judd. Rochester, Minn. J. Verbrugge. Antwerp, Belgium. A. B. Hepler. Seattle. R. Gutierrez. New York, and V. J. O'Connor. Chicago.—p. 477.

Slipping of Capital Epiphysis of Femur—Sutto examined microscopically the tissues removed surgically from three patients with slipping of the capital epiphysis of the femur. They exhibited evidence that the condition is one of a fracture through the upper femoral epiphyseal plate and contiguous trabeculae of bone. No definite evidence of primary degeneration of the epiphyseal plates was seen. Variations in the weight bearing forces at the hip joint may be a predisposing factor in the causation of the fracture. The normal tilting of the capital epiphysis, which is the result of normal developmental and mechanical forces, is the basis for the condition. Slipping of the capital epiphysis of the femur must be sharply differentiated from secondary coxa vara due to fractures, tumors, cysts or pathologic infiltrations, such as is seen in cases of Gaucher's disease. The congenital type of coxa vara may, if uncorrected in childhood, be mistaken for slipping of the capital epiphysis. In the former condition the neck is much more involved than the capital epiphysis, in the latter, changes in the angle of the neck to the femur are secondary to the position of the capital epiphysis. It is especially important to differentiate Perthes' disease from slipping of the capital epiphysis of the femur. Perthes' disease is characterized by aseptic necrosis of the capital epiphysis without any great disturbance to the epiphyseal plate. Changes in the shape of the slipped capital epiphysis are secondary to mechanical factors and not part of the disease.

Streptococcal Peritonitis—In eight cases of streptococcal peritonitis that Felsen and Osofsky studied there was a definite antecedent history of sore throat. The average period that elapsed between the angina and the onset of acute abdominal symptoms was 58 days. The average duration of the disease from the time abdominal symptoms were noted until death was 47 days. The onset was abrupt. In three cases the condition of the throat had cleared up prior to the development of peritonitis. Three adults and five children were affected. In two of the adults the organism was nonhemolytic, but the general features were the same with both the viridans (five cases) and the nonhemolytic type (three cases). Extremely high temperatures were seen in both groups (from 107 to 107.8 F). The initial leukocyte count was high. The Schilling counts indicated active response of the marrow. The pathologic picture in each case was essentially that of streptococcal septicemia with profound toxic effects. The lesions were most evident in the lungs, liver, spleen, intestine, mesenteric nodes and kidneys. The histopathologic pictures in general were congestive or hemorrhagic owing to a toxic effect on the walls of the smaller vessels. Many of the clinical features noted in their studies have been described by other investigators. In most of the reported cases a hemolytic streptococcus was isolated. They believe that their group is exceptional since five cases were of the viridans and three of the nonhemolytic type. The early appearance of diarrhea was absent in almost all their cases. The mortality was 100 per cent. In the experimental work the disease was reproduced in most of their animals by the intravenous injection of eighteen-hour broth cultures. The ease with which they did this, even with some old cultures, suggests the possibility of a selective affinity of their strains for the intestine and peritoneum.

The clinical features of the disease generally known as primary streptococcic peritonitis point to the throat as the primary source of infection in most cases in which a careful history is obtainable. The mechanism of peritoneal involvement may be directly through the blood stream, but the authors are of the opinion that it occurs through the focal hemorrhagic and ulcerative lesions in the intestine. There is ample experimental evidence to support this contention.

Georgia Medical Association Journal, Atlanta

24: 279-316 (Aug.) 1935

- Maternal Mortality in Georgia During the Year 1933. Report of Committee for Study of Maternal Mortality. Atlanta—p. 279.
Responsibility of General Practitioner in Diseases of Eye. Z. W. Jackson. Atlanta—p. 290.
Treatment of Varicose Veins and Ulcers. C. E. Rushin. Atlanta—p. 292.
Trend of Medical Education. R. H. Oppenheimer. Atlanta—p. 295.
Use of Digitalis in General Practice. Its Action, Indications and Limitations. A. R. Freeman. Albany—p. 299.
Painless Removal of Warts and Moles. Report of Cases. Marie M. Kershaw. Augusta—p. 301.

Journal of Lab and Clinical Medicine, St. Louis

20: 1111-1218 (Aug.) 1935

- Further Observations on Patients with High Blood Sugar But No Glycosuria. R. H. Major. Kansas City, Kan.—p. 1111.
Antiseptic and Bactericidal Action of Urea. J. H. Foulger and L. Foshay. Cincinnati—p. 1113.
Peripheral Neuritis and Abortion Following Dinitrophenol Therapy. Report of Case. E. Epstein and H. Rosenblum. San Francisco—p. 1118.
Resistance of Red Blood Cells to Hemolysis in Hypotonic Solutions of Sodium Chloride. Observations in Blood Disorders. Geneva A. Daland and Katharine Worthley. Boston—p. 1122.
Correlation of Anatomic Findings with Abnormalities of Q Wave. F. Feldman and D. Kornblum. Brooklyn—p. 1137.
Total Sulphur of Tissue in Normal and Abnormal Growth (Mouse Carcinoma). H. Brown and J. V. Klauder. Philadelphia—p. 1143.
Etiologic Relationship of Amidopyrine to Agranulocytosis. F. Stenn. Chicago—p. 1150.
Immunity Phenomena in Tuberculosis. S. A. Levinson. Chicago—p. 1153.
Effect of High Protein Diets on Kidney Function in Dogs. L. K. Campbell. Chicago—p. 1162.
Blastomycosis in Infant Six Months Old. J. M. Rosenthal. Allentown, Pa.—p. 1164.
Effect of Formaldehyde on Growth of Tubercle Bacilli. R. D. Herrold. Chicago—p. 1165.
Concomitant Complete Heart Block and Bundle-Branch Block. Theoretical Discussion. E. F. Horine and M. M. Weiss. Louisville, Ky.—p. 1167.
High Blood Urea Nitrogen Not Due to Chronic Nephritis. M. G. Wohl and R. W. Brust. Philadelphia—p. 1170.
Cardiovascular System in Protected and Unprotected Animals with Acute Diffuse Peritonitis. B. Steenberg and J. L. Kobacker. Toledo, Ohio—p. 1180.
Observations on Intensifying Metachromatic Properties of Cresylecht Violet. B. G. R. Williams. Paris, Ill.—p. 1185.
Technic for Isolation and Preparation of Bacteriophage. Gladys Morton and Marie Wasseen. New York—p. 1188.
Preventing Air Holes in Serum Culture Mediums. M. Edeltrude. St. Paul—p. 1193.
Bagg Albino Mice for Testing Hormones and Other Expensive Substances. J. F. McClendon and H. Street. Minneapolis—p. 1194.
Convenient Apparatus for Rapid and Accurate Tubing of Culture Mediums. Elizabeth S. Porter and R. McBurney. University, Ala.—p. 1196.
Laboratory Study of Amidopyrine. Barbitol. Phenylhydrazine and Benzene in Relation to Agranulocytic Angina. V. L. Bolton. Kansas City, Kan.—p. 1199.
Selenium as a Catalyst in Determination of Nonprotein Nitrogen in Blood. F. Reis and H. H. Powers. Boston—p. 1204.

Peripheral Neuritis and Abortion Following Dinitrophenol Therapy.—Epstein and Rosenblum present an instance of peripheral neuritis and abortion occurring in an obese woman following the administration of dinitrophenol. On entry to the hospital the blood gave a positive test for alpha-dinitrophenol according to the method of Bolliger. The evidence presented strongly suggests that the peripheral neuritis in this patient was due to dinitrophenol. Numerous instances of patients suffering from pains and paresthesias in the extremities while on dinitrophenol medication have been reported. The neuritis developed in this patient while the drug was being taken and disappeared within three weeks after its administration was discontinued. Compounds chemically closely related to dinitrophenol have caused true peripheral neuritis. The abortion might have been due to the drug passing through the placenta

and causing the death of the fetus, or the mechanism might be analogous to the early premature separation of the placenta sometimes seen in hyperthyroidism. The absence of any discoverable etiologic factor except dinitrophenol makes it probable that the drug was responsible for the abortion. The importance of these two complications makes it advisable that the possibility of dinitrophenol causing peripheral neuritis and miscarriage be brought before the medical profession.

Resistance of Red Blood Cells to Hemolysis in Sodium Chloride Solutions.—Daland and Worthley submit a method for determining the resistance of the red blood cells to hypotonic sodium chloride. The amount of solution and the amount of red cell suspension are kept uniform throughout. The careful reading of the end-points makes it possible to observe slight variations in the resistance of the red cells. Normal maximal resistance occurs in pernicious anemia and lymphatic leukemia. Increased maximal resistance may be found in various sorts of hypochromic anemia, erythroblastic anemia (Cooley's), polycythemia rubra vera and myelogenous leukemia, depending on the degree of anemia present. In idiopathic thrombocytopenic purpura and hemophilia the changes are apparently consistent with the degree of hypochromic anemia. After splenectomy in hemolytic jaundice and occasionally in pernicious anemia during treatment a temporary hypochromic blood picture may be accompanied by increased maximal resistance. Decreased maximal resistance is usually found in hemolytic jaundice and in advanced aplastic anemia. Normal minimal resistance may be found in moderate degrees of hypochromic anemia, including that of purpura, hemophilia, Banti's disease, sometimes in pernicious anemia and in polycythemia vera. Rarely it is normal in hemolytic jaundice. Increased minimal resistance occurs in pernicious anemia in severe relapse and in aplastic anemia. Decreased minimal resistance is usually found in hemolytic jaundice and may be found in hypochromic anemia, erythroblastic anemia, polycythemia vera and myelogenous leukemia. In general, with the exception of hemolytic jaundice and pernicious anemia in remission the standard deviation of the cell diameters increases as the span of resistance increases. This variation in cell diameter is somewhat representative of the heterogeneity of the cell population and may be better correlated with variations in resistance than mean values. In hypochromic anemia, as the standard deviation cell diameters from the mean decrease as a result of therapy there is a progressive decrease in the span of resistance. The increased maximal resistance in hypochromic anemia, Cooley's anemia and polycythemia rubra vera is associated with a lowered mean corpuscular volume and mean corpuscular hemoglobin concentration. The latter may be important in causing flattening of the erythrocytes observed by Haden in this condition. According to the theory of Gänsslen the numerous poikilocytes should be an additional factor making for increased resistance since they present striking deviations from the spherical form associated with a decreased resistance in hemolytic jaundice.

Relationship of Amidopyrine to Agranulocytosis.—To investigate the effect of amidopyrine on the white and differential blood count, Stenn undertook a study of 120 animals—guinea-pigs, rabbits and monkeys—over a period of eight months. Amidopyrine was given orally to one group in doses from a fraction of a grain to 3 drachms (12 Gm.) and blood and differential counts were taken daily. The symptoms were stupor, diarrhea and loss of weight. Many of the animals died of pneumonia and some from amidopyrine poisoning but at no time was agranulocytosis observed. This work was repeated with subcutaneous intraperitoneal and intravenous injections but no change in the blood picture occurred. With another group an attempt was made to sensitize some of the animals treated and these were given a rest period of one month after which the medication was again given still without effect. Incidentally a pregnant guinea-pig was injected with huge doses of the drug for one and a half months, but the newborn guinea-pig and the mother both had normal blood pictures. A group of animals was bled daily until the red blood count fell between 1,500,000 and 2,000,000 and the red cells in the smear showed anisocytosis, poikilocytosis and polychromasia. Despite this preparation the white blood count failed to fall on prolonged administration of amidopyrine. In another group small quantities of benzene in olive oil were injected subcuta-

neously until a severe neutropenia and anemia were produced. In most of the animals the white blood count fell to below 1,500. To half of this group amidopyrine was given orally, and these animals showed a more rapid rise in the white blood count and polymorphonuclear differential picture than the other animals not given the drug. A third group of animals was starved for five days and the drug administered, but without avail. A fourth group of animals was injected subcutaneously with broth cultures of *Bacillus subtilis*, *Streptococcus viridans* and *Salmonella supestrifer*, and one month later, with the infection still persisting, they were given heavy doses of amidopyrine orally during three weeks. The white blood counts were elevated during the period of amidopyrine treatment, and the differential counts showed a predominance of polymorphonuclear leukocytes.

Selenium in Determination of Nonprotein Nitrogen—Reis and Powers used selenium in the determinations of nonprotein nitrogen in blood filtrates, their aim being to develop a method of digestion as rapid and as convenient as the Folin-Wu method but without the troublesome formation of a precipitate of silica due to the action of the phosphoric acid of the digestion mixture on glass. As a result of several preliminary experiments they found that 45 per cent sulphuric acid containing a small amount of selenium could be substituted for the Folin-Wu digestion mixture with but little sacrifice of the length of digestion time and with no formation of silica precipitates. Either selenium or selenous acid may be used. The best results were obtained with a solution of 70 mg of selenium in 200 cc of a 45 per cent solution of sulphuric acid. The digestion is carried out in much the same way as with the Folin-Wu method. In place of the charring seen in the latter method, a rust-colored precipitate of reduced selenium appears. This dissolves as the heating is continued and the digest becomes practically colorless within thirty seconds to three minutes after the appearance of the fumes of sulphur dioxide. Five minutes of heating from the first appearance of the acid fumes is sufficient for the complete digestion of most samples of urine and for all blood filtrates, unless these filtrates, through improper preparation, contain traces of protein. In the selenium sulphuric acid method this trace of protein goes into solution but is quite difficult to digest. Usually an additional five minutes of heating completes the digestion and, if a slight brown color still persists after ten minutes of digestion, it may be disregarded as it apparently does not affect the accuracy of the determination. Analyses were done on urine and on known solutions of urea and uric acid. For the urine a value of 107 Gm of nitrogen per liter was obtained as compared with 10.64 Gm with the Folin-Wu method. The urea solution gave a value of 3.35 mg of nitrogen per hundred cubic centimeters as compared with the calculated value of 3.5 mg. A lithium carbonate solution of uric acid on one analysis gave a value of 3.29 mg of nitrogen per hundred cubic centimeters and on a second analysis, 3.33 mg as compared with a calculated value of 3.33 mg. By the use of gum ghatti the authors succeeded in nesslerizing solutions that were milky with precipitated tungstic acid, although in some cases the solution would have to stand for several minutes before all the tungstic acid was dissolved by the alkali of Nessler's solution.

Journal of Nervous and Mental Disease, New York

82: 249-372 (Sept.) 1935

- Pyknolepsy J. L. Abramson Brooklyn—p. 249
 Syndrome of Superior Cerebellar Artery S. A. Sandler Jersey City N. J.—p. 263
 Preliminary Report on Personality Studies in Thirty Migraine Patients Olga Knopf New York—p. 270
 Pathologic Changes in Tuber Cinereum in Group of Psychoses L. O. Morgan Cincinnati and H. S. Gregory Binghamton N. Y.—p. 286
 Psychopharmacology of Sodium Amytal in Catatonia M. W. Thorner Norristown Pa.—p. 299

Michigan State M. Society Journal, Grand Rapids

34: 463-520 (Aug.) 1935

- Individualized Anesthesia R. Maurits Grand Rapids—p. 463
 Physiologic Postural Deformities in Contrast to Pathologic Postural Deformities C. E. Badgley Ann Arbor—p. 469
 Important Integrations of the Medical School J. E. Davis Detroit—p. 472
 Hematuria W. J. Butler Grand Rapids—p. 479
 Puerperal Sepsis L. A. Crouch Detroit—p. 484
 Treatment of Craniocerebral Injuries L. Davis Chicago—p. 487
 Physician's Philosophy J. A. MacMillan Detroit—p. 497
 Normal Nutrition in Children H. C. Metzger Detroit—p. 502
 The Doctor and Malpractice W. J. Stapleton Jr. Detroit—p. 504

Military Surgeon, Washington, D. C.

77: 57-112 (Aug.) 1935

- Recent Trends in Diabetes Mortality L. I. Dublin—p. 57
 Diabetic Coma J. R. Darnall—p. 75
 Standardization of Differential Leukocyte Count A. P. Hitchens—p. 84
 Unilateral Fused Kidney and Ectopic Right Kidney H. C. Chenault—p. 89
 The United States Hospital Ship Red Rover (1862-1865) L. H. Roddis—p. 91

Missouri State Medical Assn Journal, St. Louis

32: 313-350 (Aug.) 1935

- Advances in Renal Surgery with Particular Reference to Nephropexy O. S. Lowsley New York—p. 313
 Tuberculosis of the Genito-Urinary System C. E. Burford St. Louis—p. 316
 Complications Developing After Operation for Rectal Fistula W. R. Rainey St. Louis—p. 320
 Gastro-Intestinal Series Intravenous and Oral Cholecystography Methods in Use at the Edward Mallinckrodt Institute of Radiology W. G. Scott St. Louis—p. 324
 The Present Day Role of Physical Therapy in Medicine A. J. Kotlas St. Louis—p. 329
 Rubber Catheter Retained in Abdominal Cavity for Twenty Six Years Report of Case R. Hill St. Louis—p. 333

New England Journal of Medicine, Boston

213: 339-384 (Aug. 22) 1935

- History of Dermatology in Boston Chairman's Address C. J. White, Boston—p. 339
 *Oral Manifestations of Bismuth F. P. McCarthy and S. O. Dexter Jr., Boston—p. 345
 *Treatment of Psoriasis with Organic Sulphur Compound F. M. Thurmon Boston—p. 353
 Diagnosis of Industrial and Nonindustrial Skin Diseases J. G. Downing Boston—p. 358
 Fungus Diseases of Skin A. M. Greenwood Boston—p. 363
 Report of Fatal Case of Fluoride Poisoning L. Maletz Hathorne Mass.—p. 370

Oral Manifestations of Bismuth.—McCarthy and Dexter state that the high incidence (80 per cent) of bismuth pigmentation in the mouth, in a series of 511 cases of syphilis under treatment in a hospital clinic, indicates that local oral hygiene and tartar deposits seem to represent the important factor. The contact buccal mucosal pigmentation is shown to be definitely due to irritation from the opposing gingival irritant, which is essentially tartar. Severe cases of gingival pigmentation and inflammatory reaction are relatively few, and over a period of about ten years since the preparation of insoluble bismuth salicylate in oil has been in use the number of cases of necrosis and gangrene has been extremely rare. Therefore this drug may be considered a safe therapeutic agent in the treatment of syphilis, as the presence of pigmentation and mild gingivitis seems to have no deleterious effect on the general health of the patient. A series of urinary examinations in a selected group of severe cases of pigmentation with gingivitis was negative for evidence of nephritis. Chronic nephritis was present in the two cases reported and this condition is definitely a factor in the production of local gangrenous processes, although susceptibility to the drug undoubtedly may play an important part. Examination of the blood of a small group of patients showed no dyscrasia related to bismuth therapy. In contrast to the hospital cases studied in this series, a small control group of office patients under bismuth salicylate therapy showed a low incidence of pigmentation, about 5 per cent. Poor oral hygiene is the important factor that predisposes to pigmentation in the oral cavity. Removal of tartar deposits with improved dental hygiene hastens the disappearance of pigmentation and tends to prevent further deposits.

Treatment of Psoriasis with Organic Sulphur Compound.—Thurmon describes a solution in which the total sulphur averages 0.185 per cent by weight and is distributed possibly as 30 per cent allyl sulphide, 25 per cent polysulphide, 35 per cent allyl mercaptan, 7 per cent polymer (insoluble material) and possibly 3 per cent thio acid. Each cubic centimeter of the final solution contains about 2 mg of sulphur. The solution may be administered with safety intravenously, intramuscularly, intracutaneously, subcutaneously, orally, by inhalation in the form of a spray and by injection as an ointment. Blood counts and examinations of the urine repeatedly performed on patients during and following the sulphur intravenously, have failed to reveal any abnormal change, except that occasionally patients will show a slight increase in the blood

cell count and hemoglobin, the latter increasing from five to fifteen points, the white cells to a count ranging between 9000 and 10,000 and the red cells at times increasing as much as 1.2 million per cubic millimeter when the count is below normal. In the fifty-eight patients treated, other complications were pregnancy, diabetes mellitus, alimentary glycosuria, biliary cirrhosis, infectious jaundice, postarsphenamine hepatitis, essential hypertension, cardiorenal disease, aortic dilatation and insufficiency, generalized arteriosclerosis, and orthostatic albuminuria. The drug was administered to these and to two additional patients during the febrile period of erythema multiforme with out untoward reaction. Repeated examination of the optic fundi has failed to reveal any toxic manifestation. In all cases syphilis has been ruled out as an etiologic factor. It is advisable to start each patient on treatment three times a week until ten or twelve injections of organic sulphur have been administered. For an adult, 10 cc is the initial dose, the subsequent dosage ranging from 15 to 25 cc, depending on the response of the individual lesions. From the beginning a bland ointment is used that keeps the psoriatic scales soft and flexible, prevents and alleviates dryness, pruritus and the irritation occasionally encountered in the thickened, roughened and fissured plaques. The first change noted after the initial two or three injections is that the psoriatic areas are transformed into a vivid pink to cherry red. The process of involution continues at a pace varying with the individual response of each patient until the areas are devoid of scales but are present as smooth soft pink thin, flexible papular elevations. Finally the papules become erythematous macular areas, easily blanched with pressure and eventually disappear when involution is completed. No pigmentation or roughness of the skin remains to mark the site of previous involvement. Intravenous organic sulphur is not a cure for psoriasis. With proper administration of the drug it is possible to control psoriasis and to effect a complete involution of the eruption. Remissions have been attained that have lasted six months. Other patients in whom complete involution of psoriasis has been accomplished have had recurrences in less than six months, but with additional treatment at the beginning of such a recurrence it is possible to render it completely under control.

New Jersey Medical Society Journal, Trenton

32 449 506 (Aug.) 1935

- Indications for Operative Intervention in Diseases of Stomach and Duodenum G Blackburne Newark—p 455
Physical Factors in Mental Disease J A Toren Marlboro—p 458
Prophylaxis of Mental Disease G L Jones Marlboro—p 460
Practical Suggestions for Management of Certain Ear Nose and Throat Conditions J R Page New York—p 463
Intestinal Obstruction A M Wright New York—p 465
Treatment of Ringworm of the Feet C C Carpenter Summit—p 467
Moses Maimonides the Physician E J Ill, Newark—p 469
Maimonides in the World of Philosophy and Metaphysics L S Lang Newark—p 472
Traumatic Surgery of the Chest S Z Hawkes Newark—p 473
Some New Developments in Thyroid and Parathyroid Diseases F H Lacey Boston—p 479
Colitis from the Practitioner's Standpoint A Bassler New York—p 482
Skin Grafting L A. Peer Newark—p 484
Sclerosing Osteitis of Orbit. Case of Sclerosing Osteitis Following Perforation of Eyeball by Foreign Body B B Adelman Newark—p 487
Care of Teeth in Pregnancy A W Bingham East Orange—p 488
Infection Susceptibility and Vaccination in Acute Anterior Poliomyelitis J A Kolmer Philadelphia—p 491
Lymphogranuloma Inguinale H S Talbot East Orange—p 493

New Orleans Medical and Surgical Journal

88 139 202 (Sept.) 1935

- Tribute to Dr. Joseph Goldberger W A Dearman Gulfport, Miss.—p 139
Classification and Treatment of Neri J K Howles New Orleans—p 142
Chronic Epidemic Encephalitis. Report of Eleven Cases with Chronic Alcoholism as Outstanding Symptom R C Young Covington La—p 150
Astenopia and Headache. Not of Ocular Origin. Differential Diagnosis W T Davis Washington D C—p 158
Prostate and Seminal Vesicles as Focus E B Vickery New Orleans—p 168
Report of Pasteur Institute of Charity Hospital of New Orleans for Year 1934 R D Aunoy and J H Connell New Orleans—p 169
The Perforated Appendix F C Shute Jr New Orleans—p 171

New York State Journal of Medicine, New York

35: 799-850 (Aug. 15) 1935

- Application of Diagnostic Criteria to Treatment of Anemias F H Bethell Ann Arbor Mich.—p 799
Fracture of (Navicular) Carpal Scaphoid E K Cravener Schenectady—p 807
Wood Splinter in Right Orbital Cavity. Case Report J L. Sengstack Huntington—p 809
Poliomyelitis. Symptomatology and Treatment of Acute Poliomyelitis Josephine B Neal New York—p 811
Id. Active Immunization Against Poliomyelitis M Brodie and W H Park New York—p 815
Id. Prevention of Poliomyelitis W H Park New York—p 818
Whooping Cough Vaccine as an Immunizing Agent L Sauer Evans ton Ill—p 821
Ultraviolet Irradiation for Secondary Anemia. Preliminary Report R Kovacs and I M Leavy New York—p 825

Philippine Islands Med. Association Journal, Manila

15: 349-406 (July) 1935

- The Leprosy Problem in Philippines and Leprosy in Norway J O Nolasco Culon—p 349
Intestinal Heterophyidiasis with Cardiac Involvement. Contribution to Etiology of Heart Failure C M Africa Washington D C E Y Garcia Binan and W de Leon Manila—p 358
Infant Mortality in Cebu Province from 1916 to 1932 Compared with That in Entire Philippine Islands from 1914 to 1932 C Camomot Cebu Cebu—p 362
Difficulties Encountered in Medical Education K L Hobbs Manila—p 371
Sex Susceptibility in Leprosy J G Tolentino Mandawe Cebu—p 374
Malaria P Villaseñor, Lucena Tayabas—p 378

Science, New York

82 181 202 (Aug. 30) 1935

- Bodily Expression of Human Growth and Welfare T W Todd Cleveland—p 181
Further Observations on Potential Rhythms of Cerebral Cortex During Sleep A L Loomis E N Harvey and G Hobart Tuxedo Park, N Y—p 198
*Intranasal or Gastro-Intestinal Portal of Entry in Poliomyelitis J A. Toomey Cleveland—p 200
Hemorrhagic Necrosis and Regression of Sarcoma 180 G Schwartzman New York—p 201

Portal of Entry in Poliomyelitis—Toomey feels that poliomyelitis in the monkey results when monkey cord virus and the toxic material in the animal's intestine combine and the combination material destroys motor cells. In the human being the causative agent usually enters the digestive system "ready made," i.e., it is already combined and capable of producing cell destruction immediately. All the vagaries of the disease both in the *Macacus rhesus* monkey and in the human being even the reason why the lumbar area usually seems to be involved first, are easily understood in the light of this theory. Much experimental and clinical work has been done that points to a relationship between the gastro-intestinal tract, the sympathetic nervous system and the production of the experimental disease. But ignoring this evidence, when virus is given either intracerebrally or intranasally, the experimental animal usually gets quadriplegia and dies. Poliomyelitis is thus produced but even though this is poliomyelitis it is not the kind that is seen in man. The objective should be to produce the disease as it appears clinically. If poliomyelitis can be produced in the experimental animal in the same way as it is seen in the human being it is plausible to suppose that the route taken to produce it in the monkey might be the same as that taken by the virus in the human being. The fact that intranasal inoculation is unsuccessful if the connection between the gray-fibered olfactory nerve and the central nervous system is severed is interesting. However transection of the olfactory nerve would be of importance only if such section made it impossible to produce the disease by the gastro-intestinal tract. The author states that, if his theory as to the production of paralysis in the monkey is right, it is obvious that passive immune serum of great value cannot be obtained by injecting monkeys with the virus alone. A high-titered antiserum was rapidly produced by injecting a sheep with these combined factors—virus and enteric toxin—and recently the author has produced paralysis in a horse by injecting these combined elements.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2: 287-326 (Aug. 17) 1935

- Pneumoconiosis with Especial Reference to Silico Anthracosis of Coal Miners S. L. Cummins—p. 287
 *Persistence of Tetanus Antitoxin in Man Following Active Immunization P. A. T. Sneath and E. J. Kerslake—p. 290
 Use of Poulton's Oxygen Tent in Bronchopneumonia Complicating Whooping Cough A. Joe and J. S. Westwater—p. 292
 Comments on Case of Periventricular Epilepsy T. M. Davie—p. 293
 Rat Bite Fever E. G. Elwell—p. 297
 Intestinal Obstruction by Roundworms Following Administration of an Anthelmintic J. B. Kirk and A. Y. Cantin—p. 298

Persistence of Tetanus Antitoxin in Man—During the last two years, Sneath and Kerslake have determined the antitoxin content in the blood serum of a group of adults at various intervals after subcutaneous injections of tetanus toxoid. Serum was obtained from thirteen persons about two years after the last dose of the primary series of injections of tetanus toxoid. Of twelve persons in whom comparison was possible, the residual antitoxin showed no evidence of having fallen below that shown from twelve to fifteen months after the last dose. Three of the group retained at least 0.1 unit of tetanus antitoxin per cubic centimeter. In view of the limitation to accurate interpretation of the tests, the apparent increases in antitoxin titer shown by three of the group during the second year cannot be accepted without reserve. If subclinical infection by *Clostridium tetani* were a possible explanation of such a delayed antitoxin increase, acting in this instance as a secondary stimulus, it is probable that a higher residual titer would be found than was shown. It is therefore considered that the apparent increase in antitoxin titer over this period is probably not significant. A fourth dose of toxoid was given to these twelve persons and serum was obtained at intervals of a week and a month thereafter. Within a week an increase in antitoxin titer occurred in the order of from ten to five hundred times more than the residual level shown two years after the primary series. After a month, five showed a further increase in antitoxin titer, four showed no appreciable change, two showed a definite fall and one serum was not tested. Eleven persons developed tetanus antitoxin in amounts of between 0.1 and 10 units per cubic centimeter. One subject, whose titer did not rise above 0.025 unit, has shown a poor antitoxin response throughout. Nevertheless, the increase is similar in trend to that of the other members of the group. A fourth subcutaneous dose of 1 cc. of tetanus toxoid given to fourteen persons about a year after a primary series of three doses has been shown to occasion a rapid increase of antitoxin within a week, thirteen of the group attaining or exceeding an antitoxin titer of from 0.1 to 0.25 unit per cubic centimeter, which level was maintained after a month. A year later one subject had retained approximately the same antitoxin titer as was found a month after the fourth dose, whereas in the others the titer had definitely fallen. Nine persons retained antitoxin in amounts varying from 0.1 to 0.75 unit per cubic centimeter, these residual levels in general being substantially in excess of those found a year after the initial doses.

Journal of Laryngology and Otology, London

50: 569-648 (Aug.) 1935

- *Anatomic Investigation of Blood Vessels of Lateral Nasal Wall and Their Relation to Turbinates and Sinuses H. H. Burnham—p. 569
 Treatment of Acute Suppurative Otitis Media by Syringing with Alcohol V. Schmidt—p. 594

Relation of Blood Vessels of Nasal Wall to Sinuses

—Burnham investigated the course and relations of the blood vessels of the lateral nasal wall and accessory sinuses. Comparatively large bony canals are present in the central part of the middle and posterior half of the inferior turbinate bones. They contain terminal branches of the turbinate arteries, veins (jacket plexus) which form an essential part of the 'venous pathways,' and nerves. The veins and nerves are enclosed in the periosteum that surrounds the artery. Owing to the delicate structure of the canals, they may be almost entirely destroyed in a macerated specimen and this may account for the vagueness

of the descriptions. Three definite canals are present in the posterior half of the inferior turbinate. The uppermost contains vessels for the antrum, and its connection with the latter through the 'uncinate aperture' is described. This aperture is a constant naso-antral bony opening, inferior to the uncinate process, through which the antrum obtains a large part of its blood supply. In the central third of the middle turbinate, a single canal terminates anteriorly in three smaller divisions. The term 'venous pathways' is used to indicate the large channels of veins that carry the blood over the lateral nasal wall to the sphenopalatine foramen. They are the inferior, middle and superior turbinate venous pathways. Each pathway is made up of erectile vessels, which pass into either periosteal or 'intra-osseous' veins, and each of these joins the jacket plexus of veins within the bony canals of the turbinate. They then leave the canals, passing into periosteal veins again before reaching the sphenopalatine foramen. The intra-osseous veins are mainly present in minute bony canals in the anterior half of the middle and inferior turbinates. The erectile tissue empties directly into these veins; very few arterioles are associated with them. The erectile tissue also passes into the periosteal vessels that accompany the larger arteries. These periosteal veins enter the large bony canals in the posterior half of the turbinate and are continuous with the jacket plexus which the latter contains. A few of the periosteal veins also accompany the arteries that pass over the lateral nasal wall to the sphenopalatine foramen. They are, however, of distinctly minor importance compared to the large bony canal channels. The superficial veins of the lateral nasal wall present such sharp turns and twists in their courses that they may be described as convoluted. This is particularly true of the erectile tissue areas. The periosteal veins, on the other hand, both those found within the large turbinate canals and those on the surface, have a more wavy course with much fewer and less abrupt turns. The veins of the sinuses are of the periosteal type and, from the plexus about the ostium, take a comparatively straight course into the sinus. This ostial plexus is but a few millimeters in width, except in the case of the antrum, in which it covers a large part of the medial wall. The vessels pass into the sinus and either end in capillaries or are conjoined to collateral branches. In the sinus, no definite superficial layer of veins has been found and a distinct contrast is evident between the straight coursed veins of the sinus and the convoluted ones of the lateral nasal wall. The erectile (cavernous) tissue vessels present pouches or pockets in their walls, continuous with the lumen of the vessel but enlarging it considerably.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

42: 577-732 (Aug.) 1935

- Upper Urinary Tract in Pregnancy and Puerperium with Especial Reference to Pyelitis of Pregnancy D. Baird—p. 577
 Muscular Spasm in Fetus Factor in Production of Malpresentation G. F. Gibberd—p. 596
 Significance of Shape of Fetal Head in Mechanism of Labor E. Rydberg—p. 600
 Survey of Results of Treatment of Prolapse and Retroversion in Royal Free Hospital from 1926 to 1933 Margaret Salmond in conjunction with Gertrude Dearnley—p. 623
 Vaginal Metastasis in Hypernephroma K. Bowes—p. 630
 Pernoxon Hyoscine Twilight Sleep Review of Thirty Cases A. M. Claye—p. 636
 Polyneuritis of Pregnancy R. K. Ford—p. 641
 Zondek Aschheim Pregnancy Test with Especial Reference to Reaction I. Mabel F. Potter—p. 646
 Four Ectopic Pregnancies in Same Woman J. B. Dawson—p. 651
 Perforation of Diverticulum of Pelvic Colon into Ovarian Cyst D. J. Harries—p. 653
 Abdominal Belt as Mechanical Aid Before and During Labor A. Danby—p. 655
 Hydatidiform Mole Spontaneous Perforation of Uterus H. I. McClure—p. 663

Japanese Journal of Obstetrics and Gynecology, Kyoto

18: 185-300 (June) 1935

- Extracorporeal Culture of Uterine Cancer Attempt to Improve Culture Medium I. Narita—p. 186
 Experimental Study of Effect of Thyroid Function on Growth of Malignant Tumors Parts I II III IV V and VI S. Nishida—p. 195
 Histologic Investigation of Fetal Kidney Part II Experimental Study of Renal Disturbance in Fetal Period S. Tsuda—p. 233
 Cytologic Study of Living Body Irradiated with Hard Ray Parts II III and IV T. Saito—p. 237

Presse Medicale, Paris

43: 1265 1280 (Aug 10) 1935

- *Relative Value of Cholecystography and Gallbladder Excretion Test in Diagnosis of Cholecystitis M Chiray I Pavel and A Lomon —p 1265

Pleural Pressure Baillet —p 1267

Cholecystography and Gallbladder Excretion Test in Diagnosis of Cholecystitis—Chiray and his collaborators studied the relations of the Meltzer-Lyon test and cholecystography to disease of the gallbladder and biliary tract. It is obvious that a negative cholecystogram can be related to a pathologic state of three organs without counting the sphincter of Oddi, whereas the negative Meltzer-Lyon test indicates the gallbladder alone as the cause. Thus cholecystography is principally valuable when positive, while the Meltzer-Lyon test has theoretically the same value for positive and negative tests. In the biologic study of gallbladder disease by those means three possibilities arise. When both duodenal drainage and the cholecystogram give a normal response it is almost certain that the gallbladder is not involved. When both tests are abnormal, it is almost equally certain that there is a diseased gallbladder present. When the two tests are divergent, the diagnosis involves real difficulties. The most common difference is when cholecystography gives a negative or questionable image and the Meltzer-Lyon test shows a 'B bile' of variable character. In these cases the latter indicates the true diagnosis. In the inverse case, when cholecystography gives a positive result and duodenal drainage is negative, pericholecystitis is most often the cause. In conclusion the authors state that the two tests are not always superimposable and that one cannot be substituted for the other but they are complementary and the employment of both does much to increase the diagnostic accuracy to an extent previously unknown.

Minerva Medica, Turin

2: 305 336 (Sept 8) 1935

- Tuberculous Meningitis in Adult Patient Presenting Pulmonary Tuberculosis. L Ferrannini —p 305
- Pericious Anemia and Diabetes with Especial Attention to Deficiency of Vitamin B₂. A Archi —p 309
- Experimental Research on Lymphography. E Lucca —p 314
- *Influence of Adrenal Cortex Extract on Bactericidal Power of Blood. E. Calderera —p 320
- Skin Reaction to Gold and Gold Therapy in Pulmonary Tuberculosis. Skin Reaction to Gold with Principal Gold Salts. G Chiuicini and A. Aradas. —p 323

Influence of Adrenal Cortex Extract on Bactericidal Power of Blood—Calderera administered two subcutaneous injections of 0.2 cc. of adrenal cortex extract twenty-four hours apart to a number of rabbits. The bactericidal power of the blood was determined in each animal before treatment and two, eight and twenty-four hours after the second injection. Blood was taken from each animal and added to an equal amount of physiologic solution of sodium chloride citrated at 15 per cent. One cubic centimeter of the citrated blood was placed in each of two tubes. One drop of a 1:40,000 suspension of *Staphylococcus aureus* was added to the blood in one tube and a similar proportion of colon bacillus to the other. The tubes were placed in an incubator at 37 C for three hours after which the blood plates were prepared. At the same time a control plate was prepared with a mixture of 1 cc of physiologic solution of sodium chloride citrated at 15 per cent with one drop of bacterial suspension. The number of colonies developing on the control plate and on the blood plate were compared. The author found that the bactericidal power of the blood is constantly increased by the use of adrenal cortex extract. Plates of blood obtained two hours after injection of extract showed a diminution of bactericidal power (greater development of colonies) while those obtained after eight hours showed a marked increase. Those obtained after twenty-four hours showed a tendency of the bactericidal power to return to normal. This tendency varies according to the micro-organism used. The bacterial index of *Staphylococcus aureus* for example was higher after twenty-four hours than in the beginning, while the bacterial index of colon bacillus after twenty-four hours was on a par with or lower than the initial values.

Prensa Medica Argentina, Buenos Aires

22 1607 1654 (Aug 21) 1935

- *Benign Spontaneous Pneumothorax Due to Rupture of Subpleural Bubbles. M R Castex and E S Mazzei —p 1607
- Pericardial Friction Rub and Its Semeiologic Value in Topographic Diagnosis of Myocardial Infarct. G Bosco —p 1624
- Anatomoclinical Forms of Pulmonary Syphilis in Adults. D Vivoli —p 1627
- Von Jacksch's Anemia and Mikulicz's Syndrome. Case. C Zubizarreta and J E Herran —p 1642

Spontaneous Pneumothorax Due to Rupture of Subpleural Bubbles—Castex and Mazzei report twelve cases of benign spontaneous pneumothorax due to rupture of subpleural bubbles. They state that the disease develops in persons (especially men) ranging in age between 22 and 30. All the authors' patients were men. There were no symptoms of tuberculosis in evolution. The disease is afebrile and lasts about four weeks ending in recovery without leaving signs of any pathologic process that can be detected in the roentgen examination of the lung. There is slight or no pleural effusion. The diagnosis is confirmed if the bubbles are visible in the roentgenogram as happened in three of the authors' cases. Active or latent tuberculosis does not play a part in the etiopathogenesis of the disease. The bubbles, the size and number of which are variable, may be located in different parts of the lung, such as the apex, borders, aspects and fissures. As a rule they originate in pleural scars. Inflammatory processes and congenital malformation of the lung have been noted. The treatment is one of expectation and consists chiefly in rest and symptomatic remedies. If there are complications, such as circulatory shock and acute anoxemia, the employment of anaesthetics and of oxygen is advised. Only in one of the authors' cases was part of the pleural air removed.

Deutsche medizinische Wochenschrift, Leipzig

61 1385 1424 (Aug 30) 1935 Partial Index

- Diagnosis of Schizophrenia and Cyclothymia. K Schneider —p 1385
- Organization of Campaign Against Cancer. A Hintze. —p 1390
- Protein Requirements of Human Beings. B Süßkind —p 1393
- *Angioid Streaks. W Reichling —p 1394
- Erroneous Diagnoses in Convulsions During Childhood. E. Hässler —p 1396
- *Serologic Differential Diagnosis Between *Brucella Abortus* and *Brucella Melitensis* Infection in Human Subjects. H Habs and Lena Sievert —p 1398

Angioid Streaks—Reichling observed three patients with angioid streaks in the retina. Two of these patients had a careful dermatologic examination, which however, gave negative results. Although the presence of pseudo-*anthoma elasticum* could not be proved in his cases, the author is inclined to agree with other observers who consider the disorder a systemic disease of the elastic substance.

Differential Diagnosis of *Brucella Abortus* and *Brucella Melitensis*—Habs and Sievert point out that a differentiation of the various types of *Brucella* is desirable from the epidemiologic point of view. In cases in which the causal organism can be cultured, the differentiation is rather simple. However in practice, the specific diagnosis is usually based on the outcome of the immunity reactions particularly the agglutination. Formerly the agglutination test did not permit a differentiation. But since the studies carried out by Wilson and his collaborators have provided a better understanding of the antigen structure of the various *brucella* types, the authors considered new tests advisable. Wilson had demonstrated that only the smooth strains should be used, because the rough strains produce disturbances. He had found also that the difference between *abortus* and *melitensis* groups is not that in addition to a common group antigen they also each have a specific antigen but rather that both groups contain two identical antigens in differing quantities. Thus there is really only a quantitative difference between the two types. The authors state that although their observations differed slightly from those of Wilson, they were able to corroborate the fact that it is possible to differentiate the *melitensis* and *abortus* types by quantitatively graded absorption experiments. Former experiments had for an object the classification of the *brucella* group into different types by means of rabbit immune serum. In the experiments described here, the opposite method was employed, that is by means of known strains it was attempted to determine

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2 287 326 (Aug. 17) 1935

Pneumoconiosis with Especial Reference to Silico-Anthraxis of Coal Miners. S. L. Cummins—p. 287

*Persistence of Tetanus Antitoxin in Man Following Active Immunization. P. A. T. Sneath and E. J. Kerslake—p. 290

Use of Poulton's Oxygen Tent in Bronchopneumonia Complicating Whooping Cough. A. Joe and J. S. Westwater—p. 292

Comments on Case of Periventricular Epilepsy. T. M. Davie—p. 293

Rat Bite Fever. E. G. Elwell—p. 297

Intestinal Obstruction by Roundworms Following Administration of an Anthelmintic. J. B. Kirk and A. Y. Cantin—p. 298

Persistence of Tetanus Antitoxin in Man—During the last two years, Sneath and Kerslake have determined the antitoxin content in the blood serum of a group of adults at various intervals after subcutaneous injections of tetanus toxoid. Serum was obtained from thirteen persons about two years after the last dose of the primary series of injections of tetanus toxoid. Of twelve persons in whom comparison was possible, the residual antitoxin showed no evidence of having fallen below that shown from twelve to fifteen months after the last dose. Three of the group retained at least 0.1 unit of tetanus antitoxin per cubic centimeter. In view of the limitation to accurate interpretation of the tests, the apparent increases in antitoxin titer shown by three of the group during the second year cannot be accepted without reserve. If subclinical infection by *Clostridium tetani* were a possible explanation of such a delayed antitoxin increase, acting in this instance as a secondary stimulus, it is probable that a higher residual titer would be found than was shown. It is therefore considered that the apparent increase in antitoxin titer over this period is probably not significant. A fourth dose of toxoid was given to these twelve persons and serum was obtained at intervals of a week and a month thereafter. Within a week an increase in antitoxin titer occurred in the order of from ten to five hundred times more than the residual level shown two years after the primary series. After a month, five showed a further increase in antitoxin titer, four showed no appreciable change, two showed a definite fall and one serum was not tested. Eleven persons developed tetanus antitoxin in amounts of between 0.1 and 10 units per cubic centimeter. One subject, whose titer did not rise above 0.025 unit, has shown a poor antitoxin response throughout. Nevertheless, the increase is similar in trend to that of the other members of the group. A fourth subcutaneous dose of 1 cc of tetanus toxoid given to fourteen persons about a year after a primary series of three doses has been shown to occasion a rapid increase of antitoxin within a week, thirteen of the group attaining or exceeding an antitoxin titer of from 0.1 to 0.25 unit per cubic centimeter, which level was maintained after a month. A year later one subject had retained approximately the same antitoxin titer as was found a month after the fourth dose, whereas in the others the titer had definitely fallen. Nine persons retained antitoxin in amounts varying from 0.1 to 0.75 unit per cubic centimeter, these residual levels in general being substantially in excess of those found a year after the initial doses.

Journal of Laryngology and Otology, London

50: 569 648 (Aug.) 1935

*Anatomic Investigation of Blood Vessels of Lateral Nasal Wall and Their Relation to Turbinates and Sinuses. H. H. Burnham—p. 569

Treatment of Acute Suppurative Otitis Media by Syringing with Alcohol. V. Schmidt—p. 594

Relation of Blood Vessels of Nasal Wall to Sinuses—Burnham investigated the course and relations of the blood vessels of the lateral nasal wall and accessory sinuses. Comparatively large bony canals are present in the central part of the middle and posterior half of the inferior turbinate bones. They contain terminal branches of the turbinate arteries, veins (jacket plexus) which form an essential part of the "venous pathways," and nerves. The veins and nerves are enclosed in the periosteum that surrounds the artery. Owing to the delicate structure of the canals, they may be almost entirely destroyed in a macerated specimen and this may account for the vagueness

of the descriptions. Three definite canals are present in the posterior half of the inferior turbinate. The uppermost contains vessels for the antrum, and its connection with the latter through the "uncinate aperture" is described. This aperture is a constant naso-antral bony opening, inferior to the uncinate process, through which the antrum obtains a large part of its blood supply. In the central third of the middle turbinate, a single canal terminates anteriorly in three smaller divisions. The term "venous pathways" is used to indicate the large channels of veins that carry the blood over the lateral nasal wall to the sphenopalatine foramen. They are the inferior, middle and superior turbinate venous pathways. Each pathway is made up of erectile vessels, which pass into either periosteal or "intra-osseous" veins and each of these joins the jacket plexus of veins within the bony canals of the turbinate. They then leave the canals, passing into periosteal veins again before reaching the sphenopalatine foramen. The intra-osseous veins are mainly present in minute bony canals in the anterior half of the middle and inferior turbinates. The erectile tissue empties directly into these veins; very few arterioles are associated with them. The erectile tissue also passes into the periosteal vessels that accompany the larger arteries. These periosteal veins enter the large bony canals in the posterior half of the turbinate and are continuous with the jacket plexus which the latter contains. A few of the periosteal veins also accompany the arteries that pass over the lateral nasal wall to the sphenopalatine foramen. They are, however, of distinctly minor importance compared to the large bony canal channels. The superficial veins of the lateral nasal wall present such sharp turns and twists in their courses that they may be described as convoluted. This is particularly true of the erectile tissue areas. The periosteal veins, on the other hand, both those found within the large turbinate canals and those on the surface, have a more wavy course with much fewer and less abrupt turns. The veins of the sinuses are of the periosteal type and, from the plexus about the ostium, take a comparatively straight course into the sinus. This ostial plexus is but a few millimeters in width, except in the case of the antrum, in which it covers a large part of the medial wall. The vessels pass into the sinus and either end in capillaries or are conjoined to collateral branches. In the sinus, no definite superficial layer of veins has been found and a distinct contrast is evident between the straight coursed veins of the sinus and the convoluted ones of the lateral nasal wall. The erectile (cavernous) tissue vessels present pouches or pockets in their walls, continuous with the lumen of the vessel but enlarging it considerably.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

42: 577 732 (Aug.) 1935

Upper Urinary Tract in Pregnancy and Puerperium with Especial Reference to Pyelitis of Pregnancy. D. Baird—p. 577

Muscular Spasm in Fetus. Factor in Production of Malpresentation. G. F. Gibberd—p. 596

Significance of Shape of Fetal Head in Mechanism of Labor. E. Rydberg—p. 600

Survey of Results of Treatment of Prolapse and Retroversion in Royal Free Hospital from 1926 to 1933. Margaret Salmund in conjunction with Gertrude Dearnley—p. 623

Vaginal Metastasis in Hypernephroma. K. Bowes—p. 630

Pernoxon Hyoscine Twilight Sleep. Review of Thirty Cases. A. M. Clave—p. 636

Polynucleosis of Pregnancy. R. K. Ford—p. 641

Zondek Aschheim Pregnancy Test, with Especial Reference to Reaction. I. Mabel F. Potter—p. 646

Four Ectopic Pregnancies in Same Woman. J. B. Dawson—p. 651

Perforation of Diverticulum of Pelvic Colon into Ovarian Cyst. D. J. Harries—p. 653

Abdominal Belt as Mechanical Aid Before and During Labor. A. Danby—p. 655

Hydatidiform Mole. Spontaneous Perforation of Uterus. H. I. McClure—p. 663

Japanese Journal of Obstetrics and Gynecology, Kyoto

18 185 300 (June) 1935

Extracorporeal Culture of Uterine Cancer. Attempt to Improve Culture Medium. I. Narita—p. 186

Experimental Study of Effect of Thyroid Function on Growth of Malignant Tumors. Parts I, II, III, IV, V and VI. S. Nishida—p. 195

Histologic Investigation of Fetal Kidney. Part II. Experimental Study of Renal Disturbance in Fetal Period. S. Tsuda—p. 233

Cytologic Study of Living Body Irradiated with Hard Ray. Parts II, III and IV. T. Saito—p. 237

Presse Medicale, Paris

43: 1265 1280 (Aug 10) 1935

- *Relative Value of Cholecystography and Gallbladder Excretion Test in Diagnosis of Cholecystitis M Chiray I Pavel and A Lomon —p 1265
Pleural Pressure Baillet—p 1267

Cholecystography and Gallbladder Excretion Test in Diagnosis of Cholecystitis—Chiray and his collaborators studied the relations of the Meltzer-Lyon test and cholecystography to disease of the gallbladder and biliary tract. It is obvious that a negative cholecystogram can be related to a pathologic state of three organs without counting the sphincter of Oddi, whereas the negative Meltzer-Lyon test indicates the gallbladder alone as the cause. Thus cholecystography is principally valuable when positive, while the Meltzer-Lyon test has theoretically the same value for positive and negative tests. In the biologic study of gallbladder disease by those means, three possibilities arise. When both duodenal drainage and the cholecystogram give a normal response, it is almost certain that the gallbladder is not involved. When both tests are abnormal, it is almost equally certain that there is a diseased gallbladder present. When the two tests are divergent, the diagnosis involves real difficulties. The most common difference is when cholecystography gives a negative or questionable image and the Meltzer-Lyon test shows a 'B bile' of variable character. In these cases the latter indicates the true diagnosis. In the inverse case when cholecystography gives a positive result and duodenal drainage is negative, pericholecystitis is most often the cause. In conclusion the authors state that the two tests are not always superimposable and that one cannot be substituted for the other, but they are complementary and the employment of both does much to increase the diagnostic accuracy to an extent previously unknown.

Minerva Medica, Turin

2 305 336 (Sept 8) 1935

- Tuberculous Meningitis in Adult Patient Presenting Pulmonary Tuberculosis L Ferrannini—p 305
Pernicious Anemia and Diabetes with Especial Attention to Deficiency of Vitamin B₁₂ A Archi—p 309
Experimental Research on Lymphography E Lucca—p 314
*Influence of Adrenal Cortex Extract on Bactericidal Power of Blood E Calderera—p 320
Skin Reaction to Gold and Gold Therapy in Pulmonary Tuberculosis
Skin Reaction to Gold with Principal Gold Salts G Chiucini and A Aradas—p 323

Influence of Adrenal Cortex Extract on Bactericidal Power of Blood—Calderera administered two subcutaneous injections of 0.2 cc. of adrenal cortex extract twenty-four hours apart to a number of rabbits. The bactericidal power of the blood was determined in each animal before treatment and two, eight and twenty-four hours after the second injection. Blood was taken from each animal and added to an equal amount of physiologic solution of sodium chloride citrated at 15 per cent. One cubic centimeter of the citrated blood was placed in each of two tubes. One drop of a 1:40,000 suspension of *Staphylococcus aureus* was added to the blood in one tube and a similar proportion of colon bacillus to the other. The tubes were placed in an incubator at 37 C for three hours after which the blood plates were prepared. At the same time a control plate was prepared with a mixture of 1 cc of physiologic solution of sodium chloride citrated at 15 per cent with one drop of bacterial suspension. The number of colonies developing on the control plate and on the blood plate were compared. The author found that the bactericidal power of the blood is constantly increased by the use of adrenal cortex extract. Plates of blood obtained two hours after injection of extract showed a diminution of bactericidal power (greater development of colonies) while those obtained after eight hours showed a marked increase. Those obtained after twenty-four hours showed a tendency of the bactericidal power to return to normal. This tendency varies according to the microorganism used. The bacterial index of *Staphylococcus aureus* for example was higher after twenty-four hours than in the beginning while the bacterial index of colon bacillus after twenty-four hours was on a par with or lower than the initial values.

Prensa Medica Argentina, Buenos Aires

22 1607 1654 (Aug 21) 1935

- *Benign Spontaneous Pneumothorax Due to Rupture of Subpleural Bubbles M R Castex and E S Mazzei—p 1607
Pericardial Friction Rub and Its Semeiologic Value in Topographic Diagnosis of Myocardial Infarct G Bosco—p 1624
Anatomoclinical Forms of Pulmonary Syphilis in Adults D Vivoli—p 1627
Von Jacksch's Anemia and Mikulicz's Syndrome Case. C Zubizarreta and J E Herran—p 1642

Spontaneous Pneumothorax Due to Rupture of Subpleural Bubbles—Castex and Mazzei report twelve cases of benign spontaneous pneumothorax due to rupture of subpleural bubbles. They state that the disease develops in persons (especially men) ranging in age between 22 and 30. All the authors' patients were men. There were no symptoms of tuberculosis in evolution. The disease is afebrile and lasts about four weeks ending in recovery without leaving signs of any pathologic process that can be detected in the roentgen examination of the lung. There is slight or no pleural effusion. The diagnosis is confirmed if the bubbles are visible in the roentgenogram, as happened in three of the authors' cases. Active or latent tuberculosis does not play a part in the etiopathogenesis of the disease. The bubbles, the size and number of which are variable, may be located in different parts of the lung, such as the apex, borders, aspects and fissures. As a rule they originate in pleural scars. Inflammatory processes and congenital malformation of the lung have been noted. The treatment is one of expectation and consists chiefly in rest and symptomatic remedies. If there are complications, such as circulatory shock and acute anoxemia, the employment of anaesthetics and of oxygen is advised. Only in one of the authors' cases was part of the pleural air removed.

Deutsche medizinische Wochenschrift, Leipzig

61 1385 1424 (Aug 30) 1935 Partial Index

- Diagnosis of Schizophrenia and Cyclothymia K Schneider—p 1385
Organization of Campaign Against Cancer A Hintze—p 1390
Protein Requirements of Human Beings B Susskind—p 1393
*Angioid Streaks W Reichling—p 1394
Erroneous Diagnoses in Convulsions During Childhood E Hassler—p 1396
*Serologic Differential Diagnosis Between *Brucella Abortus* and *Brucella Melitensis* Infection in Human Subjects H Habs and Lena Sievert—p 1398

Angioid Streaks—Reichling observed three patients with angioid streaks in the retina. Two of these patients had a careful dermatologic examination, which however, gave negative results. Although the presence of pseudoxanthoma elasticum could not be proved in his cases, the author is inclined to agree with other observers who consider the disorder a systemic disease of the elastic substance.

Differential Diagnosis of *Brucella Abortus* and *Brucella Melitensis*—Habs and Sievert point out that a differentiation of the various types of *Brucella* is desirable from the epidemiologic point of view. In cases in which the causal organism can be cultured, the differentiation is rather simple. However, in practice, the specific diagnosis is usually based on the outcome of the immunity reactions, particularly the agglutination. Formerly, the agglutination test did not permit a differentiation. But, since the studies carried out by Wilson and his collaborators have provided a better understanding of the antigen structure of the various *brucella* types the authors considered new tests advisable. Wilson had demonstrated that only the smooth strains should be used, because the rough strains produce disturbances. He had found also that the difference between *abortus* and *melitensis* groups is not that in addition to a common group antigen they also each have a specific antigen but rather that both groups contain two identical antigens in differing quantities. Thus there is really only a quantitative difference between the two types. The authors state that although their observations differed slightly from those of Wilson they were able to corroborate the fact that it is possible to differentiate the *melitensis* and *abortus* types by quantitatively graded absorption experiments. Former experiments had for an object the classification of the *brucella* group into different types by means of rabbit immune serum. In the experiments described here, the opposite method was employed, that is by means of known strains it was attempted to determine

by absorption experiments the agglutinin content of the serum of patients and thus find whether the patients had a *Brucella abortus* or a *Brucella melitensis* infection. At first the authors followed the technic suggested by Wilson, but later they modified it in various ways. They give several tabular reports, indicating the observations on various serums. On the first, a *melitensis* serum, absorption experiments were made with a *melitensis* strain on the one hand and with an *abortus* strain on the other. The absorbed serum was further combined with another *abortus* strain, with a *suis* strain and with two additional *melitensis* strains. The table indicates that, following the absorption with the *melitensis* strain, none of the *abortus* strains became agglutinated. Following absorption with the *abortus* strain, however, only the agglutinins for the *abortus* strains and the *suis* strains were withdrawn, whereas the *melitensis* strains were still agglutinated up to one fourth of the original serum titer. Thus it is proved that the serum was from a patient with *Brucella melitensis*. The authors describe tests on several other serums.

Medizinische Klinik, Berlin

31 1125 1156 (Aug. 30) 1935 Partial Index

- Myasthenia Pseudoparalytica H. Curachmann—p. 1125
- *Function of Thyroid and Heart G. W. Parade—p. 1130
- Biomotor of Eisenmenger as Life Saving Apparatus in Poliomyelitic Respiratory Paralysis F. Hamburger—p. 1132
- Glyceril Trinitrate in Prophylaxis of Angina Pectoris F. Kisch—p. 1133
- Mistakes in Diagnosis and Treatment of Cystitis and Pyelitis W. Pollak—p. 1136

Function of Thyroid and Heart—Parade discusses the circulatory mechanism in case of dysfunction of the thyroid. He emphasizes that the thyroid is an important link in an interconnected system in which the sympathetic centers of the diencephalon, the hypophysis, the sympathetic nervous system, the adrenal cortex, and other incretory organs play a part. In discussing the effects produced by the hypofunction of the thyroid on the heart and the circulation, he points out that during starvation there develops a bradycardia as manifestation of a hypofunction of the thyroid and that hibernation in animals is accompanied by an involution of the thyroid and a great reduction in the frequency of the pulse. In human myxedema one observes bradycardia and a slowing down of the circulation and of the metabolic processes. If, however, under the influence of thyroid medication the myxedema symptoms disappear, the heart action likewise improves. The close relation between thyroid and heart is proved further by the fact that the administration of thyroid extract is followed by acceleration of the pulse and other cardiac symptoms if too large doses are given. The author discusses the cardiac function in hyperthyroidism. He shows that the increased rate of the basal metabolism in exophthalmic goiter is accompanied by accelerated circulation. He points out that absolute arrhythmia with auricular fibrillation is relatively frequent in older persons with exophthalmic goiter. He emphasizes that, if old persons have a cardiac insufficiency of obscure etiology, particularly if the insufficiency does not respond to digitalis and is accompanied by auricular fibrillation, a thyrogenic origin should be considered and the proper therapeutic measures should be taken to counteract the thyrotoxicosis.

31 1157 1188 (Sept. 6) 1935 Partial Index

- Liver and Diabetes W. Falta—p. 1157
- Therapeutic Actions of Carbon Dioxide R. Cobet—p. 1160
- *Nervous Disturbances in Pernicious Anemia with Especial Consideration of Their Amenability to Therapy G. Straube—p. 1164
- Paroxysmal Ventricular Tachycardia in Case of Pericardial Calcification R. Fischer and K. Wasserbrener—p. 1171
- *Does Positive Outcome of Agglutination Test Prove the Presence of *Brucella Abortus* Infection? W. Hauptmann—p. 1174

Nervous Disturbances in Pernicious Anemia—Straube summarizes his observations on the nervous symptoms of patients with pernicious anemia, compares his observations on certain points with those of other investigators and pays especial attention to the therapeutic aspects. In discussing the etiology, he expresses the opinion that funicular myelitis as well as other organic nervous disturbances are not the result of the anemia, for they have been known to precede the anemia, but that the anemic as well as the spinal symptoms may have

a common cause. After discussing the histologic aspects and the incidence of the spinal symptoms, he gives his attention to the question whether funicular myelitis has become more frequent since the era of liver therapy. He thinks that the patients survive longer, which allows more time for the development of funicular myelitis. In reviewing the literature on the therapeutic amenability of the spinal symptoms, the author observed great discrepancies not only in the selection of the therapeutic method but also in the estimation of the results. However, he found that all those who employed liver therapy in a large number of cases agree that funicular myelitis is not favorably influenced by the liver therapy. At the author's clinic several hundred cases were observed. The liver therapy had the desired effect on the blood status and the general symptoms, but, in spite of the fact that excessive doses of liver were given in the hope that a therapeutic effect might be exerted on the spinal symptoms, the results were negative. To be sure, in some instances the paresthesias and the disturbances of sensitivity improved, but these improvements were, as a rule, not lasting. The author concludes that the spinal symptoms which accompany pernicious anemia cannot be cured and cannot even be prevented. However, he does not think that treatment should be entirely omitted but suggests that the combined administration of strychnine, arsenic, phosphorus and liver may eventually be effective. Moreover, he thinks that general tonicizing measures, such as walking exercises, massage and hydrotherapy, might be helpful.

The Agglutination Test and *Brucella Abortus* Infection—Hauptmann points out that the occurrence of positive *Brucella abortus* agglutination reactions in healthy persons and in patients with other disorders, which he observed in the course of tests on 2,315 serums, limits the diagnostic value of the agglutination test. The existence of a *Brucella abortus* infection is the more likely, the higher the agglutination titer is above the 1:100 ratio. However, there is no definite boundary line that applies to all cases. The author stresses that the positive outcome of the *Brucella abortus* agglutination test should not induce the diagnostician to give up the thought that typhoid or paratyphoid might be present. Complementary examinations will be necessary in order to reach a definite diagnosis.

Münchener medizinische Wochenschrift, Munich

82: 1389 1430 (Aug. 30) 1935 Partial Index

- Serum Anaphylaxis After Injections of Tetanus Antitoxin E. Mackuth—p. 1392
- *Action of Sulphur in Experimental Carbon Monoxide Poisoning K. Voit and H. H. Schmidt—p. 1393
- Substitute for Anal Sphincter Produced by Thermocauterization L. Moszkowicz—p. 1395
- *Congo Red in Treatment of Intestinal Hemorrhage During Typhoid. F. Szirmai—p. 1403

Sulphur in Experimental Carbon Monoxide Poisoning—Voit and Schmidt direct attention to studies conducted by Vita and Salmoiraghi. In animal experiments on the action of colloidal sulphur in carbon monoxide poisoning, these investigators were able to show that guinea-pigs treated with sulphur survived carbon monoxide poisoning and recovered in a relatively short time while the control animals died. When the animals were exposed to fatal doses those which had received prophylactic injections of sulphur survived three times as long as those which had not. In spectroscopic studies on the detoxication mechanism in experimental carbon monoxide poisoning it had been determined that at the time the signs of poisoning disappear there appears a blood spectrum that greatly resembles the spectrum of carbon oxy-sulphide in the blood. From this observation it was deduced that carbon oxy-sulphide is formed in the blood during carbon monoxide poisoning and that this is a detoxication process. It was thought that the injection of sulphur might accelerate the formation of carbon oxy-sulphide. The authors decided to investigate whether the prophylactic treatment with sulphur would prevent the development of erythrocytosis, leukocytosis and hyperglycemia, which frequently develop in the course of carbon monoxide poisoning. They studied the action of sulphur on acute as well as on chronic cases. They found that the injection of sulphur prevents the development of hyperglycemia and of erythrocytosis. The observation of Vita and Salmoiraghi that the animals

treated with sulphur have a greater resistance to carbon monoxide poisoning could be corroborated in the majority of animals, but not in all

Congo Red in Treatment of Intestinal Hemorrhage—Szirmai considers severe intestinal hemorrhage one of the gravest complications of typhoid, and, in order to control it in several cases of typhoid that were under his treatment, he followed Pely's suggestion and employed intravenous injections of congo red. He points out that congo red belongs to the electronegative, neutral, high molecular dyestuffs. In experiments it was proved to be nontoxic, and it was found to increase the blood platelets, the monocytes and the coagulability of the blood. The author employed congo red in ten typhoid patients with severe intestinal hemorrhages. In four cases a single intravenous injection of 10 cc of a 1 per cent solution stopped the hemorrhage, while in the other cases two or three injections were necessary. The repeated injections are given at intervals of twelve or twenty-four hours. Aside from mild attacks of chills that developed in two patients, there were no harmful results from the congo red.

Wiener klinische Wochenschrift, Vienna

48 1103 1126 (Sept. 6) 1935

- Relations Between Heredity and Endocrinology J. Bauer —p. 1103
Electrohygiene S. Jellinek —p. 1107
*Clinical Aspects and Differential Diagnosis of Foreign Body Tumors of Colon M. D. Manizade —p. 1111
Casuistic Contribution to Cerebral Surgery J. Hohenwallner —p. 1114
*Influence of Diuretics on Alkali Reserves of Blood G. Gottsegen —p. 1116

Foreign Body Tumors of Colon—Manizade describes a case of foreign body tumor of the colon presenting the aspects of a malignant neoplasm. Not until after a careful anatomic examination was it possible to exclude the existence of a malignant neoplasm, and this examination revealed also the real cause of the chronic inflammatory process, namely, a small foreign body (chicken bone). Although it is generally assumed that swallowed foreign bodies are discharged from the intestine by the natural route as soon as they have passed the duodenal flexure and the ileocecal valve, a review of the literature discloses that occasionally inflammatory tumors arise on the basis of a foreign body lodged in the lower portion of the intestine. It appears that the sigmoid is most subject to such processes, since this section of the intestine favors the lodging of foreign bodies because of its flexures and the retarded passage of the intestinal contents. However, another observer has suggested that the size of the lumen plays a part in the lodging of and perforation by a foreign body. The author, on the other hand, cites a case in which retardation of the passage and flexure of the intestinal tube were responsible for perforation by a foreign body. The peculiar postoperative course in the first patient, that is, the recurrent inflammatory tumor, induced the author to search for the causes of this behavior. He points out that Weltmann's coagulation reaction is helpful not only in differentiating chronic inflammatory tumors and neoplasms but also in detecting a change in the protein coagulation which in turn would explain the development of such hyperplastic tumors. In the reported case the Weltmann reaction disclosed an extremely wide coagulation band. This outcome of the test favors definitely a chronic productive process and militates against a neoplasm but also indicates why the foreign body gave rise to such extensive inflammatory proliferation. The author points out that persons with dental prostheses particularly if the prostheses cover the entire palate, readily swallow comparatively large bodies without noticing them.

Influence of Diuretics on Alkali Reserve of Blood—Gottsegen thinks that it cannot be doubted that changes in the acid base equilibrium are of great importance for the water economy of the organism. He cites the opinions of several other investigators and then reports studies carried out by himself. He found that mercury diuretics (salyrgan and others), ephylline and sodium dehydrocholate increase the alkali reserve of the blood. The mercury compounds have the strongest action in this respect, the bile acid the weakest. The combination of mercury salts with sodium dehydrocholate changes nothing in regard to the development or the extent

of the alkalosis. Ammonium chloride inhibits the alkalosis only if its administration is continued following the injection of the diuretic. If it is given only before, the alkali reserve increases in the same manner as if only the mercury compound had been given. The diuretic action of ammonium chloride cannot be ascribed entirely to the acidosis that develops, but it may be assumed that various changes in the internal milieu play a part.

Zentralblatt für Chirurgie, Leipzig

62 2049 2112 (Aug. 31) 1935 Partial Index

- Notomelus E. König —p. 2050
*Results of Serum Treatment in Peritonitis O. Kapel —p. 2053
*Thrombophlebitis Migrans (Saltans) and Its Etiology J. Jákó —p. 2056
Interesting and Rare Complications of Adhesion Ileus A. Adler —p. 2059
Cancer Caused by Arsenic Case S. Miyaji —p. 2063

Serum Treatment of Peritonitis—Kapel says that he has employed a combination of a serum obtained by the immunization of horses with the toxins of selected colon strains with a so-called peritonitis serum prepared in the same manner by means of *Bacillus perfringens*. The ampules of colon serum contained 25 cc and the ampules of perfringens serum contained 20 cc. In severe cases the author administers the first dose intravenously together with an infusion of a sodium chloride solution while the patient is still under the anesthetic. The same dose is also given intramuscularly. On the following five days the patient is given daily one ampule of each of the two serums intramuscularly. In the case of children, the injections are given for only three days. In cases in which the general condition is not noticeably impaired, the intravenous injection is omitted and only the intramuscular injections are given. The author employed serotherapy in all cases of diffuse, free perforation peritonitis, in the majority of cases of localized perforation peritonitis in cases in which there was an accumulation of pus around the vermiform process and finally in cases in which large portions of the appendix were gangrenous so that the bacteria could penetrate. In investigating the results of this serotherapy, the author finds that it produced no changes in the total mortality rate. Nevertheless, he gained the impression that the serum exerted a beneficial effect in patients who recovered for the signs of general intoxication were less severe than is otherwise the case. The intestinal function was reestablished in a shorter time, and the recovery was more rapid. The serotherapy had the disadvantage that in some instances it resulted in arthralgias, exanthems, edemas and fever, but these disturbances were only temporary. He concludes that further experimental studies will be necessary in order to determine whether these serums really contain antibodies. He is inclined to believe that these serums are only antibacterial, not antitoxic.

Thrombophlebitis Migrans (Saltans)—According to Jákó, thrombophlebitis migrans differs from ordinary thrombophlebitis in the manner in which it appears and in its clinical symptoms. It usually appears in the superficial, peripheral veins. Another characteristic is that it appears in widely distant regions. The author points out that the term "migrans" is really not quite suitable for the relapsing thrombophlebitis generally does not spread progressively although this too is possible, but advances by leaps leaving healthy sections in the same vein and suddenly appearing in a distant vein. For this reason he thinks that the term thrombophlebitis "saltans" would be more fitting. As a rule, thrombophlebitis migrans (saltans) appears without preliminary symptoms but occasionally spasm-like pains precede it. He reports two cases, in describing the histologic aspects he points out that all layers of the venous wall show signs of inflammation. Many investigators consider the etiology unknown. He rejects Buerger's opinion according to which thrombophlebitis migrans is supposedly an accompanying symptom of thrombo-angitis obliterans. Other investigators consider syphilis or tuberculosis a causal factor, but they do not furnish definite proof for this. The author thinks that the clinical aspects indicate that an infection of low virulence is the cause. However, in addition to an infectious origin, a characteristic reaction of the veins plays a part. It is chiefly the latter factor that differentiates the process from the ordinary type of thrombophlebitis. He is of the opinion that thrombophlebitis migrans (saltans) is an allergic problem. He thinks that a hypersensi-

tivity is involved and that a disturbance in the sympathetic nervous system plays a part in this hypersensitivity. The infectious cause should be given especial attention. In the reported cases a latent infectious focus in the teeth was the eliciting cause. The search for and the elimination of the latent infectious focus is one of the most important factors in the treatment.

62 2113 2160 (Sept 7) 1935 Partial Index

- *Disinfection of Operative Field by Means of Solution of Formaldehyde E. Borchers—p 2114
- Innervation of Vena Saphena with Regard to Operations on Varicose Veins Mathilde Ambrus—p 2120
- *Computation of Basal Metabolic Rate from Pulse Frequency and Pulse Pressure by Means of Read's Formula Annemarie Oettinger—p 2124
- Case of Congenital Sarcoma E. Kubany—p 2126

Disinfection by Solution of Formaldehyde—After pointing out that the use of tincture of iodine in the disinfection of the operative field has certain disadvantages, Borchers states that for about nine years he has used a 5 or 10 per cent alcoholic solution of formaldehyde. He proved the suitability of the formaldehyde preparation in practice and by experiments. He describes comparative tests, and in summarizing his observations he states that (1) the immediate influence of the alcoholic solution of formaldehyde on the bacterial content of the skin is better than that of tincture of iodine, (2) its lasting action on the bacteria of the skin is better than that of tincture of iodine, (3) injuries of the skin (dermatitis, necrosis) are almost never observed, if the application of the formaldehyde has been suitable, (4) exudation from the puncture channel occurs only in a small number of cases, and (5) solution of formaldehyde is much less expensive than tincture of iodine.

Computation of Basal Metabolic Rate—Oettinger calls attention to the fact that Read's formula makes the determination of the basal metabolic rate comparatively simple in that it does not require the use of a complicated apparatus but computes the metabolic rate according to the following formula: Basal metabolic rate = 0.75 (pulse rate + 0.74 pulse pressure) — 72. In order to determine the reliability of the formula, the author made comparative tests on fifty-nine persons, that is, she determined the basal metabolic rate by means of an apparatus and also computed the rate according to Read's formula. In the majority of cases she found only slight discrepancies. She also was able to corroborate Read's statement that his formula does not give reliable results in persons less than 15 and more than 55 years of age, in those with a blood pressure in excess of 160 mm of mercury, in patients with severe disturbances in the cardiovascular-renal system and in severe cardiac lesions. She concludes that, even with these limitations, the formula is valuable for use in the clinic and for the general practitioner.

Zentralblatt für Gynäkologie, Leipzig

59: 2049 2096 (Aug 31) 1935

- Irritability of Uterine Muscle and Galvanic Irritability of Nerve-Muscle System E. Klaffen and Z. Ruffel—p 2050
- *Experimental Studies on Influence of Iron and Phosphorus on Pregnant Organism and Fetus R. L. Schub—p 2058
- Hormone Therapy for Increase in Milk Secretion K. Volz—p 2061
- Treatment of Umbilical Hernia in the New Born J. Oberholzer—p 2062
- Does Renewed Surgical Treatment or Delivery Involve Danger of New Thrombosis in Patients Who Have Passed Through One Thrombosis? M. Mátyás—p 2066

Influence of Iron and Phosphorus on Pregnant Organism—Schub made studies on ninety-six pregnant white rats. One half of this number of animals served as controls. The latter were given food that was deficient in iron and phosphorus. The other animals received in addition to the same food organic iron and organic phosphorus. Every third day the animals were carefully weighed. Already on the fifth day the experimental animals showed an increase over the controls. The increase in weight during the entire period of observation was 38 Gm in the rats that received no addition of iron or phosphorus and 63 Gm in the animals that received the addition. The offspring of the control animals weighed 44 Gm and that of the experimental animals 518 Gm. After delivery and the cessation of the iron and phosphorus therapy, the experimental animals lost weight less rapidly than did the controls.

Acta Medica Scandinavica, Stockholm

85: 493-597 (Aug 28) 1935 Partial Index

- Aim and Prospects of Medicinal Treatment of Cancer R. Roosen—p 499
- Alternating Spontaneous Pneumothorax in Apparently Healthy Persons S. Grapengresser—p 505
- *Duodenal Regurgitation Versus 'Electrolyte Diffusion' in Gastric Juice T. Teorell—p 518
- Correlation Between Acidity and Total Chloride Amount in Clinical Test Meals P. J. Nordenfelt and T. Teorell—p 525
- Thallium Poisoning Case A. Gjeritz—p 531
- *Pulmonary Bilharziasis Simulating Tuberculosis F. Mainzer—p 538
- Effect of Vitamin C Therapy on Lowered Capillary Resistance in Patients with Gastric Achylia P. Schultzer and O. Grin—p 563
- Blood Proteins and Sedimentation of Erythrocytes E. Kylin—p 574

Pulmonary Bilharziasis Simulating Tuberculosis—Mainzer reports five cases of a chronic infiltrative disorder of the lung which simulated tuberculosis but which was accompanied by an enlargement of the spleen and an excessive eosinophilia and responded to treatment with antimony. The eosinophilia, the treatment, the simultaneous presence of a urinary and intestinal bilharziasis in one case (and a similar report in the literature) and the clinical and experimental aspects of a pulmonary infection in the course of the development of different forms of schistosomiasis favor the assumption that the disorder was a pulmonary schistosomiasis. The author differentiates the described cases of bilharziasis into three groups. The first group, represented by one case, can be designated as bronchial asthma produced by Bilharzia. The second and third groups are pulmonary bilharziasis in the strict sense of the term. The second group includes the acute cases of pulmonary bilharziasis. In this form the foci may completely disappear after the treatment. The third group includes the chronic cases of pulmonary bilharziasis in which a pulmonary cirrhosis remains after the treatment. The author thinks that two reports in the literature under the headings of "familial eosinophilia" and "persistent eosinophilia with enlargement of the spleen" are probably cases of this disease. He emphasizes that pulmonary bilharziasis must be differentiated from the well known pulmonary symptoms that accompany bilharziasis of other organs.

Hospitalstidende, Copenhagen

78 833-860 (Aug 13) 1935

- *Medical Treatment of Congenital Pyloric Stenosis Elisabeth Srenggaard—p 833
- Secondary Pelagra Review of Forty Cases A. Hofman Bang—p 845
- *Sporadic Goiter on Genotypical Basis S. Hanum and J. E. Holst—p 855

Treatment of Congenital Pyloric Stenosis—Srenggaard's material consists of seventy-one patients, from 1911 to 1922, treated with stomach lavage and feeding by duodenal sound, forty-seven from 1922 to 1927 treated with atropine and sixty-one since 1927 treated with atropine methylnitrate. The average hospitalization was, respectively, 108, 96 and 77 days, the mortality 71, 64 and 16 per cent and the average increase in weight per week 62, 91 and 122 Gm. The author emphasizes that treatment with salt solution is important until dehydration is past, when treatment with atropine or atropine methylnitrate is begun, and that the medication is given one-half hour before meals. The grave prognosis for patients with a tendency to hemorrhage is stressed.

Sporadic Goiter on Genotypical Basis—Hanum and Holst report ten cases of goiter in one family, in two generations, one in a man and nine in women or girls. They assert that these cases are definitely distinguished from exophthalmic goiter, although half of the patients have presented symptoms resembling those of exophthalmic goiter. While most of the reported cases of sporadic goiter on a genotypical basis have been nodose, only one of their instances is nodose, in one case information is lacking and in the remaining eight (a father and seven daughters) the goiter is diffuse. Thus difference, they suggest, may be partially explained by the different ages represented, the goiter noted in childhood, as in the seven sisters, most often being diffuse, but other factors are believed also to be present.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 105, No 18

CHICAGO, ILLINOIS

NOVEMBER 2, 1935

THE ETIOLOGY OF HEART DISEASE

WITH SPECIAL REFERENCE TO THE PRESENT STATUS
OF THE PREVENTION OF HEART DISEASE

HOWARD B SPRAGUE, MD

AND

PAUL D WHITE, MD

BOSTON

In the history of our knowledge of circulatory disease the nineteenth century contributed chiefly through its descriptions of structural change in the heart and blood vessels. The present century may become known as the one in which emphasis on causation led to the etiologic classification of heart disease and to the first steps in its prevention. This has proved already to have been a great advance and proceeds most decisively from the work of Cabot¹ in Boston. He attributed the four common types of heart disease to rheumatism, syphilis, hypertension and arteriosclerosis, and these remain the causes of nine tenths of the organic heart disease of the United States. In the remaining one tenth are found such diverse types of heart affliction as congenital, thyroid, acute and subacute bacterial, diphtheritic and toxic heart disease, and the damage to the heart produced by pulmonic hypertension, anemia, trauma, systemic disease and neoplasms. While it is true that heart disease is now thought of in terms of etiology as one of the elements of the triad of diagnosis—etiologic, structural and functional—one must not be satisfied to confuse knowledge with nomenclature, since it must be admitted that in the four major types of heart disease the pathogenesis is obscure in more than 90 per cent. The causes of rheumatism, hypertension and arteriosclerosis are unproved and in this ignorance of the causes lies to date much of the failure of preventive medicine in heart disease.

In the 10 per cent of heart disease with assorted etiology the possibility of prevention depends on the underlying conditions, many of which are remediable, but, except in goitrous districts with an abnormal incidence of thyroid heart disease, not one of these minor groups presents a public health problem of any great importance.

On the other hand, the four major groups constitute a preponderant problem since they are responsible for two and a quarter times as many deaths as their nearest rival, cancer. It appears not too optimistic, however, to believe that three of them—rheumatic, syphilitic and hypertensive—may eventually become amenable to pre-

ventive measures and that even the fourth—arteriosclerotic—may be so controlled that it will cause serious damage only in the aged.

RHEUMATIC HEART DISEASE

Rheumatic infection is a disease the cause of which has been "discovered" by many investigators, but unhappily each time it is a different cause and no one of them has as yet satisfied the criteria for final proof. The disease has not been reproduced unequivocally in animals and disputes have arisen as to the pathognomonic changes in tissue that can be accepted as evidence of the disease. The Aschoff body, necrosis of collagen, perivascular infiltration with round cells, and giant cell formation are the fundamental reactions of human tissues, but only in a limited degree have they been reproduced in animals. More often the response has been that of sepsis or of some nonspecific reaction. Similarly, immunologic investigation has been hampered. The organism most commonly blamed has been *Streptococcus haemolyticus*, and its role in the etiology is at present a hotly disputed point. It has been thought by some to be the cause of the disease, by others the sensitizer to the infection, and by others to play no part but that of the innocent bystander. From the studies to date, there appear certain definite points:

- 1 Rheumatic fever in the United States is predominant in the northeastern part and is a disease of temperate climates. The more carefully it is searched for, however, in regions thought to be relatively free from it, the more frequently it appears to be found, though disguised in less classic form.

- 2 It has a seasonal variability, being more active in the late winter and early spring in this country.

- 3 It is a disease of the lower middle class and is aggravated by crowding and urban conditions. Paul has found it eight times as frequently in children attending public schools in poverty-stricken areas in New Haven as in children attending private schools, which confirms figures from our clinic.

- 4 It tends to be more common in certain families.

- 5 It has an optimal age period for first attacks at from five to twelve years.

- 6 Whatever the underlying virus may be, the disease is capable of reactivation by many nonspecific agents or events, the chief of which is respiratory infection. Accidents, injuries, emotional episodes, surgical operations, nonspecific protein shock and high temperature therapy have been shown by Bland and Jones at the House of the Good Samaritan in Boston to be able to precipitate a recurrence of signs of active infection in rheumatic children.

From this mixture of etiologic factors one can extract a composite ideal recommendation for the pre-

Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.
¹ Cabot R. C. The Four Common Types of Heart Disease. J. A. M. A. 63: 1461 (Oct. 24) 1914.

vention of the disease. It would seem as if children, especially of well-to-do parents, living in the rural tropics and free from respiratory disease with hemolytic streptococci, would be in the most desirable situation so far as avoidance of rheumatic infection is concerned, they should not migrate to temperate climates in the colder months of the year, since they can develop very severe rheumatism, such as happened to Puerto Ricans studied by Coburn in New York.

It is clear that such a combination of factors as appears in this ideal composite cannot be effected even though it would reduce the prevalence of rheumatic fever, nor, indeed, would it be desirable for many other reasons. From the standpoint of preventive medicine there are two aims for which to strive. The first concerns the actual destruction of the disease by removing the soil in which it flourishes, this is based on the hope that a gradual improvement in the average standard of living may abolish the urban crowding, malnutrition, faulty housing and possibility for direct transmission of disease, which seem the abettors of the rheumatic infection. This is perhaps utopian and remains for the distant future to evolve. As regards the individual case, efforts can be made for the betterment of living conditions which our first aim implies as well as for the recommendations about residence in warm and equable climates.

The second avenue of preventive approach is less concerned with racial betterment but is more immediately applicable. It has to do with the attempt to prevent reactivation of rheumatic fever already acquired by the child but lying quiescent and perhaps associated with only minor cardiac damage. Here it is a matter chiefly of the prevention of respiratory infection. Matters of diet or rest, isolation from family or school contacts with colds and sore throats, and instruction of parents, nurses and teachers are all necessary, as is the appreciation by all who deal with such children that rheumatic infection is of long duration and that the appearance of any one of the many signs of its activity is a requirement for bed care for the child. This second aim, then, is the prevention of involvement of the heart, since this is the crippling damage, although it is now known that the rheumatic disease also attacks all other organs of the body through its effects on mesodermal structures, as shown by the perivascular response.

So far, the use of vaccines, preventive or curative serums, change in immune reactions by nonspecific measures, high or selective vitamin feeding, and attempts to reproduce tropical conditions in institutions in temperate zones have failed to prevent recrudescence of the disease. One variable not controlled, to our knowledge, has been the humidity of the air in hospitals for rheumatic children where temperature regulation and ultraviolet radiation have been used to reproduce tropical weather. Keeping a group of children in such an atmosphere with adequate humidity throughout the winter might be helpful and would more nearly approximate the conditions that we have sought in sending children to Florida from the House of the Good Samaritan.

SYPHILITIC HEART DISEASE

The incidence of syphilitic heart disease is not high in any large group of the population of the United States except the Negro, and even in this race hyper-

tension is more common. In New England the incidence is about 5 per cent and in Texas 19.5 per cent in a combined group of white persons and Negroes, with a percentage of 32 in Negroes alone.² The etiology of syphilitic aortitis became firmly established almost thirty years ago, and with the introduction of modern treatment for the primary infection the possibility of eradication of its effects on the cardiovascular system became apparent. Of the four chief etiologic types of organic heart disease, this is the one seemingly destined the soonest to disappear through the early diagnosis and treatment of its underlying cause. Already there is some evidence of a decrease in aortic syphilis in New England, in the ten years from 1900 to 1909, 51,875 patients were admitted to the Massachusetts General Hospital and the diagnosis of aneurysm of the aorta was made in 113 cases—an incidence of practically 0.2 per cent. In a similar ten year period that ended in 1934, 75,184 patients were admitted and only sixty one aneurysms of the aorta were found, or an incidence of only 0.08 per cent, and this in spite of the improved roentgenologic facilities for diagnosis in the latter period.

HYPERTENSIVE HEART DISEASE

High blood pressure is a tremendously important cause of strain on the heart and leads to cardiac failure by producing fatigue, dilatation, and hypertrophy of the left ventricle. In New England it is a primary or secondary factor in 30 per cent of all organic heart disease. It can be separated from coincident arterio-sclerosis only with difficulty in certain cases, but the present evidence is in favor of the view that when they are combined the arterial hypertension precedes the degeneration of the vessels. The cause of high blood pressure is not known, but innumerable theories have led to the addition to, or subtraction from, the environment of patients with hypertension of such a collection of foods, drugs, joys and sorrows, virtues and vices as would comprise most of the human experience. In many instances the patient has been bettered, in many others he has been made worse, and in both instances his blood pressure has usually remained the same.

It is popular at the moment to blame our modes of living for the increase in hypertension in the belief that emotional hyperactivity results in arteriolar spasm, decrease in peripheral vascular bed, increase in systemic pressure, degenerative changes in arterioles and arteries and an overwhelming burden on the heart. Apparently good evidence has been found which shows that the prevalence of hypertension in different races is in direct ratio to the strains of civilized life rather than dependent on any of the dietary factors that have been such popular culprits. For example, the African Negro is said to be less hypertensive in a state of nature than when exposed to white civilization. It still seems difficult to explain the prevalence of high blood pressure in the American Negro on the basis of emotional tension when a relative freedom from worry has been adduced by some to explain a rather strikingly low incidence of angina pectoris in this group.

There are probably many causes for hypertension—some remediable, did we but know them, and some beyond our power to change in the event that we, as

² Stone, C. T., and Vanzant, Frances R. Heart Disease as Seen in a Southern Clinic, J. A. M. A. 89: 1473 (Oct. 29) 1927.

a nation, choose to continue to live at a constantly accelerating speed

It has been said that the younger members of hypertensive families should be spared the tensions of life, which are thought to lead later to high blood pressure. How that can be done is not clear. All existence is strongly competitive at present and for men to become the objects of public or private charity in no way leads to emotional relaxation, although it may appear to permit physical rest. A compromise, with the avoidance of some strains, is, however, always possible and may make the difference between health and illness.

The newer studies on endocrine factors, carotid sinus reflexes, and pressor substances may lead to preventive measures in the future, but if the mechanism of hypertension is to remain a function of the emotions there seems little immediate hope of its abolition.

ARTERIOSCLEROTIC HEART DISEASE, MUCH BETTER DESIGNATED CORONARY HEART DISEASE

Here a word or two about definitions is of fundamental importance at the start. The unsatisfactory term "arteriosclerotic heart disease" is at last being rapidly supplanted by the expression "coronary heart disease," which might be more accurately given under the cumbersome designation "atherosclerotic coronary heart disease." Arteriosclerosis generally distributed throughout the body or localized even in high degree in organs other than the heart does not cause heart disease, except as severe renal involvement may influence the heart secondarily through much hypertension or the toxic effect of uremia. Coronary arterial disease of any importance is in the very great majority of cases due to an atherosclerotic process and only rarely to infection, narrowing or occlusion of the mouths of the coronary arteries by syphilitic aortitis should not be considered coronary arterial disease any more than the blocking of the vessels by emboli as in bacterial endocarditis, the hypothetical but plausible coronary spasm, if it occurs, may be the result of irritation of the vessel walls by some disease process as well as of nervous vascular irritability. The term atherosclerosis is better than that of arteriosclerosis so far as the coronary arteries are concerned, as many of the most serious lesions, especially in youth, are the result of softening or atheroma, with ensuing reaction, which may occlude the vessels, rather than of sclerotic changes with calcification, which may be only the terminal stage in the aged. Finally, the term angina pectoris is not to be used interchangeably with that of coronary atherosclerosis, it is, to be sure, a symptom which in the great majority of cases does spell much coronary vascular disease, but it is in large part dependent on nervous irritability and sometimes not due to any obvious disease of the coronary arteries themselves, as in syphilitic aortitis when the coronary mouths are narrowed and in extensive aortic valve disease when the blood flow is not normal and an element of vascular spasm is probably superadded. Thus angina pectoris may exist without coronary atherosclerosis, and, much more frequently, coronary atherosclerosis, even of very high degree, may occur without angina pectoris.

Coronary disease occurs as an important factor in the production of heart disease in about 25 per cent of the heart cases in this country.

Coronary disease, as defined, shows itself clinically most commonly by the occurrence of either angina pec-

toris or coronary thrombosis or both, occasionally by certain electrocardiographic changes, namely, auriculo-ventricular or intraventricular block and inversion of the T waves with or without abnormal position of the ST intervals not otherwise explained, and infrequently by congestive failure of the heart without previous warning.

There is one other type of so-called atherosclerotic heart disease that is occasionally encountered and which has been discussed off and on in the past, but not with a very clear estimate of its importance. This is atherosclerosis involving the endocardium and valves, particularly the aortic valve. There is no doubt about the existence of this condition. It probably has much the same basis as atherosclerosis of the arteries, but it practically never assumes any clinical importance. The amount of change is slight. The usual manifestations are a little atheroma or sclerosis on the valve cusps, and especially fibrosis and calcification at the base of the aortic cusps on the aortic side of the valve. Infrequently the aortic valve ring, and very rarely the mitral valve ring, may become calcified and the process may extend a little way up on to the cusps themselves, producing a slight amount of stenosis. This condition involving the aortic valve has been called Monckeberg's sclerosis. The important degrees of valvular stenosis are, however, always on an infectious background even though calcification may be superimposed, that is significant calcareous valve disease is never, so far as we know, the result of a simple atherosclerosis.

The cause or causes of coronary atherosclerosis are not known. They have been the subject of extensive discussion for well over a hundred years now and the International Association of Geographic Pathologists, which met last summer in Utrecht to study arteriosclerosis, was unable to throw any new light of vital importance on the time worn subject. Infection, wear and tear, malnutrition due to lesions of the vasa vasorum, hereditary weakness, and metabolic disorders have been the most popular culprits. At present it is rather the vogue to believe that serious atherosclerotic changes are produced in arteries or portions of arteries that are under the greatest mechanical strain (wear and tear) in individuals who have inherited arteries that are fragile in this particular and who for some unknown reason have been depositing an excessive amount of fat in their artery walls for years, sometimes since early youth. Diabetes and obesity, especially the former, favor the earlier appearance of coronary atherosclerosis.

Coronary thrombosis is still another problem. It is, to be sure, implanted as a rule on coronary artery walls that are badly damaged and in lumens that are much narrowed, but not always. In some cases, at least, a thrombotic tendency appears to exist.

From what we have said it is evident that we cannot do much as yet to prevent coronary atherosclerosis. The advice, which, from our own studies of healthy centenarians and of young persons with coronary disease and from the study of others, we might in our present ignorance bestow, would be "to select good ancestral coronary arteries, to avoid diabetes and excessive obesity or, if they are present, to treat them, and to establish healthy habits of life—in work, leisure, exercise, rest, diet, digestion, and the avoidance of certain poisons like lead, which increase the tendency to arteriosclerosis." Country life and hard physical work,

the avoidance of excessive worries and nervous strains, and the temperate use of tobacco appear to be of some importance in promoting longevity. Finally, why should the male sex be so preponderantly affected? Every one of twenty-five patients of ours with clinical evidence of serious coronary atherosclerosis 40 years of age or under was male and nearly 90 per cent of those under the age of 50 were male, here apparently lies a vital clue.

270 Commonwealth Avenue

AN ANALYSIS OF THE APPARENT INCREASE IN THE HEART DISEASES

ALFRED E. COHN, M.D.
NEW YORK

It seems scarcely necessary to repeat the commonplace that the death rate from cardiac and circulatory diseases is mounting while that from the infectious diseases is falling (chart 1). But it is necessary to insist

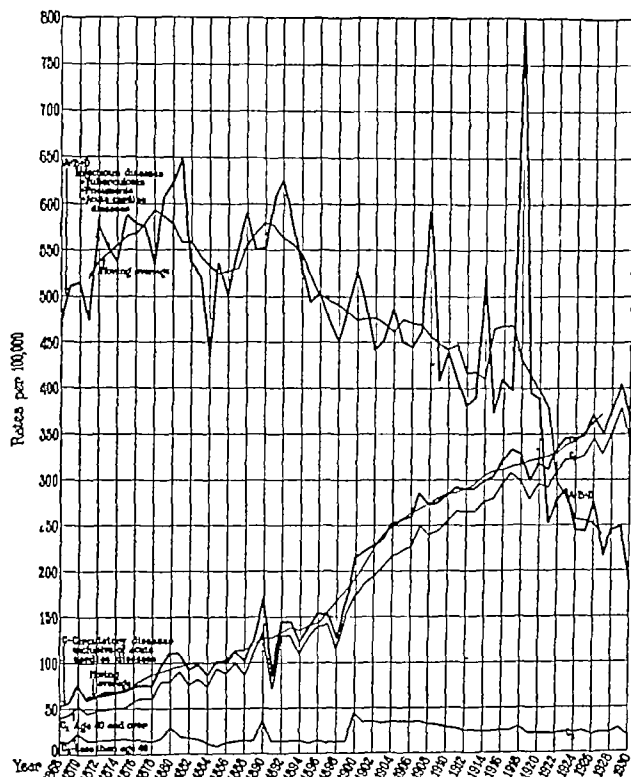


Chart 1—Mortality rates per hundred thousand of various diseases in first ten registration states and the District of Columbia 1868-1930. The diseases are grouped as follows: A (infectious diseases). Typhoid, measles, scarlet fever, whooping cough, diphtheria, influenza, mumps, dysentery, acute poliomyelitis, meningococcus meningitis, malaria, and cholera nostras. B (Tuberculosis, pneumonia, and bronchopneumonia). C (circulatory diseases exclusive of acute cardiac diseases). Apoplexy, angina pectoris, other diseases of the heart (including endocarditis), diseases of the arteries, and other diseases of the circulatory system. D (acute cardiac diseases). Pericarditis, acute endocarditis, and myocarditis. The states included are Connecticut, Indiana, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and the District of Columbia.

on this fact in order to raise these questions. First, how do the individuals who died formerly of infectious diseases come to an end? and, second, is it really true

that the increase in deaths from circulatory diseases takes place because of the fall in deaths from infectious ones? It is necessary to show that the fall in the former is actually enough to account for the rise in the latter. A simple calculation shows that this is not true. The decades that are especially involved are those after age 40, for it is in these that the rises in circulatory diseases have taken place. The increases in circulatory diseases are indeed greater than the decreases in the infectious ones. There is, in short, a net increase in the circulatory diseases after age 60. How this takes place can be demonstrated in a set of curves. It should be understood that the figures given describe the condition in the U. S. registration area of 1900. They may be representative of the country as a whole, but, seeing how closely diseases of all sorts are dependent on the environment, the climate in the West and South may actually require a different description of the course of cardiac diseases for these states.

Next, changes have taken place in the diagnoses commonly employed in reporting deaths from circulatory diseases (chart 2). It is clear that beginning with age 40 there has been a rise in the death rate from chronic cardiac diseases, decade by decade, from 1900 to 1930. The same statement can be made about diseases of the arteries until the year 1920. Since then, if diseases from the coronary arteries are excluded, the rate has either fallen or remained constant. In chronic nephritis it is only beginning at age 70 that the rate rose to a high point in 1920, and it has fallen since in every decade. In the diagnosis cerebral hemorrhage and softening there has been a fall in each decade after 1920 and, as against 1900, no rise until age 70. Senility, a diagnosis commonly employed formerly, is made with conspicuously less frequency now. If these five sets of curves are viewed as a whole, it appears that it is only in chronic cardiac diseases that a more or less consistent rise has taken place since 1900 after age 40. In short, these banks of curves show fairly conspicuous tendencies. If all of them are added together, as is done in the last column, the curves appear flatter and exhibit rises of a more or less important nature only after age 60. From this chart alone the conclusion may be drawn that, although there has been a rise in all these diseases taken together since 1900, the rise is not conspicuous.

It has already been stated that there have been savings in every decade in the infectious diseases. It has also been stated that there are increases in circulatory ones in every decade after age 50. Finally, it should be repeated that the increases are somewhat more than the savings, especially between ages 70 and 89. This relation can be shown by studying the facts arranged in a somewhat different way. In each decade it is clear that the rate of all the infectious diseases has fallen (chart 3, curve 2). It is also clear that, beginning with age 50, the curves in each decade showing the combined death rates from circulatory diseases have risen (chart 3, curve 1). If curves 1 and 2 are added it appears that only after age 80 has the fall in curve 2 (infectious diseases) been insufficient to bring about a fall in the combined curves 1 and 2. Here, in short, the savings from infectious diseases just about balance the increases in the circulatory ones so that since 1920 the curves in these decades are flat. One must reckon then with the fact that if, since 1900, there has been on the whole a rise in the death rate from circulatory

diseases, this rise is slight and is due to the fall in infectious diseases. It is a matter of great importance to notice that the fall in infectious diseases has taken place in the very decades in which rises from circulatory diseases occur. The notion which has been prevalent that the increases in circulatory diseases, small as they are relatively, are due to the decrease in the rate of infectious diseases in the early ages of life is therefore incorrect. The savings from infectious diseases which occasion the rises in the circulatory ones take place in the same decade. The reason for the small discrepancy according to which there is a rise in the circulatory diseases at all is not explained in this analysis. Considering the nature of vital statistics, it is not surprising that an exact balance has not been found. The opportunity for error is, of course, very great. It should be pointed out that the result which has been attained in this study should have been anticipated, for, although the number of deaths in circulatory diseases, and indeed from other diseases, may be expected to have risen as a result of doubling of the population in every decade after age 40, between 1900 and 1930 there is no reason why there should have been a change in rate. This should have remained the same except for special alterations in balance, such as are exhibited in the interplay

2 Changes in the diagnoses which have been employed account in part for the interpretation which has been placed on the course of events

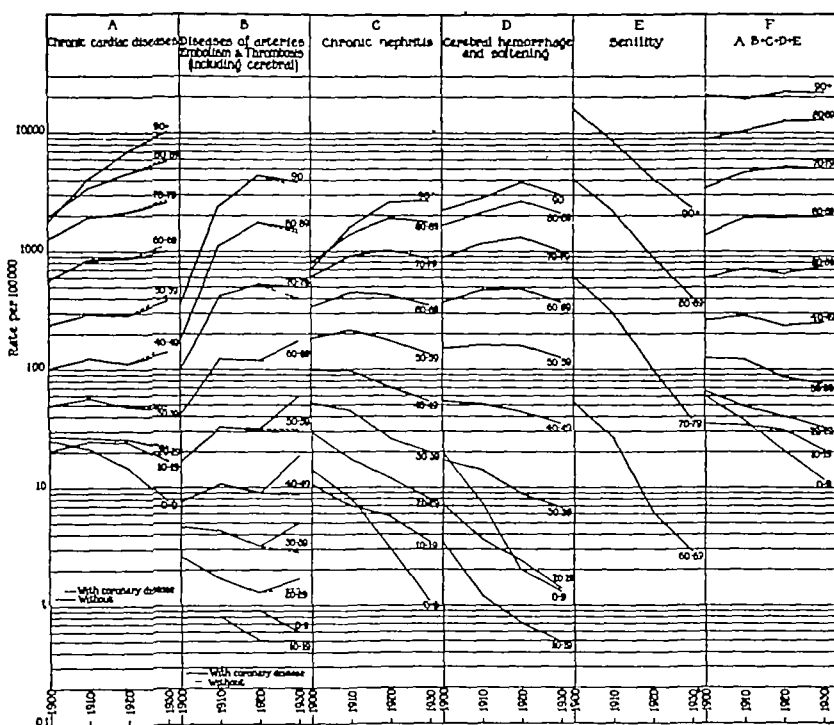


Chart 2—Death rates per hundred thousand of population for United States registration area of 1900 for certain diseases

3 The slight rise in the total death rate from circulatory diseases is due apparently to savings from deaths resulting from infectious diseases in the very decades in which the slight rise in the circulatory diseases has occurred¹

Sixty-Six Street and York Avenue

¹ A more detailed account of these studies has been given by Cohn A. E. and Lingg Claire. *Am Heart J* 9: 283 (Feb) 1934

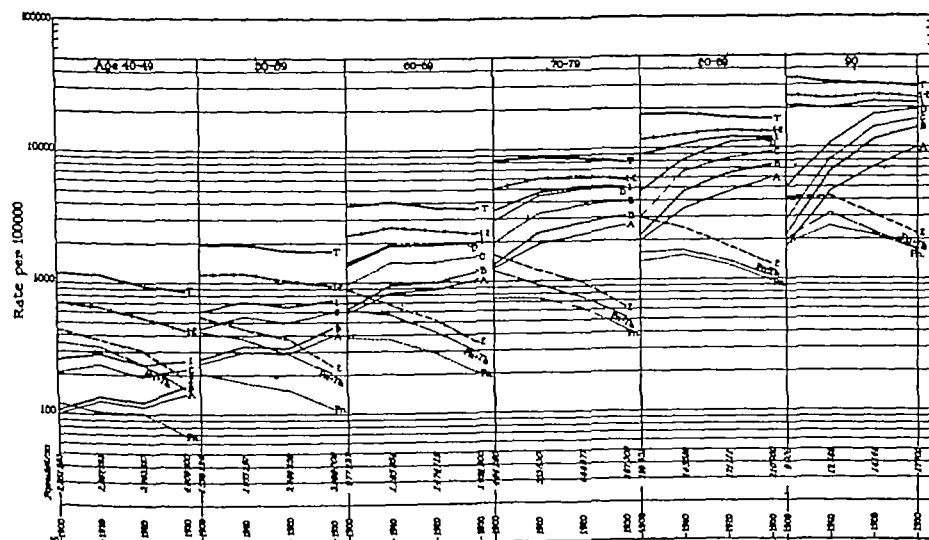


Chart 3—Death rates per hundred thousand of population for United States registration area of 1900 for certain diseases and combinations of these diseases by age groups in 1900 1910 1920 and 1930. Curve A describes the course of the death rates in chronic cardiac diseases. Curve B adds to curve A the death rates in diseases of the arteries. Curve C adds to curve B the death rates in chronic nephritis. Curve D adds to curve C the death rates in cerebral hemorrhage and softening. Curve E adds to curve D the death rates in senility and represents therefore the death rates of this entire circulatory group. Curve F adds to curve E the death rates from tuberculosis. Curve G adds to curve F the death rates from pneumonia. Curve H adds to curve G the death rates from all the other causes of death and describes therefore the total death rate.

between circulatory and infectious diseases. The following inferences may be drawn from this study

1 There has been a rise, but a slight one only, in the death rate from circulatory diseases

effects are to be expected if the cold showers are kept up during menstruation. If a shower is available, there would seem to be no reason why it should not be enjoyed—Novak, Emil. *The Woman Asks the Doctor*, Baltimore, Williams and Wilkins Company, 1935

Bathing During Menstruation.—Should bathing be omitted during menstruation? On this point there has been a considerable change of opinion and practice in recent years. Our grandmothers were certainly as a rule taught that the daily bath must be abjured during menstruation while now many "modern" girls take a daily shower, or perhaps go in swimming, without regard to menstruation. It would be foolish to lay down hard and fast rules in this respect. It can be said, however, that for the girl who has accustomed herself to a cold bath or a cold shower every morning no harmful

THE HEART IN HYPERTENSION

GEORGE FAHR, M.D.
MINNEAPOLIS

The appalling death rate associated with essential hypertension¹ is just beginning to dawn on the medical public. Bell and Clawson² found that 12.6 per cent of all patients over 40 years of age and 14.8 per cent of all patients over 50 years of age coming to autopsy had a history of high blood pressure or showed anatomic evidences of having had hypertension. These figures were partly based on increased heart weight in cases showing no valve defect, adherent pericardium, chronic nephritis or hyperthyroidism. There is some slight error in the assumption that idiopathic left ventricular hypertrophy is always due to increased blood pressure, but this slight error is well balanced by the fact that in some cases of severe hypertension known to have existed for years previous to autopsy the hearts are of normal weight. On the other hand, Bell and Clawson have considered only female hearts over 450 Gm and male hearts over 500 Gm as indicating the presence of hypertension during life. Using the coefficient of variation of 17.7 per cent calculated for normal heart weight by Greenwood³ and assuming that the normal mean female heart weight is 300 Gm and the male is 350 Gm, I have calculated that there is not one chance in twenty that a female heart weighing 400 Gm or a male heart weighing 450 Gm is normal. It can also be calculated that, if Bell and Clawson had used the foregoing heart weights as the upper limits of normal, they would have found that their material showed about 20 per cent of hypertension for patients for the ages above 50 years.

Making use of the official mortality statistics for the registration area of the United States for 1924, I⁴ have calculated that there were approximately 140,000 deaths, or 23 per cent of all deaths, during this year in persons aged 50 years or older in consequence of essential hypertension. This is nearly twice as many as the number of cancer deaths for the same age group. Although there is some error connected with all these figures, they do show that the incidence of hypertension in the general population over 50 years of age is very high indeed and that the death rate in consequence of high blood pressure greatly overshadows the death rate due to any other factor. Since at least 55 per cent of all patients with high blood pressure die of heart failure,⁵ it can be readily seen that knowledge of this most frequent form of heart disease is of paramount importance to the general practitioner.

PATHOLOGIC ANATOMY

In any study of the heart in essential hypertension it is well to begin with the pathologic anatomy of this

organ. With a few exceptions all hearts in which hypertension has been present for some time show a considerable increase in weight. The majority will weigh over 400 Gm in females and over 450 Gm in males. This increase in weight is due largely to hypertrophy of the left ventricle. There is also some hypertrophy of the right ventricle, because as a general rule when the left ventricle fails the right ventricle hypertrophies in some degree. There is always some dilatation of the left ventricle and frequently of the right ventricle during life, but the left ventricular dilatation may not show up well at autopsy because the left ventricle contracts vigorously at death. In the orthodiagram and the x-ray silhouette made at six feet distance this left ventricular dilatation is nearly always shown.

Some scar tissue is frequently found, especially in the left ventricle. This scar tissue replaces muscle fibers which had previously undergone degeneration. Occasionally one sees small areas of necrosis with leukocytic infiltration. Bacteria have never been demonstrated in such lesions, and Clawson⁶ has shown that this degeneration of the heart muscle and the subsequent scar tissue replacement are practically always found when coronary arteriosclerosis is present. Aschoff⁷ was probably the first to insist that there is no anatomic evidence for chronic myocarditis or true inflammatory processes in the heart muscle in cases of heart failure associated with nephritis and coronary arteriosclerosis. He related the replacement fibrosis to the narrowing of the coronary vessels. Inflammatory infiltration of the heart muscle he found only when rheumatic fever or diphtheria had been present.

Coronary arteriosclerosis of some degree is found in 90 per cent of all hearts of patients dying with hypertension. This is a most important finding because it is a powerful contributing factor in the heart failure that follows high blood pressure and helps to explain the scarring of the myocardium so frequently found in cases of hypertension. As the muscle cell hypertrophies its volume increases faster than its surface, because the surface is proportional to the diameter whereas the volume is proportional to the square of the diameter of the muscle fiber. If the metabolism of the fiber is a function of its volume it is evident that the need for oxygen increases faster than the surface of the muscle through which gas exchange must take place. This may place the heart muscle fiber at a disadvantage so far as supplying its oxygen need is concerned unless an increased capillary circulation is developed. A narrowing of the coronary arteries will lead to a reduced blood flow and a reduced supply of oxygen to parts in need of a greater supply, and eventually the fiber may become atrophic or necrotic and disappear from lack of oxygen. Scar tissue is an indication that a portion of the muscle has disappeared and has been replaced by white fibrous tissue.

In my opinion there is another relationship between hypertension and coronary arteriosclerosis that needs to be emphasized. If the number of hearts with some degree of coronary arteriosclerosis is calculated from Bell and Clawson's 420 cases of hypertension, on the assumption that 90 per cent of all cases show some degree of coronary disease, one finds that there were 378 cases of coronary disease directly associated with

From the University of Minnesota Medical School and the Minneapolis General Hospital.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

1 By essential hypertension is meant high blood pressure not due to glomerulonephritis, congenital cystic kidneys, coarctation of the aorta or hyperthyroidism. High blood pressure includes all systolic pressures over 150 and all diastolic pressures over 90 mm of mercury. The hypertension is the primary pathologic factor. Heart failure, cerebral accident and uremia are consequences.

2 Bell, E. T. and Clawson, B. J. Primary Hypertension. Arch. Path. 5:939 (June) 1928.

3 Greenwood, P. Weight of Human Viscera. Biometrika 3:67 1904.

4 Fahr, George. Hypertension Heart, Am. J. Med. Sc. 175:453 (April) 1928.

5 Bell and Clawson² Fahr⁴

6 Clawson, B. J. The Myocardium in Noninfectious Myocardial Failure. Am. J. M. Sc. 188:648 (Nov.) 1924.

7 Aschoff, Ludwig. Die heutige Lehre von den pathologisch-anatomischen Grundlagen der Herzschwäche. Jena 1906.

hypertension In addition, Bell and Clawson's autopsy material showed sixty-nine cases of coronary disease that gave no history of hypertension and the hearts did not weigh enough to be included in the hypertension group But 55.5 per cent of these coronary arteriosclerosis cases showed renal arteriosclerosis It is generally conceded that renal arteriosclerosis is practically never found excepting when hypertension has previously been present From this I conclude that hypertension was present in thirty-eight of these cases of coronary arteriosclerosis Therefore in Bell and Clawson's autopsy material there was a total of 447 (378 + 69) cases of coronary disease, in 416 (378 + 38) of which hypertension was present In other words, 90 per cent of Bell and Clawson's coronary arteriosclerosis material showed evidence of association with hypertension

HYPERTENSION AND CORONARY ARTERIOSCLEROSIS

I have not made a careful and accurate statistical study of my clinical material for information as to the percentage of hypertension present in cases of coronary arteriosclerosis, but a cursory examination of the cards in my index at the Heart Clinic at the University Hospital shows that 83 per cent of all patients had blood pressures over 150 systolic and 90 diastolic Only 50 per cent of the cases of coronary arteriosclerosis were filed directly as coronary arteriosclerosis The other 50 per cent were filed directly as hypertension heart and cross filed as coronary arteriosclerosis The evidence of high blood pressure in the cases filed directly as coronary arteriosclerosis was 67 per cent There is often considerable doubt as to whether a case should be filed as hypertension heart or as coronary disease, and the final decision is somewhat arbitrary The same may also be said of Bell and Clawson's separation of their cases into hypertension cases and coronary cases The remarkable thing is that their anatomic investigation results in the same conclusions as my cursory examination of the clinical records, namely, that coronary arteriosclerosis is associated with hypertension in a very large proportion of cases In his *Textbook of Pathology*, Bell states that 75 per cent of all coronary cases are associated with high blood pressure This agrees well with my analysis giving 80 per cent I think it can conservatively be estimated that 75 per cent of all patients with coronary disease at some time have had high blood pressure

I have been at some pains to emphasize this close relationship of hypertension and coronary arteriosclerosis because I believe it to be of great importance in prognosis and in an understanding of the progress of the disease In patients with hypertension who die of uremia, it is the arteriosclerosis of the small renal vessels that decides the outcome, the state of the cerebral vessels decides the outcome in patients with hypertension who die of encephalomalacia or apoplexy, the fate of the heart in hypertension is also to a very considerable degree decided by the state of the coronary vessels Moreover, it is not infrequently found that the blood pressure falls appreciably and sometimes nearly to normal when an advanced degree of coronary arteriosclerosis develops in a case of hypertension When the patient is seen by the physician the blood pressure may give no evidence of the high values previously present because of the coronary disease and sometimes because of the heart failure Because of their frequent association, hypertension and coronary arteriosclerosis should be considered together

BLOOD PRESSURE

A word must be said about the variability of the blood pressure in hypertension, because it is the high blood pressure that increases the work of the left ventricle and leads to the hypertrophy, dilatation and finally failure of this heart chamber It is rare for the blood pressure to have a steady value in hypertension If one takes the blood pressure from day to day one sees that both the systolic and the diastolic values vary more or less If the patient is put to bed, the blood pressure usually falls some within twenty-four to forty-eight hours In not a few patients with very high blood pressure when up and about, the blood pressure falls to moderate pressures after a few days rest in bed In most persons with hypertension the blood pressure falls somewhat when they are asleep In not a few it falls very considerably and approaches the normal The reassurance of a patient with high blood pressure by a good physician will not infrequently lead to some lowering of the average blood pressure I have already pointed out that the development of coronary disease not infrequently leads to some lowering of the blood pressure Heart failure may also lead to lowering of blood pressure but not invariably There are, however, quite a few exceptions to the general rule that blood pressure in hypertensia varies from day to day and under various external sources of stimulation and under various forms of sedative treatment Many patients retain their high blood pressures despite severe degrees of failure and severe degrees of coronary disease and I have seen pressures of 240/120 up to within one hour of death from severe congestive heart failure

In calculating the work of the left ventricle in hypertensia it is therefore well to keep in mind that the blood pressure falls somewhat during sleep and often during rest in bed Also it is well to keep in mind that the blood pressure often drops not inconsiderably for periods of varying length, thus lessening the fatigue of the left ventricle temporarily The highest blood pressures do not measure the fatigue effect on the left ventricle any more than the lowest pressures do It is the integration of the varying blood pressures over a period of time that measures the effect of hypertension on the left ventricle

It is often said that the diastolic blood pressure is the more important measure in hypertension So far as the work of the left ventricle is concerned, this is not true The work of the left ventricle is measured by the product of the minute volume of blood⁸ and the "mathematical mean" pressure in the root of the aorta during systole When systole sets in, blood is ejected from the left ventricle into the aorta. At the beginning of the ejection the blood pressure in the aorta is the diastolic blood pressure, but within a few hundredths of a second the blood pressure in the root of the aorta rises to the systolic value, at which point it stays as long as blood is ejected from the left ventricle An integration of the blood pressure curve as taken with optical manometers shows that the mathematical mean pressure during the ejection time of the left ventricle is very much closer to the systolic blood pressure than to the diastolic blood pressure, in fact, the blood pressure against which most of the blood is injected into the aorta is very much nearer to the systolic blood pressure than it is to the "arithmetical mean" pressure

⁸ The minute volume is the volume of blood ejected from the ventricle during a minute. In other words it is the volume flow

Therefore the work of the left ventricle in both normal persons and such as have hypertension is approximately proportional to the systolic blood pressures, provided the output per minute is the same.

As the blood pressure rises, so does the work of the left ventricle, however, at first there are no symptoms of fatigue of the left ventricular muscle. The left ventricle must dilate a little according to the "law of the heart" in order to take care of the increased load of

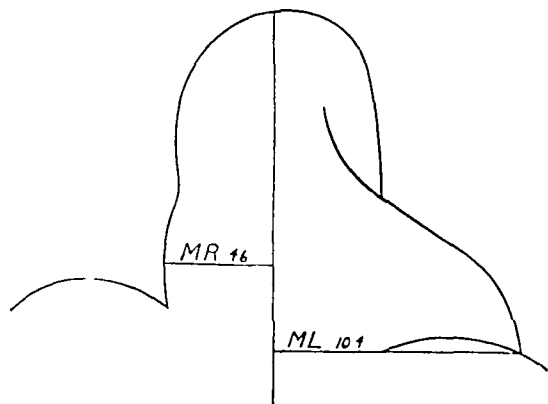


Fig 1—Orthodiagram of heart in case 3. Typical left ventricular dilatation.

work. This physiologic dilatation is only a few millimeters in transverse diameter and is not noticeable on roentgen examination. This physiologic dilatation of the left ventricle takes place at once and is followed later on by a hypertrophy of the left ventricular muscle. Slowly but surely the left ventricle fatigues, and after it has overcome high blood pressure for some years another period of dilatation sets in, which goes on continuously throughout the life of the patient. This dilatation marks the beginning of heart failure. Up to this point there has been compensation for the increased work of the left ventricle through a very slight physiologic dilatation and through hypertrophy. These compensatory mechanisms having failed, increased dilatation must develop.

Even when very high blood pressures prevail, this fatigue dilatation takes place very slowly—usually not as much as 5 mm in transverse diameter in a year, provided there is very little coronary artery narrowing present at the same time. If there is ischemia of the left ventricle consequent to coronary narrowing, this dilatation of the left ventricle takes place more rapidly. As a rule symptoms of congestive heart failure do not develop until there is a very definite left ventricular dilatation present. This left ventricular dilatation produces the typical boot shaped heart (fig 1). Not infrequently the right side of the heart dilates because failure of the left side ultimately increases the work of the right. Moreover, the coronary system to the right ventricle may be narrowing, bringing with it ischemia and failure of the right side. When the right side dilates as well as the left, the x-ray picture corresponds to figure 2. As the heart dilates more and more there are increased signs of congestive heart failure.

SYMPTOMS

Perhaps the first symptom noticed by many patients with a failing heart in consequence of hypertension is an increased tiring at work, a decreased resistance to fatigue. Dyspnea on exertion is also an early symptom.

The dyspnea is consequent to failure of the left ventricle and the accompanying increased venous and capillary pressures in the lungs. Later, rales may appear at the lung bases. As the heart failure increases, edema of the extremities, symptoms of enlarged passive congested liver and cyanosis are added to the symptomatology. Occasionally symptoms of heart failure develop after a severe infection of the upper respiratory tract or other infection. Occasionally severe exertion precipitates heart failure. In some cases the onset of auricular fibrillation brings forth clinical evidence of heart failure. But, even without these precipitating causes, failure of the left side of the heart will eventually develop in all cases of severe hypertension, provided death from some other cause does not intervene before the heart failure develops.

In some cases, attacks of angina pectoris or coronary thrombosis appear. These attacks reveal the presence of coronary disease. Attacks of nocturnal dyspnea are not infrequent in cases of hypertension associated with moderately severe or severe coronary arteriosclerosis. The symptoms of coronary disease may wholly dominate the picture.

Auricular fibrillation is the most common form of arrhythmia found associated with hypertension. When it appears the heart fails rapidly and unless the heart receives competent treatment congestive failure progresses dangerously. Pulsus alternans may be found associated with hypertension some years before congestive failure is present, on the other hand, congestive failure symptoms may come on very shortly after the discovery of pulsus alternans. The electrocardiogram may show only left preponderance or be entirely normal if there is no coronary disease present. The presence of coronary disease is frequently shown on the electrocardiogram by negative Ts, Pardee Q_{III}, depressed ST interval or heart block. On the whole, the symptoms

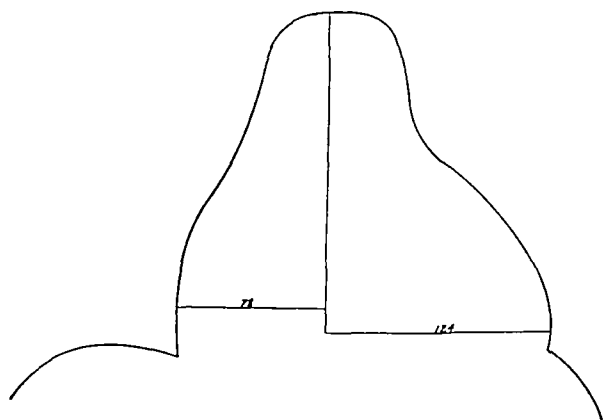


Fig 2—Tracing of six foot heart plate in case of severe congestive heart failure with blood pressure of 220/110 and electrocardiogram showing evidence of coronary arteriosclerosis. Left and right ventricular dilatation the left predominating.

and signs of congestive heart failure in hypertension are the same as in other forms of heart disease, and when coronary disease is associated with the hypertension the symptoms and signs do not differ from the symptoms and signs in coronary disease not associated with hypertension.

LIFE EXPECTANCY

In my opinion the life expectancy in hypertension is much longer than most physicians are accustomed to believe. I have many patients with hypertension now

under observation who have survived from twelve to seventeen years of very high blood pressure. I am inclined to believe that the average life expectancy is from fourteen to fifteen years. Most persons with hypertension do not come to a physician until symptoms develop, and as a rule such symptoms are not manifest until hypertension has been present for some years. I believe that the short life expectancy found by Blackford in his series is due to the fact that many of his patients had been symptom free with hypertension for years and came to his clinic only after symptoms had developed. Rarely does hypertension produce symptoms of heart failure, renal insufficiency or cerebral disease until it has been present for a number of years. Persons with hypertension are usually vigorous and well for years until the three well known sequelae develop in the heart, brain or kidney. The left ventricle stands up wonderfully under the increased load of work day in and day out. The presence of coronary disease cuts down the time before heart failure intervenes, but even with coronary disease present the left ventricle is equal to its increased task for many years. The following three cases will illustrate this. I do not believe that these cases are very exceptional. I have other cases of high blood pressure of twelve to seventeen years' standing that might have been used for illustration, but these three cases have very full records over a long period of time and in addition the first two have autopsy examinations to supplement the histories.

REPORT OF CASES

Patient 1 was found to have a blood pressure of 220 systolic in April 1912. At that time he was very nervous and showed a trace of sugar in the urine. When he was sent to a celebrated consultant because of the glycosuria, it was discovered that he did not have diabetes but that he had high blood pressure. Since that time he has been examined frequently. His blood pressure has been found as low as 170 systolic on two occasions, once after a long vacation and then in November 1933, a month before he died and at a time when he was resting in bed. His blood pressure was usually found to be from 210 to 230 systolic and from 115 to 130 diastolic. I have found the systolic as low as 190 on a few occasions but a day or two before or after this it would be above 200. The patient was known as a very hard worker. He was active as president of a bank and as president of a merchandising business at the time of his death. He never played golf or took part in organized sports. Yet he was accustomed to walk at a good pace every day up until shortly before he died. In 1925, after thirteen years of high blood pressure, he ran a third of a mile to a fire in a block in which he had his business. Although quite dyspneic, he suffered no other ill effects from this exertion. Only two months before he died he played vigorously with his youngest grandson, following which he stated that he was getting too old for such vigorous exercise and that his wind was gone. He was accustomed to drink wine nearly every day and throughout a large part of his life smoked from eight to twelve cigars a day. The last eight years of his life he noted some shortness of breath on walking rapidly and climbing stairs. His heart showed a slow progressive left ventricular dilatation. Two months before his death the transverse diameter was 16 cm on the six foot heart plate. The transverse diameter for a man of his height and weight is 13.5 cm. Rales were heard at both lung bases and the liver was found just below the right costal margins on several occasions during the seven years preceding his death. Pulsus alternans was found on one occasion about seven years before his death. He fell and fractured his arm in October 1933. He had had one mild stroke a few weeks previously and the fall was undoubtedly in consequence of a cerebral accident. He never recovered after his fall. His sensorium became cloudy and he passed away in November 1933. Autopsy

revealed extensive cerebral arteriosclerosis with moderately extensive encephalomalacia. The lungs showed no signs of edema. The liver was not passively congested on gross examination. The heart weighed 370 Gm and showed very little arteriosclerosis of the coronary arteries. These arteries were wide open on all sections. There was no gross scarring of the muscle. The patient lived twenty-one years with a very high blood pressure. He died from softening of the brain with no demonstrable hypertrophy of the heart muscle and no demonstrable signs of heart failure on gross examination of the organs at the time of his death. He had mild symptoms of heart failure the last seven years of his life but he did not die of heart failure even after twenty-one years of high blood pressure. If he had had moderately severe narrowing of his coronary arteries he would surely have developed severe heart failure and probably would have died many years sooner.

Patient 2 entered the University Hospital in 1917 with a blood pressure of 230/100. She came in because of severe headaches and interstitial nephritis was diagnosed at that time. She was in the University Hospital four times and in the Minneapolis General Hospital four times between 1917 and 1934. During the same period she visited the University Dispensary two or more times every year. Her systolic blood pressure had never been known to be under 200 mm of mercury in all these years. It had usually been from 220 to 230 during the twelve years that I have taken care of her. The diastolic pressure had not been under 100 in seventeen years, and during the twelve years that I have taken care of her it had always been between 110 and 130. My orthodiagraphic examinations showed a slowly progressing dilatation up to 1928. The transverse diameter of the heart was then 16 cm. The normal transverse diameter for her height and weight is 12.5 cm. At this time she had dyspnea on climbing stairs and some pitting edema. In 1932 the six foot plate taken at the Minneapolis General Hospital showed a transverse diameter of 15.9 cm. Moreover she had no clinical symptoms of heart failure any more. She was frequently in bed for long periods from 1931 to 1934 because of her mental condition. This bed rest probably accounts for the recession in heart failure symptoms and in transverse cardiac diameter. In 1930 she had a left hemiplegia and in 1931 symptoms of cerebral arteriosclerosis developed. Her memory became poor, she had transient attacks of aphasia, she was very irritable, and she had many crying spells and often fits of rage. She became very emaciated in 1934 a few months before she died. In 1934 she died. The autopsy revealed a heart weighing 310 Gm. According to the autopsy report of Dr. N. H. Lufkin, there seemed to be a definite hypertrophy of the left ventricle, the thickest portion of it being 2 cm. The left coronary artery in its proximal fourth showed occasional concentric thickening due to atherosclerosis without severe closure of the lumen. After its bifurcation the deeper branch was found to be quite free from thickening of any type while the more superficial branch in the middle fourth and again terminally became rather severely narrowed to half its normal diameter by concentric thickening. The lumen of the circumflex branch was normal in its proximal portion but from its midportion narrowed to one-fourth or one-fifth its normal caliber by concentric thickening. The right coronary artery was concentrically thickened in all portions. Nevertheless it was dilated to nearly twice its normal caliber and even the terminal portions seemed to be of greater than normal capacity. There was moderate patchy fibrosis of the myocardium over the basal portion of the left ventricle posteriorly in the region supplied by the circumflex branches of the left coronary artery. There was one patch of fibrosis near the tip of the left ventricle close to the septum. This was approximately 1 cm in diameter. The kidneys were small and had finely granular surfaces. The cut surfaces showed slight though definite narrowing of the cortices. The brain showed severe diffuse atherosclerosis of all the large arteries at the base. Serial sections of the brain revealed irregular and scattered areas of softening throughout the brain. Autopsy revealed no signs of heart failure, only a moderate degree of arteriosclerotic kidney but a severe degree of focal encephalomalacia, which was the cause of the patient's death.

Patient 3 is now 57 years of age. She was told by her physician in 1919 that she had a very high blood pressure. She had gone to him on account of frequent and severe nosebleeds. In January 1920 she entered the University Hospital, where her blood pressure taken on entrance and throughout a three weeks period of rest in bed was 220/120. On one occasion during the hospital stay the diastolic pressure was measured at 152. She was seen by a private physician for two years, during which time her blood pressure was around 220 systolic and 110 diastolic. I saw her for the first time in 1922 in the University Dispensary. At this time her blood pressure was 240/120. Since then I have seen her at least twice a year, usually much more frequently. Gradually in the course of thirteen years her blood pressure has risen to about 260/140, with some values of 270/150 on the case record. I have had the patient in the University Hospital twice for long periods of observation. Her blood pressure did not fall during sleep. Long rest in bed does not lower it. She has been on an extremely small daily salt intake and on most of the other measures recommended for lowering blood pressure without any effect. In 1928 she had very mild symptoms of beginning heart failure, such as tiring easily and a mild degree of dyspnea on climbing stairs. At this time the transverse diameter of her heart on the orthodiagram was 14 cm. Now in 1935 with a transverse diameter of the heart of 15 cm (Fig 1) and after sixteen years of extremely high blood pressure she complains of considerable dyspnea on climbing stairs. Recently I walked with her at a fair pace and found that she developed little or no dyspnea. She has worked very hard at her housework until the last three years. She still does all her own housework, but this she states is not very hard since her last son left for a home of his own. She notices that she fatigues easily. She has occasional attacks of numbness in the fourth and fifth fingers of her left hand. This numbness radiates up the inner aspect of the left arm to the neck. This angina pectoris equivalent corresponds to an electrocardiogram with a deeply inverted T in lead 3. There are no signs of heart failure, such as rales in the lung bases or enlarged tender liver at this time. There is a very slight edema along the shin bones, but this could easily be explained by the varicose veins that are also present. After sixteen years of very high blood pressure there is only a mild degree of heart failure present and no measurable renal insufficiency.

COMMENT

These patients developed symptoms and signs of heart failure only after many years of high blood pressure. Heart failure might have developed sooner if they had been compelled to perform severe physical exertion. One can see that the frequent periods of bed rest enforced in case 2 after 1931 tended to cause the symptoms of heart failure to disappear and tended to cause a slight reduction in the dilatation of the heart. This shows that decreasing the physical exertion in hypertension tends to prolong the period during which failure is developing. On the other hand, the first patient was known throughout his life as an exceptionally active man and the circumstances of life as well as inclination tended to cause the two women to do more than the average amount of work for an American woman. I think they can be considered average cases in most respects.

TERMINOLOGY

Heart disease consequent to high blood pressure is still called chronic myocarditis by many physicians despite the fact that neither careful clinical study nor competent pathologic investigation gives it any support. I object strongly to this name, because it suggests that infection and inflammation are prominent factors in the production of this form of heart failure, an assumption for which there is no good evidence. In former years, cases of hypertensive heart disease were not infrequently diagnosed mitral insufficiency because of

the presence of the loud systolic murmur that often accompanies dilatation of the left ventricle. This name is also misleading because it suggests that a valvular insufficiency is the cause of the heart failure, whereas relative mitral insufficiency is a result rather than a cause of the heart failure. Other physicians call this condition cardiorenal disease. This name is objectionable because the word renal is equivocal and suggests glomerulonephritis, renal insufficiency, uremia and a host of other factors that may be but usually are not associated with the kind of heart disease I am discussing in this paper. In Munich, where many of the inhabitants drink enormous quantities of beer, this form of heart disease was often called "bier-herz," and in Tübingen it was not infrequently diagnosed "Tübingen wein-herz" when found in a vintner who was supposed to consume quantities of wine and carry heavy loads up the hills where the vineyards are located. There is no justification for any of these names at the present time and it would be well to emphasize the relation of this type of heart disease to hyperpiesia by terming it "hypertensive heart disease" or "hypertension heart."

TREATMENT

The therapy of the heart in hypertension does not differ from the therapy of congestive failure of other origin. I have treated this subject quite thoroughly in a previous paper and will refer to that paper for a discussion of the therapy of the heart in hypertension. At present I am inclined to use somewhat larger doses of theophylline ethylenediamine or aminophylline to dilate the coronary arteries than were recommended in that paper, 0.2 Gm four times a day being the usual amount that I now prescribe.

CONCLUSIONS

- 1 Fifty-five per cent of the appalling death rate consequent to essential hypertension is due to heart failure. Moreover, heart failure of some degree is nearly always present in cases of essential hypertension in which death occurs in uremia or from apoplexy or cerebral softening.

- 2 The heart in hypertension shows left ventricular hypertrophy and dilatation with varying grades of replacement scarring in the muscle. There is some coronary arteriosclerosis present in 90 per cent of the cases. The coronary narrowing is responsible for the scars found in the heart muscle.

- 3 A very high percentage of patients with angina pectoris and coronary arteriosclerosis have high blood pressure complicating the cardiac picture.

- 4 Hypertension and coronary arteriosclerosis are so intimately and frequently associated that they should be considered together and the term "hypertensive heart disease" or "hypertension heart" should connote coronary involvement.

- 5 What has been termed "chronic myocarditis" is usually the result of high blood pressure and coronary artery disease and not the result of infection.

- 6 Heart failure in the clinical sense does not develop in hypertension until many years (from ten to twelve) have passed unless the coronary disease accompanying the high blood pressure becomes very severe or unless some other cardiac complication is present. Many patients with hypertension live fifteen years or more and finally die of one of the other consequences of hypertension, though some degree of heart failure may have been present previously or at the time of death.

THE REHABILITATION AND PLACE-
MENT IN INDUSTRYOF THOSE HANDICAPPED WITH CARDIOVASCULAR
DISEASEWILLIAM D STROUD, MD
PHILADELPHIA

Owing to the results of the World War, organization for training the handicapped and placing them in industry of necessity has progressed much more rapidly in Europe than in this country. In most European countries, during the past seventeen years, it has become a national obligation. In Germany they have gone so far as to regulate legally the training and placing of the handicapped, demanding that 2 per cent of all positions in various industries must be filled with individuals at least 50 per cent disabled.¹ I first became interested in this problem while working in England during the years of 1919 and 1920. One day at luncheon, Sir Thomas Lewis remarked that "in the ideal state, no position in industry which might be filled by a person handicapped with cardiovascular disease should be filled with an entirely healthy individual." This, of course, is a strong statement but is certainly worthy of careful consideration.

The majority of the handicapped who may be rehabilitated and placed in industry are those with cardiovascular, arthritic and orthopedic disabilities. Various studies of the numbers of handicapped individuals and vital statistics would suggest that by far the largest group of such handicapped individuals trainable and available for industry is the cardiovascular group.

One of the first and most practical steps in planning for the training and placement of those handicapped with cardiovascular disease was the advocacy of a functional classification of cardiac patients that might be practical from the standpoint of the social service worker, those administering state and city rehabilitation bureaus, and employers in industry. The Heart Committee of the New York Tuberculosis and Health Association has recommended the following functional classification of patients with organic heart disease.²

Class I Patients with organic heart disease, able to carry on ordinary physical activity without discomfort.

Class II Patients with organic heart disease, unable to carry on ordinary physical activity without discomfort

A. Activity slightly limited

B. Activity greatly limited

Class III Patients with organic heart disease, and with symptoms or signs of heart failure when at rest, unable to carry on any physical activity without discomfort.

Class E Possible heart disease. Patients who show abnormal signs or symptoms referable to the heart but in whom the diagnosis of heart disease is uncertain.

Class F Potential heart disease. Patients without circulatory disease whom it is advisable to follow up because of the presence or history of an etiologic factor that might cause disease.

The greatest difficulty in such a movement is the fear in the minds of the employers as to the result of the workmen's compensation act and the possible draining of sick benefit funds, if cardiac patients are given work and then break down in their employ. It is

notoriously difficult to state positively that almost any occupation may not have contributed in some slight degree to the progression of a cardiovascular lesion that has finally ended in heart failure or sudden death. During the past few years I have given expert testimony in such cases before a compensation board referee and I have been impressed with the marked difference in various states as to the standards on which compensation board referees make their decisions as to the relationship of cardiovascular disease to sudden death. In Pennsylvania a man while filling a bucket at a marble hopper suddenly fell, striking his head on the edge of the marble hopper. He died within a few minutes and the coroner's diagnosis as to the cause of death was coronary thrombosis. The family was awarded compensation for accidental death, since the referee decided that if the man had not struck his head against the marble hopper as he fell, the coronary thrombosis might not have killed him!

TABLE 1—Ten Leading Causes of Death in New York City,
1875-1930 *

| 1875 | | 1895 | |
|-------------------------|-------|--------------------|-------|
| All causes† | 28.25 | All causes | 24.76 |
| Pulmonary tuberculosis‡ | 373 | Tuberculosis (all) | 392 |
| Diarrhea (under 5)§ | 316 | Diarrhea (—5) | 257 |
| Diphtheria | 294 | Pneumonia | 247 |
| Pneumonia | 242 | Diphtheria | 146 |
| Smallpox | 124 | Heart | 123 |
| Violence | 99 | Violence | 95 |
| Heart | 93.5 | Nephritis | 87 |
| Nephritis | 59 | Cancer | 51 |
| Scarlet fever | 54 | Scarlet fever | 45 |
| Cancer | 41 | Typhoid | 27 |
| 1900 | | 1930 | |
| All causes | 18.32 | All causes | 10.70 |
| Pneumonia | 246 | Heart | 244 |
| Tuberculosis (all) | 238 | Diarrhea (—5) | 157 |
| Nephritis | 147 | Cancer | 116.5 |
| Diarrhea (—5) | 145 | Pneumonia | 115.0 |
| Heart | 144 | Violence | 81.8 |
| Violence | 109 | Tuberculosis (all) | 73.1 |
| Cancer | 73 | Arterial disease | 56.7 |
| Diphtheria | 38 | Nephritis | 41 |
| Typhoid | 16 | Diabetes | 25.0 |
| Scarlet fever | 12 | Appendicitis | 15.9 |

* This table was compiled by the Metropolitan Life Insurance Company of New York.

† Death rates from all causes are per thousand of population.

‡ Death rates from tuberculosis and other causes except diarrhea are per 100,000 of population.

§ Death rates from diarrhea under 5 years of age are based on the population under 5.

In the District of Columbia a man who for many years had placed fruit on a display stand of a fruit store and piled potato sacks in a corner developed a pain in his chest while lifting one of the potato sacks. He went home and went to bed. A few days later he developed evidence of congestive heart failure. A physician examined him and found a plus four Wassermann reaction, evidence of syphilitic cardiovascular disease with aortic insufficiency and congestive heart failure. Six months later the patient died, never having sufficiently recovered to arise from his bed. The referee awarded compensation to the family, since he decided that the lifting of the potato sack was a contributing factor in the development of the heart failure, in spite of the fact that his work the day of the so-called accident was no different than on any other day during the past few years.

In West Virginia a mule driver in a mine helped his mule by pushing a small coal car over a small incline. A few minutes later he developed an agonizing epigastric and anterior chest pain. He died a few minutes later, and the coroner's diagnosis as to the cause of death was coronary thrombosis. The compensation

This work has been done through the Robinette Foundation of the University of Pennsylvania and the M. W. Stroud Jr. Fellowship in Cardiology of the Pennsylvania Hospital.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

1 From an unpublished report by Mr. Sherman C. Kingsley.
2 Adopted and distributed by the American Heart Association, Inc., 50 West Fiftieth Street, New York.

board referee decided against awarding compensation to the family, since helping the mule at times was part of his ordinary duty in the place where he worked.

Until there is some uniformity in the workmen's compensation act in the various states, and some uniformity in the interpretation of the act by the various

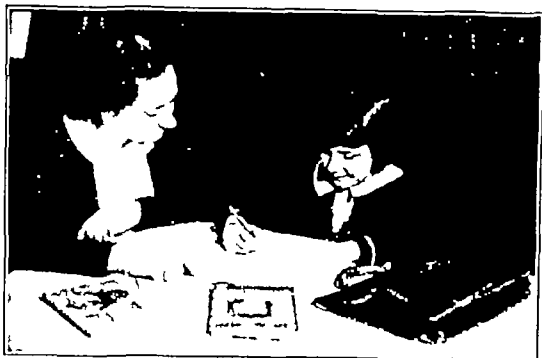


Fig 1—A. L. aged 9 years. Home education. Rheumatic fever (arthritis), enlargement of the heart, mitral stenosis and insufficiency aortic insufficiency sinus arrhythmia, class 2B. This little girl went to school for only two days. Later she was taught in the Children's Heart Hospital. She was not able to return to school and when the visiting teacher made her first contact she found a 9 year old child who could read only at the first grade level and could not do better than 2A work in any subject. She had a great fear of returning to school because she was so far behind. In five months she has completed a year's work in the fundamental subjects and looks forward with pleasure to returning to school next September. Referred by Philadelphia Heart Association.

referees and courts, it will be a difficult matter to persuade employers to accept individuals handicapped by cardiovascular disease.

During the past twenty years the medical profession has learned that, in spite of valvular disease, many individuals can perform the average type of work without materially impairing their health or shortening their lives. The realization by the medical profession that infections appear to play a larger part in cardiac failure and the progression of cardiac disease than does physical effort should aid in the placement of cardiac patients in industry, if this impression, through public

health education, can be passed on to the employer and the general public.

TRAINING IN SHELTERED WORK SHOPS³

In the sheltered work shop of the Philadelphia branch of the Shut-In Society and Vocational Adjustment Bureau for the Handicapped, which is financed by the Welfare Federation of Philadelphia, in three years' time



Fig 2—W. C. C. aged 60. arteriosclerosis cardiac enlargement and coronary sclerosis normal sinus rhythm class 2B. This man was a World War veteran and was unable to procure employment for many years. He had vocational training at home for several years before his death. The occupational therapist trained him to make hooked rugs. He became quite an expert at this and the organization was able to dispose of them for him.

there have been twenty-six persons with heart conditions classified from 2A to 2B. They worked at carpentry, machine and hand sewing, upholstery, and general work about the place.

In the machine and hand sewing department there were ten who worked six hours a day. They were paid

³ Statistics supplied by Miss Ann Laws Calley, executive secretary of the Philadelphia branch of the Shut-In Society and Vocational Adjustment Bureau for the Handicapped.

from 75 cents to \$1.68 a day and furnished milk for lunch. In the woodworking and upholstery departments fifteen persons worked from three to five days a week from five to seven hours a day. One worked at part time cleaning. They received from \$1 to \$2.80 a day. These persons accomplished a good normal day's work in these departments. There were no deaths and no accidents while at work. In a year two persons, both women, fainted and were treated in the rest room. Of these twenty-six cardiac patients, two have died as a result of their heart condition, but this was at home under ordinary circumstances. We have not been successful in placing any cardiac patients in industry through the Rehabilitation Bureau, but this I believe is due to the inefficiency of the local bureau and the present unemployment situation.

One patient who worked in the shop had progressed into a fine full time worker. Owing to lack of work she was placed on part time. With this extra time at home, she tried to take on the activities of other girls of her own age and is now in the hospital with a reaction of her rheumatic fever.

One hundred and ninety-five persons with heart conditions are known to our organization. Of this number



Fig 3—N. D. aged 19. rheumatic fever cardiac enlargement and mitral insufficiency normal sinus rhythm class 2A. Began working in the woodworking department seven hours a day Oct. 31, 1934 at \$5 a week. Total wages \$53.58. Total time worked three months. This young man is the only one employed in his family. He was very eager to work even though it was not possible to pay him a larger salary. He was very much interested in the work and did it very well.

fifty-seven could be employed if work were available, fifty are not employable and eighty-eight are under 16 years of age.

PLACEMENT OF CARDIAC PATIENTS IN EMPLOYMENT⁴

The placement of cardiac patients in suitable employment was carried on successfully from 1926 to 1932 by the Philadelphia Heart Association through a cooperative arrangement with the Philadelphia Health Council and Tuberculosis Committee. The entire placement service included persons with arrested tuberculosis as well as heart patients, but I shall speak only of the heart patients who were placed.

During the seven years from 1926 to 1932 a total of 280 heart patients were placed in employment, some of them more than once, so that a total of 388 jobs were filled by these patients. During the first three years of this service, no effort was made to ascertain the amount earned by the cardiac patients who were

⁴ Statistics supplied by Mr. Harvey Dee Brown, executive secretary of the Philadelphia Health Council and Tuberculosis Committee.

placed. But from the years 1929 to 1932 the earnings of heart patients placed by the service amounted to upward of \$90,000.

During the time of the service twenty-two heart patients were placed in training, fifteen of whom had completed the training or were still carrying it on in December 1932. This work was then transferred to the State Bureau of Rehabilitation in 1933 and is being continued by the bureau.

The applicants for placement were referred from the twenty-one heart clinics of Philadelphia and by private physicians. Each applicant had a medical examination and a diagnosis card filled out by the referring physician. The diagnosis included etiologic, anatomic and physiologic factors, a functional classification and an indication of the work tolerance of the applicant in terms of the activities he would normally undertake. A statement of the applicant's limitations regarding stair climbing, standing, stooping, weight lifting and walking was included. In addition to this report, each applicant was studied individually by the social service worker in charge of this placement service, as to his employment history, his mental attitude and his abilities as a worker. Each presented an individual problem.

Finding employment for the applicants required persistent interviewing of employers. All sections of the city were included so as to place the applicants in work near their homes and reduce travel if possible. In order to get an idea of safe jobs in factories, as well as of the physical conditions existing in the plant, visits were made to various parts of the plants.

Few employers desire persons below par physically even for the simplest jobs. All placement work of handicapped persons requires persistent solicitation of the employers. They must be told that persons whose physical condition has been determined by an examination can be placed in suitable work and prove to be a definite asset. It is pointed out also that physically



Fig 4—J. T. a cardiac patient engaged in machine and true hand sewing. Referred by the Pennsylvania Hospital. Rheumatic fever, cardiac enlargement, mitral insufficiency, mitral stenosis, regular sinus rhythm, class 1.

handicapped workers, when properly placed, are usually permanent and faithful, since they appreciate having a job. The fact that a continuous follow up after placement is stressed which insures that the worker will not be allowed to remain on the job unless he can safely do so is pointed out. These arguments ordi-

narily reduce the employer's objections. Often after a handicapped person has been placed and proves to be a successful worker, calls are made for another handicapped worker.

A single illustration from the records of this service shows the value of this work. Rocco C. is a boy who had started to learn the plumber's trade. As it involved

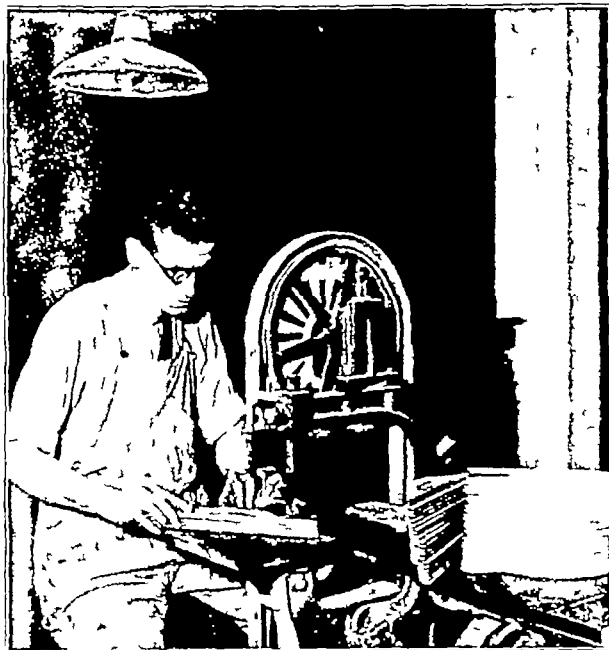


Fig 5—R. B. aged 50 years, a cardiac patient engaged in wood working. Rheumatic fever, mitral stenosis and insufficiency, normal sinus rhythm, class 2A.

a great deal of physical strain, which was showing its effect on his damaged heart, his physician insisted that he give it up. After Rocco had been seen and some idea of his capabilities had been obtained, he was sent to talk with the superintendent of a leather goods factory. This factory makes high grade leather purses, hand bags and toilet cases. Although the superintendent had said he would not be able to take on any beginners then, after talking with Rocco he employed him to begin the following day. Since then Rocco has had his troubles at home, as his father was out of work for some time, and much pressure was brought to bear to make him leave and get a job paying more money. This, however, he refused to do. Rocco has since had a raise, and the superintendent reports that he takes an interest in his work and is getting along nicely. Rocco's frequent correspondence corroborates this statement. His physical condition is satisfactory as reported by the clinic physician.

POSSIBILITIES FOR EMPLOYMENT IN INDUSTRY⁵

In the study of employment possibilities for the physically handicapped in Philadelphia industry, the occupations suitable for general cardiac patients have been defined by the following restrictions:

Generally good working conditions as to ventilation and comfort, without special hazard of materials, machinery, electricity and so on.

Light work requiring no rapid movements of the body.

A minimum of nervous tension such as may be attendant on intensive production methods or the operation of high speed machinery.

⁵ Statistics supplied by Mr. F. W. Steuber working for the Philadelphia branch of the Pennsylvania State Bureau of Rehabilitation.

COMMENT

No subdivisions of cardiac cases have been considered. It appears that the restrictions of work as given are sufficient to allow for the majority of patients not actually unemployable.

It will be noted that this study is not primarily concerned with the individual's disability but with the jobs that can be performed by the general class of those so handicapped.

TABLE 2—*Vocational Possibilities for Heart Patients*

| Skilled Labor | |
|---|--|
| Woodwork | Electrical construction |
| a Cabinet making | a Wiring signs |
| b Novelty—small toys jig saw puzzles, bag tops small weaving frames | b Radio work |
| | c Assembling electric cords and the like |
| Textiles | Mechanical drafting |
| a Chemistry | a Making and filing blue prints |
| b Weaving | b Architectural planning |
| c Designing | Commercial art |
| Commercial work | a Advertising |
| a Stenography and typewriting | b Poster making |
| b Filing and indexing | Designing |
| c Telephone operator | a Jewelry |
| Handiwork | b Clothes |
| a Basketry and caning | c Wallpaper linoleum |
| b Fine sewing | Vocational music |
| c Quilting | a Playing an instrument |
| d Hooked rug making | b Teaching an instrument |
| e Leather art | Librarian (no lifting of heavy books) |
| f Monogramming | Dressmaking |
| g Embroidery | Millinery |
| Jewelry | Hairstressing |
| a Polishing | Tailoring |
| b Engraving | Shoe cobbling |
| c Filing | Necktie cutting |
| d Soldering | |
| e Carding | |
| Unskilled Labor | |
| Factory Work* | |
| a Packing and dressing dolls painting faces making dolls clothes | |
| b Lining trays and drawers riveting small parts in trunk factory | |
| c Stripping and packing tobacco | |
| d Finishing running ribbons packing in garment factory | |
| e Packing in any factory where objects handled are not heavy | |
| Errand boy | Clerical work filing |
| Office boy | Kitchen work in hotels |
| a Stamping | |
| b Labeling | |
| c Sorting slips | |
| d Folding posters | |

* If a factory has signed an NRA code it may not employ any children under 16 but the labor law has not yet been changed.

In the pursuance of this study, 40,000 workers have been more or less directly observed in the performance of 1,000 different operations in twenty-five industries. Since these operations at present employ as many more workers not observed and the total grows to 115,000 in normal times—about half of the 200,000 odd normally employed in manual work in Philadelphia industries, when common labor and the higher brackets have been excluded—the coverage is considered sufficient to represent the whole. The data gathered during the study of these operations from the standpoint of performance of the specifically handicapped has been tabulated on the basis of possibilities per thousand workers in each industry. For the cardiac classification, the data are given in table 3.

The large variations among the industries reflect primarily the differences in the character of the work. In some cases, notably hat and cap manufacturing, the influence of a strict medical examination of employees is paramount. It must also be admitted that the individual making the study has had an influence in some cases, though these men have all been engineers with industrial experience.

A number of other industries have been covered without tabulations having been made. The general

showing bears out the figures of the tables, indicating that 25 per cent of all jobs in industry are possible of performance by this class of handicapped person without compromising either the job or the job holder.

CONCLUSIONS

1 Vital statistics suggest that individuals with cardiovascular disease comprise as large a group, if not the largest group, of persons with physical handicaps.

2 It seems questionable whether physical effort is responsible for the production of cardiovascular disease or plays as large a part in the progression of cardiovascular disease as has been previously believed. If this is true, the training of cardiac patients and their placement in industry constitute as great a responsibility for the physician as any other form of therapeutics—in fact, in class 1 and 2A cases a much more important responsibility than medication or other forms of therapy.

3 With proper functional classification by private physicians or physicians in heart clinics, with especially trained placement workers in city and state rehabilitation bureaus, cardiac patients in much larger numbers than previously recognized may earn a living through

TABLE 3—*Possibilities for Employment of Cardiac Patients in Philadelphia Industry**

| Industry | Probable Number per 1 000 | Normal Employment | Number of Cardiac Patients Employable in Normal Times |
|---|---------------------------|-------------------|---|
| Storage battery manufacturing | 56 | 4,500 | 2.2 |
| Radio set manufacturing | 607 | 13 900 | 9,200 |
| Hat and cap manufacturing | | 6 000 | |
| Glass manufacturing and processing | 144 | 1,200 | 173 |
| Milk distribution | 25 | 4 000 | 112 |
| Ball bearing manufacturing | 164 | 1 400 | 220 |
| Knit goods manufacturing | 245 | 6 000 | 1 400 |
| Hosiery manufacturing | 230 | 18 000 | 4 140 |
| Garage service | 680 | 5 000 | 3 400 |
| Machine tool manufacturing | 430 | 2 000 | 870 |
| Printing and publishing | | 12,000 | |
| Drug manufacturing | 678 | 1 000 | 678 |
| Paper manufacturing | | 1 000 | |
| Recording instrument manufacturing | 840 | 1 500 | 1,260 |
| Leather tanning and dyeing | | 3,500 | |
| Gear manufacturing | 268 | 500 | 134 |
| Mall order industry | 248 | 3,000 | 744 |
| Cigaret and cigar manufacturing | 1 | 6 100 | 6 |
| Paint manufacturing | | 2,000 | |
| Sugar refining | 892 | 1 100 | 431 |
| Shoe manufacturing | 153 | 3,500 | 530 |
| Bakery industry | 322 | 6 000 | 1 932 |
| Confectionery manufacturing | 506 | 3,900 | 1 619 |
| Sporting goods manufacturing | 940 | 600 | 568 |
| Laundry industry | | 5 000 | |
| | | 113,300 | 27 764 |
| These are separated into six classes For 1 000 in each class the figures are | | | |
| Men | | | |
| Novice | 810 | 9 600 | 2,960 |
| Trained | 169 | 16,200 | 2,576 |
| Skilled | 144 | 45,000 | 6,480 |
| Women | | | |
| Novice | 470 | 7 900 | 3 784 |
| Trained | 270 | 22,500 | 6,156 |
| Skilled | 483 | 11 800 | 5,690 |

* Table prepared by Mr. F. W. Steuber working for the Philadelphia branch of the Pennsylvania State Bureau of Rehabilitation.

training in sheltered work shops with ultimate placement in industry, or, if previously trained, through direct placement in industry.

4 If common labor is divided into two classes, namely, light labor and heavy labor, almost 100 per cent of cardiac patients, except those in class 3, are employable at light labor.

5 To accomplish such rehabilitation and placements, it is necessary to obtain the interest of the medical pro-

fession and to impress physicians with their responsibility toward the handicapped, and the necessity of cooperating with the social service workers, especially trained placement workers and city, state and county rehabilitation bureaus. Employers should be carefully approached and educated. Finally, and perhaps most important of all, is the sympathetic handling of the unfortunate individual handicapped by cardiovascular disease.

1011 Clinton Street

A CRITICAL ANALYSIS OF HEART DISEASE MORTALITY

O F HEDLEY, MD

Passed Assistant Surgeon, U S Public Health Service
PHILADELPHIA

The statement that heart disease is the leading cause of death has become almost axiomatic. Despite the voluminous literature that has been developed regarding heart disease mortality, most of the writers have been uncritical of the sources from which such information is obtained and of current practices in compiling vital statistics. My purpose in this article is to discuss frankly the accuracy with which deaths from cardiac diseases are reported and to appraise present-day methods of computing heart disease mortality statistics. I shall show that the official system of tabulating heart disease mortality is not keeping pace with well established advances in clinical medicine and offer suggestions for improving it.

HOW ACCURATE ARE HEART DISEASE MORTALITY STATISTICS?

To determine the present status of heart disease mortality statistics, a study was made of deaths attributed to heart disease in Washington, D C, during 1932 by analyzing death certificates filed in a routine way throughout the year. It was obviously impossible to ascertain the accuracy of the entire number of deaths listed as being due to heart disease. Through the courtesy of every hospital in the city, permission was obtained to review intensively the clinical records not only of fatal cases officially recorded as heart disease but also of deaths listed under other titles, to determine the possibility of heart disease playing a role in the fatal termination. It is with the deaths occurring in hospitals that this paper will largely deal, although references will be made to deaths attributed to heart disease occurring in the city at large.

There were all together 1,631 deaths listed in the office of the registrar of vital statistics as being due to heart disease, 416 of which were reported from hospitals (table 1). In sixty-six instances the clinical records could not be used because of insufficient evidence, these described deaths occurring en route or within twenty-four hours after admission. There remained 350 deaths attributed to heart disease with clinical records sufficiently complete to determine whether the deaths were due to heart disease, and, if so, the etiologic factors in most cases.

On review of the records it was found that in seventy-one instances, or slightly over 20 per cent, the clinical records indicated that the cause of death was due to conditions other than heart disease. Of the deaths recorded as heart disease but found to be due to other diseases pulmonary tuberculosis occurred most frequently, cerebral hemorrhage came second and malignant conditions third (table 2). Of these seventy-one deaths the actual cause was determined by necropsy in thirty-four instances. It should be noted that the list included no deaths from senility or borderline cases of nephritis or similar conditions in which the cause might reasonably be considered due to heart disease or to the other condition.

The etiologic factors involved in these 450 fatal cases of heart disease included arteriosclerosis and hypertension in 61.4 per cent, rheumatic infection (active and inactive) in 13.3 per cent, syphilis in 12.0 per cent, bacterial endocarditis and pericarditis in 4.7 per cent, congenital malformations in 2.0 per cent, thyrotoxicosis in 1.3 per cent, cor pulmonale in 0.4 per cent, tuberculous pericarditis in 0.2 per cent and undetermined etiology in 4.7 per cent. These percentages approximate quite closely those of numerous other workers dealing with both clinical and necropsy material. A more detailed account of these observations with special emphasis on the differences in etiologic factors in the races and sexes has been made the subject of another article now in course of publication.¹

The extent to which heart disease mortality was recorded as heart disease varied considerably with the different etiologic categories. Only 64.5 per cent of the arteriosclerotic-hypertensive forms of heart disease were so tabulated. Of the deaths from rheumatic heart disease, only 60 per cent were so listed. Of the deaths from syphilis of the thoracic aorta and heart, only 51.8 per cent were included under heart disease. The deaths from subacute bacterial endocarditis were recorded as heart disease in 85.7 per cent of instances, the highest of any etiologic type (table 3). None of the nine deaths from congenital heart disease were incorporated into the mortality statistics as heart disease, and only one of five deaths from thyrotoxic heart disease was so tabulated.

Furthermore, there was no relation between the etiologic factors and the recorded causes of death. Thus, of the forty-eight deaths attributed to chronic endocarditis, nine were due to arteriosclerotic changes, twenty-one to rheumatic infection, thirteen to syphilis, four to bacterial endocarditis, and one to heart disease of undetermined etiology. With the present system of tabulating heart disease mortality an attempt is made to group arbitrarily quite dissimilar clinical and pathologic conditions. The result is that, in each of the titles and subtitles into which deaths from heart disease are catalogued, diseases are included that have no relation to one another.

Referring to table 3, it should be noted how frequently deaths from heart disease are recorded as due to the conditions etiologic of it. This is due to the trend toward diagnosing heart disease along etiologic lines. If mention is made on death certificates of causative factors, they are not tabulated as heart disease, if reported as organic heart conditions, no consideration is given the various underlying infections and metabolic disturbances.

Published by permission of the Surgeon General.
Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Sixth Annual Session of the American Medical Association Atlantic City N J June 14 1935.
This study was made while the author was stationed at Washington D C, and will be described in greater detail in a Public Health Service bulletin entitled *Studies of Heart Disease Mortality*. More definite recommendations are made in the forthcoming bulletin.

¹ Hedley O F. The Etiology Race and Sex of 450 Fatal Cases of Heart Disease Occurring in Washington (D C) Hospitals During 1932. Pub Health Rep to be published.

EXPLANATION OF THE UNSATISFACTORY STATE OF HEART DISEASE MORTALITY STATISTICS

The reasons for the unsatisfactory state of heart disease mortality statistics are fourfold (1) mistakes in signing death certificates, (2) weaknesses inherent in the present system of recording heart disease mortality, (3) misinterpretations and lack of competent professional supervision in offices of vital statistics, and

TABLE 1—*Sources of Material and Extent of Errors in Recording Hospital Deaths from Heart Disease, Washington D C, 1932*

| | |
|--|-------|
| 1 Total deaths in Washington, D C officially recorded as due to heart disease according to International List of Causes of Death (titles 90-95) | 1 631 |
| 2 Deaths in hospital patients officially recorded as due to heart disease (titles 90-95) | 410 |
| 3 Deaths in hospital patients officially recorded as heart disease (titles 90-95) not studied because of incomplete clinical records | 60 |
| 4 Deaths with hospital records sufficiently complete for study | 350 |
| 5 Deaths in hospital patients officially recorded as heart disease (titles 90-95) but considered on review of the hospital records as having been due to other conditions (20% error in reporting and recording) | 71 |
| 6 Deaths officially recorded as heart disease and considered on review as due to this cause | 270 |
| 7 Deaths not officially recorded as heart disease according to the International List of Causes of Death but considered on review as due to this cause (35% error of omission) | 171 |
| 8 Total deaths in hospital patients considered after review to have been due to heart disease | 450 |
| 9 Percentage of deaths from heart disease officially recorded as heart disease (titles 90-95) according to the International List of Causes of Death | 62% |

(4) the theory that a definite cause should be assigned to each death, even though the knowledge of the case does not warrant it

The accuracy of any system of vital statistics depends on the diagnostic skill and care used by the practicing profession preparing death certificates. In the matter of reporting mortality, heart disease may be called "the Great Convenience." The idea seems to prevail in many quarters that "when in doubt call it myocarditis." Without attempting to minimize the significance of heart disease as a clinical or public health problem, the fact nevertheless remains that many diagnoses of heart disease are made without an adequate factual basis.

The main reason for this is that death occurs in many conditions other than heart disease after varying degrees and duration of congestive heart failures. Consequently attention is focused on the heart during the terminal stages of many diseases not primarily cardiac. The family of the patient is informed that the heart is weak, consultations are not infrequently held, and medication is administered to maintain the heart action. This is justifiable from both humanitarian and therapeutic points of view. The trouble is that, when death occurs, undue emphasis is placed on the heart in signing the death certificate. It should be remembered that, while cardiac failure is clinically easily detectable and to a certain extent combatable, other organs show evidence of agonal failure. One shudders to think of the number of contested wills and other forms of litigation that would result if diagnoses of encephalopathies or mental insufficiency were made as frequently in cases showing terminal clouding of the sensorium as diagnoses of myocarditis or myocardial insufficiency are now made.

Heart disease is not infrequently purposefully assigned as the cause of death from other conditions. This is especially true in the South, where certain insurance companies with Negro policyholders refuse to pay benefits on deaths due to tuberculosis and syphilis. Deaths from such conditions or malignant growths are sometimes reported as heart disease

to save the feelings of the bereaved family. There is also too great a tendency to report deaths as due to heart disease when the exact cause is not known. In general, heart disease is a "safe" diagnosis, one frequently expected and not often questioned by members of the family, bureaus of vital statistics, or insurance companies.

Owing to the necessity of filing death certificates prior to moving a body, they are sometimes hastily prepared. It often happens in hospital practice that after the death certificate has been completed permission for necropsy is obtained. The actual cause of death is determined but the death certificate is not corrected. This has been overcome in some places by requiring the pathologist as well as the clinician to certify the cause of death in cases in which postmortem examinations are held.

Many of the terms used in ascribing causes of death are indefinite or obsolete. Thus, of the seventy-one deaths listed as heart disease but found on examination of the records to be due to other causes, the diagnoses in fifty instances were myocarditis, myocardial degeneration or myocardial insufficiency, while only three were diagnosed along etiologic lines. While the use of an etiologic basis is not suggested as a panacea for all mistakes in diagnosis, the use of correct terminology implies greater accuracy of thought, or at least a more comprehensive knowledge of the subject. Certainly the converse seems to apply. Mistakes are more common when inexact or antiquated terms are used.

Some physicians appear to have faith in the adage that there is strength in numbers. A total of 3,506 diagnostic expressions relating to heart disease were used in describing 1,631 deaths. Not infrequently three items were found on a death certificate. Some con-

TABLE 2—*Deaths Occurring in Washington, D C, Hospitals During 1932 and Recorded as Being Due to Heart Disease but Actually Due to Conditions Listed Below*

| Diagnoses | Number | Necropses |
|-----------------------------|--------|-----------|
| Pulmonary tuberculosis | 13 | 9 |
| Cerebral hemorrhage | 0 | 3 |
| Malignant conditions | 6 | 4 |
| Prostatic hypertrophy | 5 | 0 |
| Pelvic inflammation | 4 | 4 |
| Septicemia | 4 | 1 |
| Cellulitis | 3 | 0 |
| Enterocolitis | 3 | 1 |
| Gallbladder diseases | 3 | 1 |
| Fractures | 2 | 0 |
| Meningitis | 2 | 0 |
| Lung abscess | 2 | 0 |
| Alcoholism | 1 | 1 |
| Arsenic poisoning | 1 | 1 |
| Arteriosclerotic gangrene | 1 | 1 |
| Diphtheria (laryngeal form) | 1 | 1 |
| Epilepsy | 1 | 1 |
| Hemorrhage of gastric ulcer | 1 | 1 |
| Leukemia | 1 | 1 |
| Lobar pneumonia | 1 | 1 |
| Syphilitic meningitis | 1 | 0 |
| Phenobarbital poisoning | 1 | 0 |
| Mastoiditis | 1 | 0 |
| Postoperative hernia | 1 | 0 |
| Pulmonary embolism | 1 | 1 |
| Toxic hepatitis | 1 | 1 |
| Typhoid fever | 1 | 1 |
| | 71 | 34 |

tained as many as six. Many of the terms used were nearly synonymous. Others were descriptive only of symptoms, signs or terminal events. It is difficult to see what place such terms as dyspnea, ascites, edema, heart failure or cardiac asthma have on death certificates, either as primary or as contributing causes. The routine use of multiple diagnoses is cumbersome and makes the adjudication of the cause of death extremely difficult. It would be far better to describe a death as "rheumatic pancarditis" than as "endocarditis, myo-

carditis and pericarditis," or as "hypertensive heart disease" rather than as "myocarditis, cardiac enlargement, high blood pressure and cardiac asthma."

While errors and laxities in diagnosis constitute more than a mote in the eye of the practicing profession, it is not a beam of such magnitude as that in the eye of those entrusted with the collection and tabulation of mortality statistics.

The International List of Causes of Death² was promulgated in 1853 during a period when interest centered around the discovery and clinical interpretation of organic lesions. Although the product of many revisions, the present list, prepared in 1929, is a not dissimilar elaboration of the first one. Heart disease mortality is tabulated under pericarditis, endocarditis, myocarditis and diseases of the myocardium, angina pectoris and diseases of the coronary arteries, and other diseases of the heart. The chief difficulty is that

of the American Heart Association, and some form of etiologic classification, usually that of the American Heart Association, is used by practically all of 250 other cardiac clinics not affiliated with that organization.⁵

The etiologic classification of heart disease has recently received a further impetus by the inclusion of the American Heart Association nomenclature in the Standard Nomenclature of Disease⁶ prepared in 1933 under the auspices of the Commonwealth Fund. Copies have been sent to about 550 hospitals. One hundred and fifty institutions are known to have adopted it and it is believed that about 300 are now using it.⁷ Most of the university hospitals in the country have already adopted this classification.

The Office of Heart Disease Investigations of the Public Health Service sent questionnaires to 1,400 hospitals inquiring about the use of etiology in their classification of diseases. Of 1,000 thus far reporting,

TABLE 3—Extent to Which the Etiological Types of 450 Fatal Cases of Heart Disease Occurring in Washington D C, Hospitals Were Officially Recorded as Being Due to Heart Disease According to International List of Causes of Death

| Etiologic Types of Heart Disease | | | | | | | | | |
|--|--|----------------|-----------------|----------------|-----------------|---------|-------|-------------------|-------|
| | Arterio- sclerotic Hyper- tensive | Rheu- matic | Syphi- litic | Bac- terial | Congen- ital | Thyroid | Other | Undeter- mined | Total |
| A. Deaths recorded as being due to heart disease (titles 90-99) | | | | | | | | | |
| 90 Pericarditis | 1 | 2 | | | | | 1 | 1 | 5 |
| 91 Acute endocarditis | | 3 | | 11 | | | | | 14 |
| 92 Chronic endocarditis | 9 | 21 | 13 | 4 | | | | 1 | 48 |
| 93 Chronic myocarditis | 122 | 5 | 13 | 2 | | | 1 | 9 | 152 |
| 94 Angina pectoris and diseases of the coronary arteries | 13 | 1 | 1 | | | | | 1 | 16 |
| 95 Other diseases of the heart | 33 | 4 | 1 | 1 | | 1 | | 4 | 44 |
| Total deaths from heart disease so recorded (titles 90-99) | 178 | 30 | 28 | 18 | 0 | 1 | 2 | 10 | 270 |
| B. Deaths from heart disease recorded as due to other conditions | | | | | | | | | |
| 34 Syphilis | 2 | 3 | 20 | | 1 | | | | 26 |
| 56 Acute rheumatic fever | | 10 | | 1 | | | | 1 | 12 |
| 66B Exophthalmic goiter | | | | | | 5 | | | 5 |
| 96 Aneurysms | 1 | | 3 | | | | | | 4 |
| 97 Arteriosclerosis | 10 | | | | | | | | 10 |
| 98 Other diseases of the arteries | 11 | | | 1 | | | | | 12 |
| 109 Anomalies of blood pressure | 1 | | | | | | | | 1 |
| 115A Diseases of tonsils | | 2 | | | | | | | 2 |
| 130-132 Nephritis and other diseases of kidneys | 63 | 8 | 3 | 1 | | | | 2 | 77 |
| 157C Congenital malformation of heart | | | | | 8 | | | | 8 |
| Miscellaneous conditions including diabetes mellitus diseases of the spleen cardiac hemorrhage dementia paralytica bronchopneumonia congestion of the lungs asthma and so on | 10 | 1 | | | | | 1 | 2 | 14 |
| Total deaths from heart disease recorded as other than heart disease | 98 | 24 | 23 | 3 | 9 | 5 | 1 | 5 | 171 |
| Total deaths from heart disease (A and B) | 276 | 60 | 51 | 21 | 9 | 6 | 3 | 21 | 450 |
| Necropsies | 81 | 27 | 29 | 12 | 0 | 4 | 2 | 2 | 157 |
| Percentage of total deaths recorded as heart disease | 61.5 | 60.0 | 51.8 | 85.7 | 0 | 16.0 | | | 62.0 |

heart disease is no longer thought of clinically in terms of structural diagnoses but along etiologic lines. It is impossible to interpret satisfactorily etiologic diagnoses in terms of the International List of Causes of Death. This, together with improvement in diagnosis, results in a continuous ebb and flow of deaths computable as "organic diseases of the heart" and a constant realignment of diseases tabulated under this heading. It is doubtful whether mortality statistics from heart diseases in one decade closely parallel those of another.

Etiology is the basis of modern clinical diagnosis. This developed from the observation by Cabot³ in 1914 that most heart disease was due to arteriosclerosis, rheumatic fever, syphilis and thyrotoxicosis. Since then a number of etiologic classifications have been devised, notably that by the Heart Committee of the New York Tuberculosis and Health Association and now sponsored by the American Heart Association.⁴ This nomenclature is now in use in the ninety-six member clinics

nearly 500 indicated the use of some form of etiologic nomenclature.

This emphasis on etiology is no passing fad. It is being incorporated into the standard textbooks not only on heart disease but on general medicine. Practically every medical school in the country is teaching heart disease from this point of view. It reflects a real advance in clinical concepts and will probably be the permanent basis for cardiac diagnosis.

Certain deaths previously tabulated under other categories are now considered due to heart disease. At one time it was thought that most deaths associated with arterial hypertension were due to nephritis. Now many of these are grouped under heart disease. Deaths previously attributed to senility are now listed as heart disease. "Acute indigestion" is a thing of the past. Only three such deaths were listed among 7,949 deaths in Washington, D C, during 1932.⁸ Most

5 Gertrude P. Wood, office secretary American Heart Association, personal communication to the author.

6 Standard Nomenclature of Disease Prepared under the auspices of the Commonwealth Fund, New York, 1933.

7 H. B. Logie, executive secretary National Conference on Nomenclature of Disease, personal communication to the author.

8 Annual report of Health Department of the District of Columbia for 1933.

2. Manual of the International List of Causes of Death ed 4 Paris, 1929. U. S. Dept. of Commerce Bureau of the Census.

3. Cabot, R. C. The Four Common Types of Heart Disease. J. A. M. A. 63: 1461 (Oct 24) 1914.

4. Criteria for Classification and Diagnosis of Heart Disease ed 3 New York Tuberculosis and Health Association 1932.

of such cases are recognized as coronary thrombosis. On the other hand, there has been a splitting off of deaths formerly listed under organic diseases of the heart but now diagnosed along etiologic lines. Deaths previously diagnosed as aortic insufficiency and listed as heart disease are now diagnosed as syphilitic heart disease and tabulated not under heart disease but as syphilis. Deaths from acute rheumatic carditis are recorded under title 56, "rheumatic fever," as though the joint and not the cardiac manifestations were the cause of death. Deaths from the more chronic forms of rheumatic heart disease, while recorded as heart disease, are placed in various titles and subtitles, depending on the slightest variation in the wording of death certificates. If diagnosed as "rheumatic valvular disease," deaths are considered due to endocarditis, while, if diagnosed as "rheumatic heart disease," they are tabulated under "other diseases of the heart." Congenital heart disease is tabulated as a separate subtitle under congenital malformations. Thyrotoxic heart disease is recorded under various forms of goiter, while the myxedema heart is listed under myxedema.

Within the group of diseases listed as "organic diseases of the heart" there is a constant change in interpretation. Halsey⁹ pointed out that from 1922 to 1926 in New York state deaths reported as chronic myocarditis increased from 34.1 to 48.6 per cent of the total recorded mortality. During this period, deaths from valvular diseases decreased from 23 to 15.7 per cent. During that period the profession was "myocardially minded." Since then it has become more fully recognized that in many cases the functional ability of the myocardium depends on the state of the coronary arteries and that coronary arteriosclerosis not infrequently results in death from congestive failure without coronary thrombosis or the anginal syndrome. Consequently, another shift is now in progress. As it is generally observed that diagnoses based on etiologic conceptions tend to be made more uniformly, it is believed that the use of an etiologic basis for computing mortality statistics would serve as a balance wheel against fads and fancies in diagnosis.

To enable registrars of vital statistics to determine which of two or more diagnoses occurring on a death certificate is to be assigned as the cause of death, a manual of joint causes of death has been prepared. The necessity for such a manual becomes apparent when it is considered how frequently multiple diagnoses are made. Many of the rulings contained in this manual appear to be highly arbitrary. For example, nephritis takes precedence over heart disease if the two are mentioned jointly on a death certificate. Thus, if nephritis is listed as a secondary diagnosis while the primary cause of death is rheumatic heart disease or subacute bacterial endocarditis, the cause of death is officially attributed to nephritis.

This system of selecting the outstanding diagnostic factors becomes even more involved when only the diseases of the heart are considered. Chronic myocarditis is given precedence over diseases of the coronary arteries, although in reality the myocardial changes are secondary to those in the coronary arteries. Angina pectoris, on the other hand, is favored over chronic myocarditis. Chronic myocarditis is preferred over acute endocarditis but is regarded as less significant than chronic endocarditis. Angina pectoris takes preference over diseases of the coronary arteries,

despite the fact that angina pectoris is generally considered due to coronary insufficiency. It was found that in Washington, D. C., during 1932 angina pectoris was mentioned on seventy-two death certificates, as the primary cause of death in only fifty-eight instances, but was the recorded cause of sixty-eight deaths. Coronary thrombosis was listed on 259 death certificates, on 144 of which as the primary cause of death, but only seventy-eight deaths were officially ascribed to diseases of the coronary arteries. This lack of correlation between the reported causes of death and the official tabulation occurred in practically each title and subtitle included under "organic diseases of the heart."

Not infrequently death certificates diagnosed according to approved and widely accepted methods are returned to physicians for correction largely because of difficulties in interpreting such diagnoses in terms of the International List of Causes of Death. For example, hypertensive heart disease is frowned on as a cause of death, yet it is a condition recognized in modern textbooks¹⁰ and by the American Heart Association.⁴ I have seen diagnoses of hypertensive heart disease made in university hospitals in two cities returned for correction and have had cardiologists of nation-wide reputation tell me of the difficulties in having their diagnoses accepted by offices of vital statistics. This places a premium on incorrect diagnoses or the use of obsolete terminology and is not playing fair with the profession.

Apropos the last paragraph, one of the chief sources of error is due to lack of competent professional supervision in offices of vital statistics. It was found that in Washington, D. C., diagnoses of coronary thrombosis were recorded under heart disease while those of coronary occlusion were tabulated under diseases of the peripheral arteries. It is doubtful whether any health department is so understaffed that death certificates cannot be reviewed by a graduate in medicine. Under no circumstances should the lay personnel be permitted to challenge physicians' diagnoses.

One of the chief hindrances to better mortality statistics of heart disease is the fallacious idea that death certificates must necessarily contain some precise cause of death, even though the facts of the case do not warrant it. This is especially significant with regard to coroners' cases and other forms of sudden death. While most sudden deaths are due to heart disease, this is not always the case. Many such diagnoses are made on very meager knowledge. This is not always the fault of the coroners, as in several states they are not permitted to hold necropsies except when there is presumptive evidence that death is due to intentional violence by some other person. In many localities, coroners are not given sufficient funds to hold necropsies except in cases with medicolegal implications. It is suggested that greater latitude be given in such cases and that diagnoses of "sudden death due to natural causes" be permitted more frequently. This also holds for deaths from natural causes occurring in private practice, when the physician does not know and cannot determine the exact cause.

SUGGESTIONS FOR IMPROVEMENT

The current system of compiling heart disease mortality is entirely out of step with modern clinical concepts. The anomalous situation exists that, within certain limits, the more accurately heart disease is

⁹ Halsey R. H. *Etiology of Heart Disease* J. A. M. A. 98: 593 (Feb. 20) 1932

¹⁰ White P. D. *Heart Disease* New York, Macmillan Company 1932. Lewis Thomas *Diseases of the Heart*, New York, Macmillan Company 1933. Musser J. H. *Internal Medicine* Philadelphia Lea & Febiger 1934.

reported the greater will be the difficulties of interpretation in terms of the International List of Causes of Death. Unless revised, it will eventually become a sort of statistical anachronism.

The International List of Causes of Death was devised for the purpose of obtaining relatively uniform vital statistics throughout the civilized world. In most cases it serves a useful purpose. It is recognized by law and treaty agreements. There is no possibility of replacing this system or even of materially altering it prior to the next decennial revision in 1940. At the next meeting of the International Commission, serious consideration should be given plans whereby heart disease mortality may be tabulated along lines in keeping with approved clinical practices. Incidentally, it would be interesting to learn to what extent heart disease is being reported along etiologic lines in other countries.

Meanwhile there are several steps which can be taken to improve heart disease mortality statistics. Physicians should be encouraged to report deaths from heart disease from the point of view of etiology. Descriptions of organic lesions and of significant physiologic changes should be made with and after the etiologic diagnosis. In the matter of tabulation, however, the entire diagnosis of heart disease should be considered as a unit. This could be accomplished by giving the etiologic diagnosis greater weight than other factors in the Manual of Joint Causes of Death.¹¹

The profession is urged to diagnose as heart disease only those deaths in which there is manifest evidence of heart disease as determined by the clinical course, history and laboratory evidence of established etiologic factors, and the finding on physical examination and at necropsy of organic cardiac lesions. The implication of the heart in cases of terminal congestive failure due to other causes is to be deprecated. Diagnoses should be made with an exactness of terminology commensurate with the knowledge of the cases. Physicians, especially coroners, should be permitted greater latitude in ascribing deaths to natural but ill defined causes when the facts do not permit greater exactness. It should be remembered that there is nothing gained in superficial statistical accuracy at the expense of basic information.

Offices of vital statistics should refrain from questioning diagnoses made along approved clinical lines, unless there is some reason to doubt their validity. The ultimate classification of causes of death should not be left to laymen but should be made by professionally trained individuals.

With regard to the classification of deaths reported along etiologic lines, it is suggested that they be placed in subtitles under their various respective causative factors. This can be accomplished without materially affecting the present scheme of recording vital statistics. There is a precedent for this in the case of congenital cardiac malformations. These are not tabulated as heart disease but in a separate subtitle under congenital malformations. Similarly, deaths reported as thyrotoxic heart disease should be placed in a separate category under exophthalmic goiter or toxic adenoma of the thyroid. Those from syphilitic heart disease and aneurysms of the thoracic vessels due to syphilis should be tabulated as definite subtitles under syphilis. Although, strictly speaking, in view of the recent work by Rothschild, Kugel and Gross,¹² who have found

evidence of active rheumatic infection in most cases of rheumatic heart disease, all deaths from rheumatic heart disease should be placed under rheumatic fever, it is doubtful whether this can be done at present without too greatly disrupting the prevailing scheme of recording vital statistics. It is recommended, however, that deaths so reported be set aside in separate categories under heart disease. Similarly deaths from hypertensive and arteriosclerotic forms of heart disease should be listed as distinct entities.

SUMMARY AND CONCLUSIONS

1 The present method of reporting and tabulating heart disease mortality statistics does not reflect a true picture of heart disease mortality. Only 80 per cent of deaths occurring in hospitals in a large city and tabulated for the purpose of vital statistics as due to heart disease were found on examination of the hospital records to be due to that cause, while only 62 per cent of deaths due to heart disease were so officially recorded. It is not possible to obtain an accurate conception of the total number of deaths from heart disease or of any of the various etiologic types.

2 Within certain limits, the more accurately heart disease is diagnosed the less reliable are the official mortality statistics. This is due to the difficulties in interpreting diagnoses made along etiologic lines in terms of the International List of Causes of Death. It is quite likely that with further advances in clinical medicine these points of view will become more divergent and vital statistics even more unreliable.

3 Steps should be taken to remedy this situation. It is proposed that heart disease when reported along etiologic lines shall be tabulated as subtitles under the respective etiologic categories. Consideration should be given toward eventually revising the International List of Causes of Death so that heart disease mortality may be officially recorded on an etiologic basis.

4 Physicians are urged to use etiologic diagnoses in reporting heart disease mortality. Registrars of vital statistics should be most loath in questioning death certificates containing approved clinical terms.

5 It should be recognized by practicing physicians, coroners and statistical officials that the employment of superficially accurate diagnosis based on insufficient evidence results only in the vitiation of mortality statistics in general.

6 Many diagnoses of heart disease are made without sufficient evidence. While the use of an etiologic terminology is not suggested as a panacea for intentional misstatements, it is believed that fewer mistakes are made when heart disease is diagnosed in terms of its causative factors.

Maloney Building University of Pennsylvania

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS SPRAGUE AND WHITE, COHN, FAHR,
STROUD AND HEDLEY

DR. HAVEN EMERSON, New York. The International List of Causes of Death undergoes a decennial revision at the beginning of each decade, at which time organized clinical and pathologic opinion has opportunity to effect desirable changes in terminology. Preliminary recommendations for the revision that will be made in 1938 have already taken into consideration suggestions for classification of deaths from heart diseases offered by a committee of clinicians of the American Heart Association. Etiologic classification is used whenever practicable throughout the list. Until recently, following such papers as those presented by Dr. Fahr, there has been no

¹¹ Manual of Joint Causes of Death. U. S. Department of Commerce, Bureau of the Census, 1932.

¹² Rothschild, M. A., Kugel, M. A. and Gross, Louis. Incidence and Significance of Active Infection in Cases of Rheumatic Cardiovascular Disease During the Various Age Periods. *Am. Heart J.* 9: 586 (June) 1934.

approximate agreement as to the specific etiology of the 80 per cent of all deaths attributed to heart diseases, apparently chiefly related to the process of senescence. The registrar of vital statistics of the local or state health department has recourse to the querying of death certificates by mail. When ambiguity of terms occurs there is uncertainty as to relative importance of primary and secondary causes as stated by the physician. This is not to be considered a criticism of the clinician who certified to the cause of death but as a means of avoiding errors in classification. The registrar cannot practically follow the method used by Dr Hedley, and I doubt whether the method can be relied on to improve the accuracy of death certificates. In general the cause of death certified by a physician who cared for the patient during life and observed the manner of death is a more valuable record than the opinion of a subsequent student of the record who did not see the patient dead or alive. It is important to recognize that such standard lists as the International List of Causes of Death and the National Standard Nomenclature of Disease represent only an approximation to an ideal and lag somewhat behind the ideas of specialists. They are, however, indispensable for comparability of morbidity and mortality experience and are responsible for a high degree of trustworthiness in American vital statistics and for the records of disease prevalence in the leading hospitals in this country. I assume that Dr Sprague distinguishes in his own mind between decrease in heart disease attributed to syphilis and decrease in the incidence of syphilis itself. No one can have heard the statements and seen the charts offered by Dr Cohn without being impressed by the necessity of withholding all judgment on trends in cardiac mortality unless age specific death rates for each of the rubrics of heart disease are presented. In a general way a good index of a high level of health of a community is found in a low and decreasing death rate from heart diseases in persons less than 50 years of age and a high increasing rate in persons 60 years of age and over. Improved life expectancy at all ages up to 60 years and lowered mortality from practically all preventable causes of death are consistent with a rising death rate from heart diseases, particularly in persons over 60 years of age.

DR HAROLD E. B. PARDEE, New York. Dr Sprague's summary of our present knowledge of the prevention of the different etiologic types of heart disease shows us just where we are strong and where we are weak. When it comes to hypertension and arteriosclerosis, we are barren of definite suggestions because we do not properly understand the cause of these conditions. It is important to reveal the relative weight of coronary arteriosclerosis and hypertension in producing the cardiac syndrome of failure. Only with this in mind can one clearly understand the role of hypertension. I feel that hypertension has been overstressed by many and I would be inclined to give arteriosclerosis more importance in these patients than it has often received. I do not intend to imply that it should have more importance than Dr Fahr has given it. Dr Stroud's work is along practical lines, because after all, physicians have more to do with the management and treatment of patients with heart disease than they do with prevention. Since patients have heart disease and must work during so many years when they have heart disease and since heart disease is being discovered so much more frequently in its early stages by the industrial, life insurance and school examinations, a practical study along these lines is important. The factors to be taken into account in considering occupation are multiple. We must be concerned with the influence of the patient's projected occupation on the etiologic factor of his disease and with its influence on his functional cardiac capacity. Lastly there are occasional anatomic features which must be taken into consideration such as the influence of a large aortic dilatation due to syphilis or arteriosclerosis. Dr Cohn's work has impressed me with the importance of using thought rather than mathematical processes in the analysis of figures. Such an analysis is vastly more important than the mere tabulation that is usually presented to the medical profession and that has led, as he pointed out, to various errors. Of course, the influence of changing diagnostic titles during past years is a difficult one to eliminate. It certainly has been present and

there, of course, one encounters the difficulties suggested by Dr Hedley. Certainly with the large percentage of autopsies which Dr Hedley has obtained, his results must be nearly enough correct to have demonstrated an error of enough magnitude to be important. What influence this will have on the mortality trend I cannot say. I am in accord with his suggestions for changes in the nomenclature of heart diseases. I feel that they should be allocated to the particular etiologic factor and that one should say "heart disease due to rheumatism" or "heart disease due to syphilis." There should be subheadings under the etiologic factor in each case. With this sort of diagnosis the knowledge of the frequency of the different types of heart disease would be definitely available.

DR TIMOTHY LEARY, Boston. From the data collected the evidence that cholesterol is the cause of atherosclerosis is as definite as the evidence that the pneumococcus is the cause of lobar pneumonia. The average physician pictures arteriosclerosis from his memory of the aortic lesions. These lesions are so varied that a single agent would not be expected to cause them all. However, studies demonstrate that the diverse character of the lesions depends on more or less distinct reactions to cholesterol at different age periods. In the aortic lesions of the young, phagocytic cells pick up imbibed cholesterol esters in the aortic intima modify them as the cells become amebic, split the lipid into finer and finer droplets and cause it to disappear. This definite metabolism of cholesterol within lipid cells is associated with a stimulation of the subintimal connective tissue. The growth of this tissue is limited, and with the rapid removal of the lipid minimal scarring results. In the middle period of life this metabolism of the lipid is slowed. The new connective tissue ages, secretes collagen and becomes scar tissue, so that scarring is the characteristic picture in this period. In the late period of life, cholesterol metabolism ceases and the lipid cells tend to pile up without adequate supporting tissue and undergo nutritional necrosis with the formation of atheromatous "abscesses," which are typical of this period. The evidence that cholesterol is the cause of atherosclerosis is based not only on the studies of human lesions but on the experimental reproduction of the disease in rabbits. It is further supported by the results of unintentional human experimentation in the treatment of diabetes. During the decade 1920-1930 high fat diets, rich in substances containing cholesterol e. g., butter, cream and eggs, were used in the treatment of diabetes. Shields Warren drew attention to the tremendous increase of arteriosclerosis in diabetic patients so treated. There was not only an increase in the disease in adults but x-ray shadows of calcified leg arteries were obtained in children as young as 4 years of age. During the more recent period, under low fats in diabetic diets adult arteriosclerosis has diminished, and roentgen evidence of the disease in children is no longer obtainable. Heredity and race may play a part in the etiology, stresses are important and the influence of endocrine factors may play a part, but inadequate cholesterol metabolism is the principal cause.

DR S. ADOLPHUS KNOPP, New York. There have been many statistics as to the number of cardiac diseases and their treatment. I think, however, that too little attention has been paid to the prevention of heart disease and arteriosclerosis. More physicians fall victim to angina pectoris than any other group of men. Perhaps it is due to overwork and an irregular life in general, and all one can say in warning is that self preservation is as important as the care of others. For the prevention of attacks of angina pectoris and congestive heart conditions in general, total or partial thyroidectomy has been performed. This operation is considered dangerous by many. The ligation of both superior and inferior thyroid arteries has been resorted to with varying results. The latest in cardiac surgery is Lyon and Horgan's method, consisting in the "dissociation of the thyroid from the sympathetic nervous system and the reduction of the blood supply to the thyroid." I have no new medical measures for congestive heart disease and arteriosclerosis. Diaphragmatic respiration has been helpful in preventing attacks of angina pectoris, and if in addition the patient learns what he can or cannot do, he has a good chance of prolonging his life. Controlled diaphragmatic respiration is not only helpful in early tuberculosis, as it gives relative rest to the upper lobe usually the first invaded, but is also beneficial

in arteriosclerosis, because it increases the oxygen supply and massages the heart and the aorta, thus preventing the thickening of the intima of the coronary arteries

DR SAMUEL FRIEDMAN, New York. Though the causes of arteriosclerosis are not definitely known, a larger proportion of people after 40 suffer from angina pectoris and high blood pressure than formerly. Neither the medical profession nor the government has yet planned anything definite for this great mass of sufferers, from whom I believe as much good could be accomplished as in typhoid and tuberculosis. Some people have low blood pressure and others have high blood pressure. In 1920 I reviewed the statistics of the health departments of New York, Philadelphia, Chicago and Cincinnati and found that the mortality rate from these diseases had increased about 100 per cent from 1900 to 1920. I felt that perhaps the two hours unwholesome travel to and from work daily, under the prevailing overcrowded conditions, added considerably to the wear and tear of the cardiovascular system. It occurred to me that a national five day (work) week would mend that damage by giving the people a two day rest. A word as to the prevailing abuses in the school and traction systems. Children who have just recovered from serious febrile diseases must on their return to school walk the stairs in line with the healthy ones several times a day during change of periods. This unquestionably may hurt many whose myocardium might still be affected though showing no murmurs. Those children should either use the elevator or be allowed to come a few minutes later to classes for about a month. The overcrowding of subway trains and climbing of subway stairs inevitably inflict serious damage on senile and diseased hearts. Many of these patients not only become winded but get attacks of angina. Occasionally one succumbs on reaching the street, having been pushed upward along the stairs. To overcome these two abuses, my idea would be that persons with active or potential heart disease should receive a medical certificate entitling them to a seat during the rush hours in a car designed for that purpose. Also, any subway lower than 20 feet should be provided with an escalator.

DR HAROLD B WOOD, Harrisburg Pa. Some of the inaccuracies in our heart statistics are due to the physicians themselves not understanding how to fill out death certificates, wrongfully omitting important causative conditions or improperly inserting extraneous diseases or incidental operations. Those of us who have the opportunity of instructing students or physicians in any way as to the proper method of recording causes of death should use this opportunity. If a physician writes "chronic heart disease" on the death certificate, with a ruptured gallbladder, acute alcoholism, influenza, bronchopneumonia or a cerebral hemorrhage, which are obvious causes of death, the cases become classified as deaths from heart disease thereby giving incorrect death rates from heart disease. Physicians who write articles on heart disease and compare statistics of the present time with those of ten or twenty years back do not realize that the records are not at all comparable. During these years different systems of recording, coding and tabulating deaths have been adopted. Those who write to different cities for their records on any disease whatever, to compare one city with another, do not realize that the records are not comparable. Until recently Philadelphia, New York and Chicago used absolutely different methods of tabulating their causes of death by using different systems of coding when two or more causes were recorded on the death certificates. The action of federal and state authorities making inquiries of physicians for better information on death certificates was brought out in the last paper. Thousands of certificates are incomplete. The queries sent out obtain many corrections and better records. Thousands of death certificates are signed by practitioners of various sects and by other laymen. Should they be tabulated and accepted with the causes of death as determined by physicians? A few years ago the matter was brought up of the importance of tabulating only death certificates signed by physicians, but that system has not been put into practice as yet as it should. These few points illustrate the absolute absurdity of using decimals in death rates.

DR HOWARD B SPRAGUE, Boston. I am glad that Dr Emerson brought out the fact that there was a decrease in some of the tertiary manifestations in our part of the country

and not necessarily in the infection itself. In this connection it is of interest to remember that it is now just twenty-five years since the original discovery of the arsenicals for the treatment of syphilis, and that is about the average time for the development of cardiovascular syphilis after the primary injection. It may be that we are at the beginning of a period of great decrease in these late manifestations of syphilis, as the result of improved methods of treatment.

DR GEORGE E FAHR, Minneapolis. Dr Pardee put his finger on the crux of the situation in hypertensive heart disease. It is the evaluation of the two factors of increased work for the left ventricle and the decreased oxygen supply to the left ventricle consequent on the coronary arteriosclerosis. I don't think that one can say at this time which is the more important, but from an extended study of this subject I would say that it varies from case to case. In a man or a woman with a very high blood pressure and a very moderate amount of coronary arteriosclerosis the important factor in heart failure will be the hypertension, and there are patients who have had a high blood pressure for many years. The roentgenogram first of all shows evidence through the dilatation of the left ventricle that there has been a hyperdynamic condition produced in the left ventricle musculature, consequent to the hypertension, and at autopsy in a few cases no arteriosclerosis of the coronaries is found. On the other hand there are cases with moderately low blood pressure and a considerable degree of coronary narrowing and the most important factor is the coronary narrowing with the consequent ischemia of the heart muscle, so I think that the two factors cannot be separated. They work to produce ultimately a heart failure in hypertension provided a patient doesn't die of uremia, cerebral accident or something else before that. Certainly when hypertension works alone the patients live on the average from ten to fourteen years before mild symptoms of dyspnea are produced in hypertension when there is no coronary disease present, and then they live longer because of careful handling of the case after the first symptoms, even after the first severe congestive failure, and then die of uremia, septicemia, apoplexy and so on. In one case the hypertension is the most important factor, in another the coronary arteriosclerosis.

DR O F HEDLEY, Philadelphia. Dr Emerson apparently misunderstood several of my statements. He stated that of 450 deaths considered due to heart disease 416 of them actually were, making a very small balance. Dr Pardee in his discussion restated the matter correctly. Seventy-one, or 20 per cent, of 350 deaths reported as heart disease were found to be due to other conditions while among 450 deaths due to heart disease only 279 or 62 per cent, were so recorded. These figures speak for themselves. The nomenclature sponsored by the American Heart Association is the best one at present. It or some other form of etiologic nomenclature is being widely used in clinics and hospitals throughout the United States. The etiologic diagnosis of heart disease is a fact and not a theory and must be reckoned with in computing vital statistics. While the Public Health Service has not seen fit to adopt the Standard Nomenclature of Disease for use in the marine hospitals it is in the process of adopting an etiologic nomenclature. The recording of vital statistics is not a function of the Public Health Service. Dr Pardee spoke of the desirability of having all rheumatic heart diseases grouped under rheumatic fever, the ultimate etiologic factor. I thoroughly agree with him but doubt whether it can be done without too greatly disturbing the International List of Causes of Death. It may be necessary to work out a plan by which heart disease can be tabulated and reported along etiologic lines and still conform to the International List. This could be used either in the United States as a whole or in cities or states as desired. Dr Wood mentioned the desirability for improvement in death certificates. More time in medical schools should be devoted to teaching prospective physicians the correct method of certifying the causes of death. This should be included in the courses of preventive medicine. The average undergraduate course in preventive medicine devotes too much time to the mechanics of public health. This is an era of specialization, and about 95 per cent of physicians never encounter such problems in after years. All of them, however, sign death certificates.

THE CONTROL OF MYOPIA

EDWARD JACKSON, M.D.

DENVER

A paper read before this section in 1891 stated that¹ "the constant wearing of full correction lenses, no matter what their strength, with careful attention to other points of ocular hygiene, checks promptly and permanently the advance of myopia in the majority of cases." In 1892 in a paper on the full correction of myopia, read before the American Ophthalmological Society, I² asserted that "myopia should be fully corrected and the correcting lenses constantly worn, except at such times and to such extent as the emmetropic eye would require the aid of convex lenses for presbyopia." Supporting this, twenty-seven cases were reported that had been under observation three years or upward with this treatment. At the same meeting Dr. George C. Harlan³ reported thirteen cases of high myopia, from 4 diopters upward, in which full correction had been worn constantly for more than five years, and stated that "excessive convergence without accommodation is the most important factor in progressive myopia."

Before that time Foerster⁴ had published his observation that constant wearing of glasses, fully correcting, or overcorrecting the myopia, did not lead to increase of myopia, which he supported by the histories of fifty cases. Many observers had reported statistical studies of the eyes of infants and school children proving that myopia was very rarely present at birth but arose and was progressive during school life. These statistics for children were brought together and correlated by B. Alexander Randall in two papers, published in 1885⁵ and 1890,⁶ and W. F. Norris⁷ had stated that, in more than forty new-born children examined with the use of atropine, all the eyes were hyperopic.

The significance of the facts so accumulated was lost, however, in the attention given to theoretical explanations of myopia, although all admitted the truth of Donders' statement that "a myopic eye is a diseased eye." It was generally admitted that the refraction increased in the eyes of children, hyperopia grew less and myopia increased, but theoretical explanations claimed more attention than clinical facts. It was thought of as a step in evolution, when the theories of Darwin were poorly understood. It was attributed to some congenital defects, such as softness of the scleral tissues. Peculiar shapes of head and orbits, anomalous positions of attachment of the ocular muscles were suggested. With more reason astigmatism, newly discovered, was blamed for causing myopia.

The view of progressive myopia put forward by Dr. Harlan is still not understood by ophthalmologists. N. Bishop Harman of London, who has worked for thirty years for the establishment of myopia schools and sight-saving classes, is puzzled. He says "It is very difficult to control the progress of even low degrees of myopia in some school children." He also suggests "Stop all schooling and reading for at least a year, let the child run wild, preferably at the seaside." The

whole subject of myopia needs to be considered in the light of actual experience of the results obtained by applying such suggestions to the prevention and limitation of myopia.

To this end 381 cases of myopia (755 eyes) seen in private practice, determined with cycloplegia and followed through periods of from two to thirty-nine years, an average of nine and one-half years, have been studied and tabulated. They include patients of all ages, from 4 to 82 years, and have been grouped and studied according to the age periods at which they came under observation and at which the constant wearing of the full correction was begun. Other ophthalmologists who have case records with good data can make similar studies of their own experience. When the eye begins to be myopic it is a diseased eye, and the results of such changes in it lead to grave disability and blindness in an important proportion of cases. The careful study of myopia is a step toward the prevention of the blindness of later life. It is not yet known to what extent blindness from cataract and retinal separation depend on myopia or how, through the general nutrition of the eyes, myopia and glaucoma may be related or opposed to each other.

Percentages in Age Groups

| Age | Myopia Changes | | | | Vision Changes | | | |
|----------|----------------|------|----------|-----------------------|-----------------------|----------|------|----------|
| | Increase | None | Decrease | No Change or Decrease | No Change or Increase | Increase | None | Decrease |
| Under 10 | 69 | 16 | 2 | 41% | 89% | 58 | 37 | 5 |
| 10 to 20 | 42 | 47 | 11 | 58% | 91% | 61 | 30 | 9 |
| 20 to 30 | 19 | 58 | 23 | 81% | 93% | 42 | 51 | 7 |
| 30 to 40 | 24 | 53 | 23 | 70% | 87% | 52 | 35 | 13 |
| 40 to 50 | 20 | 60 | 20 | 80% | 75% | 40 | 35 | 25 |
| 50 to 60 | 16 | 60 | 24 | 84% | 76% | 21 | 54 | 25 |
| Over 60 | 23 | 45 | 32 | 77% | 42% | 14 | 23 | 58 |

The accompanying table shows that under 10 years of age the tendency toward myopia is general and that in most myopic eyes the defect is increasing. When one bears in mind the fact that at birth practically all eyes are hyperopic, it is safe to say that in all young children there is a tendency toward myopia. After the age of 20 this tendency has disappeared and the majority of myopic eyes show little or no increase. In later life, after 50, there is a tendency to decrease of myopia, although the cases of senile myopia, so-called second sight, balance the physiologic lessened hyperopia of childhood.

When case records are studied individually there appears to be strong reason for accepting the classification of anterior and posterior myopia that was adopted by Risley. The anterior myopias are the cases that have been classed as conical cornea, and slight dislocations and deformities of the lens. Anterior myopias are associated with high degrees of astigmatism. Two of these patients, followed from 7 to 15 and from 10 to 17 years of age, had bilateral, partial dislocation of the lens, and the myopia increased, although the high astigmatism did not increase. Nearly all the high anterior myopias appearing later in life, in patients from 16 to 48 years of age, were cases of corneal change, keratoconus.

Decreases in myopia did not occur before 10 years of age, but in some patients, placed that early on constant use of the full correction, decreases appeared before 20. From that time on, about one case of myopia in five showed increase until over 60, and after that about

Read before the Section on Ophthalmology at the Eighty Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

1. Jackson, Edward. Tr. Sect. Ophth. A. M. A. 1891.

2. Jackson, Edward. Tr. Am. Ophth. Soc. 1892, p. 360.

3. Harlan, G. C. Tr. Am. Ophth. Soc. 1892, p. 374.

4. Foerster, Arch. Ophth. 15: 399, 1885.

5. Randall, B. A. Am. J. M. Sc. 90: 123, 1885.

6. Randall, B. A. Tr. Am. Ophth. Soc. 1890.

7. Norris, W. F. Tr. Am. Ophth. Soc. 1885, p. 369.

one in three. Such decrease in the amount of myopia corresponds with the increase of hyperopia, found by Priestley Smith in his studies of the growth of the crystalline lens, between 25 and 65 years of age.

The increase of vision shown, not the better vision with correcting glasses but vision developing gradually as the glasses were constantly worn, was a matter of surprise. It began at the earliest age, and was found at all periods of life. In early life it might be ascribed to the gradual gain in visual acuity, commonly seen after the correction of astigmatism in young people. But after 30 it was best explained by the general improvement of the nutrition of the eye, with the wearing constantly of glasses that placed it on a footing of equality with the emmetropic eye or with the hyperopic eye not used excessively for near work.

The rather steady proportion, at all ages, of eyes that showed no change of visual acuity, as well as of those that showed no change of myopia, supports the idea of improved ocular nutrition under the conditions of using the eyes with the advantage of full corrections. The small proportion of eyes in which vision decreased, not more than one in four, even after middle life, should dispel the idea that nothing can be done to control myopia and preserve the usefulness of myopic eyes. Myopia can be controlled by removing its causes and securing the essential conditions for healthy eye work.

CAUSES OF MYOPIA

What are the causes of myopia? Certain congenital tendencies act under conditions unfavorable to ocular health. Under the influence of the work of Donders on the accommodation and refraction of the eye, the ophthalmologists of seventy years ago thought first of accommodation and astigmatism. Donders feared that accommodation had an important influence in causing myopia. Landolt based his rules for the care of myopia on that supposition. Graefe had pointed out that, when a young person with pulsating retinal veins fixed and focused vision on a near object, increased pulsation showed increased intra-ocular pressure. He arrived at the conclusion that the increased pressure was due to the accommodation of the eye.

Repetition of Graefe's experiment with the eye under observation with the ophthalmoscope subjected to complete cycloplegia by atropine, shows that the increased pulsation is not caused by accommodation but by convergence. Years ago the experiment was tried on an eye with oculomotor paralysis—complete ophthalmoplegia externa, but with good accommodation. The distinct venous pulse was not increased by the maximum exertion of the accommodation. There was not the slightest increase of the pulsation. It was only in later years that full understanding of the cause and mechanism of myopia was arrived at. Harlan was right. His view that myopia depends on excess of convergence has been confirmed. Decrease of convergence, even by wearing full correcting glasses, with increase of accommodation, controls myopia. And the same result may be secured by the use of prisms base in to diminish convergence.

ANTERIOR MYOPIA

Anterior myopia is caused by distention of the globe at the anterior pole. The center of the normal cornea is thinnest, the periphery has greater thickness, and the central and peripheral zones differ somewhat in structure.⁸ The normal balance between the intra-ocular

pressure and the sclerocorneal coat of the eye is usually maintained with great exactness. But sometimes, after general illness affecting tissue nutrition, the cornea gives way before the intra-ocular pressure, producing keratoconus and increasing the anteroposterior length of the eyeball. This process is checked by absolute avoidance of near work for the eyes, with complete correction of the myopia and astigmatism already present, and measures to restore normal metabolism. This should be conscientiously planned and persistently carried out, before any operative measure to change the shape of the cornea is considered.

POSTERIOR MYOPIA

Posterior myopia is what is commonly meant by "myopia." It includes "progressive myopia," "malignant myopia" and other groups of cases that are given special names. It has long been the subject for theories and academic discussions. Its causes, complications and sequels give it a major place in ophthalmic literature. But the distention that causes it does not begin, or center, at the posterior pole of the eye. Its pathologic changes begin, continue and are most extensive at the temporal side of the optic nerve entrance.

There are very few cases that do not show their chief lesions in this situation. The descriptions and illustrations of cases, and the sections of myopic eyeballs, all emphasize the fact. The myopic crescents, the myopic atrophies, have this location. The choroidal "halo atrophy" due to increased pressure of chronic glaucoma is entirely different in appearance and distribution. It appears equally advanced and equally broad all around the optic nerve entrance, with usually no pigment changes. The characteristic appearances of the myopic fundus are shown in all the atlases of ophthalmoscopy. Even where the picture is not intended to represent the fundus of a myopic eye, the crescent of myopia is sometimes noticeable. This illustrates that fundus changes may be started in eyes becoming less hyperopic, which do not go on to myopia.

CONVERGENCE

In most mammals the eyes are placed laterally, so that the two cannot be fixed on the same point. Binocular fixation, binocular vision, appears only in some of the cat tribe and in the primates. In the human embryo the primary optic vesicles start on opposite sides of the head but in the development of the eye are pushed around to the front, with the visual axes about parallel. In the human infant binocular vision is rudimentary at birth and is developing up to the sixth year, or later. The infant, looking at objects held in the hand close to the eyes, develops both binocular coordination and accommodation and probably diminishes the hyperopia that practically all eyes have at birth. The exercise of these new functions is quite intermittent. The infant looks at its hand and then away at something else—the typical exercise for growth.

Going to school, with set tasks requiring continued near looking, has a very different effect, physiologic hyperemia becomes pathologic. The educational process becomes dangerous in direct proportion to its scholastic efficiency. Risley⁹ described the lesion produced as a "limited choroiditis of varying extent and intensity, affecting the region of the nerve entrance and generally manifested at the temporal margin of the optic disk as a crescent of altered color and pigment absorption." Norris⁷ reported eleven cases and Risley seventeen

⁸ Salzmann. *Anatomy and Histology of the Human Eyeball* translated by E. V. L. Brown. Chicago Medical Book Company. p. 26.

⁹ Risley. *Tr. Am. Ophth. Soc.* 2: 363 and 368. 1888.

such cases that were watched for years, passing "from the hyperopic eyeball over into near sight, through the turnstile of astigmatism" Risley strongly emphasized the effect of astigmatism in producing such changes. Other factors are corneal opacities, poor lighting, a stooping posture and impaired general health, on which Batten¹⁰ inclined to put all the blame for myopia. Perhaps the work of Norris and Risley failed to produce the impression it should, because they did not point out the enormous importance of the mechanical effects of excessive convergence.

Any one who turns in its socket the eye of a patient rendered unconscious and relaxed by general anesthesia will realize that the main obstacle to free movement of the eyeball is the rigid optic nerve, firmly attached to the sclera. This, much more than the check ligaments or the tonus of the extra-ocular muscles, limits the free movements of the eyeball. In convergence this resistance is constantly added to that of opposing muscles and other tissues. The forces meet all around the attachment of the optic nerve and its sheaths to the globe, around the optic nerve entrance. But the effects produced on the nasal and temporal sides are quite different. On the nasal side the tissues are jammed together by the turning in of the eyeball. On the temporal side the tissues are put on the stretch, and the choroid, with its vascular nutritive tissue, is pressed between the firm sclera and the outward pressure of the contents of the eyeball. These mechanical factors are quite sufficient to account for the pathologic changes in this region revealed by the ophthalmoscope and in the eyeball examined by the microscope after removal.¹¹ These changes are produced directly by excessive and too long continued convergence. They are not merely a symptom, they are the constant and essential lesion of myopia. They may be prevented by stopping and avoiding excessive convergence.

This has now been proved by sufficient clinical experience. Other theoretical explanations of myopia can be set aside until excessive convergence has been eliminated. Its elimination by constant use of correcting lenses and attention to posture puts the myopic patient on the direct road to safety. As myopia becomes high, above 6 diopters, the overstrain of convergence causes exophoria, which goes on toward divergent squint. This may require the assistance of prisms base in, or it may go on to divergent squint, and stopping convergence usually checks what has previously been a progressive myopia. The statistics recently published by Marlow¹² illustrate this.

This study of the effects of full correction shows that even for bad cases of progressive myopia the prognosis is not hopeless. The weakening, atrophic process does not extend forward to the anterior segment of the sclera. The illustration, which Sir John Parsons¹³ credits to Heine, representing a section of the normal eye laid on a section of a highly myopic eye shows this. The anterior sclera reinforced by the insertions of the rectus muscles, their connecting bands, the ciliary ring, the doubled capsule of Tenon, seem never to suffer from the stretching, thinning process of high myopia, although the anterior sclera does give way, in rupture, or staphyloma, in other pathologic conditions. The same is true of the temporal part of the posterior

sclera, which is supported by the tendons of insertion of the oblique muscles and the bands of scleral tissue that receive their stress. The unknown "tendency to scleral softening," which has been assumed to be the basis of scleral distention, is narrowed down to the region to the temporal side of the optic nerve entrance, especially subject to convergent stress.

The more remote pathologic sequels that have been associated with myopia, cataract and detachment of the retina are not necessarily results of myopia, and probably ignorance of the pathologic relation between them and myopia exaggerates its importance. Cataract is sometimes associated with other forms of choroidal disease, and its association with myopia may have no peculiar significance. The recent evidence of shrinking and detachment of the vitreous, before detachment of the retina, which has been emphasized by Lindner, may be a more direct result of the pathologic sequence of myopia. But in any case the indefinite danger of such sequels is a sound reason for stopping the development of myopia in its early stages. The dangers may have been exaggerated, but they exist. The teaching of toleration and indifference toward beginning low myopia needs to be sharply reversed. The evidence of the tendency to myopia and its beginnings should be sought at the start of school life, and the check of full correction by lenses and posture, the breaking up of habits of excessive convergence, is one of the most important applications of school hygiene.

Myopia is not a subject for theoretical speculation and hypotheses, it is a possible danger to be met, prevented, and eliminated from the life of the growing child. Its cause was long a mystery. The suggestion of the mathematician Kepler that near seeing caused myopia was buried under two centuries of speculation and academic discussion. The authority of Graefe directed attention away from convergence to accommodation. Pathologists searching with compound microscopes could not recognize a mechanical factor in causation. Cohn's statistics showed myopia increasing from 14 per cent in the lowest school grades to 59.5 per cent in the theological graduate school of the university. Risley found that the proportion mounted year by year in the schools of Philadelphia, and Derby, using atropine, proved that it increased from 35 to 47 per cent of the class in four years at Amherst College. These are now confirmed by extended clinical experience. The matter is worthy of attention.

Republic Building

ABSTRACT OF DISCUSSION

DR. ALBERT C. SNELL, Rochester, N. Y. Since myopia is very common, it is natural that some ophthalmologists question the efficacy of any or of all modern efforts to control it. Dr. Jackson's present dictum that 'myopia can be controlled by removing its causes and securing the essential conditions for healthy eye work' is encouraging. From the statistics which I have studied the general deduction is made that the number of myopic cases in public schools today is not diminishing but that the degree of myopia in the present school generation is much less than that of previous decades. Dr. Jackson's paper presents several surprises. The first is his deduction that after the age of 20 one patient in five showed a decrease in myopia, and the second is the large percentage of myopia patients showing an improvement in visual acuity. In a review of 1100 cases of myopia I found that only 2 per cent showed a decrease in myopia up to 30 years of age, and 4 per cent showed a decrease after 30. My studies of myopia do not reveal the large percentage of cases with improvement in visual acuity shown in Dr. Jackson's table.

10 Batten Ophth Rev 11 1 1892
11 Parsons J H Diseases of the Eye New York Macmillan Company p 488
12 Marlow F W Muscle Imbalance in Myopia Arch Ophth 13: 584-597 (April) 1935
13 Parsons I H Pathology of the Eye New York, Putnam's Sons vol 3 p 915

In the same records considered previously I found about 6 per cent with improvement in visual acuity, in contrast with the 40 to 61 per cent shown in Dr Jackson's table. About 50 per cent of myopia seems to be developmental, self limited and but little influenced by the use or nonuse of glasses. In this class the myopia is of low degree and becomes stationary before the age of 25. In contrast with this class and at the other extreme are found the progressive or malignant myopias. With regard to the latter and the intermediate class of myopias, I agree with Dr Jackson that the combination of the constant use of full correcting lenses, restriction of visual tasks and attention to proper general and ocular hygiene has produced favorable results in their control.

DR F T TOOLE, Montreal. Control is the holding in check of a pathologic process or possibly the elimination of elements that may predispose toward the creation of causative factors. One speaks of the control of tuberculosis, scurvy and rickets through adopting ways of living which prevent their genesis. Is it not equally true of myopia that its control consists in adopting rules of life that inhibit the creating of the prodromal causative factors? In myopia one is not merely dealing with a refractive error. Donders has truly said that every myopic eye is a diseased eye and that such an eye is as much a cripple actually as the lesion in a hip joint. Both can be controlled but both might have been prevented. Relatively low errors of myopia may be associated with retinal detachments, lens changes, vitreous opacities and a host of other pathologic changes that hold up progressive myopia as one of the commoner contributing factors in the loss of sight. The healthy offspring of a myopic parent is prone to inherit myopia much more so than the child of hypermetropic parents and the greater the degree of myopia in the parent the greater the likelihood. No one can challenge that heredity is a predisposing factor. I have only to refer to such authorities as Pflüger, Schneller and Tschering. With the new-born child introduced into the world without an actual physical handicap other than a predisposition should not our debt to society compel us to adopt more rational methods for the education and upbringing of our children? One has only to regard the figures taken from the upper grades in school statistics to note the inroads that have been made by myopia. So many children often defective physically and handicapped by a fore-ordained heredity, should not be encouraged in the intensive application of near vision. Are there not too many highly educated people today and would not many do better if they were told at the outset that a life demanding close application was unsuitable for them? One cannot transfer all one's myopia subjects to the mid-Atlantic where convergence is reduced to a minimum but there is a happy medium. The establishment of sight saving classes is a step in the right direction but a great deal of instruction can be given by the ear rather than by the eye. The facility of using artificial light at all hours of the day and night encourages a precocious child to indulge in perverted practices that ultimately assume a psychology almost pathologic in character in its unwillingness to indulge in moderation or restraint.

DR S W NEWMAYER, Philadelphia. In a recent survey a CWA project in Philadelphia, 16,200 high school boys and girls were studied for their eye status. An amount of myopia sufficient to reduce vision to 15/50 or less was found in 425 boys and girls. Of these, twenty-seven had more than 6 diopters of myopia and 398 had less than 6 diopters. In the sight saving classes of Philadelphia 190 pupils are enrolled, sixty-seven have been placed because they possess excessive myopia, but only three of these have a vision of 20/100 or less. Cases of myopia in sight-saving classes show little or no progression and rarely any decrease in vision. This I believe is due in part to maintaining a full correction of the defect.

DR MEYER WIENER, St. Louis. I think that certain statements made by Dr Jackson which he states as facts should not go unchallenged. He states that fifty years or more ago authors proved that myopia was produced by the use of the eyes for close work. I admit that many authors fifty years ago did maintain and many down to the present time have

maintained that such is the case. I do not admit that this has been proved. Dr Jackson also states that myopia is produced by excessive convergence. I take exception to that statement. I don't think it is proved. I think that there are many things which can controvert that opinion. In the first place it is taken for granted that, because myopia increases during the grammar and high school age, it is the use of the eyes for close work that produces or increases it. The fact must not be lost sight of that this is the period of greatest growth and that during this period, whether the eyes are used for close work or not, if there is a tendency for the production of myopia or the increase of myopia it will occur whether the children are going to school or are not using their eyes at all. There is one thing that to my mind is unanswerable. Why is it that if the use of the eyes for close work in school is the cause of myopia after one reaches the university it ceases to increase and it doesn't increase? It increases to the greatest extent during the period of greatest growth, between the ages of about 9 or 10 and 17 and 18 or 19, and after that there is but little increase whether one uses the eyes or not. I think that statistics show this. Why is it that most domestic animals are myopic? They certainly are not using their eyes for close work and they certainly are not using the power of convergence. Wild animals are not myopic. If convergence produces myopia and produces it in the school age, why doesn't it continue to increase after the school period is finished? If convergence produces myopia why is it that persons with one eye can develop myopia? Why is it that persons who have no binocular single vision develop myopia and have myopia increase?

DR JOSEPH I PASCAL, New York. There is a type of myopia found in children which is of low amount and progresses slowly. It shows no pathologic fundus changes, and corrected vision is at all stages perfectly normal. This type of myopia seems to be due not to a stretching of the sclera but to a hypertonicity of the whole neuromuscular mechanism of the accommodation. It may be called for this reason tonic myopia. It is in a sense a permanent tonic spasm, though it can hardly be termed a true spasm. It is more nearly a state beyond the tonic spasm as the latter is a state beyond the clonic spasm. The cause of this type of myopia seems to be a primary exophoria. In these cases there is a fairly high degree of exophoria, more at distance a true divergence excess. The exophoria seems to be the primary condition and is due to a relatively higher tonicity of the divergence center. It is well established now that there is an active divergence center just as there is an active convergence center and that the balance of the eyes is determined by the relative tonicity of the two opposing centers. Exophoria, therefore, is not just a passive state resulting from over-relaxation of the convergence center but is an active state due to a relative overtonicity of the divergence center. Now this primary exophoria necessitates a continuously excessive convergence effort in order to obtain binocular fixation. And because of the association between the accommodation and convergence the excessive convergence tends to produce excessive accommodation resulting in a permanently hypertonic accommodative mechanism and resultant myopia. Not all children showing a primary exophoria develop myopia. The principal reason for this is that there is a variable intensity in the association of the two functions of accommodation and convergence. When the two functions are tightly bound the overactivity of the convergence will tend to produce tonic myopia. When the two functions are but loosely bound the desire to have clear as well as single vision will prevent the development of this type of myopia. A similar explanation though in the reverse direction, has been mentioned by Dr Maddox in explaining why some hyperopic children develop convergent strabismus and other hyperopic children do not. Considering the etiology of this type of myopia one method of control suggests itself. An effort must be made to dissociate the two functions of accommodation and convergence. By means of simple stereoscopic exercises, it is possible to loosen the bond between the accommodation and convergence. And this procedure seems indicated in this type of myopia in addition to other measures used in the case.

DR. WALTER B. LANCASTER, Boston The subject is obviously one of many sides and the solution is not simple, because myopia is due to a number of causes acting together. One man will emphasize one cause, and another will emphasize another. The causes may be grouped into two classes: the local causes in the eye and the causes that depend on hereditary and general hygienic health conditions. It is important to urge the parents and nurse to guide the habits of the child and to teach him the proper method of holding the book, especially of holding the book farther away. However, in a family in which myopia is hereditary one child grows up myopic, and then the next one comes along and he also develops myopia. So one wants something more to do. Many have tried Dr. Wiener's method of epinephrine. Some have tried Dr. Luedde's method of atropine in one eye. I am not sure whether he has published a report on that, but he has tried it for some years. It is based on the belief that convergence is to be combated. It seems to me that convergence is an important factor. What can be done to diminish it? Using atropine in one eye may in some cases suffice to favor suffusion and do away with binocular vision and allow the eye to diverge instead of converge, but if suppression with divergence is a good thing to produce, why not go a step further and use not only atropine in one eye but also cover it with the crinkly glass that is now available and so much less conspicuous than a ground glass or a black glass before one eye and yet effectively cuts down the vision? I have been using this method. It will take a long time to determine its value, so I am asking that some ophthalmologists try it. Perhaps five or ten years from now some one will have some more data.

DR. EDWARD JACKSON, Denver The discussion has shown that the problems of myopia may be approached from very different points of view. It is a large subject and it requires such studies as Dr. Snell has made and as Dr. Tooke has made and suggested and all the others. They will have to be brought together and coordinated before any general conception of the whole subject is possible. The matter of heredity has not been doubted at all. Immediately there arises in my mind a family in which the father and mother and the four children were myopic. This would probably have occurred even if they had been started to school with glasses or if glasses had been put on before they went to school. A former theory, which was frequently put forward before much was understood about the process of evolution, was that myopia was a preparation of the race for the use of the eyes for close work. I think that the statistics will show that perhaps 999 out of 1,000, or perhaps only 99 out of 100, are born hyperopic. The size of the eyeball, its length, the curves of the refracting surfaces all indicate that those eyes must be expected to be hyperopic and that they are more highly hyperopic than the eyes ordinarily encountered at school age. The vision of children certainly is not complete at birth or within a year or two afterward. But early they begin to be interested in objects that they can seize in the hands and bring as close as they please to the eye, in that way they get a large enough image to see, even if they do not have very good vision. Practically all children come to school age with the habit of looking at near objects too close to their eyes for complete accommodation and with more convergence than they ought to have after they get to working in school. Every year I see some children having trouble with their eyes who on examination are found simply to be holding the print too close to their eyes. The only way to meet this situation and control it is to test the child repeatedly with very fine figures by bringing the card closer and closer to the eye until the child begins to back off, that is, give it a lesson that it is easier for the eye to see things farther away. Then if the mother is taught that she must watch the child with reference to this, one will get rid of the excessive convergence of infancy. It is new to me that the domestic animals are found to be nearsighted. They have deficiency of vision and they lack the full foveal vision that human beings have. Generally the lower animals have hyperopia. They may occasionally have myopia. The statistics with reference to savage races show that they are nearly all hyperopic. I think that Dr. Randall's statement has never been controverted that hyperopia cannot be "healthfully outgrown." The myopic eye is diseased when it becomes myopic.

CHOLECYSTIC DISEASE

A COMPARISON OF THE CLINICAL WITH THE
CHOLECYSTOGRAPHIC DATA CONCERNING
500 PATIENTS NOT OPERATED ON

B. R. KIRKLIN, M.D.

AND

THOMAS W. BLAKE, M.D.

Fellow in Radiology, the Mayo Foundation
ROCHESTER, MINN.

The reliability of cholecystographic data when subjected to the test of operation and pathologic examination has been proved repeatedly. For example, of 4,676 patients examined by cholecystography in 1932 at the Mayo Clinic, 732 were operated on, and the cholecystographic report, whether positive or negative, was confirmed in 696 (95 per cent) of the cases. Among 287 patients whose cholecystograms were normal and who were operated on chiefly for diseases other than of the gallbladder, surgical exploration confirmed the cholecystographic diagnosis in 257 (89.5 per cent). Of 445 patients concerning whom cholecystographic data were positive, 439 (98.6 per cent) had disease of the biliary tract. Comparable statistics have been reported by many other roentgenologists, so that the trustworthiness of the method, so far as proof by operation goes, is well established and generally accepted.

Occasionally, however, the question as to patients not operated on is raised, the implication is that, as only those patients who give marked symptoms of disease of the biliary tract ordinarily are subjected to operation, the percentage of correct cholecystographic diagnoses may easily be high but that if all patients regardless of severity of symptoms were operated on, the record of cholecystography might be less brilliant. Those who raise the question are not disposed to doubt cholecystographic evidence of gallstones or tumors, even in the absence of symptoms, but intimate that in other instances cholecystography is perhaps merely a procedure of confirmation and not of independent diagnosis, that often the cholecystographic data are not in consonance with the clinical facts, and that mere impairment of function of the gallbladder, as shown by cholecystography, is not of itself significant of disease of the biliary tract.

With respect to such intimations, the concession must be made that cholecystography is primarily a test of function of the gallbladder at the time of examination and that it is a direct method of diagnosis only when gallstones, calcific deposits in the bile or in the walls of the gallbladder, tumors or deformities of the gallbladder are demonstrable. It will also be admitted frankly that the roentgenologist cannot determine absolutely whether impaired function alone, as indicated by absence or faintness of the dye shadow, is attributable to disease of the biliary tract, to disease of other organs directly or reflexly affecting the ability of the gallbladder to receive and concentrate dye, or to conditions unrelated to disease. Notwithstanding these considerations, since thousands of operations have proved that disordered function usually is a result of disease of the biliary tract, as a rule it is far safer to draw this inference than to assume that the cholecystographic indications of impaired function are probably attributable to other causes.

From the Section on Roentgenology, the Mayo Clinic.
Read before the Section on Radiology at the Eighty-Sixth Annual
Session of the American Medical Association, Atlantic City, N. J., June
12, 1935.

Doubts as to the constant significance of cholecystographic indications of disordered function of the gallbladder may arise from lack of confidence that the technic of examination and the rationale of interpretation have been sufficiently perfected, or from a supposition that the normal gallbladder may be erratic in the performance of its functions, or from the hypothesis that its functions are often materially altered by diseases or abnormal states of other organs

Again and again, roentgenologists have emphasized the necessity of employing a scrupulous technic in administering the dye and in the roentgenographic procedure, regardless of the method employed, whether oral or intravenous. With either method the dose must be adequate, purgatives and other medicines that might interfere with the test must be interdicted, and food must not be taken by the patient except as ordered. For several years the relative merits of the two methods were in debate, but this has ceased since experience has shown that the oral method is just as dependable as the intravenous method if certain well known principles are respected. At the Mayo Clinic it is insisted that the dye be given in solution, which is required to be made palatable by the addition of grape juice and which is directed to be taken immediately after a full meal almost devoid of fats¹. If such, or similar, precautions are not followed, early vomiting, defective absorption of the dye, or delayed entrance of the dye-laden bile into the gallbladder may result in absence or faintness of the shadow when the viscus is normal. Unless the roentgenographic technic is correct, the shadow of the gallbladder may be obliterated by movement or overhard rays, or the organ may not be included in the region exposed. If the shadow is not dense, it may be concealed by gas or fecal material in the bowel. Extraordinary caution must be used in adjudging a shadow to be faint, for under normal conditions the density is affected by numerous variable factors and a standard cannot be established. Unless the shadow is so delicate that it can scarcely be discerned and its borders can be traced only with difficulty, it should be considered normal. Always it should be judged by its best appearance in the successive films not by its worst appearance. But the qualified roentgenologist is aware of these and of many other pitfalls, and only the inexperienced examiner is likely to be entrapped by them.

If there is a lingering suspicion that the normal gallbladder sometimes behaves eccentrically because of unexplainable inhibitions, substantial grounds for such mistrust are hard to find. Certainly when the technic of cholecystography is without flaw, the gallbladders of normal persons almost invariably respond normally to the test, and in the apparent exceptions the roentgenologist usually assumes that he, not the test, has erred.

At one time some roentgenologists were confident that various diseases of other organs might interfere with the ability of the gallbladder to receive and concentrate bile. Listed among them were duodenal ulcer, diabetes, exophthalmic goiter, pernicious anemia, cancer or ulcer of the stomach, low basal metabolism and obesity. Duodenal ulcer, diabetes and exophthalmic goiter were at first regarded as especially likely to impair the validity of the cholecystographic test, but with further investigation it appeared that they were far less common causes of deception than had been

supposed. An incomplete canvass of our own cases indicated that the incidence of cholecystographic evidence of impaired function, or of other disease of the biliary tract among patients who also suffered from any of the diseases or conditions mentioned, was even lower than such incidence among all patients examined, except perhaps in cases of diabetes and obesity, and possibly in cases of pernicious anemia and exophthalmic goiter. Further, when patients who had any of these concurrent diseases had been operated on, the conditions found had agreed closely with the cholecystographic data. However, because patients having these disorders are seldom sent for operation on the gallbladder unless there are marked symptoms of disease of the biliary tract in which event such disease is likely to be found, conclusive proof as to the influence of concurrent disorders on the function of the gallbladder is lacking, and as those named have been under suspicion, whether justly or unjustly, it is entirely proper for the clinician to take account of their potential effect in any case. A lesion causing marked pyloric or duodenal stenosis may retard evacuation of the dye, thus delaying absorption of the compound by the bowel and hence delaying its appearance in the gallbladder beyond the time of examination, but in such a case it is improbable that the clinician will fail to surmise the presence of obstruction or neglect to make appropriate investigation. Congenital absence and transposition of the gallbladder are such rare sources of error that they require only passing mention. Carcinoma of the pancreas may mechanically obstruct the common duct, but this is among the rarer diseases.

Impairment of hepatic function by disease of the liver, such as carcinoma or cirrhosis, would seem theoretically to be an effective cause of error in cholecystography. But Graham, Cole, Copher and Moore² have pointed out that normal cholecystograms have been found in the presence of retention of dye as high as 50 or 60 per cent in the blood stream thirty minutes after injection. However, they considered it reasonable to suppose that, if damage to the liver became sufficiently extensive, the amount of dye passing through would be inadequate for the production of a shadow by concentration in the gallbladder. It may be that roentgenologists have been inclined to underestimate the effect of hepatic damage on the cholecystogram, but their experience and the results of experimentation indicate that this effect can easily be overestimated.

On the whole, notwithstanding the many possible causes of absence or faintness of the shadow of the gallbladder, other than disease of the biliary tract, the percentage of errors from these sources, as proved by operation, has not been large, and it is to be doubted that the percentage in cases in which operation has not been performed would be materially larger.

Obviously, the reliability of cholecystographic data relative to patients whose symptoms do not warrant surgical intervention cannot be determined with finality except by subjecting a large number of such patients to cholecystectomy, and that is unthinkable. Even the most critical comparison of clinical with cholecystographic observations relative to patients not operated on cannot be decisive, for there are wide variances in the individual experience of clinicians, in their skill in eliciting the anamnesis and physical observations, in their degree of care in recording data, in the extent to

¹ Kirklín B R. Persisting Errors in the Technic of Oral Cholecystography. A Procedure Designed to Avoid Them. *J A M A* 101: 2103 2104 (Dec 30) 1933

² Graham E. A. Cole W H. Copher G H and Moore Sherwood. Diseases of the Gallbladder and Bile Ducts. ed 2. Philadelphia Lea & Febiger 1928 pp 393 396

DR. WALTER B LANCASTER, Boston The subject is obviously one of many sides and the solution is not simple, because myopia is due to a number of causes acting together. One man will emphasize one cause, and another will emphasize another. The causes may be grouped into two classes: the local causes in the eye and the causes that depend on hereditary and general hygienic health conditions. It is important to urge the parents and nurse to guide the habits of the child and to teach him the proper method of holding the book, especially of holding the book farther away. However, in a family in which myopia is hereditary one child grows up myopic, and then the next one comes along and he also develops myopia. So one wants something more to do. Many have tried Dr. Wiener's method of epinephrine. Some have tried Dr. Luedde's method of atropine in one eye. I am not sure whether he has published a report on that, but he has tried it for some years. It is based on the belief that convergence is to be combated. It seems to me that convergence is an important factor. What can be done to diminish it? Using atropine in one eye may in some cases suffice to favor suffusion and do away with binocular vision and allow the eye to diverge instead of converge but if suppression with divergence is a good thing to produce, why not go a step further and use not only atropine in one eye but also cover it with the crinkly glass that is now available and so much less conspicuous than a ground glass or a black glass before one eye and yet effectively cuts down the vision? I have been using this method. It will take a long time to determine its value so I am asking that some ophthalmologists try it. Perhaps five or ten years from now some one will have some more data.

DR. EDWARD JACKSON, Denver The discussion has shown that the problems of myopia may be approached from very different points of view. It is a large subject and it requires such studies as Dr. Snell has made and as Dr. Tooke has made and suggested, and all the others. They will have to be brought together and coordinated before any general conception of the whole subject is possible. The matter of heredity has not been doubted at all. Immediately there arises in my mind a family in which the father and mother and the four children were myopic. This would probably have occurred even if they had been started to school with glasses or if glasses had been put on before they went to school. A former theory, which was frequently put forward before much was understood about the process of evolution, was that myopia was a preparation of the race for the use of the eyes for close work. I think that the statistics will show that perhaps 999 out of 1000 or perhaps only 99 out of 100 are born hyperopic. The size of the eyeball, its length, the curves of the refracting surfaces all indicate that those eyes must be expected to be hyperopic and that they are more highly hyperopic than the eyes ordinarily encountered at school age. The vision of children certainly is not complete at birth, or within a year or two afterward. But early they begin to be interested in objects that they can seize in the hands and bring as close as they please to the eye, in that way they get a large enough image to see even if they do not have very good vision. Practically all children come to school age with the habit of looking at near objects too close to their eyes for complete accommodation and with more convergence than they ought to have after they get to working in school. Every year I see some children having trouble with their eyes who on examination are found simply to be holding the print too close to their eyes. The only way to meet this situation and control it is to test the child repeatedly with very fine figures by bringing the card closer and closer to the eye until the child begins to back off, that is, give it a lesson that it is easier for the eye to see things farther away. Then if the mother is taught that she must watch the child with reference to this, one will get rid of the excessive convergence of infancy. It is new to me that the domestic animals are found to be nearsighted. They have deficiency of vision and they lack the full foveal vision that human beings have. Generally the lower animals have hyperopia. They may occasionally have myopia. The statistics with reference to savage races show that they are nearly all hyperopic. I think that Dr. Randall's statement has never been controverted that hyperopia cannot be "healthfully outgrown." The myopic eye is diseased when it becomes myopic.

CHOLECYSTIC DISEASE

A COMPARISON OF THE CLINICAL WITH THE
CHOLECYSTOGRAPHIC DATA CONCERNING
500 PATIENTS NOT OPERATED ON

B. R. KIRKLIN, MD

AND

THOMAS W. BLAKE, MD

Fellow in Radiology, the Mayo Foundation
ROCHESTER, MINN.

The reliability of cholecystographic data when subjected to the test of operation and pathologic examination has been proved repeatedly. For example, of 4,676 patients examined by cholecystography in 1932 at the Mayo Clinic, 732 were operated on, and the cholecystographic report, whether positive or negative, was confirmed in 696 (95 per cent) of the cases. Among 287 patients whose cholecystograms were normal and who were operated on chiefly for diseases other than of the gallbladder, surgical exploration confirmed the cholecystographic diagnosis in 257 (89.5 per cent). Of 445 patients concerning whom cholecystographic data were positive, 439 (98.6 per cent) had disease of the biliary tract. Comparable statistics have been reported by many other roentgenologists, so that the trustworthiness of the method, so far as proof by operation goes, is well established and generally accepted.

Occasionally, however, the question as to patients not operated on is raised, the implication is that, as only those patients who give marked symptoms of disease of the biliary tract ordinarily are subjected to operation, the percentage of correct cholecystographic diagnoses may easily be high, but that, if all patients regardless of severity of symptoms were operated on, the record of cholecystography might be less brilliant. Those who raise the question are not disposed to doubt cholecystographic evidence of gallstones or tumors, even in the absence of symptoms, but intimate that in other instances cholecystography is perhaps merely a procedure of confirmation and not of independent diagnosis, that often the cholecystographic data are not in consonance with the clinical facts, and that mere impairment of function of the gallbladder, as shown by cholecystography, is not of itself significant of disease of the biliary tract.

With respect to such intimations, the concession must be made that cholecystography is primarily a test of function of the gallbladder at the time of examination and that it is a direct method of diagnosis only when gallstones, calcific deposits in the bile or in the walls of the gallbladder, tumors or deformities of the gallbladder are demonstrable. It will also be admitted frankly that the roentgenologist cannot determine absolutely whether impaired function alone, as indicated by absence or faintness of the dye shadow, is attributable to disease of the biliary tract, to disease of other organs directly or reflexly affecting the ability of the gallbladder to receive and concentrate dye, or to conditions unrelated to disease. Notwithstanding these considerations, since thousands of operations have proved that disordered function usually is a result of disease of the biliary tract, as a rule it is far safer to draw this inference than to assume that the cholecystographic indications of impaired function are probably attributable to other causes.

From the Section on Roentgenology, the Mayo Clinic.
Read before the Section on Radiology at the Eighty-Sixth Annual
Session of the American Medical Association, Atlantic City, N. J., June
12, 1935.

Doubts as to the constant significance of cholecystographic indications of disordered function of the gallbladder may arise from lack of confidence that the technic of examination and the rationale of interpretation have been sufficiently perfected, or from a supposition that the normal gallbladder may be erratic in the performance of its functions, or from the hypothesis that its functions are often materially altered by diseases or abnormal states of other organs

Again and again, roentgenologists have emphasized the necessity of employing a scrupulous technic in administering the dye and in the roentgenographic procedure, regardless of the method employed, whether oral or intravenous. With either method the dose must be adequate, purgatives and other medicines that might interfere with the test must be interdicted, and food must not be taken by the patient except as ordered. For several years the relative merits of the two methods were in debate, but this has ceased since experience has shown that the oral method is just as dependable as the intravenous method if certain well known principles are respected. At the Mayo Clinic it is insisted that the dye be given in solution, which is required to be made palatable by the addition of grape juice and which is directed to be taken immediately after a full meal almost devoid of fats¹. If such, or similar, precautions are not followed, early vomiting, defective absorption of the dye, or delayed entrance of the dye-laden bile into the gallbladder may result in absence or faintness of the shadow when the viscus is normal. Unless the roentgenographic technic is correct, the shadow of the gallbladder may be obliterated by movement or overhard rays, or the organ may not be included in the region exposed. If the shadow is not dense, it may be concealed by gas or fecal material in the bowel. Extraordinary caution must be used in adjudging a shadow to be faint, for under normal conditions the density is affected by numerous variable factors and a standard cannot be established. Unless the shadow is so delicate that it can scarcely be discerned and its borders can be traced only with difficulty, it should be considered normal. Always it should be judged by its best appearance in the successive films, not by its worst appearance. But the qualified roentgenologist is aware of these and of many other pitfalls, and only the inexperienced examiner is likely to be entrapped by them.

If there is a lingering suspicion that the normal gallbladder sometimes behaves eccentrically because of unexplainable inhibitions, substantial grounds for such mistrust are hard to find. Certainly when the technic of cholecystography is without flaw, the gallbladders of normal persons almost invariably respond normally to the test, and in the apparent exceptions the roentgenologist usually assumes that he, not the test, has erred.

At one time some roentgenologists were confident that various diseases of other organs might interfere with the ability of the gallbladder to receive and concentrate bile. Listed among them were duodenal ulcer, diabetes, exophthalmic goiter, pernicious anemia, cancer or ulcer of the stomach, low basal metabolism and obesity. Duodenal ulcer, diabetes and exophthalmic goiter were at first regarded as especially likely to impair the validity of the cholecystographic test but with further investigation it appeared that they were far less common causes of deception than had been

supposed. An incomplete canvass of our own cases indicated that the incidence of cholecystographic evidence of impaired function, or of other disease of the biliary tract among patients who also suffered from any of the diseases or conditions mentioned, was even lower than such incidence among all patients examined, except perhaps in cases of diabetes and obesity, and possibly in cases of pernicious anemia and exophthalmic goiter. Further, when patients who had any of these concurrent diseases had been operated on, the conditions found had agreed closely with the cholecystographic data. However, because patients having these disorders are seldom sent for operation on the gallbladder unless there are marked symptoms of disease of the biliary tract, in which event such disease is likely to be found, conclusive proof as to the influence of concurrent disorders on the function of the gallbladder is lacking, and as those named have been under suspicion, whether justly or unjustly, it is entirely proper for the clinician to take account of their potential effect in any case. A lesion causing marked pyloric or duodenal stenosis may retard evacuation of the dye, thus delaying absorption of the compound by the bowel and hence delaying its appearance in the gallbladder beyond the time of examination, but in such a case it is improbable that the clinician will fail to surmise the presence of obstruction or neglect to make appropriate investigation. Congenital absence and transposition of the gallbladder are such rare sources of error that they require only passing mention. Carcinoma of the pancreas may mechanically obstruct the common duct, but this is among the rarer diseases.

Impairment of hepatic function by disease of the liver, such as carcinoma or cirrhosis, would seem theoretically to be an effective cause of error in cholecystography. But Graham, Cole, Copher and Moore² have pointed out that normal cholecystograms have been found in the presence of retention of dye as high as 50 or 60 per cent in the blood stream thirty minutes after injection. However, they considered it reasonable to suppose that, if damage to the liver became sufficiently extensive, the amount of dye passing through would be inadequate for the production of a shadow by concentration in the gallbladder. It may be that roentgenologists have been inclined to underestimate the effect of hepatic damage on the cholecystogram, but their experience and the results of experimentation indicate that this effect can easily be overestimated.

On the whole, notwithstanding the many possible causes of absence or faintness of the shadow of the gallbladder, other than disease of the biliary tract, the percentage of errors from these sources, as proved by operation, has not been large, and it is to be doubted that the percentage in cases in which operation has not been performed would be materially larger.

Obviously, the reliability of cholecystographic data relative to patients whose symptoms do not warrant surgical intervention cannot be determined with finality except by subjecting a large number of such patients to cholecystectomy and that is unthinkable. Even the most critical comparison of clinical with cholecystographic observations relative to patients not operated on cannot be decisive for there are wide variances in the individual experience of clinicians, in their skill in eliciting the anamnesis and physical observations, in their degree of care in recording data, in the extent to

¹ Kirkin B. R. Persisting Errors in the Technic of Oral Cholecystography. A Procedure Designed to Avoid Them. J. A. M. A. 101: 2103-2104 (Dec. 30) 1933.

² Graham E. A. Cole W. H. Copher G. H. and Moore S. H. Diseases of the Gallbladder and Bile Ducts. ed. 2. Philadelphia Lea & Febiger. 1928. pp. 393-396.

which they are influenced by the cholecystographic report, and in the particular factors they deem necessary for the diagnosis of disease of the biliary tract, and a similar, although less pronounced, variance in the interpretation of cholecystographic phenomena obtains among roentgenologists. Nevertheless, such comparison is the sole available method of approach, and we have attempted to make an analysis of this sort.

The material comprised the records of 500 patients examined both clinically and cholecystographically at the clinic but not operated on. In 200 of the cases no shadow of dye had been discernible, and a report of nonfunctioning gallbladder had been made, in 100 the shadow of dye had been only faintly discernible, and a report of poorly functioning gallbladder had been made, in 200 the cholecystographic response had been normal and had been so reported.

The records were not selected but those of each group were taken consecutively as they appeared in the files of the Section on Roentgenology. Those patients who had nonfunctioning, or poorly functioning, gallbladders were examined in 1933 and 1934, and those who responded normally to the test were examined in the final weeks of 1934. Clinical examinations had been made by consultants and their assistants in the various sections of the clinic, and in most cases more than one consultant had seen the patient and had participated in the diagnosis. Cholecystographic examinations had been made after oral administration of the dye according to a rigid technique described heretofore, and interpretations had been made alternately by four consultants in the Section on Roentgenology.

In 185 (92.5 per cent) of the 200 cases in which there were nonfunctioning gallbladders, according to the cholecystograms, a clinical diagnosis of cholecystic disease was made. Among the fifteen exceptions, a questionable diagnosis of cholecystic disease was made in one instance, the cholecystographic report of nonfunctioning gallbladder was recorded without comment in two and disease of the biliary tract was not mentioned in twelve. Further, among these twelve a diagnosis of cirrhosis of the liver was made in eight and a low basal metabolic rate was emphasized in one. On the other hand, among the 185, diabetes was also diagnosed in three, cirrhosis of the liver in two, pernicious anemia in two, hyperthyroidism in two, duodenal ulcer in five, and a low basal metabolic rate was given special note in two.

In eighty-one (81 per cent) of the 100 cases in which there were poorly functioning gallbladders, a clinical diagnosis of cholecystic disease was made. Among the nineteen exceptions were one case in which one of the consultants held the opinion that the gallbladder was at fault and should be removed, five in which there were various degrees of doubt as to the presence of cholecystitis, three in which the cholecystographic report was cited without comment, and ten in which disease of the biliary tract was not mentioned. Moreover, among the nineteen cases excepted, a diagnosis of duodenal ulcer was made in one and a low basal metabolic rate was emphasized in one. However, among the eighty-one cases in which disease of the biliary tract was considered to be present, diabetes was also diagnosed in three, hyperthyroidism in three, duodenal ulcer in six, and cirrhosis of the liver in one.

In 188 (94 per cent) of 200 cases in which there were normally functioning gallbladders, disease of the biliary tract was not mentioned by the clinician in the record. Among the twelve exceptions the clinician

made a definite diagnosis of cholecystic disease in three cases and noted the possibility that such disease might be present in nine. Again, among the exceptions the additional diagnosis of duodenal ulcer was given in one instance and of pernicious anemia in one. But among the 188 cases in which it was considered that disease of the biliary tract was not present, duodenal ulcer was diagnosed in twenty-four, diabetes in two, cirrhosis of the liver in one and pernicious anemia in one, and the low basal metabolic rate was stressed in four.

Thus the results of this study do not confirm any mistrust that the test of function by cholecystography, as a basis for judgment whether the gallbladder is probably diseased or normal, is less reliable in cases in which operation is not performed than in cases in which it is performed. On the contrary, in 90.8 per cent of these 500 cases the cholecystographic report was in consonance with the final clinical opinion, and this closely approximates the accuracy of cholecystography as proved by operation.

But, if this percentage is fairly representative, it is to be hoped that no one will hastily conclude that cholecystography is superfluous and that the symptoms and signs, together with the results of other tests, are consistently sufficient for the diagnosis or exclusion of disease of the biliary tract. Surely, quite aside from its revelation of gallstones and tumors, cholecystography must have considerable value, both in direct and in differential diagnosis, else it would not be employed as freely as it is. In this appraisal of cholecystography there is no subtle suggestion that the clinical examination can be discarded or that the two methods are competitive. Roentgenologists have always insisted that the cholecystographic data should invariably be weighed in the light of the clinical facts. When the respective conditions found are inconsistent, it is the acknowledged privilege and duty of the clinician to consider whether technical or interpretive errors may have been made or whether disease elsewhere may have affected the functional behavior of the gallbladder, or whether in spite of a normal cholecystogram, the biliary tract may nevertheless be diseased. Further, however valid the cholecystographic signs of impaired function may be as indications of disease of the biliary tract they will not determine whether the disorder is transient or chronic, mild or severe, or whether it is the cause of the patient's chief complaint, and determination of these matters rests solely with the clinician. In short, the roentgenologist and the clinician are obliged to cooperate and neither will profit from entertaining captious doubts as to the efficiency of the other's method.

ABSTRACT OF DISCUSSION

DR. I. S. RAVDIN, Philadelphia. Any laboratory examination that can be proved correct in its interpretation in 95 per cent of instances needs no further justification. It should be admitted, however, that in its universal application by roentgenologists the results of cholecystography are not nearly so good. The excellent results reported in the paper are due to the great care in the administration of the dye and in the roentgenographic procedure factors that were stressed by Graham and Cole when the method was first described. The suggestion that even faint shadows be considered an indication of normal function is not in accord with known facts in regard to gallbladder function. Studies of the gallbladder bile in gallbladder disease in a large number of patients have conclusively demonstrated that all degrees of concentration may take place. A faintly visualized gallbladder may be due to the failure of the gallbladder to concentrate the dye adequately, and such a gall-

bladder is in no sense normal in its function. The varied terminology now being used by roentgenologists for reporting the results of cholecystographic study should be discouraged and an attempt should be made to develop a standard nomenclature for reporting the results of study. The authors have exercised such caution in the determination of the status of what may well be called borderline cases that no possible exception can be taken to their statements. It is in this group that full cooperation between the roentgenologist and the clinician is necessary. I hope that before long some one will publish the cholecystographic data from a group of noncalculous cases in which gallbladders have been removed partly as a result of the cholecystographic evidence and compare the results of roentgen study with the end results of operation. It is my impression that in this group regardless of the cholecystographic evidence the end results of operation are not good.

DR B R KIRALIN, Rochester, Minn. Did I understand Dr Ravdin that that was the recognition of the stones in all the gallbladder cases or stones in a certain group?

DR I S RAVDIN, Philadelphia. That was a consecutive series of 165 cases. The stones were frequently present as positive shadows when the concentration of shadow was below 5 per cent. It gave no information as to where the stones might be visualized.

EXPERIENCES IN LEG LENGTHENING

E C JANES, M.B. (TOR.)
HAMILTON, ONT.

The subject of leg lengthening is of vital importance to those patients who are unfortunate enough to have a short extremity. They must wear an unsightly and heavy lift of some sort, or they must be content to walk with an awkward gait and bear with what fortitude they have the compensatory deformities that inevitably develop.

If a lift is not worn to equalize the length of the legs, the pelvis is constantly tilted, and a scoliosis develops which may seriously handicap the patient. A lift as well as being unsightly means extra weight on an already weakened extremity.

What doctor has not had patients ask if anything can be done to correct the shortening of an extremity? What doctor has not felt at least a little guilty because

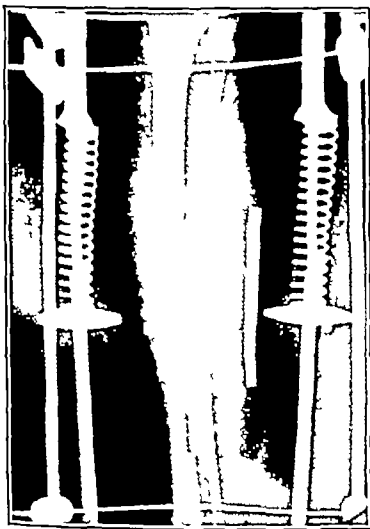


Fig 1 (case 1)—Appearance after lengthening was complete but with the apparatus still in position.

of the patients' disappointment if the answer is in the negative? It is necessary and just that all those interested in orthopedic surgery make themselves familiar with the best methods of correcting inequality in the length of legs and be prepared to offer their patients the benefits thereof.

Codivilla¹ and Putti² showed that lengthening was a practical procedure—that it must be done gradually, and that skeletal traction and countertraction should be used. They proved that it was the fascial structures of an extremity that provided the greatest resistance to lengthening and that blood vessels and nerves would tolerate considerable gradual extension.

It remained for Abbott³ to devise an apparatus and a surgical technic that was practical. Abbott should get full credit for giving this work the necessary stimulus on this continent. He described a form of osteotomy that left considerable bone surface in contact when lengthening was complete and he devised an apparatus to maintain accurate alignment as well as extension. Various modifications of his technic and apparatus have been reported but the fundamentals are not changed and might be listed as follows:



Fig 2 (case 1)—Five and one-half years after operation showing very little evidence that any operation has been performed on the tibia.

- 1 Skeletal traction and countertraction
- 2 Slow and gradual lengthening
- 3 A form of osteotomy that leaves considerable bone surface in contact when lengthening has been completed
- 4 Wide division of fascia
- 5 Some form of stabilizer to maintain accurate alignment of fragments
- 6 Rigid surgical technic
- 7 Postponing of stabilizing operations until lengthening has been completed

The purpose in this presentation is to stimulate interest in the subject and to report a few cases in which leg lengthening has been performed. The cases chosen illustrate shortening due to various causes and several difficulties that may be encountered. From these experiences one may form an opinion as to what types of cases are suitable for leg lengthening and also what might be considered the ideal case for this procedure. Details of technic and apparatus will not be described, because space does not permit. A modified Abbott machine was used in all cases.

REPORT OF CASES

CASE 1—D K., aged 15 years, had infantile paralysis at 18 months of age, followed by extensive paralysis of the left leg including the quadriceps. The patient walked with the aid of crutches and a long leg brace until the age of 14 years.

In November 1928 triple arthrodesis was done with fixation of the achilles tendon and transplantation of the semimembranosus tendon to the patella.

In May 1929 lengthening of the left tibia of 2¾ inches was obtained. The leg was supported in a plaster cast for six months. The patient now walks well without any appliance, and the legs are equal in length.

- 1 Codivilla A. On the Means of Lengthening in the Lower Limbs the Muscles and Tissues Which Are Shortened Through Deformity. *Am J Orthop Surg* 2: 353 (April) 1905.
- 2 Putti Vittorio. The Operative Lengthening of the Femur. *J A M A* 77: 934 (Sept 17) 1921.
- 3 Abbott L C. The Operative Lengthening of the Tibia and Fibula. *J Bone & Joint Surg* 9: 128-152 (Jan) 1927.

CASE 2—K D, a girl, aged 15 years, had atrophy of the right leg due to infantile paralysis. The right leg was 2 inches shorter than the left.

In July 1932 lengthening of the right tibia of $2\frac{1}{4}$ inches was obtained. The leg was supported in a plaster cast for six months. Moderate infection developed but cleared up without trouble. At present she walks well. Her legs are equal in length.



Fig 3 (case 1)—Apparatus in position

CASE 3—J I, aged 21, had $1\frac{1}{2}$ inch shortening of the right leg, as the result of malunion of a fracture of the right femur five years before.

In October 1932 lengthening of the right tibia of $1\frac{1}{2}$ inches was obtained. The leg was supported in a plaster cast for about seven months but the patient was able to return to work in four months. Moderate infection developed necessitating the curetting of a sinus from the tibia in December 1933 after which the infection cleared rapidly.



Fig 4 (case 4)—Condition A in April 1930 B in May 1935

In January 1930 a Helferichs osteotomy was performed to allow straightening of the knee without loss of length.

In March 1930 lengthening of the left femur of 3 inches was obtained. Altogether after operation the left foot was $5\frac{1}{2}$ inches closer to the floor, 3 inches by lengthening the femur and $2\frac{1}{2}$ inches by osteotomy of the knee, and she now requires a 2-inch lift built into her shoe to walk comfortably.

One and a half years after the lengthening she fractured the left femur through the same area in which the lengthening

had been done, but union took place in the usual length of time. There was mild infection about the lower end of the upper fragment after lengthening.

CASE 5—W K, a youth, aged 17, had 4 inch shortening of the left leg, due to healed tuberculous arthritis of the left hip joint.

In October 1932 lengthening of the left tibia of 2 inches was obtained. Bony union in the upper part of the tibia was delayed and about six months after operation a fracture occurred through this area. Healing still did not take place, so a bone graft was placed across the fracture in September 1933. Healing then progressed rapidly. At present he walks quite well with about a $1\frac{1}{2}$ inch lift inside the left shoe.

COMMENT

The average lengthening obtained was approximately $2\frac{1}{4}$ inches. Troublesome infection occurred in three cases but no serious osteomyelitis developed. Although fairly satisfactory results were obtained even in these cases one feels that more lengthening might have been obtained if infection had not been present. This was

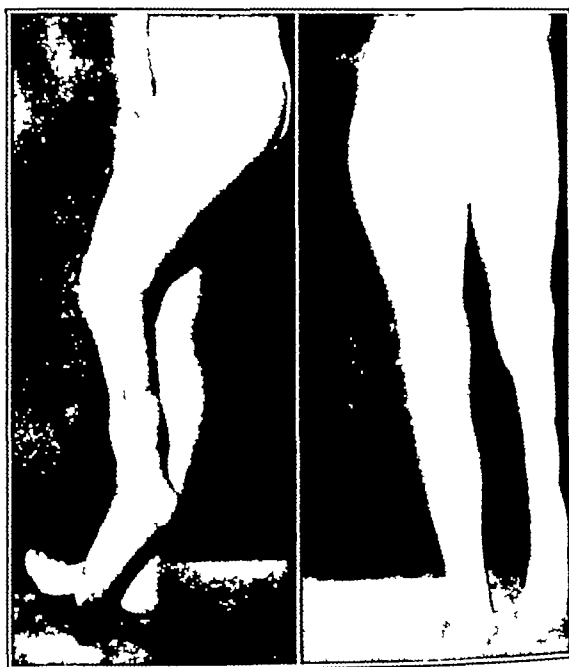


Fig 5 (case 4)—Shortening in January 1930

particularly true in cases 4 and 5. Safe bony union was slow in all the cases. It was necessary to keep the leg supported for at least six months, and about eighteen months in case 5, in which a bone graft was required. There was some trouble because of tilting of the fragments during lengthening in two cases, and the apparatus is now provided with a stabilizer to correct this defect. The results are gratifying to the patients in spite of the discomforts and dangers, and all of them feel that the time was well spent. The entire period is not necessarily wasted because further rehabilitation is possible during convalescence. Two of these patients took courses in shorthand and stenography during their treatment and have subsequently found remunerative positions.

In these cases the operation was performed for shortening due to (1) infantile paralysis, (2) healed tuberculosis of the hip joint, (3) malunion of fracture and (4) growth disturbance due to destruction of the epiphyseal lines.

One hesitates to be dogmatic about the amount of shortening necessary to justify operation, but I feel that

it should never be done for less than $1\frac{1}{2}$ inches. Each case, of course, should be individualized, and the psychologic effect of a short extremity and an unsightly limp on both the patient and a prospective employer must never be forgotten.

If the shortening is due to infantile paralysis, and the patient is able to walk without a brace—perhaps after various stabilizing operations—leg lengthening should be done, but if the quadriceps is paralyzed and cannot be replaced a long leg brace is usually necessary, and lengthening would appear to be too formidable for the benefit to be obtained. The ideal type of case would be one in which the extremity is normal except for its length. This condition is most closely approximated when shortening is due to malunion of a fracture or to healed tuberculous arthritis of a hip joint.

Apparently the blood vessels and nerves will allow the extension necessary, provided they are stretched

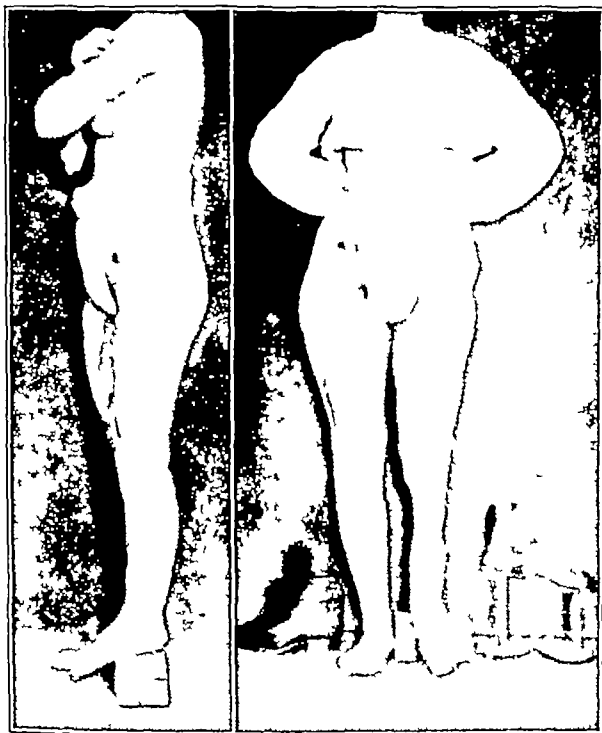


Fig 6 (case 4)—Appearance in May 1935 with the cumbersome apparatus worn before lengthening and the shoe worn at present

very slowly. If lengthening is too rapid, the foot may show temporarily a little coldness and numbness.

The operation must not be undertaken lightly. It should be done only in a hospital, where rigid surgical technique and adequate after-care can be obtained. The surgeon should have some mechanical inclination and sufficient training in major bone surgery.

Patients who undergo the operation should be prepared to give up about six months. The ideal time in the patient's life is at 15 or 16 years of age, when growth is nearly complete but before the wage earning period. There is no reason, however, why the operation cannot be performed at practically any age.

The entire process is a formidable one, but, judging from my own experience and the reported experience of others, it is a quite justifiable procedure and should be added to the armamentarium of all those who undertake the surgery of cripples.

250 Main Street East

ABSTRACT OF DISCUSSION

DR PAUL N JEPSON Philadelphia My comment on Dr Janes's procedure is one of caution. The operation with its pitfalls and objections, was first clearly discussed by Dr Abbott several years ago. There are several avenues open to infection. The one important objection to the operation is that the bone marrow is widely opened. Some irritation is caused by the introduction of the pins or wires and these bony openings are the avenues by which infection may enter. The procedure in competent hands works well but the wounds must be watched carefully and must be carefully dressed. It has been suggested that a series of simple single-step osteotomies be done in place of this procedure. Such an operation has been done by means of a long slanting osteotomy notching for the required length and prying the bones into place. Only a limited amount of leg lengthening can be obtained, namely, three-fourths inch and according to the amount of shortening present the procedure may require several operations, which in itself is a definite objection. For this reason, unless the conditions under which it is performed are adequate the operation ought not to be undertaken. To me it is a formidable procedure. The cases presented by Dr Janes are remarkably good ones.

DR JAMES A DICKSON Cleveland Most excellent and satisfactory results can be obtained in bone lengthening operations by means of the Abbott technique and its modifications. It is a formidable surgical procedure, and each case must be given serious consideration before the operation is undertaken. The patient requires long hospitalization and careful supervision for from six months to a year and sometimes even longer, hence the economic as well as the surgical difficulties must be considered thoroughly.

In well chosen cases the final result more than compensates for these difficulties. As Dr Janes has pointed out this operation should not be considered unless the shortening amounts to $1\frac{1}{2}$ inches or more. When there is a flail extremity and the patient is going to have to wear a brace anyway the lengthening operation should not be considered. When there is a weakness of the gluteus medius and the patient has to walk by deviating the spine to the opposite side in order to bring the leg forward at least $1\frac{1}{2}$ inches of shortening is required to enable the patient to

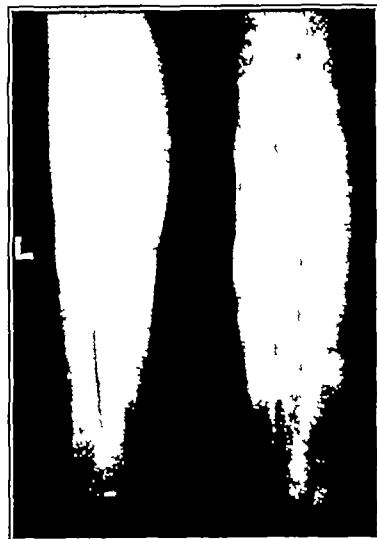


Fig 7 (case 5)—Condition in March 1933 showing a weak bridge of bone supporting the leg and in November 1933 showing the fracture of the bone graft in place

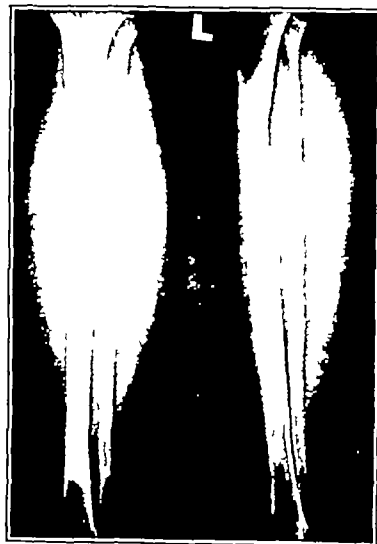


Fig 8 (case 5)—Well healed and strong, tibia in May 1935

PARAFFIN IN BLADDER—KATZEN

Jour. A. M. A.
Nov. 2, 1935

walk with an optimal gait. It is advisable therefore to experiment with various heights of lift on the shoe in every case of poliomyelitis in order to determine which height gives the best walking gait. In this way the optimal degree of lengthening can be determined before operation. In view of the fact that in spite of all precautions a certain degree of valgus deformity may result during the lengthening procedure, it would probably be better to perform the lengthening operation first and attend to stabilizing procedures later. Probably the most dramatic results in leg lengthening are obtained when the shortening is caused by something other than poliomyelitis such as tuberculosis of the hip or knee. In the healed tuberculosis of the hip Dr. Janes did a lengthening of the tibia rather than of the femur. Successful lengthening of the femur can be accomplished by weights alone with the line of pull in the axis of the upper fragment of the femur. In tuberculosis of the knee, when the roentgenogram shows that the shortening is due to a fusion of the tibial or femoral epiphysis, the legs may be equalized by the Phemister operation for fusion of the same epiphysis on the well leg. The type of operation to be used in equalizing the length of the extremities in this type of case should be chosen also according to the structural type of the individual.

trouble is liable to come later on when lengthening has been started. There has really been very little shock from the actual application of the apparatus. Dr. Anopol has shown some modifications of technic and apparatus that should prove interesting.

Clinical Notes, Suggestions and New Instruments

PARAFFIN FOREIGN BODY IN THE BLADDER
PERRY KATZEN, M.D. BROOKLYN

Foreign bodies in the urinary bladder are by no means uncommon, all varieties of objects having been described in the literature. Such articles composed of wax, however, seem to be of comparatively rare occurrence. The following case is reported as an instance of the nonoperative removal of such a foreign body.

REPORT OF CASE

F. S., an unmarried white man, aged 21 years, consulted me Nov. 3, 1934, giving the following history. Three days previously while at a house party, he and several companions became intoxicated and as a practical joke his "friends" inserted into his urethra a paraffin candle measuring approximately 2½ inches in length and one-fourth inch in diameter. The patient stated that he immediately felt the candle slip into his bladder. Twelve hours later there developed frequency of urination, dysuria, tenesmus and terminal hematuria. At the time of examination he was voiding every thirty minutes with severe pain. During the preceding twenty-four hours he had noticed that the urine was quite cloudy and bloody. The previous history was irrelevant, there was no history of venereal disease.

Physical examination was negative except for tenderness on palpation over the suprapubic region. The temperature and pulse were normal. The urine was grossly bloody, and on analysis the reaction was alkaline, the specific gravity was 1.016, there was a trace of albumin, there was no dextrose, many pus cells and red blood cells were present and there were many gram negative bacilli having the morphology of *B. coli*. On roentgenologic examination of the urinary tract both kidneys appeared normal in size, shape and position. There was no radiographic evidence of calculus or foreign body.

Cystoscopy revealed intense inflammation of the entire bladder mucosa and scattered throughout were many hemorrhages. Floating near the vault was a white paraffin candle of a size corresponding to that described by the patient. It was divided into three segments attached to one another by the wick, but apart from that its form had not been altered as a result of its three-day stay in the bladder; the wax not appearing softened and the spiral design of the candle being well preserved. Several attempts were made to grasp the candle with a cystoscopic forceps, but the candle repeatedly slipped away as the jaws of the forceps closed down on it and further efforts at removal were abandoned at that sitting. Methenamine and ammonium chloride were prescribed.

The patient was seen again the following day; his symptoms were unchanged and the urine was still bloody. A Young's cystoscopic rongeur was introduced into the bladder, the cystoscopic appearance was the same as noted the previous day. With considerable difficulty, owing to the elusiveness of the floating wax, several pieces of the candle were removed with the rongeur, but with each bite of the latter numerous small fragments of the candle were broken off and remained in the bladder so that at the end of the procedure probably half of the original amount of paraffin could still be seen floating near the bladder vault. A portion of the wick also remained, attached to several pieces of wax.

To effect the removal of the remaining wax it was decided to employ liquid petrolatum as a solvent, as first suggested by Harris.¹ Accordingly, 100 cc. of warm sterile liquid petrolatum was instilled into the bladder through a rubber catheter.

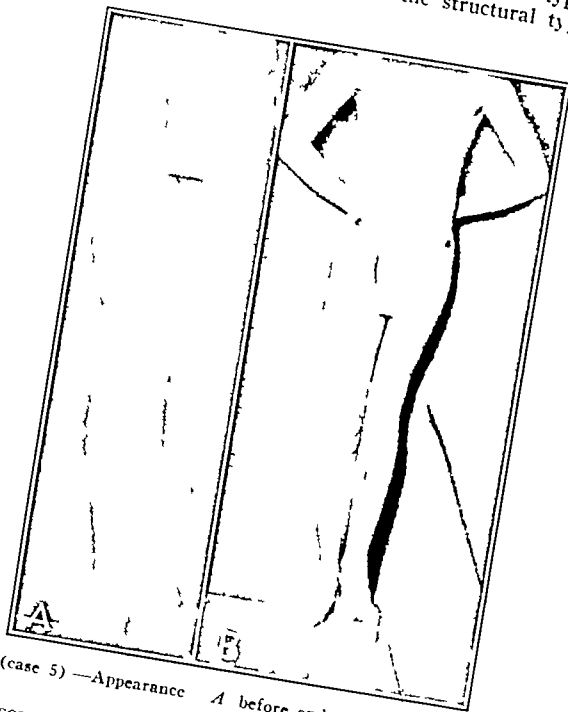


Fig. 9 (case 5)—Appearance A before and B after the lengthening

DR. GEORGE ANOPOL, New York. My purpose is to bring out a more simplified method in holding the fragments in line and during their traction making the patient more comfortable during his stay in the hospital and eliminating any trauma to the operated site in case of any emergency or moving the patient from the bed to the chair. Most of the other appliances require the patient to be kept in bed. The method I use consists of two isometric parts. Each consists of two telescoped tubes, the inner one being graduated and two posts, one at the upper and one at the lower end with the traction so arranged that when they are pushed apart the distance between them is reported by the calibration on the inner tubes. This eliminates the distance roentgenography with pieces of metal and then calculating the distance obtained. The apparatus is combined with plaster-of-paris technic.

DR. E. C. JANES, Hamilton, Ont. I quite agree that the warning about a little caution regarding this operation is timely. Still any one doing surgery of cripples should be prepared to take a fair amount of responsibility. It must be remembered that these children will at times be willing to undergo a great deal of risk and discomfort to have their deformities corrected. I have not been much impressed by the danger of shock from the operation itself in my cases. The

¹ Harris, Augustus A. Case of Paraffin Foreign Body in the Bladder. *M. J. & Record* 134: 372 (Oct. 21) 1931.

and the suprapubic region was massaged thoroughly. The patient was instructed to refrain from urinating as long as possible and to massage over the bladder at intervals.

The following day he felt better, the frequency and dysuria had diminished, although gross hematuria was still present. The bladder was irrigated with 1 5,000 mercuric oxycyanide solution and 100 cc of warm, sterile liquid petrolatum was again instilled, followed by massage over the bladder region. The same treatment was instituted the next day. On each occasion the patient was able to retain the oil for from two to three hours without any evident bladder irritation.

The patient was reexamined two days later, at which time he stated that there was considerable lessening of the urinary distress and that he now noticed only occasional slight hematuria. On cystoscopy there was still evident a severe hemorrhagic cystitis, but it was less marked than previously. Neither wax nor wick was visible, the latter having apparently been passed unnoticed by the patient.

During the following month the bladder was irrigated twice a week with 1 4,000 solution of acriflavine base accompanied by a gradual clearing of the urine. The patient was last examined Dec. 8, 1934. On that date he was entirely free from symptoms, the urine was crystal clear, and cystoscopy revealed a normal bladder mucosa.

COMMENT

Paraffin acts as a marked irritant to the bladder mucosa, provoking a violent hemorrhagic cystitis within twenty-four hours. Occasionally it may serve as a nucleus in the formation of a vesical calculus. The prompt removal of such a foreign body is therefore clearly indicated.

In most cases it should not be necessary to employ cystotomy for this purpose. At times one may succeed with the use of the cystoscopic forceps, Young's rongeur, or the cystoscopic lithotrite, but there is great difficulty if not complete failure in such procedures. The wax constantly slips away from the jaws of the instrument and floats high in the bladder. If the wax finally is grasped, it crushes very readily into many fragments on account of its friable nature, making repeated instrumentation necessary. In a severely inflamed irritable bladder which bleeds easily, this procedure is far from desirable.

Various methods of dissolving wax in the bladder have been employed. Heat alone applied by means of bladder irrigations as hot as could be tolerated was used by Boss² with only partial success in a patient with a candle in the bladder. After twenty-two days of treatment several pieces of wax were still present.

Lohnstein³ in 1907 was the first to describe the use of chemical solvents. A patient with a stearin candle in the bladder was given an instillation of 15 cc. of benzene and retained it for forty-five minutes. This was immediately repeated with 25 cc. which the patient could retain for only ten minutes. The same treatment was instituted the following day. Although this was effective in dissolving the wax, there ensued symptoms of benzene poisoning as well as considerable vesical irritation. Weisz⁴ also employed benzene but he first injected 120 cc of water into the bladder, so that the trigon which was the part most severely inflamed in his patient, would not come in contact with the benzene since the latter floated on the water.

A number of other solvents have been used. Caples⁵ after three unsuccessful attempts at removal with the cystoscopic rongeur of a paraffin candle lodged in the vesical neck, dissolved this foreign body by bladder instillations of 33⅓ per cent gasoline in liquid petrolatum at 110 F. giving seven such injections over a period of three days. The same solvent was effectively used by Melen⁶ in a bladder containing a wax drawing-crayon using six instillations. Hottinger⁷ in a boy with a mass of beeswax in the bladder was able to remove

part of the wax through the operating cystoscope and dissolved the remainder with xylene, injecting water into the bladder first and following with 12 cc. of xylene, which was retained for four hours. Xylene was also employed successfully by Geyer,⁸ who used 50 cc. and repeated this instillation five days later.

The use of liquid petrolatum, described by Harris, impressed me with its effectiveness and freedom from irritation. Harris injected 100 cc of warm liquid petrolatum into a boy's bladder which contained part of a paraffin candle. This was followed by massage over the bladder and the application of external heat by means of hot sitz baths and a hot water bag held over the suprapubic region. Four such instillations were given twenty-four hours apart, each being retained for three or four hours. Most of the wax was dissolved after two injections, the wick was passed spontaneously after the second instillation. Several days after the last treatment cystoscopy revealed only a few patches of mild cystitis, with no evidence of foreign body.

CONCLUSIONS

1 The removal of paraffin from the bladder should not require cystotomy or operative cystoscopic procedures.

2 Liquid petrolatum is an effective, nonirritating solvent for such foreign bodies. In the case of paraffin candles, if the wick is not voided spontaneously, it may easily be removed with the cystoscopic forceps.

855 Ocean Avenue

A CASE OF AUTHENTICATED FERTILITY IN A MAN AGED 94

FRANCES I. SEYMOUR, M.D., NEW YORK; CHARLES DUFFY, M.D.,
NEW BERN, N. C.; AND ALFRED KOERNER, M.D., NEW YORK

The patient here studied was born on a farm in North Carolina in the year 1840. His entire boyhood was spent in the usual pursuits of a farm boy until at the outbreak of the war between the states he joined the Confederate troops. After some time in the army he was put into a grinding mill, which turned out flour for the soldiers. The end of the war found that he had not been in any battles. The war over, he returned to farming. In 1872 he married. His wife lived until ten years ago, bearing him sixteen children, of whom six are living and well, the oldest being 63 and the youngest 33. Evidence that the stock was good is further supported by the fact that there are thirty-eight grandchildren. Approximately a year ago our subject remarried, this time pledging himself to a widow of 27. A few weeks ago a child was born of this union, the father at this time being a little over 94 years old.

He has always been a man of outdoor habits. Except for an occasional cold and pneumonia eighteen years ago, he has been singularly free from illness. He has had no operations, accidents or hospitalization of any sort. He chews tobacco but does not smoke. Until a few years ago he drank considerable alcohol. On both his father's and mother's side, long life has been the rule, his mother dying at the age of 103. There has been a total freedom from familial involvement in any chronic diseases.

The general appearance of the patient is senile. He has a markedly wrinkled skin, brownish in cast, leathery in texture and having a considerable number of comedones. The angle of the jaw is distinctly of the senile type. On both eyes there are pterygia, the left being incipient. Arcus senilis is present and there are early cataracts on both eyes. The fundi present an interesting picture. The light reflex is considerably increased, the arteries appearing silver-wire and the veins being somewhat ampullated. The pupils react to light, though somewhat sluggishly. They are round and equal and respond to accommodation. There is no evidence of hippus, no deviation, no divergence, no enophthalmos and no exophthalmos. The ear drum is lusterless and opaque. A tonsillar tag is present on the left side. Most of the teeth are missing and there are several which are represented by roots only. Those which the patient retains are in poor condition.

8 Geyer, Blasenentzündung durch Paraffinklumpen. Deutsche med. Wchnsch. 48:1284 (Sept. 22) 1922.
Read before the Craven Medical Society of North Carolina at New Bern, March 12, 1935.

² Boss, William. Fremdkörper der Harnblase. Ztschr. f. urol. Chir. 34:378 (May 20) 1932.

³ Lohnstein, H. Ueber einen Wachsklumpen in der Blase—Entfernung desselben durch Auflösung mittels Benzin-Injection. Verh. d. Berl. med. Gesellsch. 28:199 (part 2) 1908.

⁴ Weisz, F. Removal of a Wax Candle from the Bladder by Means of Benzene. Am. J. Urol. 5:459 (Dec.) 1909.

⁵ Caples, B. H. Foreign Body in the Urinary Bladder. Surg. Gynec. & Obst. 29:315 (Sept.) 1919.

⁶ Melen, D. R. Nonsurgical Removal of Paraffin in the Urinary Bladder. J. A. M. A. 80:685 (March 10) 1923.

⁷ Hottinger, R. Ueber Fremdkörper der Harnblase und ihre Entfernung. Cor. Bl. f. Schweiz. Aerzte 40:875 (June 14) 1919.

The subject is pigeon chested and has a slight kyphosis. His height is 5 feet 8 inches (173 cm) and his weight is 165 pounds (75 Kg). The heart is enlarged about the width of three fingerbreadths to the left and two fingerbreadths downward. The rate and rhythm are regular, there are no murmurs, and there is no dyspnea on exertion. The lungs present no evidence of pathologic changes. The radial arteries are pipe-stem in character. The pulse is regular, there being no variation in pressure and no arrhythmia.

The abdomen presents a rather surprising amount of good musculature, and there is no evidence of any herniation. The prostate is not enlarged. The extremities are not remarkable.

In general, the muscles of the body are well developed, firm, and in a good state of preservation. The cranial nerves were tested in detail, peppermint energine (a cleaning fluid) and ether being (among other things) the substances used in the sensory determination.

The first seven cranial nerves were normal both on sensory and on motor tests. The bone conduction was greater than the air conduction, phonation was good and the oculocardiac reflex was negative. The eleventh nerve showed no abnormality. The movement of the tongue was more pronounced to the right than to the left side. Its papillae were accentuated.

The patient's gait was normal. There were no tremors present. Coordination, both equilibratory, including the Romberg phenomenon, and nonequilibratory, was entirely normal. There was no evidence of aphasia, either motor or sensory. The diffuse tactile sense was hyperesthetic. The reaction to pain was hypesthetic, muscle sense being hyperesthetic, while both temperature and vibration were normal. Mentally the patient was entirely normal, his general behavior and cooperation being excellent, his emotional state was euphoric, and his orientation, memory, intelligence and judgment were very good.

Examination of the blood showed hemoglobin 85 per cent, white cells 6,500 and red cells 4,900,000. The blood clotting time was three and one-half minutes. The blood sugar was 115 mg per hundred cubic centimeters and a negative Wassermann reaction and gonorrhea fixation test were offered in further examination of the blood. A differential count of the white cells showed 44 per cent polymorphonucleocytes, 14 per cent large lymphocytes, 21 per cent small lymphocytes, 5 per cent monocytes, 3 per cent basophils, 2 per cent eosinophils and 11 per cent stab cells. The red cells showed some poikilocytosis, some variation in size and considerable achromia (about 30 per cent). The platelets appeared normal in number. The urine showed a specific gravity of 1.020, it was the color of light amber, its reaction was neutral, sugar and albumin were absent. Microscopic examination revealed a few amorphous crystals, an occasional epithelial cell, no casts, no red blood cells, and no pus. The specimen contained several cylindroid strands.

The seminal fluid was entirely within average limits in appearance, color and viscosity. The spermatozoa were of the average size, only 65 per cent of the customary number were present. Their conformation was entirely normal, and their motility was very great.

COMMENT

We have presented here a man of 94, the first instance within our knowledge in which fertility has been definitely and affirmatively checked up medically. We are confronted by an individual showing evidences of fine preservation coexistent with signs of advancing age, in whom the element of fertility seems practically unaffected. We have shown that in a case in which fertility is retained until very late in life, as here, the appearance of the sperm is indistinguishable from that of a young individual in the virile state. On the basis of the physical examination it is rather difficult to understand why a certain function of the body should be spared from the inroads of advancing age beyond those seen in the vast preponderance of human beings. This record tends to throw doubt on the doctrine sometimes advanced that hard work is inconsistent with fertility. It also may be considered to question the occurrence of and constancy of the menopause in the male.

To what benign influence this happy state is attributable must remain the subject of conjecture. Whether heredity, outdoor habits of life, particularly suitable tissue structure, or a mental state that finds itself in peculiar harmony with nature,

or whether any combination of the elements is intriguing speculation, to which, however, at present no definite answer can be given.

It is of the greatest interest in such cases to endeavor to isolate the element to which fecundity may be definitely ascribed so that it may be supplied in those cases in which a premature absence occurs. Whether such a substance is hormonal in nature, whether it is species specific, type specific or entirely individual is as yet not known. It does, however, seem that the familial tendencies of the individual and the soil on which the seed is planted are important factors that exhibit a certain amount of constancy on which dependence can be placed.

53 East Ninety-Sixth Street.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE. HOWARD A. CARTER, Secretary

THE PHYSICAL CHARACTERISTICS OF DIATHERMY AND SHORT WAVE DIATHERMY MACHINES

ALLAN HEMINGWAY, PH.D.
AND

K. W. STENSTROM, PH.D.
Assistant Professor of Physiologic Chemistry and Professor of Biophysics, Resectively University of Minnesota
MINNEAPOLIS

An electric current produces heat when it passes through tissues, and this action has for a number of years been utilized by physicians for treatments of certain conditions. The apparatus used is referred to as the diathermy machine. The most important feature of this machine is that it delivers a high frequency current. This is the only type of electric current which can safely be passed through the body at high enough intensity to raise the temperature appreciably. Diathermy could not be developed until physics had advanced enough to make such currents available.

A method of producing high frequency currents to generate electromagnetic waves was discovered by Hertz in 1887. A few years later, in 1893, d'Arsonval discovered that a high frequency alternating current in passing through animal tissues would not stimulate the neuromuscular system to cause an electrical shock but would produce heat in the tissues. During the next few years apparatus was developed for the purpose of generating high frequency alternating current to heat the tissues for therapeutic purposes. The clinical use of diathermy at first developed gradually but became quite popular during the years 1905 to 1910. During the years 1910 to 1920 diathermy was enthusiastically used and favorable reports were numerous for many forms of disease. Since 1920 the use of diathermy has been subject to a more critical examination clinically, physiologically and physically, with the result that its characteristics, contraindications, dosages and uses are well known.

At the present time two types of diathermy machines are used to produce high frequency electric current which will pass through the tissues producing heat but no neuromuscular stimulation. These two types of machines will be referred to in this paper as the spark gap diathermy machine and the vacuum tube diathermy machine.

TYPES OF DIATHERMY MACHINES

The Spark Gap Diathermy Machine—This has been used for the past forty years. It is this type of machine which was first used by d'Arsonval and the earlier workers. During the operation of the machine, when a nonstimulating electrical current is being generated, there is electrical sparking at specially constructed spark gaps built within the machine. The electrical current that is produced by the machine and that passes through the patient oscillates back and forth in the electrical circuit which contains the patient. The oscillation of the current is very rapid, one oscillation lasting about one millionth of a second. The inability of this current to cause electrical stimulation is due to its rapid oscillation. The spark gap diathermy machine does not deliver to the patient a current that is continually oscillating. The current oscillates for a short time and then ceases. The oscillating period is followed by a pause during which no current flows. This in turn is followed by an interval in which an oscillating current again flows. This process of oscillation current—pause, oscillation current, pause—is repeated indefinitely until the switch is turned "off." The electric current is sent through the patient as a series of pulses separated by intervals in which no current flows. Each pulse consists of a train of oscillations. At the beginning of each train the current is high but during the oscillation interval the current decreases, each successive oscillation decreasing in magnitude until the oscillations cease as the magnitude becomes zero, when the pause between oscillation trains commences. With spark gap diathermy there would be several hundred to several thousand trains of oscillations and the same number of pauses per second. The curves in figure 6 are drawings made from oscillograms of actual diathermy currents. The curves show how the voltage, or the electromotive force which drives the current, varies during the passage of a diathermy current. The current varies in a manner similar to the voltage.

The majority of spark gap diathermy machines, but not all, produce an oscillating current which has a frequency of some value between one-half million and 2 million cycles per second. In using diathermy current of this frequency it is necessary to apply the electrodes tightly against the skin. This is necessary to insure good electrical contact. If the electrode fits loosely, sparking is likely to occur, causing a burn.

The Vacuum Tube Diathermy Machine—This has been developed into a practical therapeutic unit during the last ten years. The early machines of a decade ago were not practical, owing to the high cost of vacuum tubes and the short life of the tubes. During recent years vacuum tubes have been much improved mechanically and electrically, with considerable reduction in cost. At present the manufacture of these machines is increasing, but whether they are superior to spark gap machines for therapeutic purposes is a question.¹

The nonstimulating current delivered by these machines is a current that is oscillating continually. The stream of electrical charges, in the electrical circuit which contains the patient moves back and forth at a regular rate. There are no pauses between trains of oscillations as in spark gap diathermy. The type of current is similar to the alternating current used for lighting purposes except that it oscillates from 10,000 to 100,000 times faster than the lighting current.

Vacuum tube diathermy machines are of two different types, differing in the frequency of the diathermy current that they generate. One type of machine generates alternating current in the range usually covered by the spark gap machine, namely from one-half to two million cycles per second. This type of machine is generally used for surgical purposes. Another type is the so-called short wave diathermy machine. This machine generates diathermy current of a much higher oscillation frequency, the frequency range extending from 10 million to 100 million cycles per second.

Diathermy machines, while producing a nonstimulating diathermy current, also radiate energy in the form of electromagnetic radiation in a manner similar to a radio transmitting set in a radio station. The wavelength of the radiation depends on the frequency of the diathermy current. If the frequency is 10 million cycles per second, the wavelength of the electromagnetic radiation is 30 meters. If the oscillation frequency has

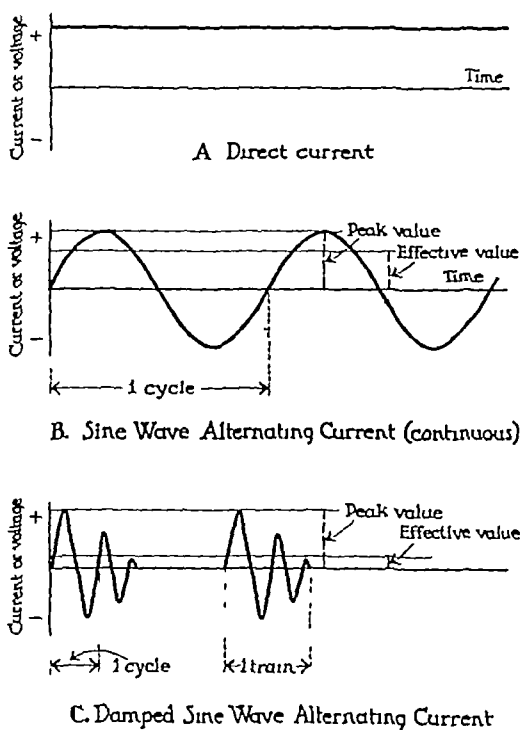


Fig. 1—Oscillographic tracings of a direct current, a continuous sine wave alternating current, and a damped sine wave alternating current.

a high value of 100 million oscillations per second, the wavelength of the radiant energy is 3 meters. As a consequence of this inverse relation between oscillation frequency of the electrical current and wavelength of the radiant energy the term "wavelength" is quite frequently used in place of "frequency." The exact relation is: oscillation frequency (cycles per second) \times wavelength (meters) = 300,000,000. The diathermy current from vacuum tube machines, which has a frequency of from 10 million to 100 million cycles per second, can be delivered to the patient in an unusual manner. This consists in placing the diathermy electrodes not in actual contact with the skin but at some distance from the skin surface. An air space of from one-half to 2 inches separates the metallic electrode and the skin. Used in this way a metallic electrode can be covered with an insulator and still be effective. On starting the diathermy machine the diathermy current passes from one electrode, across the air gap to the

¹ Mortimer Bernard and Osborne S. L. Tissue Heating by Short Wave Diathermy. Some Biologic Observations. J. A. M. A. 104: 1413 (April 20) 1935.

patient and then across the other air gap to the other electrode. The diathermy current is concentrated in the region between the electrodes. This method of applying the diathermy electrodes should prove valuable in treatment of regions of the body in which the surface is very irregular with bony projections and where it is difficult to apply an electrode by actual contact. It is then advisable to have the space between the electrode and the skin filled with a substance of about the same

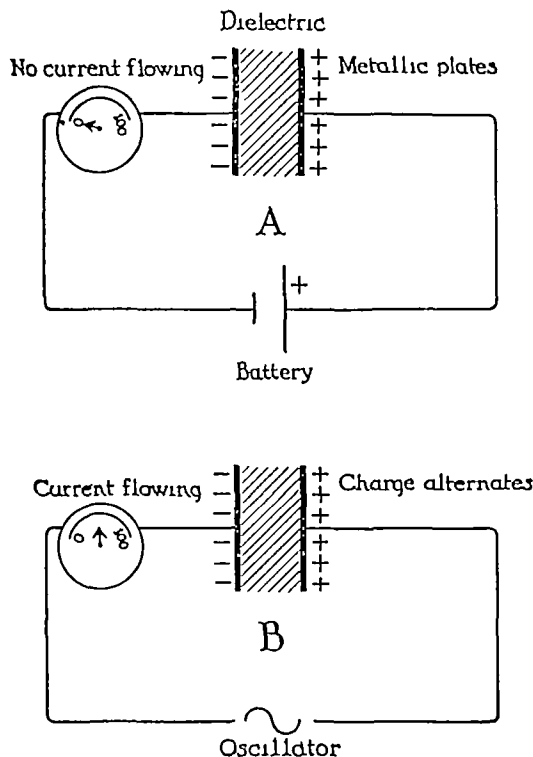


Fig. 2—Typical condenser circuits

dielectric constant as the tissues (e. g., distilled water in a rubber bag with thin walls) in order to prevent overheating of these projections.

Another method of administering heat by diathermy is to surround the region to be heated by a coil of wire through which a high frequency current is passing. The high frequency current in the coil generates local "eddy currents" within the tissue. It is these localized currents which produce heat.

In choosing a machine of the vacuum tube type for diathermy treatments by electrodes not in actual contact with the skin it is necessary to have the machine conform to a certain standard if it is to be of value. The first requirement is that the machine must be able to deliver to the patient sufficient energy. Unfortunately, some machines are now being manufactured that are deficient in this energy requirement. It is necessary to deliver heat energy to the patient to raise the temperature of the tissues treated. These low power machines do not generate the required amount of heat. A second requirement is that the frequency of these machines for this noncontact method of placing the electrodes must be greater than 10 million cycles per second, otherwise this method of applying the electrodes cannot be used.

PROPERTIES OF ELECTRIC CURRENTS

Before a more detailed description of diathermy apparatus is given a few technical terms that are commonly used will be defined.

A direct current (abbreviated D. C.) consists of a flow of electrical charges through a conductor in one direction only. Such a current is delivered from a battery or a direct current generator (fig. 1 A).

An alternating current (abbreviated A. C.) consists of a flow of electrical charges through a conductor in such a manner that the electrical charges oscillate back and forth in the electrical circuit. The number of oscillations (cycles) per second is called the frequency. This type of current is usually supplied for illumination and for electrical power devices. It is the type of current generated by the vacuum tube diathermy machine. Essentially, the vacuum tube diathermy machine changes sixty cycle alternating current, which causes electrical stimulation, to fifty million cycle current, which does not stimulate (fig. 1 B).

The spark gap diathermy machine delivers damped alternating current. The current through the patient oscillates back and forth, each oscillation becoming smaller and smaller, until the current ceases. After a brief pause the whole process is repeated. The decrease in amplitude of each oscillation is called damping (fig. 1 C).

The force that drives electrical charges through a circuit is the electromotive force and is measured in volts. The electric current, which measures the number of charges flowing through a circuit per second, is measured in amperes. The ratio of volts divided by amperes is the electrical resistance and is measured in ohms. It is a measure of the resistance encountered by the flowing electrical charges. A physiologic analogy would be the action of the heart, in which the driving force would be the mean aortic pressure, the current the minute volume of the heart and the resistance that of the arterioles, capillaries and venules.

The voltage that drives the alternating current under goes a cyclic variation from a high positive value through zero to a high negative value. The highest value reached is the peak voltage. The effective voltage continually exerted, however, is not the peak voltage, just as the systolic pressure is not the effective pressure of the blood flow. The effective driving voltage is called the effective voltage or "root mean square" voltage and would correspond to the mean aortic pressure in the analogous blood flow. The analogy must not be carried too far, since the alternating current voltage is both positive and negative while aortic pressure, although it fluctuates, is always positive.

An electrical condenser consists of two metallic plates, which are good conductors of electricity, separated by a medium called the dielectric. The circuit of figure 2 represents a condenser in an electrical circuit containing a meter that measures current when it flows and a battery that can supply a direct current. When the connections are made a current will flow for a very short interval of time until electrical charges accumulate on the plates of the condenser. Once the charge has accumulated, the flow of current will cease. If the battery is replaced by an oscillator or a generator of alternating current,

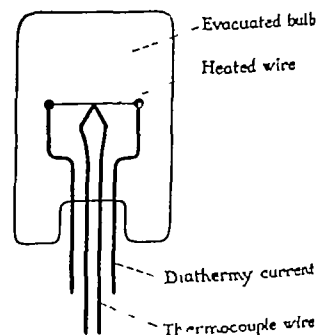


Fig. 3—Construction of vacuum thermocouple used to measure high frequency currents and effective voltages

A current will oscillate back and forth in the circuit. Electrical charges will flow into the condenser and then out again as the current reverses. This back and forth movement of the electrical charges into and out of the condenser forms the electric current. A condenser possesses capacity, which is measured in farads or microfarads. The larger the area of the condenser plates and the closer they are together, the greater will be the capacity. The capacity depends on the mechan-

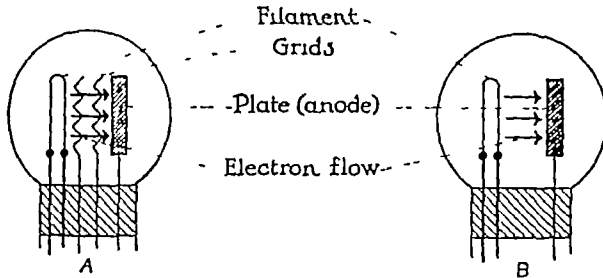


Fig 4—A thermionic vacuum tube B rectifier vacuum tube

ical dimensions of the condenser. A condenser will block the flow of direct current but will permit the flow of alternating current. A condenser used in this way is called a "blocking condenser."

A coil of wire wound in the form of a helix possesses inductance, which is measured in henrys or millihenrys. The value of the inductance depends on the number of turns and the coil diameter. A large inductance coil offers a considerable impedance to the flow of alternating current. A large coil in an alternating current circuit would reduce the current without an appreciable loss of energy. "Choke coils" are coils with a large inductance, i. e., many turns and a large diameter, which prevent the passage of alternating current but permit the passage of direct current.

HIGH FREQUENCY APPARATUS

The High Frequency Ammeter or Milliammeter—These instruments are now made of the thermocouple type, although the older machines have hot wire meters. A vacuum thermocouple consists of an evacuated glass bulb (fig 3) with four wires. Two of these conduct the high frequency current to a small heated wire. This wire is heated by the high frequency current, the greater the current, the more heat produced and the higher the temperature of the wire. A thermocouple junction of two dissimilar metals soldered or brazed together is joined to the center of the heating wire, the junction of the two metals being at the point of contact with the heated wire. The junction of the dissimilar metals behaves as a small direct current battery which produces a voltage proportional to the temperature or the squared value of the current. This voltage is recorded on a small galvanometer to which the other two wires from the evacuated bulb are attached.

The conventional diathermy ammeter is usually placed on the panel of the diathermy machine and indicates the amount of high frequency current flowing through the patient. Since the diathermy dosage is regulated by the meter, this instrument must be kept in good order. If the needle does not indicate zero when the switch is "off," the needle should be adjusted to zero by a small regulating screw near the bearing of the needle. The metallic parts of one electrode cable

should not touch the metallic parts of the other cable. This would cause a short circuit, which might "burn out" the small heated wire of the vacuum thermocouple or the fuse in the meter. If the needle of the meter does not deflect promptly in a normal manner when the current is turned "on," it should be examined by a qualified person. It is relevant to mention at this point that meters on short wave machines do not read the true value of the current passing through the patient.

Low Frequency Transformer—Every diathermy machine, whether vacuum tube or spark gap, contains a low frequency transformer. This changes low voltage to high voltage. The transformer consists of an iron core on which two separate coils are wound, the coils being called the primary and the secondary. The ordinary sixty cycle illuminating current flows through the primary.

The Thermionic Vacuum Tube—This is an evacuated tube resembling a light bulb. It is made of glass with an insulated base. Metallic connections pass through the base from the outside to the inside of the tube (fig 4 A). These metallic connections on the outside are made to fit into metallic sockets through which electric current can be conducted into the interior of the tube. The metallic parts within the tube consist of the following: 1. A filament heated by a suitable current. When heated, the filament emits electrons. 2. An anode, which is usually a large plate of metal or carbon. This plate is connected to a source of positive electricity, which attracts the negative electrons emitted by the filament. 3. Between the anode and the filament there may be interposed one or more grids. These grids, which consist of wire screens, are usually connected to varying voltages, so that when the grid voltage is changed the electric current flowing from filament to plate changes in a corresponding manner.

The rectifier vacuum tube (fig 4 B) is a thermionic vacuum tube containing a heated filament which emits electrons and an anode to which the electrons are drawn. The current flows only in one direction through this tube, namely, negative

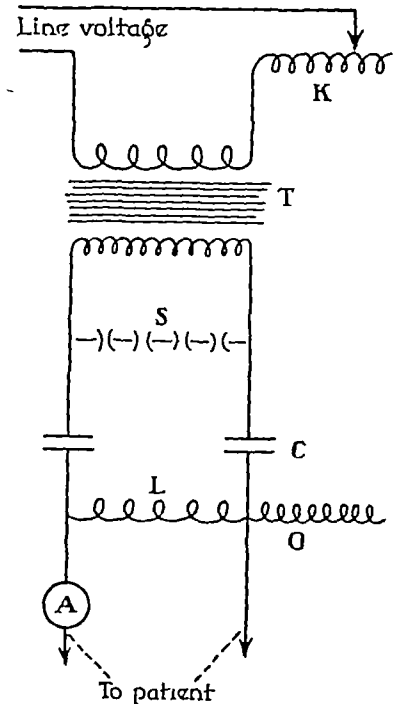


Fig 5—Diagram of a typical spark gap diathermy machine. A variable inductance in primary circuit of input transformer to regulate current. T 60 cycle transformer. S spark gaps. C condensers in oscillating circuit. L inductance of oscillating circuit. O Oudin coil. A high frequency ammeter.

charges (electrons) from the filament to the anode. If this tube is placed in a circuit in which an alternating voltage is applied, the current will flow only in one direction and will not oscillate, as would happen if the tube were not in the circuit. This tube is used to

change alternating current to direct current. It is used in vacuum tube diathermy and to rectify the current for x-ray machines.

The Spark Gap Diathermy Machine—Figure 5 shows the circuit of the spark gap diathermy machine. The 60 cycle alternating current from the power mains passes through the primary of the 60 cycle transformer, *T*. The amount of current flowing through the primary

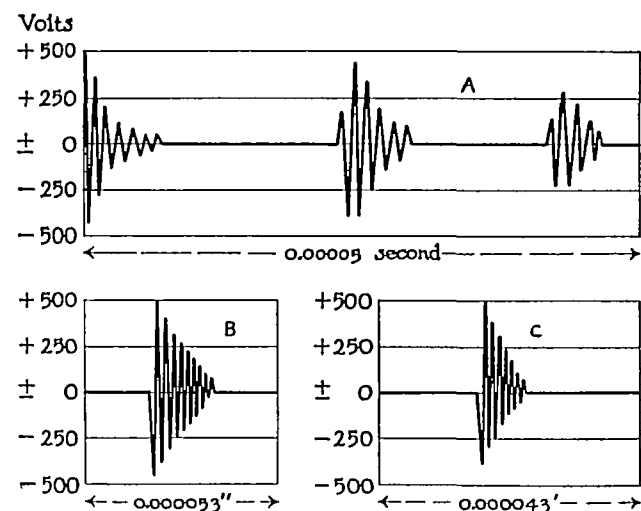


Fig 6—Representative types of diathermy currents. A cutting current slow damping wave trains from 0.00001 to 0.000015 second apart. B coagulation current wave train. C diathermy current wave train wave trains 0.0001 second apart rapid damping.

can be regulated by the variable inductance, *K*. The secondary coil of *T* delivers high voltage alternating current to the condensers, *CC*. These store electrical charges. When a high charge accumulates, the condensers "discharge" and a current oscillates back and forth in the circuit *SCCL*. The frequency of oscillation depends on the amount of inductance *L* and the capacity *C*, the lower the capacity and inductance, the higher the frequency. The type of current is the damped oscillating type already described. The part of the oscillating current of the circuit *SCCL* passes to the patient through the meter.

The Vacuum Tube Diathermy Machine—This machine is simply a vacuum tube oscillator. The machine converts the 60 cycle alternating current from the power mains into high frequency current with frequencies varying from 10 million to 100 million cycles per second. Detailed descriptions of such oscillators for therapeutic purposes are quite infrequent in the medical literature. Two of the more recent descriptions are those of Schereschewsky² and Bishop.³ Figure 7 shows a typical vacuum tube generator of high frequency currents of the type used by Bishop. The circuit is not recommended by the Council over any other practical hookup. Two transformers, *T*₁ and *T*₂, convert the 110 volt sixty cycle alternating current from the power mains into (1) low voltage current to heat the filaments of the vacuum tubes (transformer *T*₁) and (2) a high voltage current for the anodes of the vacuum tubes (transformer *T*₂). The high voltage current from *T*₂ is rectified, i. e., converted into direct current in the rectifier vacuum tubes 866. The high voltage direct current is applied to the anode of the

oscillator tubes 852. The oscillating circuit in which the high frequency current is generated contains the inductance *L* and the capacity *C*. The frequency of the alternating current is determined by the magnitudes of *L* and *C*. To produce the current of very high frequency, *L* and *C* must be small. *Ch Ch* are "choke coils," which prevent the high frequency current from flowing into the rectifier tubes and the transformers. *C*₂ *C*₂ are two "blocking condensers," which prevent the direct current from the anode of the oscillating tubes from flowing into the high frequency circuit and the grids.

The theory of the production of an alternating current will not be given here, since it involves a considerable amount of technical discussion and mathematics. The theory in a brief form is well presented in an article by Rechou⁴ and in more detail by Morecroft.⁵

REQUIREMENTS OF A DIATHERMY MACHINE

Energy Requirement—A diathermy machine for clinical use must be able to deliver sufficient energy to the patient to produce the required amount of heat in the tissues. A machine should be capable of delivering to the patient 200 watts of high frequency power.⁶

Efficiency Requirement—Diathermy machines will overheat if poorly constructed or if made of inferior

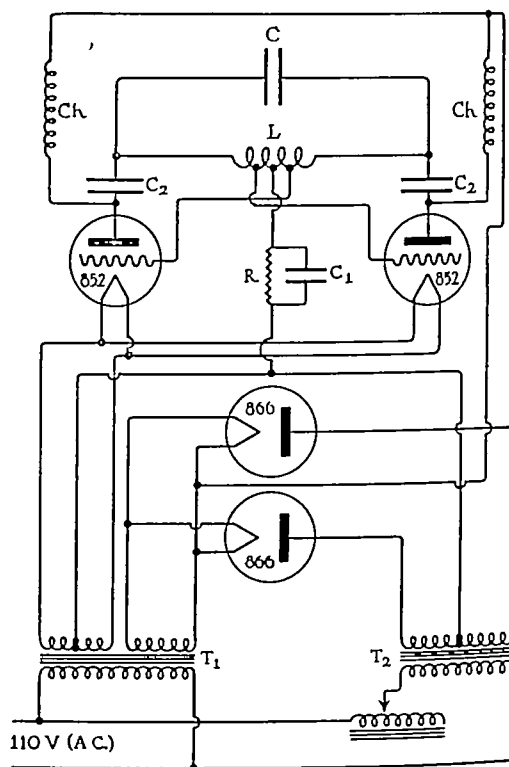


Fig 7—One type of vacuum tube generator of high frequency currents.

material. The heat is produced in the machine and not in the patient. This is particularly noticeable in the transformers. Many manufacturers of diathermy machines are guilty of furnishing their machines with cheap and inefficient transformers. During a test of the diathermy machine the temperature of the trans-

² Schereschewsky, J. W. Heating Effect of Very High Condenser Fields on Organic Fluids and Tissues. Pub. Health Rep. 48:844-857 (July 21) 1933.

³ Bishop, F. W. An Apparatus for the Production of Local Heat in Body Tissue by Means of High Frequency Electric Fields. Radiology 21:487-491 (Nov.) 1933.

⁴ Rechou. Les ondes courtes en médecine. J. de radiol. et d'électrol. 17:481 (Sept.) 1933.

⁵ Morecroft, J. H. Pinto, A. and Curry, W. A. Principles of Radio Communication. New York: John Wiley & Sons, 1933.

⁶ Hemingway, Allan. The Examination of Diathermy Machines for Local Diathermy Treatments. J. A. M. A. 101:776-778 (Sept. 2) 1933.

former must be noted. This must not exceed the limits specified by the American Institute of Electrical Engineers.

Frequency Requirement—The high frequency diathermy current must not cause electrical stimulation of the tissues. In order to prevent electrical shock, the frequency should be high. It is recommended that the frequency exceed one-half million cycles per second.

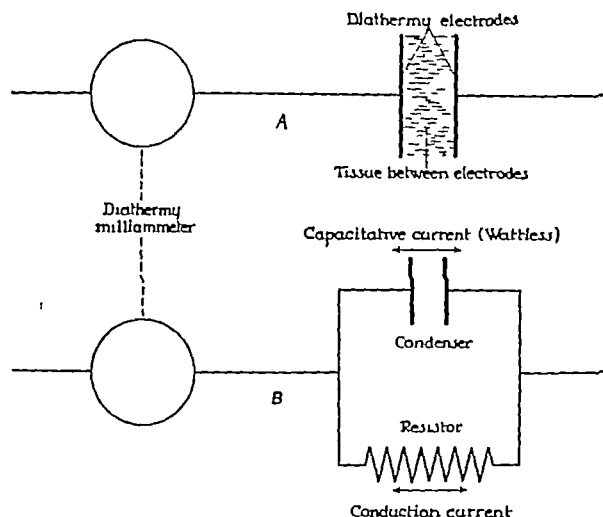


Fig 8—Tissue between diathermy electrodes represented electrically

There should be no low frequency transient currents associated with the high frequency currents.

Insulation and Protection Requirement—The cables to the patient and the connections to the cables should be well insulated with no exposed metallic parts raised to a high voltage. The insulation within the machine must be adequate to prevent internal leak currents, which would lower the efficiency. The spark gaps must be covered.

Testing of Machines—The Council on Physical Therapy has been conducting a series of rigid tests on various commercial diathermy machines. Any machine approved by the Council will conform to the specifications required.

THEORY OF THE HEATING OF TISSUES BY HIGH FREQUENCY CURRENTS

1 Diathermy—In a diathermy treatment, metallic or saline pad electrodes are applied to the skin of the patient. The diathermy current passes through the tissues and warms those tissues traversed by the current. The current follows the tissues of lowest electrical resistance, such as blood and muscle, and evades when possible the tissues of high resistance, as fat and bone. In cases in which a high resistant tissue cannot be avoided, as subcutaneous fat directly beneath the electrodes, the heating is more intense, as is indicated by Joule's law, the heating being proportional to the resistance multiplied by the squared value of the current. Hence a high resistance and a high current value would produce a high temperature. The tissue between diathermy electrodes can be represented electrically by the arrangement in figure 8. The tissue between the electrodes behaves as a dielectric and the metallic plates as the plates of a condenser; hence it is necessary to consider two types of current: (1) that which flows to charge and discharge the condenser plates and forms the wattless component, and (2) the conduction current, which flows through the tissue and

produces heat. It has been shown⁷ that the diathermy current for diathermy frequencies less than 2×10^6 cycles per second is almost entirely conduction current. The significance of this is that the diathermy current as indicated by the diathermy meter is all utilized in heating the patient. More technical details are given in an earlier paper.⁸

The upper limit that may be used without causing burns and possible necrosis lies between 10 and 20 milliamperes per square centimeter or 100 milliamperes per square inch of the smallest electrode.

The specific resistances in ohms of human tissue for high frequency currents are as follows:⁹ skin, 289, fat, 2,180, bone, 1,800, muscle, 110, kidney, 126, liver, 298, cardiac muscle, 132, spleen, 256.

Since the diathermy current is almost entirely conduction current, that is, the tissues offer a pure resistance to the diathermy current with no reactance, it is possible to obtain the heat production in the tissue. If a high frequency voltmeter is connected in parallel with the patient and the effective voltage and current read from the voltmeter and ammeter, the rate of heat production in the patient is equal to the voltage multiplied by the current (watts).

2 Short Wave Diathermy—Pätzold¹⁰ has shown that an electrolytic conductor such as an electrolytic solution placed between the metallic electrodes but not in actual contact with the electrodes can be represented by the equivalent circuit shown in figure 9. It is reasonable to suppose that the same circuit would represent a section of the human body between similar electrodes, though it should be remembered that the human body is a complex, heterogeneous structure. The condenser C_1 represents a condenser in parallel with the tissue to be heated. Part of the high frequency current charges and discharges the metallic plates and does not pass as a conduction (heating) current through the patient. This component I_1 of the total current I is said to be wattless. Hence the ammeter does not measure the true heating current, since some of the energy is radiated into space. The condensers C_2 , C_2 have each a dielectric of air between two conductors, namely, the

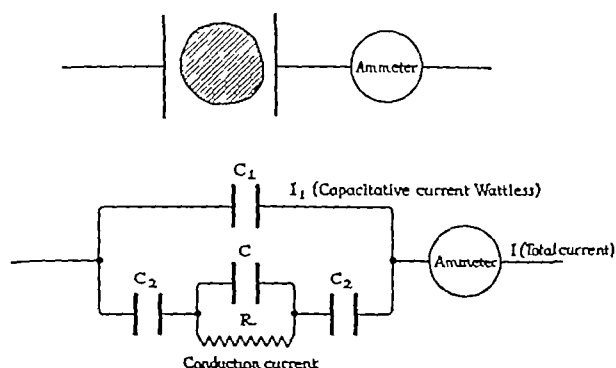


Fig 9—Equivalent circuit representing an electrolytic solution placed between metallic electrodes but not in actual contact with the electrodes.

tissue and one metallic plate. This capacity becomes lower the closer the metallic electrodes approach the tissue in which event the conduction current flowing

7 Hemingway Allan and Stenstrom K. W. Physical Characteristics of High Frequency Current. *J A M A* 98:1446-55 (April 23) 1932.
8 Hemingway Allan. Thermal Effects of Diathermy. *Radiology* 14:99 (Feb) 1930.
9 Hemingway Allan, and McClendon J. F. The High Frequency Resistance of Human Tissue. *Am J Physiol* 102:56-59 (Oct.) 1932.
10 Pätzold Johannes. Die Erwärmung der Elektrolyte im hochfrequenten Kondensatorfeld und ihre Bedeutung für die Medizin. *Zschr f Hochfrequenztechnik* 36:85-98 1930.

through the tissue is increased at the expense of the wattless current, I_1 . The true capacity of the tissue C depends on the dielectric constant and the shape and size of the body between the electrodes. R depends on the specific resistance of the tissues. For the human body between metallic electrodes the values C_1 , C_2 , R and C are unknown. They vary with the shape, size, position and composition of the tissues.

The closer the body between the electrodes is brought to the electrodes, the more the short wave treatment approaches the conditions of diathermy. That is, the closer the body to the electrodes the greater will be the surface heating of the tissue next to the electrode. In order to have a more nearly uniform heating throughout, the tissues would have to be at a considerable distance from the electrodes.

It has been shown by Hosmer,¹¹ Patzold,¹⁰ McClenan and Burton,¹² and others that there is a selective heating of the electrolytic conductor, which depends on the frequency of the alternating current and the specific resistance and dielectric constant of the tissue. Thus, as the frequency is varied the various tissues in turn would be selectively heated, the ability to be selectively heated depending on conductivity and dielectric constant. Theoretically, at least, there is a possibility that a certain tissue could be selectively heated by varying the frequency of the machine. This has been demonstrated for dead tissues by McClenan and Burton^{12b} and by Jellinek.¹³ Schliephake¹⁴ has shown that a temperature distribution in parts of dead cadavers heated by short wave diathermy differs from the temperature distribution of diathermy. These experiments, while of theoretical interest, do not apply without modification to the living animal. The circulation of the blood and its variations in the different tissues and under different conditions affect markedly the temperature of a heated organ. For clinical use, temperature distributions in living animals or human subjects must be made. Recently Sheard and Pratt¹⁵ have measured temperature distributions in the region of the knee joint of anesthetized dogs when heated with short wave diathermy of a frequency of 27 million cycles per second. They have found in agreement with others that electrodes placed close to the skin give a temperature distribution in the tissues resembling the usual diathermy.

The usual spark gap diathermy furnishing alternating current of frequencies from one half million to two million cycles per second heats those tissues with the lower electrical resistance, such as blood, muscle and glandular tissue. These are the tissues which possess a rich blood supply. With the conventional type of diathermy there is little possibility of overheating these tissues, since the rapid flow of blood through them distributes the heat to neighboring parts. With short wave diathermy the conditions are somewhat different. The short wave diathermy tends to produce selective heating of tissues, which depends on their electrical resistance, dielectric constant and structure. The temperature to which a tissue is raised during a treatment

depends on two factors namely, (1) the rate of heat production by the electrical current, raising the temperature, and (2) the rate of blood flow through the tissue, which lowers the temperature. In the case of articular cartilage, for instance, where the blood supply is poor, there is a possibility of overheating. The seriousness of this is enhanced when one considers the slow rate of regeneration of this cartilage.

CONCLUSION

The newer method of heat therapy, namely, the short wave diathermy, is at present in an experimental stage. Much valuable research has been done to clarify the problems involved, at the same time there are in the literature some very confusing and misleading statements in regard to the merits of this form of therapy. For a good critical discussion we would recommend the recent article by Mortimer and Osborne.¹ In particular, we would recommend that, owing to the lack of knowledge on many phases of this work and the indications of dangerous possibilities, the newer machines be used with the utmost caution. On the other hand, conventional diathermy is an old established form of therapy about which much is known that has proved to be of definite clinical value.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary

BISMUTH SUBSALICYLATE (See New and Nonofficial Remedies, 1935, p 123)

The following dosage form has been accepted

Amponle Bismuth Subsalsicylate with Butyn D R L 1 cc A 10 per cent suspension of bismuth subsalsicylate-U S P in peanut oil to which has been added 0.4 per cent of butyn and metapnen 1 20 000. Each cubic centimeter represents from 0.057 to 0.059 Gm of elemental bismuth.

Prepared by the Abbott Laboratories North Chicago Ill No U S patent or trademark

DIOTHANE (See New and Nonofficial Remedies, 1935, p 54, also THE JOURNAL, Feb 23, 1935, p 641)

The following dosage form has been accepted

Ampules Diothane 0.5% in Solution of Sodium Chloride 0.6% 6 cc

"SHADOCOL NOT ACCEPTABLE FOR N N R" A CORRECTION

THE JOURNAL, March 16, 1935, page 922, contains the Council's report explaining the unacceptability of Shadocol (Davies, Rose & Co., Ltd.) for inclusion in New and Nonofficial Remedies. In this report appears the following statement:

'The addition of lactose and citric acid represents an unnecessary modification which is probably useless except as a commonplace flavor. It is fallacious to consider a modification of this sort as representing 'an original product' the result of extensive research,' and to claim that it is unequaled by other preparations.'

A letter received from Davies, Rose & Co., Ltd., explains to the Council that the citric acid was added not as a flavor but for the purpose of liberating the acid form of tetraodophenolphthalein from the sodium salt as a fine precipitate, with a view to the obviating of gastric irritation. Accordingly, the criticism expressed in the quoted statement becomes invalid. The Council regrets the error in its original report and deems it necessary that this statement be published. However, the product remains unacceptable because of the proprietary name.

11 Hosmer, Helen R. Heating Effects Observed in a High Frequency Field. *Science* 88 325 (Oct 5) 1928

12 McClenan, J. C. and Burton, A. C. (a) The Heating of Electrolytes in High Frequency Fields. *Canad J. Research* 3: 224-239 (Sept) 1930. (b) Selective Heating by Short Radio Waves and Its Application in Electrotherapy, *ibid* 5: 550-566 (Nov.) 1931

13 Jellinek. Role de la structure des tissus dans leur échauffement par les ondes courtes. *Compt rend Acad d sc.* 198: 1723 (May 7) 1934

14 Schliephake, E. Tiefenwirkungen im Organismus durch kurze elektrische Wellen. *Ztschr d ges exper Med* 66: 212 1929

15 Sheard, Charles and Pratt, C. B. Changes in Temperatures of Tissues After Systemic Applications of Short Wave Electric Fields. *Proc Soc. Exper Biol & Med.* 32 763-66 (Feb) 1935. Pratt, C. B. and Sheard, Charles. Thermal Changes in Tissues by Local Applications in Radiotherapy. *ibid* 32 766-771 (Feb) 1935

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING
REPORTS

RAYMOND HERTWIG, Secretary

ACCEPTANCE WITHDRAWN BIOVEGETIN

Manufacturer—BioVegetin Products, Inc., Chicago

Description—Finely powdered mixture of dehydrated spinach, tomatoes, carrots and irradiated yeast

Manufacture—Fresh spinach freed of roots and stems is mechanically washed and placed on cloths on wire trays which are run through tunnels of warm filtered air not exceeding 71 C. The dry spinach is pulverized and stored in drums. Fresh carrots are mechanically washed, peeled, again washed and subsequently treated as the spinach. Tomatoes, trimmed by hand and washed, are processed as described above. Irradiated yeast (not less than 2,500 U S P vitamin units per gram) is autoclaved for twenty minutes at 17 pounds pressure to kill the yeast. The powdered ingredients are mixed in definite proportions, sifted, and packed in jars.

| Analysis (submitted by manufacturer) — | per cent |
|--|----------|
| Moisture | 10.3 |
| Ash | 6.1 |
| Fat (ether extract) | 3.4 |
| Protein (N X 6.25) | 20.1 |
| Reducing sugars as invert sugar | 13.2 |
| Sucrose (copper reduction method) | 6.4 |
| Starch | 2.5 |
| Crude fiber | 6.5 |
| Carbohydrates other than crude fiber (by difference) | 53.6 |
| Iron (Fe) | 0.013 |
| Calcium (Ca) | 0.51 |
| Copper (Cu) | 0.0012 |

Calories—3.3 per gram, 94 per ounce

Vitamins—Assay shows 400 U S P vitamin D units per gram

Reason for Withdrawal of Acceptance—BioVegetin was formally accepted Sept. 22, 1933. Recently it was learned the BioVegetin Products, Inc., was merchandising a product named VegeMucene in conflict with the policies of the American Medical Association as set forth in the rules of the Council on Pharmacy and Chemistry. VegeMucene is an unoriginal preparation of powdered okra marketed under a noninformative and misleading proprietary name, promoted with exaggerated and unwarranted therapeutic claims and advertised directly to the public, for which reasons the product is unacceptable to the Council on Pharmacy and Chemistry (THE JOURNAL, Jan. 26, 1935). Since the merchandising practices of the manufacturing company, here cited conflict with the policies of the American Medical Association the acceptance of BioVegetin is being withdrawn in accordance with the recently adopted Committee rule that

No food product or class of food products or advertising therefor will be accepted or if accepted will be retained if in the opinion of the Committee such acceptance is likely to be construed as an acceptance or approval of any other products or activities of a firm when such other products or activities of such firm are in conflict with the policies of the American Medical Association as set forth in the rules of the Committee on Foods or those of the Council on Pharmacy and Chemistry or the Council on Physical Therapy.

ACCEPTANCE WITHDRAWN LUCKY GLUTEN FLOUR

Manufacturer—Federal Mill, Inc., Lockport, N. Y.

Description—Wheat gluten flour containing not more than 44 per cent of starch.

Manufacture and Analysis—See THE JOURNAL, July 15, 1933, page 211.

Uselessness as a Special Purpose Food—Lucky Gluten Flour, manufactured specially for use in diets restricted in dextrose formers, was accepted in 1933 before the Committee adopted definite requirements for a special purpose flour of this character. To be eligible for acceptance at this time such type of flour shall contain dextrose formers yielding dextrose in an amount not greater than 3.3 Gm. per hundred cubic centimeters (the dextrose equivalence being computed as the carbohydrate,

plus 58 per cent of the protein, plus 10 per cent of the fat content of the food). Dextrose formers of Lucky Gluten Flour, on the other hand, yield approximately 50 Gm. of dextrose per hundred cubic centimeters.

There is authoritative evidence that commercially prepared special diabetic foods such as gluten flour are of limited usefulness to the diabetic patient and that the availability of insulin makes them no longer necessary. Artificial substitutes for ordinary foods are not to be favored; it is much better for the diabetic patient to learn how to plan his diet with foods in common use and readily available. The diet should be exactly prescribed in carbohydrate, protein and fat, and total calories.

The designation of a food as a "diabetic food" merely because it is low in carbohydrates is now unwarranted and misleading and gives the erroneous impression either that the food taken in unrestricted quantities in diabetes is harmless or that it has remedial action. Except for the necessity of restricting foods to avoid overstepping the food tolerance, there are no special diabetic nutrition requirements. The exploitation of starch-free or low carbohydrate foods containing an excess of protein for use by diabetic patients is unwarranted. Protein may be tolerated almost as poorly, if not quite as poorly, as starch in diabetes.

Because Lucky Gluten Flour is adjudged without usefulness or special adaptability for inclusion in diets restricted in dextrose formers, it no longer will be listed among the accepted foods of the Committee on Foods.

Gluten flours of other manufacturers, for the reasons stated, are not eligible for acceptance.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary

SOLITAIRE BRAND SIEVED ASPARAGUS, BEETS, CARROTS, GREEN BEANS, PEAS, PRUNES, SPINACH, TOMATOES UNSEASONED

Distributor—The Morey Mercantile Company, Denver

Packer—The Nielsen Corp., Ltd., Oakland, Calif.

Description—Sieved asparagus, beets, carrots, green beans, peas, prunes, spinach and tomatoes, prepared by efficient methods for retention in high degree of the natural mineral and vitamin values. No added sugar or salt. These products are the same as the accepted Warranty vegetables and fruits (THE JOURNAL, April 27, 1935, p. 1504, April 13, 1935, p. 1331, March 16, 1935, p. 923, April 6, 1935, p. 1241, April 20, 1935, p. 1419, March 30, 1935, p. 1074, Feb. 2, 1935, p. 399, June 1, 1935, p. 1999).

REYNOLDS' BRAND PITTED RED CHERRIES, WATER PACK

REYNOLDS' CHERRYLAND BRAND PITTED RED CHERRIES, WATER PACK

Manufacturer—Reynolds Preserving Company, Sturgeon Bay, Wis.

Description—Canned cooked red Wisconsin cherries packed in water without added sugar or salt. The same as Cellu Red Pitted Cherries Packed in Water Without Added Sugar or Salt (THE JOURNAL, Sept. 14, 1935, p. 885).

SWEET LIFE EVAPORATED MILK

Distributor—The Sweet Life Food Corporation, Brooklyn.

Packer—Oatman Condensed Milk Co., Dundee, Ill.

Description—Canned unsweetened evaporated milk, the same as Oatman's Brand Evaporated Milk (THE JOURNAL, April 16, 1932, p. 1376).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO, ILL.

Cable Address - Medic, Chicago

Subscription price Seven dollars per annum in advance

Please send in promptly notice of change of address giving both old and new always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, NOVEMBER 2, 1935

CONTROL OF RABIES

Bites by domestic animals, particularly dogs, are not as uncommon today as might be believed. A recent statistical survey¹ contains the rather surprising statement that in New York City alone there was a total of 20,416 instances of bites by animals reported to the department of health during 1934 and that 19,443 of these were inflicted by dogs. Laboratory examinations of specimens of the available biting dogs showed that forty-four were rabid. The survey further shows that there has been a steady increase in the number of reported instances of dog bites in New York since 1908 and that, despite the availability of satisfactory anti-rabic vaccines, the number of deaths from human rabies has remained virtually unaltered for the past twenty-five years both in New York City and in the country at large. There were sixty-five fatal cases of human rabies in the registration area of the United States in 1933. In view of these data it is obvious that increased attention should be directed to minimizing biting by dogs and thus to the occurrence of rabies.

The control of rabies is often a difficult and unsatisfactory procedure. Reliance cannot be placed solely on the treatment of the exposed subject by the Pasteur prophylactic method, since this treatment, even though properly given, may not be given sufficiently early and does not invariably protect the patient. The logical procedure is the minimizing of canine rabies and its spread by biting dogs. Actual immunization of dogs against canine rabies has been extensively studied in recent years but should be regarded as still in the experimental stage, though there is some indication that it may prove effective. The effective control of rabies at present, therefore, must revert to the control of all biting dogs. This plan necessarily involves not only the dog but also its owner. There should be a thorough elimination of all stray and unlicensed dogs. Those which are licensed should not be permitted to roam freely on public grounds but should be restrained by

a leash or should be muzzled. Statistical studies in New York have shown that bites from dogs on a leash or muzzled, as required by law in that city, are extremely rare. Apparently there has been laxity on the part of the law-enforcing personnel in New York or a lack of cooperation on the part of dog owners to prevent the complete effectiveness of the dog restraining devices. The suggestion has been made¹ that the cooperation of dog owners in the enforcement of this law might be more completely elicited if the responsibility of dog bites and the burden of all the accruing expenses should be placed squarely on the owners of the dogs.

As a supplementary measure to legislation, the general enlightenment of prospective dog owners as to the type of dog most suitable to his use and facilities might be of value. It is well known, for example, that female dogs are gentler with children than are males, that German police dogs bite more frequently than do other breeds, and that long-haired dogs develop rabies less frequently than short-haired dogs because of the greater opportunity for the removal of infectious saliva by the coat of the former. All dog owners should be advised to seek information regularly from a capable veterinarian regarding the diet, training and current health problems of their dogs.

ISOTOPES IN PHYSIOLOGIC RESEARCH

The term isotopes was coined by Soddy to describe two or more chemical elements of different atomic weights but with identical chemical properties. For the most part, these isotopic elements are also physically identical, except only with regard to the relatively few physical properties that depend on atomic mass directly. The development of knowledge of isotopes represents much of interest not only to the chemist and the physicist but to the investigators in all branches of science. About 253 stable isotopes are known,¹ and only a few elements remain without definite data to confirm the existence of all elements in isotopic forms. It is now clear, for example, that chlorine consists of two isotopes of atomic weight 35 and 37, mixed in such proportions as to give the usual atomic weight of 35.46. Some elements may have six isotopes (krypton), while other elements contain even more (xenon and tin).

Probably the most interesting chapter in the story of isotopes is the discovery of deuterium, the heavy isotope of hydrogen.² While this isotope of mass 2 exists only in small proportion, about 1 in 5,000 to 6,000 of the main isotope of mass 1 nevertheless, because of the marked difference in mass of the two components, the relative concentration of the two isotopes can be altered very definitely by various physical

¹ Olesen, Robert. Control of Rabies in New York City. Pub. Health Rep. 50: 1087 (Aug. 16) 1935.

¹ Aston, F. W. Science 82: 235 (Sept. 13) 1935.
² For reviews see Urey, H. C. and Teal, G. K. Rev. Modern Physic. 7: 34 1935. Farkas, A. Light and Heavy Hydrogen. Cambridge 1935.

and chemical processes. This has resulted in the preparation of water in which the isotope of mass 1 is completely replaced by the isotope of hydrogen of mass 2. Although this heavy water resembles ordinary water in appearance, its physical and chemical properties in general show definite differences. The surface tension is lower, while the viscosity is much greater. The density of this heavy water is about 10 per cent greater than ordinary water, while its freezing point is 3.8 degrees C higher and its boiling point is elevated 1.42 degrees C. The preparation of the new water has resulted not only in the detailed study of its chemical and physical properties but also in investigations of its effect on the processes occurring in animal and plant life. A large number of reports have been published dealing with the influence of heavy water on growth, on enzyme reactions, and on fundamental transformations in the cell. It appears, in general, that the substitution of heavy hydrogen for its lighter isotope in ordinary water produces a fluid which retards the majority of biologic processes.

It is hardly necessary to point out the wide and important fields of work opened up by the discovery of heavy hydrogen. Heavy water has received much attention, but it is obvious that the research is not limited to this solvent. Because of the greater mass of deuterium as compared to ordinary hydrogen, it is to be expected that compounds formed with the new isotope should in some cases exhibit rather different properties from the normal hydrogen compounds. Preliminary inorganic and organic chemical studies have verified this postulation. More interesting from the physiologic standpoint has been the recent suggestion² that deuterium might be used as an indicator in the study of intermediary metabolism. The fact that the hydrogen isotope deuterium occurs in the same proportion in the hydrogen of organic matter as it does in the hydrogen of ordinary water seems to indicate that the living organism is incapable of distinguishing between the organic molecules which contain deuterium and those which do not. If the reverse were true, organic matter of different biologic organs would display differences in isotopic ratios. Investigators at Columbia University have reported³ interesting applications of this fact. The following compounds containing heavy hydrogen have been prepared: stearic acid containing 4 deuterium atoms, a deuterium-containing fat and a sterol derivative with 2 deuterium atoms in the compound. These new products are reported to have properties indistinguishable from those of their naturally occurring analogues. Nevertheless, as the deuterium content of these substances or their metabolically produced derivatives can readily be determined from the properties of the water formed on combustion, their fate in the organism can be followed even after considerable dilution.

Interesting results already obtained from the use of deuterium as an experimental tool support the belief that much of value may be expected from investigations of this type. Mice have been fed a diet in which was incorporated the deuterium-containing fat, and after a time the tissues of the animals were subjected to analysis for deuterium. Although the diet fed was insufficient in quantity to maintain the body weight of the animals, it was found that a large amount of the absorbed fat was deposited in the depots, thus indicating that the fat which was burned was not oxidized directly after absorption but had been taken from the fat depots. Dietary fat is therefore for the most part apparently deposited in the fat tissues before it is utilized. These authors have also made suggestive and important preliminary observations of sterol metabolism which indicate that certain interesting relationships between the members and the derivatives of this lipid group may be clarified by the use of deuterium in metabolism studies.

CYANIDE ANTIDOTES AND MEDICAL PROGRESS

Recent successes with methylene blue and sodium nitrite in the treatment of cyanide poisoning are striking.¹ As a result, the treatment of poisoning in general is receiving more attention and undergoing creditable revision. These tendencies are resulting in more than the development of life-saving measures. They are leading to a fuller appreciation of fundamentals in pharmacologic reactions and physiologic processes. Sometimes the relationships are quite unsuspected.

Methylene blue and sodium nitrite are far apart chemically, physically and pharmacologically, so that a common factor in their antagonism of cyanide poisoning would hardly be suspected. Yet that is exactly what has been discovered, and the discovery testifies to the value of the experimental method in medical science. This common denominator is specific and definite. Its utilization should remove all guesswork from the treatment of cases of cyanide poisoning.

Historically, however, the discovery is one of those curious anomalies of reportorial service in medicine. For nearly forty years the potential value of the common denominator in cyanide poisoning, the methemoglobin process, slumbered unnoticed in the tomes of medical science. For twelve years the demonstrated value of methylene blue in cyanide poisoning also went unrecognized until the pharmacologist Hug, in South America, successfully reasoned to this conclusion. After all, twelve or forty years is but a brief period in the history of human endeavor. Today the merely interesting experiment of yesterday is a life-saving measure. The world-wide confirmations of this discovery, beginning with Hungary and then spreading to

² J. Schoenheimer, Rudolf and Rittenberg, D. *J. Biol. Chem.* **111**: 163, 169, 175 (Sept.) 1935. Schoenheimer, Rudolf, Rittenberg, D. and Graff, M. *ibid.* **111**: 183 (Sept.) 1935.

¹ Hanzlik, P. J. and Richardson, A. P. *Cyanide Antidotes*. *J. A. M. A.* **102**: 1740 (May 26) 1934.

Belgium, Sweden, the United States and South America, testify to the truly international scope and spirit of medical science

Eventually J C Geiger, health official of San Francisco, acting on the recommendation of Hanzlik and Richardson,¹ demonstrated the humanitarian value of this comparatively old, yet recent, discovery.² This single clinical experiment has deservedly earned a widespread approbation. In one sweep it confirmed the value of controlled experimental procedure, saved human life, and marked progress in medical science. These striking events have moved so suddenly that their full significance for medicine cannot be measured yet. But it is already apparent that many investigations of oxidation-reduction dyes, of methemoglobin agents and processes, and of related problems have been stimulated the world over. Apparently, nothing need be too remote or unsuspected to illuminate the dim crossings and by-ways on the great highway of medical progress.

Current Comment

TROPICAL DISEASES IN THE UNITED STATES

The field of tropical medicine has been enormously extended in recent years by the introduction or discovery of certain diseases in temperate climates. With the more recent discoveries, tropical medicine has come to require a knowledge of many of the sciences: protozoology, helminthology, entomology, bacteriology, meteorology, mycology, in addition to the various clinical fields of medicine, furthermore, the subject is not limited to these sciences as applied to man but extends to lower animals as well. Therefore the physician who practices tropical medicine may have to use knowledge from many other fields of learning. Not only are tropical diseases of paramount importance to public health, but the etiology and prevention of some of them are still a challenge to science. Realizing the need for more information on the distribution and incidence of tropical diseases, an advisory committee of the Division of Medical Sciences of the National Research Council made a survey¹ based on public health reports and information gathered from all parts of the world in reply to a questionnaire. In this geography of disease is a section reporting the information obtained from the latest available published health reports of fifteen states in the United States. Among the diseases usually classified as tropical diseases reported in one or more of these states are amebic dysentery, malaria, hookworm disease, relapsing fever, ascariasis, plague, leprosy, beriberi, bacillary dysentery, typhoid and dengue fever. Malaria was reported in thirteen of the fifteen states, hookworm disease and bacillary dysentery in ten states, ascariasis in eight states, amebic dysentery in four, leprosy in four, relapsing fever and plague

in at least one state, and dengue fever in five states. In this group of states the greatest number of cases of malaria was reported in Mississippi, with 36,133 cases for the year 1932, next in order was Georgia with 3,411 cases in the same year, and Louisiana with 3,214 cases in 1933. Typhoid is still widespread, in some of the fifteen states in this group several hundred cases were reported. Oklahoma heads the list with 2,620 cases of typhoid in 1931, and Georgia is next with 1,799 cases in 1932. The state reporting the largest number of persons infested with hookworm disease was Alabama with 16,380 positive stools reported among those examined in 1932, and Florida is second on the list with 13,750 positives in 1933. These figures, however, are no indication of the number of clinical cases of hookworm in these two states, as they represent only the positive observation of hookworm eggs in stools examined during the periods specified. Mississippi in 1932 led the list in cases of bacillary dysentery, reporting 5,688 cases, and Georgia was second with 435 cases. Leprosy was reported in California, Florida, Georgia and Louisiana. Much additional information on tropical diseases in these states is presented in the survey, as well as similar data for numerous other countries throughout the world. The director of the studies, Dr E B McKinley, and the advisory committee, comprising Drs Frederick P Gay, Richard P Strong and the late Theobald Smith, point out that their report is far from complete and is only a preliminary study, resulting from two and a half years of work. However, it serves as a beginning of a much needed larger study, which may in the future provide data in a field that is constantly growing in importance.

AMERICAN RED CROSS PLAN AND HIGHWAY FATALITIES

Because of the alarming total of road accidents in the United States each year, the American Red Cross has determined to establish highway first aid stations throughout the country. In 1934, 36,000 persons were killed on the highways and 1,255,000 were injured. With immediate first aid, many of these lives might have been saved. Already 100 stations are in operation and within the next few weeks 400 or more additional stations are to be established. In each of these stations there will be a list of the nearest local physicians and hospitals, developed by the local chapter of the Red Cross on consultation with the local medical society. The workers and attendants at the first aid stations have been instructed by the Red Cross to receive their training and supervision from local physicians. The attendants must, of course, have completed the standard course in Red Cross first aid. In these first aid stations there will be available, in addition to the personnel, first aid kits, splints for fractures, ready reference telephone directory of medical, hospital and ambulance service, and other first aid equipment. It is understood, of course, that this first aid service is not meant to take the place in any way of medical care. No recompense is to be received by those giving first aid, nor may any donations be received in this connection.

² Hanzlik P J. Methylene Blue as Antidote for Cyanide Poisoning. J A M A 100: 357 (Feb. 4) 1933.

¹ McKinley E B. A Geography of Disease (supplement to the American Journal of Tropical Medicine 15, September 1935).

Medical Economics

THIS PANEL SCHEME

EDWARD F. KLEIN, M.D.
PERTH AMBOY, N. J.

I'll look no more Let my brain turn and the deficient sight
topple down headlong—King Lear act 3 scene 6

The only excuse for writing this article on the panel system is one self conceived and self assumed. However, for justification I feel that my experiences and contacts in Germany, Austria, France and Great Britain afford me some right to communicate to my colleagues facts which they have the right to know. In some instances I have drawn on personal talks with physicians working under the panel scheme in their respective countries, in others, on knowledge gained through experience in clinics, in hospitals and with physicians not under the scheme. Many statements are excerpts of panel laws and are consequently true to the crude facts.

Of particular concern is the panel system in England. Being late in introducing compulsory national health insurance, England had the advantage of experiences with other countries. Fundamentally, the medical problems of national health insurance, though varying in detail from country to country, are the same. In the early part of the present year the magazine *Today* (the mouthpiece of the national administration) editorially advocated some such scheme as at present in use in England.

It is well known that private work is scarce, physicians agree as to the drastic reduction of fees, of increasing competition from hospitals, cheap clinics, unorthodox medical practitioners, various new cults instituted, the increasing number of new graduates and finally that there is actually a desperate economizing in medical treatment generally on the part of the public. "We may resentfully chafe at our bonds, and like Prometheus vainly strive to wrest ourselves from the rock of the past in our eagerness to bring relief to the suffering children of men." We must, however, be increasingly conscious of the fundamental fact that it is the past that makes the present, and that what goes before is the key to what comes after.

The good health of the people being of supreme national importance, it is not surprising that governments have sought to compel their working population to take part in some form of health insurance. Germany introduced national health insurance in 1883, Austria in 1885, Hungary in 1891 and Great Britain in 1911 the system becoming operative in 1912. The National Health Insurance Act in general reads as follows: All employed persons (now numbering in Great Britain about 18,500,000), are required to take part in a scheme of state insurance for health purposes. The scheme applies, with certain exceptions to all persons employed by way of manual labor and to all other employed persons whose rate of remuneration is not more than £250 (about \$1,250) a year.

The employer and employed person pay weekly contributions. The state adds a grant out of the public exchequer and the insured person becomes entitled to certain benefits, the principal being medical benefit, periodic cash payments during sickness and disablement known as sickness and disablement benefits and maternity benefit, i.e. a lump sum payment on the birth of a child. The scope of medical benefit consists in the provision of medical attendance by a general practitioner only, proper and sufficient medicine, a limited number of medical and surgical appliances and the furnishing of records of illness and a certificate of incapacity by the physician. It does not include attendance or treatment in respect of confinement.

In April 1930 the British Medical Association brought forward proposals for a general medical service for the nation which would include about 90 per cent of the population. In

1931 a deputation from the National Federation of Professional Workers, representing 400,000 workers, was received by the secretary to the Ministry of Health, asking coverage for all employees earning up to \$2,500 a year. The demand for the extension of health insurance has also brought in its trail the demand for cheaper services by specialists. Many societies have secret lists of specialists available to insured patients at special reduced fees. May 12, 1935, I saw this article in the *London Express*.

PUBLIC HEALTH INSURANCE FOR THE MIDDLE CLASS FAMILY

Health Insurance for the Middle classes who are not covered by the State has been introduced by a group of Lloyds underwriters who are operating on a national scale. For the middle class man it solves the problem of doctors' bills, nursery home fees (private rooms in private hospital) and also offers maternity benefit of £12 [\$60] if a doctor is employed and £8 [\$40] otherwise. For husband, wife and two children the premium is 15 shillings [\$3.75] a month. By paying a higher premium the insured may obtain higher rate of benefit. As age increases, the amount of premium rises. On the other hand if no claim is made in a year there is a reduction of 25 per cent in the next year's premium. Anybody can join the scheme without passing a medical examination.

THE SET-UP OF THE PANEL SYSTEM

(Assume now that the English panel system was to be adopted in its entirety.)

Every qualified medical practitioner is entitled to treat insured persons. In the main the conduct of the physician will be governed by a county insurance committee consisting of from twenty to forty members, one fifth of whom are physicians, three fifths represent insured persons, and one fifth are appointed by the county council appointing druggists and women members. This committee is responsible for the maintenance of adequate medical service for insured persons. In addition to the insurance committee in each county there is set up a local medical committee, representatives of all physicians in the area, and a panel committee, representatives of insurance physicians who are under agreement to treat the insured patients. The function of the local committee is to preserve the interest of the profession as a whole.

Any insured person may apply to a physician for acceptance and inclusion on the physician's list. The physician is entitled to refuse to accept the applicant on his list. If he decides to accept him, he will sign the applicant's medical card and send it to the insurance committee within seven days. The committee will note it and return it to the insured person. The record cards sent by the committee from time to time constitute the physician's list of insured persons for whom he is responsible. Included in the physician's list of responsibilities are those also who are (1) assigned to him by the insurance committee, (2) applicants not on any other physician's list whom he does not wish to accept on his list, and (3) applicants who are on the list of another physician who is not available.

REMOVAL OF INSURED PERSONS FROM THE LIST

Any insured person may be removed from a physician's list as a result of action by (1) the physician after fourteen days' notice, (2) the insured person by transfer to another physician, and (3) the insurance committee.

THE NUMBER ON THE PHYSICIAN'S PANEL

In 1933 the average number of panel patients for the average physician was 961. A maximum number of 2,500 insured persons is fixed and no physician single handed may ordinarily have more. In special individual cases the amount may be extended to 3,000 and conversely a lower limit of 2,500 may be allowed when desirable. If a physician employs one or more assistants he may obtain an additional 1,500 for each assistant. When two or more physicians are in partnership, the average of all partners must not exceed 2,500. A physician is not only personally responsible for providing adequate medical treatment to his insured patients but is also normally required to give

actual treatment himself. In certain cases, however, another physician may treat one's patients on one's behalf but one is responsible for all acts and omissions of the deputy or assistant and any agreement that one makes with a deputy or partner cannot override the terms of one's agreement with the insurance committee and one must notify the committee in advance whenever one proposes to be away from one's practice for more than a week, also to inform the committee of any arrangements one has made with another physician to treat one's patients when one is unable. The patient, however, is entitled to the physician's personal services except when the physician is prevented by some reasonable cause. A partnership must be in fact as well as in name. One partner is entitled to not less than one third of the share of the pay of any other partner. In 1933 the average number of panel physicians in England was 19,250.

REMUNERATION

Payment for medical services must be looked for to the insurance fund to which the insured person has paid to cover the full cost of medical attendance. A central fund is constituted and is based on an estimate by a government actuary of the whole insured population. This fund is distributed between several areas and the local fund between the physicians. The method of distributing the local fund is one to be determined by the wishes of the majority of the insurance physicians in each area, through their panel committee. Although the central fund or pool is determined on a capitation basis, the local distribution may be on a capitation basis or on the basis of payment per case with such modification as may find favor in the locality. Distribution on a capitation basis is actually the method everywhere in operation. Generally one's share of the fund is calculated by the number of patients on one's list—called units of credit multiplied by the present agreed capitation fee of 9 shillings (\$2.25) a year.

If the average number of units of credit or panel patients on the physician's list is 961, his income will be broadly \$2,162.25. The settlement is quarterly. The insurance committee at the end of the year will give the physician a statement showing the method by which his share has been calculated. His amount is further calculated with an addition or deduction, as the case may require, for emergency treatment rendered by him to another physician's patients or by other physicians to one's own patients.

RANGE AND TYPE OF MEDICAL SERVICE

The following type services have been held to be within the insurance contract for which one receives no additional fee:

- 1 Arrest of hemorrhage from the gums
- 2 Extraction of a tooth under an anesthetic
- 3 Tapping of hydrocele
- 4 Removal of a cyst in the neighborhood of the knee
- 5 Removal of a fibro-adenoma of the breast.
- 6 Operation for cellulitis
- 7 Removal of a needle from the foot
- 8 Amputation as a cure for hammer toe
- 9 Taking blood for a Wassermann test
- 10 Treatment of fracture of both bones of the leg with dislocation
- 11 Treatment of gonorrhea
- 12 Curettement of the uterus
- 13 Operation for fissure in ano, operation for deep abscess of the neck
- 14 Dislocation of the elbow and reduction under chloroform
- 15 Removal of epithelioma of the lip

Regarding preventive treatment, if the physician considers it necessary or desirable that this should be done, he is by virtue of his agreement under obligation to do it and cannot charge or accept a fee for doing it. If a patient refuses to undergo an operation and the refusal may result in need for more frequent attendance, the physician is requested to provide the attendance free of charge.

TREATMENT BY SPECIALISTS

The insured person is not entitled to receive specialist treatment as part of his medical benefit. However, if the physician is of the opinion that the patient's condition requires treatment which is not within the scope of the physician's terms of service, the physician must advise the patient as to the steps that should be taken in order to obtain such treatment. Where possible, the clinics and hospitals or the use of consultants associated with the insurance societies should be used. Whenever one performs an operation or gives treatment which is, in one's opinion, a specialist service, one is required to notify the insurance committee on a special form within two days after the date on which the treatment is given. Consultation with specialists is not affected by provisions of insurance acts and as a rule one may make no special charge. Regarding specialist services rendered by oneself, the burden of proof will be on the physician to show both the operation or service called for skill beyond that possessed by general practitioners as a whole and that one is possessed of the requisite skill and experience. Only in this manner is one entitled to a specialist fee.

VISITS

When the insured patient's condition requires, it is the physician's duty to visit and treat him at any place where he may be at the time, if that place is within the district in which one has undertaken to visit the insured persons. The rules adopted by the insurance committee require an insured person needing a visit to give the physician notice before a specified hour of the day on which the visit is required, except in cases of emergency. A further rule to protect the physician from unreasonable night calls is that which says that the insured person shall not summon the physician to visit him between the hours of —p m and —a m except in emergency. The actual time adopted by the insurance committee appears in the rules printed on the insured person's medical card. The physician is required to visit those patients whose condition requires it and not merely those who send the physician notice.

PENALTIES

For neglecting the treatment of a patient, fines ranging from \$5 to \$500 may result, and even removal from the panel. In addition, further penalties may result for charging fees to insured persons, for failure to keep records, and for failure to comply with the practitioner's obligations toward the regional medical officer. The committee within whose power these actions lie for adjudication is known as the advisory committee consisting of a chief medical officer of health or his deputy, two other medical officers of the ministry, and three physicians chosen by the minister from a panel nominated by the Insurance Act Committee. The duties of the regional medical officer will be outlined further in the paper.

PRESCRIBING AND SUPPLYING DRUGS

The panel druggist or chemist receives a list of authorized appliances and drugs. Standards for dressings have been adopted, a national formulary has been issued. The main intent is to provide therapeutic efficiency with regard to economy. For example, liniments are to be ordered in quantities of 2 ounces, ointments in 1 ounce quantities, gauze as 1 square yard. As far as possible, practitioners should keep a check on the consumption of medicine. If the cost of a physician's prescribing is called into question, any formal inquiry—which must precede any imposition of a penalty—will be conducted by a purely medical body, the panel committee.

ISSUE OF CERTIFICATE OF INCAPACITY

Sickness benefit and disablement benefit under national health insurance acts are weekly cash payments to the insured person while he is rendered incapable of work by some specific disease or by bodily or mental disablement. The physician's certificate

is the evidence of incapacity on which payment is ordinarily made to one's patients. Every certificate is in effect a check drawn on the benefit funds of approved societies and even the slightest laxity in the issue of a certificate may produce serious financial result. The obligation that the physician has accepted is to issue medical certificates to one's insured patients free of charge. There are seven authorized types of certificates used in the course of insurance practice.

REGIONAL MEDICAL OFFICERS

Regional medical officers (R M O) are officers of the Ministry of Health. They are referees in disputes concerning disabilities and examine records that physicians are required to keep. Consultations regarding capacity or incapacity for work falls under the scope. Such consultation may be demanded either by an insurance society or by the physician. It is the duty of the physician to produce records of attendance on their insured patients to the regional medical officer or his representative at all reasonable times and to furnish him any necessary information in regard to any entry. The regional medical officer is entitled to visit the physician's office or other places where the records are kept but must first give due notice of his visit. The total amount annually distributed in sickness and disablement benefits in Great Britain, mainly on evidence of insurance physician certificates for 1934, was over \$100,000,000.

Failure to observe rules causes irregularities in certification, and failures are viewed with grave concern. It may result in disciplinary action, such as removal from the panel or the withholding of part of a physician's remuneration. Such irregularities as antedating and postdating certificates, signing of blank forms, certifying that the patient was examined on a given date when in fact there has been no such examination, the patient not having been seen, are heavily penalized.

In 1921 there were 69,543 cases referred to the regional medical officers for settlement of disputes arising from sickness and disability claims. In 1925 there were 204,088 and in 1931 there were 644,332. From 1931 to 1934, benefit overpayments were the subject of report in twenty-three out of every hundred accounts certified, and it is to be borne in mind that the physicians are responsible for the certifications.

RECORDS OF ILLNESS

The physician is required to keep and furnish records in the official forms of the illness of his patients and his treatment and to afford the regional medical officer access to one's records at all reasonable times. The physician is required to record such facts as he considers would be of use to himself in any subsequent treatment of the patient or to any other practitioner into whose care the patient may subsequently pass.

COMPLAINTS

1 Any insured person or member of the family or other representative of a deceased person may raise a question to the subcommittee of the Insurance Committee in respect to the treatment rendered by a physician or of any alleged failure on his part to render treatment or of some other breach of his duties under his term of service.

2 A physician may raise a question as to the conduct of an insured person while receiving treatment.

3 An approved society may raise a question as to the actions of a physician in regard to any certificate that he is required to furnish to a member of the society.

4 After considering the subcommittee report, the insurance committee may take the following actions:

- (a) Penalize the physician financially by a deduction from his remuneration.
- (b) Diminish the number of insured persons that the physician may treat.

- (c) Withhold medical benefit sums payable to the physician.
- (d) Remove the physician from the panel after

- (1) Grave or persistent failure to provide treatment.
- (2) Personal misconduct of such a character as to bring the service into disrepute.
- (3) Repeated breaches of conditions of service without a definite guaranty against recurrence.

As regards insured persons on a physician's list, one is not permitted to demand or accept any payment for any treatment falling within one's term of service. The position is in no way affected by a desire or request on the part of the insured to receive treatment as a private patient. The acceptance of a fee from an insured person not on one's list who specifically asks for treatment as a private patient does not constitute a breach of one's term of service. But it is usually to be deprecated. It may cause a physician considerable inconvenience if the patient afterward denies that he made such a request and applies for a refund of his money.

MISCELLANEOUS NOTES OF CONCERN TO PANEL PHYSICIANS

In case of the death of a physician, patients may be free to procure another. Owing to the absence or mental or bodily disability of a physician, the insurance committee may notify his patients that he is not in a position to carry out his obligations, and arrangements are made with another physician to carry out the practice. Special reduction and modification is arranged by the committee when a physician refuses to make night calls or refuses to have patients assigned to him or has a limited list.

COMMENT

We in the United States simply plead for the continuation of sane, simple medical economics. We hope that our past contentions will not be exploited as ridiculous or absurd or antiquated. Obviously if any conclusions can be drawn from my remarks it is that panel medicine is medicine in a hurry, it is medicine by fear and threats, by bookkeeping, by penalties, by regulations and by starvation wages. Bernard Shaw said "A hungry doctor is perhaps more dangerous than a wild beast."

Dr. Dain, chairman of the Insurance Acts Committee of the British Medical Association, said in his foreword to the third edition of the Medical Insurance Practice, "It must to many have seemed amazing that so everyday a matter as the doctoring of a person could have produced or required such a mass of regulation." Do masses of regulation go hand in hand and concomitant with the good health of our people?

The main object of the insurance act is to enforce the health of the working part of the community, and by its results in this direction the act must be judged. If it has not improved the public health or has not improved its relation to its cost then the act has failed in its most important object.

C. W. Armstrong, in 'The Survival of the Unfittest' says, 'All states upon which a premium is set tend to become more common. If sickness and unemployment receive as premium a free gift of other people's money, these states will therefore tend to spread. As long as a man has to rely on healthy living for health, good workmanship for employment, and thrift for a rainy day, healthy living, good workmanship and thrift will be encouraged and become more common and they bring material reward, but as soon as material reward is to be gained with less effort in neglecting health, work and thrift, such negligence tends to increase.'

In 1930 Dr. Alfred Cox, late secretary of the British Medical Association, in a paper contributed at the Congress of the Royal Sanitary Institute, said "My correspondents nearly all agree that the insurance system combined with other forms of social assistance has had a bad effect on the morale of the working class. They regard public funds as inexhaustible."

WHAT OF PANEL MEDICINE IN OTHER COUNTRIES?

In Germany there was a tendency to limit the professional rights of the physician. There was a movement to extend the income limit of those entitled to insurance and at the same time to limit the total amount which any physician could receive out of the funds. In Austria the condition was very grave. The insured patients were frequently better off than the physicians. In France I was told that the physicians had succeeded on paper, at any rate, in getting adopted its cardinal points, among which were free choice of physician and payment to the physician direct by the patient on a tariff (scale). In Hungary I found a dispute. The profession itself was divided into one group which wished for free choice of physician and those physicians already employed, who opposed it. For all practical purposes, the physicians on the panel system were officials paid by fixed salaries, which were very low.

The position of the physicians in Yugoslavia was that there existed an excess of physicians, and their position was serious. In Holland there is no compulsory insurance and the profession is content.

Dr Cox again further said: "If the medical profession, so recently much less complex than today, and much less complex than it will be tomorrow, is to practice the art of medicine usefully and sanely, it is necessary that the practitioner should conserve his liberty, his free will and that he should have constantly in view only the interest of his patient with no fear that his diagnosis, his prognosis and above all his treatment will be governed by any other consideration."

The Association professionnelle des medecines has always emphasized that, if the profession reacts against the efforts made to socialize it, it is in the conviction that medicine made impersonal, bureaucratized and loaded up with clerical obligations is not social progress either for physicians or for their patients.

Has the panel system improved the death rate in England? In the sickness benefits from 1921 to 1927, claims of men have risen 41 per cent, claims of unmarried women 60 per cent and claims of married women 106 per cent. In the claims for disablement benefit (payment after twenty-six weeks of sickness benefit) the claims of men have risen 85 per cent, claims of unmarried women 98 per cent and claims of married women 159 per cent.

In 1920, 1928 and 1934 respectively the number of insured persons was 12,787,000, 13,798,000 and 18,500,000. The money paid out in sickness and disablement benefits amounted to £6,708,000 (\$33,540,000), £14,689,000 (\$73,445,000) and £20,131,930 (\$100,659,650). This does not include medical benefits, which in 1934 in England alone amounted to \$45,311,995, maternal benefits, hospitalization and dental or optical treatment. The cost of drugs consumed per person has risen from 55 cents to 80 cents in 1927. Since 1927 the cost of medicine and appliances has increased by more than another half million pounds (\$2,500,000). In 1921 the total cost of drugs was £1,189,450 (\$5,947,250). In 1927 it was £1,886,874 (\$9,334,370).

CONCLUSIONS

The evidence is conclusive that despite the payment of extraordinary sums, compulsory health insurance is an absolute failure to reduce the amount of sickness of workers.

Where are all these schemes leading to? What are the prospects for those entering the profession in large numbers today? Where are the potential possibilities for future discoveries? What then is panel medicine? It is medical terrorism. It is medicine blank and void of hope and endeavor.

Sir George Newman, former chief medical officer in the Ministry of Health, in the Sir Charles Hastings Lecture 1928, said: "The organization of health, which is the organization of life, is the primary, though not the supreme business of the government, and as I humbly see it, the supreme business of the

government is to assist and to cultivate the health heritage of every reputable physician in every age. There should be no crossing of the medical bar, but hand in hand, the government should go forward with the doctors 'upon the prow of the ship of civilization' in the bitter battle against disease."

136 Market Street.

Association News

**ANNUAL CONFERENCE OF SECRETARIES
OF CONSTITUENT STATE MEDICAL
ASSOCIATIONS AND EDITORS
OF STATE MEDICAL
JOURNALS**

The Annual Conference of Secretaries of Constituent State Medical Associations and Editors of State Medical Journals will be held in Chicago November 15 and 16. The first session will be convened at 10 a. m. Friday, November 15, and all meetings will be at the Palmer House.

Officers of state medical associations and county medical societies who wish to attend this conference will be heartily welcome as will individual members of the Association who may desire to be present.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

Trachoma Among the Indians—Dr. Polk Richards, medical director of trachoma activities for the Indian Service, conducted a trachoma institute at Fort Apache, October 4-11, for all physicians and nurses in the U. S. Indian Service doing trachoma work. Dr. Phillips Thygeson, assistant professor of ophthalmology, State University of Iowa College of Medicine, Iowa City, was the guest speaker. The service maintains a special school at Fort Apache for children with trachoma. There is an eighteen bed hospital for acute cases and operative work in connection with the school, in which there are 275 pupils.

ARKANSAS

Meeting of Urologists—The Southwestern branch of the American Urological Association will meet at Little Rock, November 15-16. Speakers will include:

Dr. Henry McClure Young, Columbia, Mo., The Best Surgical Approach to the Kidney.
Dr. Robert H. Akin, Oklahoma City, Transverse Urethral Bridging Following Prostatic Resection.
Dr. Samuel K. Broyles, Amarillo, Texas, Alkaline Incrustation of the Bladder.
Dr. Bransford Lewis, St. Louis, Nephropexy and Its Critics.
Dr. Julius Frischer, Kansas City, Mo., Preventive Measures in Urinary Calculus Formation.

CALIFORNIA

Society News—At a meeting of the Alameda County Medical Society, Oakland, October 21, Drs. Dexter N. Richards and Olin H. Garrison, Oakland, spoke on "Intestinal Obstruction" and "Metabolic Diseases and Their Relation to Teeth," respectively. Dr. Stanley H. Mentzer, San Francisco, discussed differential diagnosis of diseases of the gallbladder before the Solano County Medical Society, October 8, in Vallejo. At a meeting of the Trudeau Society of Los Angeles, October 22, a symposium on pneumothorax treatment was presented by Drs. John Q. A. Scroggy, Carl R. Howson, John W. Nevius and John R. Neal. Dr. Robert Sonnenschein, Chicago, addressed the Los Angeles Society of Ophthalmology and Otolaryngology, October 28, on reflexes or referred signs and symptoms of diseases of the nose, throat and ear. At a meeting of the Los Angeles Surgical Society, October 18, Dr. Max M. Peet, Ann Arbor, Mich., spoke on "Surgical Treatment of Hypertension."—A joint meeting of the staff of Mills Memo-

rial Hospital, San Mateo, and the San Mateo County Medical Society was addressed, October 9, by Karl F. Meyer, Ph.D., San Francisco, on undulant fever.—Dr. Loyd Thompson spoke on "The Modern Renaissance of Syphilis" before the San Diego County Medical Society, October 8.

GEORGIA

University News—The new Milton Antony contagious disease clinic of University Hospital and the University of Georgia Medical School was to be formally opened, October 1.

Dental Inspection of School Children—About 16,000 school children in Fulton County will be inspected by members of the Fifth District Dental Association in a program of dental health recently begun by the association. In a similar project in the county last year in which 8,568 children were examined, the incidence of defective teeth was found to be 82.6 per cent, representing an average of 27 cavities per child, it was stated. The state and county health departments are cooperating in the project.

Society News—Speakers before the Seventh District Medical Society at Chickamauga, recently, included Drs. John M. McGhee, Cedartown, on "Gonorrhea in the Male," and Henry L. Sams, Dalton, "Hygiene and Management of Pregnancy."—Dr. Herbert C. Schenck, Atlanta, among others, addressed the Eighth District Medical Society in Valdosta, October 8, on "Indications for Lung Collapse Measures in Tuberculosis, with Special Reference to Technique and Management in Artificial Pneumothorax."—At a meeting of the Second District Medical Society in Thomasville, October 11, Drs. James H. Pound, Chattahoochee, Fla., among others spoke on "Surgery in the Mentally Ill" and Henry M. Moore, Thomasville, "Tobacco Amblyopia."—The Georgia Medical Society was addressed in Savannah, October 8, by Dr. Robert L. Oliver on "Metaplasia in the Breast," and Dr. Julian F. Chisholm Jr. presented a case report on "Tumor of the Optic Nerve."—Dr. Quinney A. Mulkey, Millen, addressed the Burke-Screven-Jenkins Counties Medical Society at Millen, October 3, among others, on "Treatment of Injuries to the Eye."

ILLINOIS

Personal—Dr. Carl A. Peterson, Moline, has been named a district superintendent of health on the staff of the state health department, effective October 1. Moline will be his headquarters.—Dr. Harry A. Yeager has recently been appointed health officer of Litchfield.

Society News—Dr. Harold B. Cushing, Montreal, Canada, among others, addressed the quarterly meeting of the Iowa and Illinois Central District Medical Association in Moline, October 18, on "Newer Phases of Prophylactic Inoculation in Children—Pertussis, Measles, Diphtheria, Poliomyelitis and Scarlet Fever."—Dr. Charles F. Read, Elgin, among other speakers, discussed psychoanalysis before the Kane County Medical Society at a meeting, October 9, at the Elgin State Hospital.

Typhoid Traced to Contaminated Milk—An outbreak of typhoid occurred at Grand Tower, Jackson County, during August, one month after a family reunion at which twelve persons were present, seven of the persons who attended the dinner were ill. The hostess recalled that she had bought from a dairy four quarts of raw milk from which she had made the ice cream. Milk from the dairy in question had gone to each household of thirteen other persons involved in a similar outbreak in the same community, with onset during July and August. The health department points out that while the investigation failed to identify definitely the source of contamination, evidence indicated that the milk was responsible. It is believed that a typhoid carrier or unrecognized case among the dairy help or customers was the original source. A young girl whose parents lived on the farm came home ill from Washington late in July. She had fever and was found to have typhoid when she entered a St. Louis hospital later for treatment of appendicitis.

Chicago

Society News—Dr. David J. Davis, dean University of Illinois School of Medicine, will deliver the presidential address before the Institute of Medicine of Chicago, December 3, on "Some Studies on the Epidemiology of Streptococcus Infections."

Dr. Pemberton Will Give Mayo Lecture—Dr. John DeJ. Pemberton, associate professor of surgery, University of Minnesota Graduate School of Medicine, Rochester, will present the annual Mayo lecture of Northwestern University at Thorne Hall, November 15. Dr. Pemberton's subject will be "Development of Thyroid Surgery."

Lectures at University of Illinois—Dr. Alfred Adler, Vienna and New York, will lecture at the University of Illinois College of Medicine, November 4, on "Medical Psychology." Rear Admiral John Downes, commandant of the ninth naval district, Great Lakes, Ill., will deliver the Memorial Lecture at the university, November 11. The lecture has been endowed by alumni and faculty members of the school in memory of the alumni and members of the staff of the medical school who died during the World War.

Lectures on Psychoanalysis—Dr. Franz G. Alexander opened a series of introductory lectures on psychoanalysis at the Institute for Psychoanalysis, October 24. The lectures are presented every Thursday afternoon. Subjects include historical development of the main concepts of psychoanalysis, concept of the unconscious, fundamentals of psychic dynamics (repression, regression, fixation, reaction-formation, sublimation), theory of instincts, development of the personality, general concepts of the structure of neuroses and psychoses, principles of the psychoanalytic technique, and application of psychoanalysis to other sciences.

INDIANA

State Medical Election—Dr. Edmund D. Clark, Indianapolis, was chosen president-elect of the Indiana State Medical Association at its recent annual meeting in Gary. Dr. Roscoe L. Sensenich, South Bend, took office as president, succeeding Dr. Walter J. Leach, New Albany, who died just before the meeting. Memorial services were held for Dr. Leach during the meeting. Dr. Clark will take office Jan. 1, 1937. The next annual session will be held in South Bend. Dr. Clark graduated from Bellevue Hospital Medical College, New York, in 1891. He was director of base hospital number 32 during the World War and in 1931 was president of the Indianapolis Medical Society. At present he is secretary of the University of Indiana School of Medicine, Indianapolis, and professor of surgery.

IOWA

Society News—At a meeting of the Iowa Clinical Surgical Society in Sioux City, September 28, clinics were conducted by Drs. Robert Q. Rowse and Prince E. Sawyer, general surgery, Archibald F. O'Donoghue, orthopedic surgery, and Lawrence E. Pierson, urologic surgery.—Speakers before the Dubuque County Medical Society in Dubuque, September 24, included Dr. Max Cutler, Chicago, on "Diagnosis and Treatment of Breast Tumors."

Immunization in Polk County—State and local health authorities, parent-teacher associations and other agencies are cooperating in a campaign to immunize children in Polk County against diphtheria. It has been decided to devote one month each year to this campaign. This year it will begin in November. The campaign will be publicized by radio, newspapers and speeches. The Des Moines Council of Parent-Teachers Associations will do much of the educational work in the personal contact with parents.

Meeting of Ophthalmologists—The Iowa Academy of Ophthalmology and Otolaryngology will hold its annual meeting in Council Bluffs, November 7, with the following speakers:

Dr. Frank W. Dean, Council Bluffs, Causes of Phorias
Dr. Jack V. Treynor, Council Bluffs, Laryngotracheitis
Dr. John F. Stageman, Council Bluffs, Asthmatic Bronchitis
Dr. Wayland H. Maloy, Shenandoah, Tuberculosis of the Cornea and Iris
Dr. Earl C. Montgomery, Atlantic, Serous Meningitis as a Complication of Acute Mastoiditis
Dr. Lloyd G. Howard, Council Bluffs, Head Specialists
Dr. Abbott M. Dean, Council Bluffs, Intraocular Steel
Dr. Sydney D. Maiden, Council Bluffs, Practical Management of Antrum Infection

KENTUCKY

Advisory Committees on Social Security—The governor has appointed an advisory commission on social security, with Dr. Arthur T. McCormack, secretary, Kentucky State Medical Association as chairman. Dr. McCormack named several subcommittees to deal with the various titles of the Social Security Act. In addition, he has asked the committee on public relations of the state medical association to act as the committee on public health. The council of the state association and the committee on medical economics have been asked to serve as advisory members of the section of the commission dealing with all matters pertaining to health.

MAINE

Personal—Dr. James A. Spalding, Portland, has retired as editor of the *Maine Medical Journal* and Dr. Edwin W. Gehring, Portland, has been named to succeed him.

MARYLAND

Personal—Dr Henry E Sigerist, professor of the history of medicine, Johns Hopkins University School of Medicine, Baltimore, received an honorary degree from the College of Physicians of Madrid during the recent International Congress of the History of Medicine.—Dr Robert E Garrett, superintendent of the Spring Grove State Hospital, Catonsville, since 1928, has resigned, effective November 1, on account of ill health. Dr Garrett has been connected with the institution for thirty-five years.

State Appointments for Health Survey—William Thurber Fales, Sc D, director of the bureau of vital statistics, Baltimore City Health Department, has been designated state supervisor for Maryland in the national health survey being conducted by the U S Public Health Service. Wilmer H Schulze, Phar D, director of the bureau of environmental hygiene, is serving as industrial hygiene specialist for the industrial survey of the records of sick benefit associations to determine sickness and death rates according to occupation. This material is intended to supplement the data gathered in the house-to-house canvass.

Causes of Death in 1934—Accounting for 22 per cent of all deaths in Maryland in 1934, heart disease led the list of causes of death for the year. The mortality rates per hundred thousand of population for white persons and Negroes, respectively, were 264.9 and 265.8. Second in the causes of death was nephritis, with a rate of 127.5 per cent for white persons and 180.5 for Negroes. Cancer, all forms, was third, with a rate of 126.3 for white persons and 88.7 for Negroes. Tuberculosis, which was responsible for the greatest mortality from 1901 through 1917, stood seventh in the list of causes for 1934, having for the first time on record a death rate lower than that for accidents, which was sixth.

MASSACHUSETTS

Extension Lectures—The Massachusetts State Medical Society has begun its series of graduate extension courses in various centers throughout the state. Different centers have been selected for the spring series. Consideration will be given to diseases of the lung, liver, kidney and bladder, cancer, arthritis, dermatology, ophthalmology and otolaryngology, pediatrics, immunology, latest developments in endocrinology, and syphilis and gonorrhea.

Mental Hygiene for Adults—A university extension course on 'keeping mentally fit' will begin, November 5, under the auspices of the Massachusetts Department of Education and the Massachusetts Society for Mental Hygiene. Sessions will be held at the Gardner Auditorium, State House, Boston, and lectures will be presented by the following:

Joseph Jastrow, Ph D, New York, 'Keeping Mentally Fit', November 5.
Dr Bronson Crothers, assistant professor of pediatrics, Harvard Medical School, 'Management of Disease in Childhood in Relation to Mental Health', November 12.

Dr Lawson G Lowrey, formerly director, Institute for Child Guidance, New York, 'The Child and the Modern World', November 19.

Dr Donald Gregg, president, Massachusetts Society for Mental Hygiene, 'How Psychiatry Can Aid in Meeting Problems of Modern Life', December 3.

Dr James J Walsh, professor of physiologic psychology, Cathedral College, 'Current Ethical Trends', December 10.

Dr Karl M Bowman, assistant professor of psychiatry, Harvard Medical School, 'Adult Problems', "The Blues and Fatigue States", December 17.

Dr Jacob Kasanin, clinical director, state hospital for mental diseases, 'Howard R I Psychoanalysis and Mental Health', January 7.

Dr Albert Warren Stearns, dean, Tufts College Medical School, 'Adults in Difficulty', January 14.

Society News—Dr Charles S Burwell, Boston, will address the Suffolk District Medical Society and the New England Heart Association at the Boston Medical Library, December 11, on "Constrictive Disease of the Pericardium".—At the annual meeting of the Massachusetts Psychiatric Society, October 29, George Sarton, Sc D, associate of the Carnegie Institution of Washington, D C, gave an address on "Genius, with Special Reference to Science and Music".—Dr Harry B Levine, among others, addressed the New England Heart Association in Boston, October 28, on "Pulmonary Infarction Complicating Severe Chronic Mitral Valve Disease with Failure".—Speakers before the Worcester District Medical Society in Rutland, October 9, were Drs David Zacks Brookline on "X-Ray Diagnosis of Silicosis versus Tuberculosis," and Gullu Lindh Muller, Rutland, "Value of Blood Studies in the Selection of Cases for Thoracoplasty".—Dr Robert A Kilduffe, Atlantic City, N J, discussed 'Highlights in the History of Hospitals' before the Springfield Medical Society, October 28.—Dr Leland S McKittrick, Boston, addressed the New England Physical Therapy Society, Boston, October 16, on "Treatment of Hemorrhoids".

MICHIGAN

Board of Embalmers—Members of the State Board of Embalmers and Funeral Directors, created by an act of the last legislature, have been appointed by Dr Clyde C. Slemmons, Lansing, state health commissioner. The board will work in conjunction with the state department of health.

Dr Wessinger Honored—Dr John A Wessinger, health officer of Ann Arbor since 1909, has been made a life member of the Washtenaw County Medical Society. A similar honor was conferred on Dr Wessinger by the Michigan State Medical Society during its annual meeting in Sault Ste. Marie, September 27. Both honors were in recognition of his many years as a practicing physician. Dr Wessinger is 75 years of age and a graduate of Detroit Medical College, class of 1882.

Society News—The Kalamazoo Academy of Medicine was addressed in Kalamazoo, October 22, by Drs Raymond W Waggoner, Ann Arbor, on "The Paroxysmal Disorders", Richard M McKean, Detroit, "Disturbances in Thyroid Function", Harley A Sears, Kalamazoo, "Endocrine Therapy in Schizophrenia," and Roy A Morter, Kalamazoo, "The Problem of Mental Disorders".—A symposium on anesthesia will be presented before the Wayne County Medical Society, November 4, by Drs Myra E Babcock and Francis J Murphy, Detroit. Dr Rosco G Leland, director, Bureau of Economics, American Medical Association, Chicago, discussed "The Economics of Modern Medicine" before the society, October 21.—The Detroit Society of Neurology and Psychiatry held its first annual meeting at Ann Arbor, September 19, speakers included Dr Konstantin Lowenberg, Ann Arbor, on "Cerebral Changes in Nitrous Oxide Deaths".—The house of delegates of the Michigan State Medical Society adopted a resolution during the recent annual meeting establishing a section on radiology.

MISSOURI

Society News—Dr Thomas FitzHugh Jr, Philadelphia, discussed "Recent Advances in Clinical Hematology" before the Kansas City Academy of Medicine, October 18.—Speakers before the second annual meeting of the Missouri Academy of Science in Kansas City, October 24-26, included Dr Buford G Hamilton on "What Maternal Welfare Hopes to Accomplish in the State of Missouri".

Medical-Dental Service Bureau—Offices for the new Medical-Dental Service Bureau have been established in St. Louis at 317 Missouri Building. Mr Ross Garrett, director of a similar bureau in Washington, D C, is in charge of the organization. Representatives have been chosen from the three societies participating in the plan to make up a board of directors for the St. Louis Medical Society. Drs Fred W Bailey, David P Barr, Howard M Foster, Curtis H Lohr, John C Morfit, James Archer O'Reilly, Major G Seelig, Carl F Vohs, Thomas C Wimber and William O Winter, for the St. Louis County Medical Society. Dr Elmer O Breckenridge, for the St. Louis Dental Society. Drs Otto W Brandhorst, Val H Frederick, Virgil Loeb, Edward L Mayer, Ronald H Miller and Rudolph C Seibert.

NEW JERSEY

Health at Trenton—Telegraphic reports to the U S Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended October 19, indicate that the highest mortality rate (17.6) appears for Trenton and that the rate for the group of cities as a whole was 11. The mortality rate for Trenton for the corresponding week of last year was 14.6 and that for the group of cities, 10.9. The annual rate for the eighty-six cities for the forty-two weeks of 1935 was 11.4, as against a rate of 11.3 for the corresponding period of 1934. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

NEW YORK

Hospital News—Two new buildings were dedicated at the Suffolk Sanatorium, Holtsville, October 23. One is for children, has a capacity of sixty and is named for the late Dr Joseph H Marshall, first president of the board of managers of the hospital. The other building, which has fifty-four beds, is for the care of acute cases, it is named for Dr William H Ross, Brentwood, first president of the county board of health.

Dr Greenburg Appointed Director of Industrial Hygiene—Dr Leonard Greenburg, health officer of New Haven, Conn, has been appointed executive director of the division of industrial hygiene of the state department of labor,

effective October 15 Dr Greenburg, who is a native of New York, received a degree in sanitary engineering from Columbia University in 1915, the doctorate in public health from Yale University, New Haven, in 1923 and his medical degree from Yale in 1930. He has served as an officer of various sections of the National Safety Council dealing with industrial hazards, as a member of a committee to investigate sanitary conditions at Ellis Island and as a member of a committee studying cerebral meningitis and sanitary conditions on shipboard and in the Orient in 1931. He is associate clinical professor of public health at Yale University School of Medicine. He will begin immediately a study of silicosis and other dust disease hazards in industry in connection with the new workmen's compensation law.

New York City

Afternoon Lectures at the Academy—The tenth series of Friday afternoon lectures at the New York Academy of Medicine will begin November 8 with a talk by Dr Milton Benjamin Rosenbluth on "Newer Drug Therapy." Lecturers for the remainder of the year will be

Dr Thomas T. Mackie, "Diagnosis and Treatment of Intestinal Infections"

Dr Emanuel Libman, "Points in Medical Diagnosis"

Dr William P. Healy, "Significance of Uterine Bleeding in Later Life"

Dr George Draper, "Significance of the Human Constitution in Clinical Medicine"

Dr Ralph Pemberton, "Philadelphia: Present Status of Arthritis and the Treatment of It"

Dr Erdmann Honored—A new auditorium at the New York Post-Graduate Medical School and Hospital has been named in honor of Dr John F. Erdmann, who was professor of surgery in the school and director of the surgical service for more than twenty years. At a dedication ceremony, October 21, speakers included Drs. Walter G. Lough, Walter T. Dannreuther, Raymond B. Allen, William B. Talbot, Charles Gordon Heyd and Arthur F. Chace. Dr Charles J. Imperatori, who is chairman of the faculty association, presided and Dr Chace accepted the Erdmann Auditorium, which is a gift from the board of directors, the faculty association and the professional staff of the hospital in recognition of Dr Erdmann's long services to the institution. Dr Erdmann spoke briefly in acknowledgment. A bronze bust of Dr Erdmann, the gift of the faculty association, also was installed.

Dr Emerson Awarded Medal—The American Public Health Association at its annual meeting in Milwaukee, October 7, awarded the William Thompson Sedgwick Medal for distinguished service in public health to Dr Haven Emerson, president of the association in 1933-1934. Dr Emerson has been since 1922 professor of public health administration and director of the institute of public health at Columbia University College of Physicians and Surgeons, from which he was graduated in 1899. At various times he has served as professor of hygiene and preventive medicine at Cornell University Medical College, health commissioner of New York City and medical adviser and assistant director of the bureau of war risk insurance in the U. S. Treasury Department. In 1929 he made a survey of health and sanitation in Athens, Greece for the health section of the League of Nations and has made similar surveys for many cities in this country. He served in the medical corps of the army during the World War and received the Distinguished Service Medal.

OHIO

University News—The International Health Division of the Rockefeller Foundation has granted to the school of applied social sciences of Western Reserve University, Cleveland, \$10,000 to strengthen the public health nursing practicing field for graduate and undergraduate nursing students.

State Medical Election—Dr Edwin M. Huston, Dayton, was named president-elect of the Ohio State Medical Association at the annual meeting in Cincinnati, October 4, and Dr Ralph R. Hendershott, Tiffin, was installed as president. Next year's meeting will be in Cleveland. Dr Huston was graduated from the Medical College of Ohio, Cincinnati, in 1896.

Society News—A program of graduate lectures will be presented by the Summit County Medical Society, Akron, November 7. Speakers will be Drs. William Wayne Babcock, Philadelphia, who will discuss "Malignant Disease of the Intestine" and "Common Errors in Surgical Practice," Temple S. Fay, Philadelphia, "Important Considerations in the Administration of Fluids" and "Cerebral Injuries and Management of Intracranial Pressure Problems," and John A. Kolmer, Philadelphia, "Vaccination Against Infantile Paralysis" and "Principles and Practical Applications of Chemotherapy." Dr Grover C. Penberthy, Detroit, addressed the Toledo Academy of Medicine, October 4, on "Tannic Acid Treatment of

Burns." Dr Stanley M. Goldhamer, Ann Arbor, Mich., addressed the section on pathology, experimental medicine and bacteriology, October 11, on "Physiology and Treatment of the Macrocytic Anemias."—Dr Elias C. Fischbein, Dayton, addressed the Montgomery County Medical Society, Dayton, November 1, on "Modern Conceptions of the Neuroses."

PENNSYLVANIA

Society News—Dr James W. McConnell, Philadelphia, addressed the Northampton County Medical Society at Easton in September on "The Close Interrelationship of Medicine and Neuropsychiatry."—Dr Charles L. Brown, Philadelphia, discussed differential diagnosis of fever at a meeting of the Berks County Medical Society, Reading, October 8.—Dr Arthur M. Shipley, Baltimore, was guest speaker at the annual meeting of the Cumberland County Medical Society at Carlisle in September, his subject was "Surgery Related to Blood Vessel Diseases."

Philadelphia

Society News—A medicolegal symposium was presented before the Philadelphia County Medical Society at its meeting, October 23, by Drs. Daniel J. McCarthy, Charles W. Burr, William Drayton Jr. and Samuel Leopold and Judge Charles Brown, president of the board of judges. The October 16 meeting was a memorial to the late Dr George A. Knowles, a bronze bust of whom was presented to the society. Dr Knowles, who died in 1934, was assistant director of health of Philadelphia.—Among other speakers before the Physiological Society of Philadelphia, October 21, Dr David L. Drabkin, Mr. A. H. Wideman and Mr. H. Landow presented a paper on "The Fate of Hemoglobin Injected into the Animal Body."—Dr John F. Fulton, New Haven, Conn., was guest speaker at a meeting of the Philadelphia Neurological Society, October 25, his subject was "Recent Experiments on Relation of Frontal Lobes to Cerebellum."

Hospital Survey—In the preliminary report of a survey completed by Harold T. Prentzel, the occupancy of Philadelphia's 19,959 hospital beds is said to have averaged 75.3 per cent in 1934. The report shows that in forty-nine hospitals 50 per cent of the private beds were occupied and 83.4 per cent of the ward beds. Seventy per cent of the unoccupied beds in the city were in the forty general hospitals which have 57.1 per cent of the total number of beds. Fourteen special hospitals having 12.5 per cent of the beds had an occupancy of only 44.4 per cent. The new U. S. Naval Hospital was only 32.8 per cent occupied during the year. Considering all types of beds, the ratio of beds to population in Philadelphia was 10.23 beds per thousand, excluding all special beds, the ratio was 5.84. The investigator concluded that the hospitals with less than 100 beds should be closed or merged with larger hospitals except when they are valuable in serving small communities, that the church hospitals are in unfavorable positions to meet the needs of their constituencies and should meet their environmental conditions, remove to new locations or reduce their capacities, that the centrally located hospitals may have to move or retire from the field, that corporations organized for profit are an economic burden to the public, and that the gap between the use of private and of ward services indicates the necessity for lower cost private service.

Pittsburgh

Society News—Dr Henry M. Ray, Pittsburgh, among others, addressed the Pittsburgh Academy of Medicine, October 22, on "Blood Grouping, Clinical and Medicolegal Applications."—Drs. Ira A. Darling, Warren, and Edward E. Mayer addressed the Pittsburgh Neurological Society, October 21, on "Hospital Treatment of Inebriates" and "Nonpsychotic Conduct Disorders," respectively.

WASHINGTON

Smallpox Increasing—The state health officer reported that Washington had 1,014 cases of smallpox in the first nine months of this year. In 1934 there were 580 cases in the state and in 1933 there were 288.

WEST VIRGINIA

Personal—Dr Frederick T. Foard of the U. S. Public Health Service, who has been in charge of a sanitation program conducted by the state health department and the emergency relief administration, has been transferred to San Francisco. Dr Albert M. Price of the health department will take charge of the sanitation work.

State Health Conference—The annual state health conference was held in Huntington, October 28-30, at the Hotel Prichard. Among the speakers were Drs. Iago Galdston, New

York, on "Health Promotion by Education", Paul Padgett, Baltimore, "Modern Treatment of Syphilis", Henry Kennon Dunham, Cincinnati, "Is Tuberculosis Still a Health Problem?" and Allen W. Freeman, Baltimore, "The Future of Public Health."

Society News—Dr. Richard B. Cattell, Boston, addressed the Ohio County Medical Society, Wheeling, October 25, on "Carcinoma of the Colon and Rectum." Dr. William F. Rienhoff Jr., Baltimore, addressed the society, October 11, on "Surgical Treatment of Diseases of the Lungs and Mediastinum."—Dr. William Wayne Babcock, Philadelphia, addressed the Fayette County Medical Society, Oak Hill, September 28, on "Tumors of the Intestinal Tract."

WISCONSIN

Hobby Exhibit at State Meeting—The Medical Society of Milwaukee County and its Woman's Auxiliary sponsored an exhibit of physicians' hobbies at the annual meeting of the State Medical Society of Wisconsin in Milwaukee recently. Forty-four physicians displayed the following leisure time activities: boat models, photography, collections of rare books, sculpture, sketching, metalcraft, electrical and chemical patents, stamps, butterflies, flowers, a collection of Negro spirituals, third dimension photography and a short wave radio transmitter. The exhibit will be continued at future meetings of the state society.

Society News—Drs. Albert W. Bryan and Jerome T. Jerome, Madison, addressed the Chippewa County Medical Society, Chippewa Falls, September 25, on "Cardiac Lesions and Their Treatment" and "Injuries and Diseases of the Knee Joint," respectively.—Drs. Arthur W. Allen, Boston, and Joseph J. Adamkiewicz addressed the Milwaukee Society of Clinical Surgery, October 22, on "Present-Day Treatment of Head Injuries" and "Common Duct Stones—Their Diagnosis and Treatment," respectively.—Dr. Francis D. Murphy, Milwaukee, was the guest speaker in a symposium on cardiac diseases at a meeting of the First Councilor District of the State Medical Society of Wisconsin in Watertown, October 24.

GENERAL

Southwestern Meeting at El Paso—The twenty-second annual meeting of the Medical and Surgical Association of the Southwest will be held at the Hotel Hussmann, El Paso, November 21-23. Guest speakers, each of whom will make several addresses and conduct clinics and round table discussions, will be Drs. Charles T. Stone, Galveston, Texas, Verne C. Hunt, Los Angeles, Enos Paul Cook, San Jose, Calif., James C. Masson and Louis A. Buie, Rochester, Minn., Hermon C. Bumpus Jr., Pasadena, Isaac H. Jones, Los Angeles, and Albert H. Rowe, Oakland, Calif.

Meeting of Railway Surgeons—The American Association of Railway Surgeons will hold its annual meeting at the Palmer House, Chicago, November 13-15. The tentative program includes the following speakers:

Dr. George W. Hall, Chicago, Mental Reactions Following Trauma
Dr. James E. M. Thomson, Lincoln, Neb., Fractures of the Forearm
Dr. Edward L. Jenkinson, Chicago, Anatomic Variations of the Spine
Dr. Owen H. Wengenstein, Minneapolis, Abdominal Injuries
Dr. George H. Ewell, Madison, Hydrocele: Its Treatment by the Injection Method
Dr. Philip H. Kreuscher, Chicago, Fractures of the Pelvis and Upper End of the Femur

Dr. James Tate Mason, Seattle, President-Elect, American Medical Association, will discuss "Practical Considerations on Intravenous Fluids in Shock, Dehydration and Starvation."

Pacific Coast Obstetric Meeting—The Pacific Coast Society of Obstetrics and Gynecology will hold its annual meeting in Los Angeles, November 6-9, at the Ambassador Hotel. Speakers will include:

Dr. Philip H. Arnot, San Francisco, Morbidity, Mortality and Complications After Cesarean Section
Dr. Herbert M. Evans, Berkeley, Relation of the Anterior Pituitary to the Reproductive Process
Dr. Sterling N. Pierce, Los Angeles, Pseudojaundice of the New Born

A symposium on maternal mortality of seven cities on the Pacific Coast will be presented by Drs. Thomas Floyd Bell, Oakland; Richard J. O'Shea, Seattle; Raymond E. Watkins, Portland, Ore.; Henry A. Stephenson, San Francisco; Clarence W. Page, Berkeley; William Benbow Thompson, Los Angeles; and Thomas F. Wier, San Diego.

The Woman's Auxiliary—The October *News Letter* of the Woman's Auxiliary to the American Medical Association states that in Milwaukee, radio station WTMJ canceled all contracts carrying the radio advertising of internal "patent medicines," an action for which praise is given to the auxiliary of the Medical Society of Milwaukee County. Since the state medical society's approval at the recent annual meeting, a state

organizer in North Dakota is now under consideration, leaving Ohio and Montana the only unorganized states in the north central area. A pilgrimage is being planned in Indiana to visit and care for the graves of the two women who are considered the first in the world to be operated on for an ovarian tumor and disease of the gallbladder. Dr. Ephraim McDowell, Danville, Ky., performed the ovariectomy on Jane Todd Crawford who later lived and is buried in Sullivan, Ind. The second operation was performed by Dr. John Stough Bobbs, June 15, 1867, in Indianapolis, on Mrs. Burasworth, McCordsville. The pilgrimage will also include a visit to the grave of Dr. John L. Richmond, who lived in Indiana and was buried in Covington.

Society News—Dr. Claude W. Munger, director, Grasslands Hospital, Valhalla, N. Y., was chosen president-elect of the American Hospital Association at its meeting in St. Louis, September 30-October 4, and Dr. Robin C. Buerki, superintendent, State University of Wisconsin General Hospital, Madison, was installed as president. Dr. Bert W. Caldwell, executive secretary of the association, was designated editor of the society's official journal, *American Hospitals*.—The National Society for the Prevention of Blindness will hold its annual conference at the headquarters of the society in Rockefeller Center, New York, December 5-7. Among topics to be discussed will be medical social eye work, prevention of eye accidents caused by fireworks, and division of responsibility between official and unofficial agencies in the movement for prevention of blindness.—The sixteenth annual meeting of the American Student Health Association will be held, December 27-28, at the Hotel Pennsylvania, New York.—Dr. Clyde C. Siemons, Lansing, Mich., was elected president of the International Society of Medical Health Officers at the annual meeting in Milwaukee in October.—Dr. John F. Erdmann, New York, was chosen president-elect of the Inter-State Postgraduate Medical Association at the annual session in Detroit, October 18, and Dr. David Riesman, Philadelphia, was installed as president.—At the seventh annual meeting of the Central Association of Obstetricians and Gynecologists in Omaha, October 10-12, Dr. Jean Paul Pratt, Detroit, was chosen president-elect, Dr. Buford G. Hamilton, Kansas City, Mo., was installed as president. Other officers are Drs. James R. Garber, Birmingham, Ala., and Ralph A. Reis, Chicago, vice president and secretary-treasurer, respectively. The next annual meeting will be held in Detroit.

FOREIGN

Scientific Medicine in China—At the annual meeting of the Chinese Medical Association, November 18, in Canton, the one hundredth anniversary of scientific medicine in China will be celebrated. The meeting will be held at Canton Hospital, where Dr. Peter Parker, a medical missionary, first introduced western medicine into the country. A centennial history of the hospital is now in process of publication. A new building for the hospital will be dedicated during the meeting and the foundation stone for a new medical school will be laid.

Society News—At the Seventh International Congress of Industrial Accidents and Occupational Disease at Brussels in July, Dr. Francis D. Donoghue, Boston, was elected vice president and Dr. Robert T. Legge, Berkeley, Calif., a member of the permanent committee. Papers were presented by Drs. Henry H. Kessler, Newark, N. J.; Royd R. Sayers of the U. S. Public Health Service, Washington, D. C.; and Yandell Henderson, Ph.D., New Haven, Conn., among others. The United States delegation was headed by Dr. Claude C. Pierce of the U. S. Public Health Service.—A "Congress on Gout and Uric Acid" was held in Vittel, France, September 14-16. Dr. Hyman I. Goldstein, Camden, N. J., presented a paper on "Gout and the Uric Diathesis."

Nobel Prize in Medicine Awarded to German Scientist—Dr. Hans Spemann, professor of zoology at the University of Freiburg im Breisgau, has received the Nobel Prize in Medicine for 1935 in recognition of his research on embryonic evolution, the *New York Times* reported, October 25. Dr. Spemann is a native of Stuttgart, 66 years old, and studied medicine at the universities of Heidelberg, Munich and Würzburg. He was appointed assistant at the Zoological Institute at Würzburg in 1895 and taught there until 1908 when he was called to the University of Rostock. In 1914 he became director of the Kaiser Wilhelm Institute for Biology in Berlin-Dahlem and was appointed to his present position at Freiburg in 1919. His best known scientific work is entitled "Experimental Research in the Field of Evolutionary Physiology." He is also the author of a manual on the technique of microsurgery. In 1933 he was a guest lecturer at Yale University, New Haven for two weeks.

Government Services

Animal House Planned

The advisory committee on architectural design of the U S Treasury Department has approved a plan for a scientific animal house to be erected for the National Institute of Health on a forty-five acre farm near Bethesda, Md. This site will be developed into an experimental station for the institute under an appropriation of \$100,000, which has been available for some time. The farm was donated by Luke Wilson, retired business man, formerly of Evanston, Ill., from a part of his estate, Tree Tops, on the Rockville pike north of Bethesda.

Memorial to Colonel Hoff

A fountain erected in the circle opposite the main entrance to Walter Reed Hospital, Washington, D C was dedicated October 25, as a memorial to Col John Van Rensselaer Hoff, medical corps, U S Army, who died in 1920. Colonel Hoff was graduated from Albany Medical College in 1871 and from the College of Physicians and Surgeons in the City of New York in 1874. He organized the first detachment of the hospital corps in the army at Fort Reno I T, in 1887, and the first company of instruction hospital corps at Fort Riley, Kan., in 1891. He served through the war with Spain and was chief surgeon of the China relief expedition in August 1900. He was a member of the faculty of the Army Medical School in 1901 and 1902, in 1905 was detailed as observer with the Russian army in the Russo-Japanese war in 1906 was chief surgeon of the Department of Missouri, in 1907 and 1908 chief surgeon of the Philippines division, in 1909 chief surgeon of the Department of the Lakes, and from 1910 until his retirement for age in 1912 chief surgeon of the Department of the East and Eastern Division.

Examination for Reserve Corps of Public Health Service

The U S Public Health Service announces an examination for entrance into the Reserve Corps of the U S Public Health Service in the grade of assistant surgeon, to be held November 18. Boards will be appointed in various cities so as to avoid the necessity for travel, which if necessary must be made at the candidate's expense. Applicants must have graduated from reputable medical colleges and must have had at least one year's internship. They must not have passed their thirtieth birthday. Compensation will be \$3158 per year for an officer with dependents, \$2699 for one without dependents. Successful candidates will be ordered to active duty in the Reserve Corps, in which it is expected there will be vacancies soon after Jan 1, 1936, they will be eligible for examination for entrance into the regular corps when such examinations are held, provided they have not passed their thirty-second birthday. Those who wish to take this examination should request the necessary blanks and other information from the Surgeon General, U S Public Health Service, Washington, D C.

Captain Brister Named Rear Admiral

Promotion of Capt John Mosley Brister, medical corps, U S Navy, to the grade of rear admiral, was approved by the President, October 21. The promotion will be effective January 1 when Rear Admiral Ammen Farenholt will retire, having reached the statutory retirement age of 64 years. Rear Admiral Farenholt is inspector of medical department activities, West Coast, with headquarters at the Naval Hospital in San Diego, Calif. Captain Brister was born in Pennsylvania May 24, 1877, and graduated from the Medico-Chirurgical College of Philadelphia in 1898. He was appointed an assistant surgeon in the medical corps of the navy in 1900. After several years' service on the Asiatic Station and in the Philippines, he returned to the United States for duty at the Philadelphia Naval Hospital. During the World War he was attached to the naval hospital, Boston, and in 1919 and 1920 was in command of the naval hospital, Canacae, P I. He returned to the Boston Naval Hospital in 1921 and in 1923 was transferred to the Naval Hospital at New York. He served as fleet surgeon and aide on the staff of the commander, battle force during 1925 and 1926 and was attached to the bureau of medicine and surgery from 1927 until 1929. He was in command of the Boston Naval Hospital from 1929 until 1933 when he was assigned to his present duties as district medical officer of the fourth naval district, Philadelphia.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 5, 1935

The Future of Biochemistry and Pharmacy

At the ninety-fourth session of the School of the Pharmaceutical Society, Sir Frederick Gowland Hopkins, president of the Royal Society and professor of biochemistry at the University of Cambridge, delivered an address on the training of the pharmacist, a subject on which no one else can speak with so much authority. Knowledge concerning the control of the body by a multiplicity of hormones, with complicated inter-relations he said, was growing daily, and the literature of research on vitamins had of late contained as many as 1,000 papers in one year. Only a specialist could deal with such an output. But the fact that substances of the kind were intruding into therapeutics in such an overwhelming way made it desirable that the pharmacist should be aware of the essential facts relating to their origin, distribution and action, and should be fully acquainted with their chemical properties. For this reason he thought that the introduction of animal physiology into the courses of the college was timely. Biochemistry was fast acquiring methods that enabled it to follow the progress of the invisible molecular events occurring in the living tissues. It was progressing on lines that would enable it in the perhaps somewhat distant future to describe in detail the numerous chemical reactions proceeding in ordered sequence in every living tissue cell.

Speaking of the future of pharmaceutical progress, Sir Frederick Hopkins said that it was difficult for those who served the public to avoid supplying it with what it demanded. The public today, and not its humbler sections alone, was for the most part too ignorant to be protected from the influence of advertisements incessantly before its eyes, which proclaimed the supposed merits of a crowd of quack nostrums or expensive proprietary articles of little real value. Many pharmacists did their best to protect it from these and committees were in existence which were considering remedies for the evil. But the problem of combating it, whether by state action or otherwise, was extremely difficult. However, biologic science was gaining a footing in general education. It was beginning in the schools and was increasing its influence in the universities. The time was not far distant when even average members of the community would know much more about their bodies and their bodily functions than they knew today and would no longer display the faith that was born of ignorance.

A Criticism of Freud

In introducing a series of broadcast addresses on social problems from the point of view of a psychoanalyst Dr W R Inge, formerly dean of St Paul's, a man remarkable for the breadth and originality of his views, said that Freud seemed to him to give us psychology without a psyche and to pay too much attention to morbid states instead of investigating the healthy mind. Freud suffered himself from an obsession about sex and this was a misfortune, because there was a tendency to exaggerate enormously the place which sex played in a normal healthy life. Most people thought far more about their work and their play, about earning money and spending it, about their families and friends, than they did about sex. Lastly Freud was wrong in regarding religion as an illusion. His rival Jung was wiser, since he saw that religious faith was a cure in many neurotic cases. Man, who began as an ape afflicted with megalomania was now essentially a savage who fancied himself civilized. He called himself *Homo sapiens* a title which he had done little to earn. Modern man had an almost fatal shock. He looked within himself and found some

very ugly inmates—an earlier psychology would call them evil spirits. Freud taught us to find there only “whited sepulchers full of dead men’s bones and all uncleanness.” Had not saints known that always a psychoneurotic who could say from his heart “I believe in the Holy Spirit” would often get rid of his trouble really and not in imagination? All this evil heritage could be got rid of by the indwelling presence of the spirit of God.

Vitamin Deficiency and Anemia

In the recent extensive literature on the organic and inorganic food factors influencing the formation of hemoglobin, the part played by vitamins has been largely overlooked. At the Royal Infirmary, Edinburgh, D. Melville Dunlop and Harold Scarborough have shown the specific effect of cevitamic acid in the anemia of scurvy. That anemia occurs in scurvy is well known, but until recently it was regarded as due simply to the undernutrition and the hemorrhages, though increased blood destruction has been suggested as an additional factor. But Mettier, Minot and Townsend (*Scurvy in Adults*, *THE JOURNAL*, Oct 11, 1930, p 1089) found that a reticulocyte response could be induced in scorbutic anemia by administering orange juice and suggested that the anemia of scurvy was largely due to prolonged lack of vitamin C affecting the function of the bone marrow. More recently Mettier and Chew have produced evidence that the anemia of experimental scurvy in the guinea-pig is largely dependent on retardation of the maturation of erythrocytes in the bone marrow consequent on a vitamin C deficiency and that orange juice produces a reticulocyte response.

Dunlop and Scarborough studied two cases of scurvy in man (*Edinburgh M J* 42 476 [Sept] 1935). In one the patient was a man, aged 54, who had been unemployed for a long time and for one and one-half years before admission to a hospital had an income of only \$4 a week, of which he spent \$1.50 on his diet. This consisted of bread, margarine, treacle, corned beef or smoked sausage, cheese, and tea made with sugar and canned milk. In the one and one-half years he had never taken fresh vegetables, potatoes, fresh milk or fresh fruit. He felt in poor health and two months before admission noticed numbness in his legs and pains in his knees and calves. About this time his gums became swollen and bled easily. These symptoms progressed, and his legs became intensely painful on walking. Five days before admission he was so incapacitated that he had to go to bed. On admission there were subcutaneous hemorrhages in the lower limbs and pin point ecchymoses over the abdomen. He was given a diet exactly similar to what he had been taking. Its daily iron content was found to be only 10.2 mg, so that there was considerable iron deficiency. He was given orally 60 mg of cevitamic acid daily (equivalent to 3 ounces, or 90 cc, of orange juice) for seventeen days. In this period the red blood corpuscles increased from 2,050,000 to 4,226,000 and the hemoglobin from 45 to 77 per cent. After this he continued on the same deficient diet and no cevitamic acid was given, yet in eleven weeks the corpuscles increased to 5,600,000 and the hemoglobin to 100 per cent. Two days after he began taking the cevitamic acid the pain in the legs was better and three days still later the hemorrhages and other symptoms were receding. Within a fortnight he felt well. After he stopped taking the cevitamic acid the improvement continued for ten weeks. This case shows that cevitamic acid is capable of exerting its beneficial effects for long periods after its administration. The increase of the hemoglobin in spite of the iron-poor diet, is also noteworthy. Dunlop and Scarborough suggest that a deficiency of vitamin C in a diet may be a factor in producing anemia in working class populations even in the absence of symptoms of scurvy.

H W Dudley, Biologist

Harold Ward Dudley, Ph D, F.R.S., a distinguished biochemist, has died at the age of 47 after a short illness. Educated at Leeds University, he came under the influence of the late Prof J B Cohen and in 1910 took the degree of M.Sc. In the same year he was awarded a science research scholarship and worked in Emil Fischer’s laboratory in Berlin with Professor Traube on purine. He next became assistant in the Herter Laboratory, New York, where he came under the influence of H D Dakin. At this time physiologic chemistry was undergoing metamorphosis into biologic chemistry, to which he devoted his life. In collaboration with Dakin he did much original work, comprising the discovery of the enzyme glyoxalase and certain fundamental observations on the racemization of proteins. In 1914-1915 he was lecturer on biochemistry at Leeds University and on the outbreak of the war was attached to the Royal Army Medical College for special chemical work. In 1918 he was in charge of the antigas mission to the United States. After the war he became chief biochemist to the Medical Research Council. At the council’s laboratory he made contributions to biochemistry, including work on the chemistry of the pituitary secretions, insulin, spermine, acetylcholine, histamine and ergometrine. He was secretary of the Biochemical Society from 1922 to 1924 and joint editor of the *Biochemical Journal*. His premature death is a great loss to science.

PARIS

(From Our Regular Correspondent)

Sept. 30, 1935

Prophylaxis of Undulant Fever

At the July 9 meeting of the Academy of Medicine, attention was directed by Barbary of Nice to the necessity of close cooperation of the services of hygiene and veterinary medicine in order to prevent undulant fever. One should remember that, according to recent studies, many new views have been adopted on the two diseases grouped under the heading brucellosis, viz, Malta or undulant fever, due to *Micrococcus melitensis*, and the epizootic abortion of cattle due to the *Bacillus abortus* of Bang. It is essential to familiarize the farmer and cattle raiser, by talks and by pamphlets, with the possibility of contagion, not only through cow’s or goat’s milk (which can be sterilized by boiling) but also with the danger of infection from manure and insanitary conditions in stables and cow sheds. Villages should be subjected to thorough sanitary inspection such as proper sewage disposal, cleaner streets and stables, and fighting of insects, especially mosquitoes. Any one who has visited rural communities in European countries, especially in France, will appreciate the necessity of such sanitary reform measures.

Certain forms of tuberculosis, studied by Dr Mazet, can present a clinical picture resembling that of undulant fever.

In order to discover cases of brucellosis the intradermal reaction with the specific antigen represented by an emulsion of *Brucella abortus* should be used as a routine for cattle, sheep and goats in order to combat undulant fever. Experiments are now being carried out toward attaining a preventive vaccination in human beings.

The Abdominal Form of Migraine in Children

Migraine is seen clinically in young children oftener than in adults, disappearing as a rule at puberty. A history of similar attacks in the child’s family is of much diagnostic importance. The pain is referred to the left or right side of the forehead and in older children is accompanied by nausea and vomiting. In the *Bulletin medical* July 6, Debre and Broca directed attention to the fact that abdominal pain may dominate the clinical picture of the attack of migraine. The

pain is referred to the epigastrium and is accompanied by nausea or vomiting in most cases. The pain may, however, be diffuse, in the form of colics. In the absence of a history of migraine, the diagnosis is difficult. The painful attacks referred to the head may become less frequent, to become more and more abdominal. At times the abdominal form of migraine begins suddenly without a history of a preceding cephalic pain.

The attacks of both cephalic and abdominal migraine end as abruptly as they have begun. A rise of temperature should lead one to question the existence of an abdominal migraine. One must exclude the presence of a tuberculous meningitis, a tumor of the brain, a meningeal hemorrhage and a frontal sinusitis, in cases of the cephalic type of migraine. An appendicitis must be excluded by the less diffuse character of the pain, the absence of muscular rigidity, fever and rise in pulse rate in abdominal migraine. Cyclic vomiting with acetonemia in children presents as the chief symptom the uncontrollable emesis, which ceases suddenly. The authors have, however, observed cases of a combination of abdominal migraine and cyclic vomiting with acetonemia. In a family, an abdominal migraine was found in one child and cyclic vomiting in another. The frequency of migraine in children must be constantly borne in mind. The abdominal form may be mistaken for a condition requiring operative intervention.

Streets Named After Eminent Physicians

It is the custom in French cities to name streets after distinguished citizens. Recently this method of perpetuating the memory of men in the medical profession who have rendered noteworthy services to their fellow citizens has been applied to three streets in Paris, named respectively after Grancher, late professor of pediatrics, Dejerine, the successor of Charcot, and Emile Roux, the former director of the Institut Pasteur.

Bactericidal Action of Carbon Dioxide Gas

The question has arisen recently as to whether carbon dioxide gas can be employed to sterilize water to be used for drinking. To study the problem, Guillerd and Lieffrig allowed a current of carbon dioxide gas to pass through contaminated water for variable periods in order to observe its effects on the bacterial content. Their results were reported at the June 18 meeting of the Academy of Medicine. The rate of flow of the gas was controlled by a manometer. Contrary to certain claims of a bactericidal action of carbon dioxide gas on bacteria in water, the authors found that even when the water is saturated and the gas is allowed to act during a period from thirty minutes to an hour neither colon nor typhoid bacilli are killed.

Birth Rate Continues Downward in France

The excess of deaths over births in the first three months of 1935 has reached the figure of 33,456. During this period only 166,590 births were registered, 10,373 less than in the corresponding period of 1934 and 23,123 less than in the first quarter of 1932.

On the other hand, the number of deaths has increased to 200,046, or 10,802 more than in the first three months of 1934. Of these deaths in 1935, 13,989 were those of infants less than one year old. This is an increase of 398 in spite of the decreased number of births.

The excess of deaths over births during the first three months of 1934 was only 12,282, whereas in the same period of 1935 it is 33,456. This is the largest excess of deaths over births ever registered except during the course of wars or epidemics.

This rapid fall in the French natality figures is particularly disturbing when the increased number of births, 225,000 in 1934, is noted in Germany.

BERLIN

(From Our Regular Correspondent)

Aug 26, 1935

Gastro-Intestinal Disease and Infant Mortality

According to Professor Rott in the federal bureau of health, the deaths in Prussia (1926-1932) from diseases of the gastro-intestinal tract in children under 1 year of age were as shown in table 1.

Examination of the table reveals that the males show a higher mortality than the females. In both sexes, however, the mortality from diseases of the gastro intestinal tract is steadily

TABLE 1—Deaths from Diseases of Intestinal Tract

| Year | Males | | Females | |
|------|--------------|----------------------------|--------------|----------------------------|
| | No of Deaths | Per Thousand Living Births | No of Deaths | Per Thousand Living Births |
| 1926 | 6 326 | 16.3 | 4 613 | 12.6 |
| 1927 | 5 015 | 13.6 | 3 548 | 10.3 |
| 1928 | 4 963 | 13.3 | 3 580 | 10.2 |
| 1929 | 5 766 | 15.9 | 4 117 | 12.1 |
| 1930 | 4 118 | 11.6 | 2 891 | 8.6 |
| 1931 | 3 418 | 10.4 | 2 376 | 7.7 |
| 1932 | 3 067 | 9.9 | 2 299 | 7.9 |

regressing, a movement that began about 1905. The downward trend was interrupted during the excessively hot years 1911, 1914, 1917, 1921, 1923 and 1929. Whereas in 1905 about 550 children for each 10,000 living births were carried off by gastro-intestinal diseases, in recent years the number has been brought under 90 per 10,000 living births. In the mortality from gastro-intestinal diseases the well known summer peak has disappeared in various parts of Germany. Today one infant for

TABLE 2—Progressive Reduction in Mortality

| Year | Relative Mortality in Males | Relative Mortality in Females |
|------|-----------------------------|-------------------------------|
| 1903 | 100 | 100 |
| 1913 | 82.6% | 79.7% |
| 1918 | 40.3% | 37.3% |
| 1925 | 35.6% | 31.8% |
| 1930 | 23.6% | 20.1% |
| 1932 | 20.1% | 18.3% |

each 100 living births dies from a gastro-intestinal disease. If one places the mortality from gastro-intestinal diseases for the year 1903 (from which dates the beginning of consistent welfare aid for infants) at 100, table 2 shows the progress that has been made since that year.

Similar results are shown if the deaths from other nursing's disorders, such as eczema, furunculosis, inflammations of the cellular tissues, Barlow's disease, scurvy, rickets, anemias,

TABLE 3—Reduction in Mortality from Other Nursing's Disorders Such as Eczema and Furunculosis

| Year | Relative Mortality in Males | Relative Mortality in Females |
|------|-----------------------------|-------------------------------|
| 1903 | 100 | 100 |
| 1913 | 59.6% | 59.7% |
| 1918 | 58.9% | 56.8% |
| 1925 | 35.1% | 33.7% |
| 1930 | 20.9% | 19.8% |
| 1931 | 19.6% | 18.1% |

diseases of the ear, inflammations of the umbilicus, and, finally, infantile convulsions, are combined and the mortality for 1903 is, as before, placed at 100.

The slide in the downward movement occurred between 1903 and 1913. In this group of diseases also the mortality is today less than one fifth of that recorded for 1903. If the same comparison is applied to the general infant mortality, one gets figures shown in table 4.

Table 4 reveals that the reduction in the general infant mortality is far below that recorded in table 2 for the mortality from gastro-intestinal diseases and in table 3 for eczema, furunculosis, scurvy, rickets, ear disorders, anemias and the like. The general infant mortality today is about two fifths of the mortality for 1903, in spite of the 80 per cent reduction in mortality recorded for the two groups of diseases considered in tables 2 and 3. It is evident, therefore, that the mortality of the first year of life is no longer dominated by the mortality

TABLE 4—*Reduction in the General Infant Mortality Since 1903*

| Year | Relative Mortality in Males | Relative Mortality in Females | Relative Mortality Males and Females |
|------|-----------------------------------|-------------------------------------|---|
| 1903 | 100 | 100 | 100 |
| 1913 | 77 7% | 76 6% | 77 3% |
| 1918 | 78 2% | 76 9% | 77 6% |
| 1925 | 54 7% | 52 4% | 53 7% |
| 1930 | 44 7% | 42 0% | 43 5% |
| 1932 | 41 5% | 40 3% | 41 0% |

from diseases of the digestive tract but rather by the mortality from other diseases (constitutional weakness, influenzal disorders and the like), which were formerly pushed into the background, as it were, by the excessive mortality resulting from diseases of the gastro-intestinal tract.

Almost half of the deaths of infants are due today to constitutional weakness or lack of vitality, a seventh to influenzal disorders, including pneumonia, and about one fourth to diseases of the digestive tract and to other nurslings disorders such as eczema, furunculosis, scurvy and rickets. The deaths from diseases of the digestive tract now constitute only one ninth of the infant mortality in 1903 they amounted to one fourth. The situation, as compared with the first two decades of this century, has changed so that, in the nutritional problems of the infant, morbidity plays a more important part than mortality. In general, the combating of infant mortality, with the increasing elimination of the diseases controlled by environment, is shifting more and more in the direction of hereditary biology and constitutional history.

ITALY

(From Our Regular Correspondent)

Aug 31, 1935

The Crusade Against Tuberculosis

At a meeting of the National Federation for the Combating of Tuberculosis, Greppi spoke on purpura tuberculosa and generalized tuberculosis with episodes of purpura and with vascular signs of hemorrhagic diathesis. In benign purpura with a tuberculous substratum, clinical observations have shown the benefits derivable from splenectomy, as in the field of hemorrhagic syndromes, with a deficiency of blood platelets.

Zurria pointed out that osteo-articular tuberculosis is not following the descending curve that has characterized the pulmonary types for years. In view of the frequent coexistence of visceral lesions in patients with osteo-articular tuberculosis, especially in children, he emphasized the need of sanatoriums for the treatment of osteo-articular tuberculosis.

Fichera described the results of phrenic exeresis. The immediate results of this method have aroused enthusiasm, some authors believing that it may replace pneumothorax in the treatment of pulmonary tuberculosis. According to the author, phrenicectomy has a more limited value than was at first supposed. While it is an adjunct of collapse therapy it does not have a marked curative action. There is rarely a permanent cure. Often the good effects are of short duration. The cavities at the base of the lung are the lesions that derive the greatest benefit. The operation is not exempt from damage and complications.

Giuffrida spoke on the importance of the problem as to when pneumothorax should be interrupted. In exudative types, the treatment should not be extended over a long period. In the mixed types, and in the productive types, which heal by way of fibrosis, and in the types in which recurrences are frequent, it is necessary to continue the treatment longer.

Gualdi spoke on the spontaneous healing of early cavities and advanced three different explanations.

Randone made a contribution on the dissociation of the Koch bacillus, presenting and describing a strain of acid resistant and alcohol-resistant bacillus that he isolated in 1930 from the sputum of a tuberculous patient. The strain had as characteristics a yellowish pigmentation and a creamy consistency, which are characters of stability. The speaker thinks that it was a variety of Koch bacillus that possessed the combined characters of the variants S and Ch.

Zito, in studying patients with pulmonary tuberculosis during the application of collapse therapy, discovered that the uvula undergoes deviations from its median position. In hypotensive pneumothorax the uvula is turned toward the side of the pneumothorax, whereas the contrary is true if the pneumothorax is hypertensive. In bilateral pneumothorax the deviation is toward the side on which the lung is less expanded.

League of Mental Hygiene

The League of Hygiene and Mental Prophylaxis held its session in Bari. Professor D'Antona discussed the nature of psychiatric aid in the region of Apulia and Lucania. For about three million people there is a psychiatric hospital and an institute for mental defectives. A new hospital is about to be opened. Professor D'Antona proposed that neuropsychiatric dispensaries be established in all the principal centers, that a census be made of the mentally abnormal children in the elementary schools and in the prisons for minors, and that in the higher courses of instruction and in the schools for nurses a part of the instruction be reserved for neuropsychiatric aid, in order to train a suitable personnel for welfare aid work.

Protection for Mother and Child

During 1934 the Opera nazionale per la protezione della maternità e infanzia supplied aid through admission to various institutions, to 1,096,567 expectant and nursing mothers and children. In addition, 73,161 unmarried pregnant women and mothers, and abandoned and delinquent children, have received aid of a moral character, in observation centers and institutes for reeducation. The legal recognition of natural children has been effected and illegitimate unions have been legalized. The distribution of 8,654 marriage and birth premiums has been made, while 17,910 mothers have been given special premiums for giving children proper hygienic care. During the year 8,535 institutes needed for the carrying on of the work have been created, including obstetric and pediatric consultation centers, maternal refectories and milk stations.

Hospital Exhibits

In connection with the International Congress of Hospitals, an exposition of Italian hospitals and an exhibit of hospital equipment were organized. The army medical corps contributed a display of plaster casts and documents from some of its newer hospitals. Likewise, an exhibit was furnished by the institute of social insurance, to which are entrusted the functioning of compulsory insurance against tuberculosis and the construction and management of sanatoriums. Special exhibits were organized by the hospitals of Milan, Rome, Leghorn and Brescia. The Brescia Hospital is one of the largest and most modern hospital buildings in Italy, with a total of 1,450 beds. From a central octagonal court radiate eight separate buildings. In this hospital there is a distinct separation between the movements of persons on the ground floor and the transportation

of equipment and materials, which is effected through two distinct corridors on the floor below, the aseptic service (drugs, food supplies and linen) being confined to one corridor, and the septic service (truck loads, garments of patients, sweepings and refuse) to the other corridor. The services are organized in such an effective manner that in less than five minutes food from the kitchen or drugs from the pharmacy can be carried to any department. The practicable construction of the hospital is reflected also in the cost of erection, which does not exceed 14,000 lire (\$1120) per sick-bed, which may be regarded as a record in economy.

VIENNA

(From Our Regular Correspondent)

Sept. 8, 1935

Infant Mortality in Austria

A recently published report of the Austrian public health service reveals the beneficial effects on infant mortality resulting from the systematic aid given to infants and mothers. After the close of the World War, similar observations were reported from all countries affected, first an increase and later a rapid decline in the birth rate. In the republic of Austria 137,372 living births were recorded in 1920. The next year showed a 4 per cent increase, and the following year a 7 per cent increase, but then a distinct decline set in, which in twelve years amounted to more than 40 per cent (a drop from 150,800 in 1922 to 90,924 in 1934). In Austria no attempts on the part of the government were made to raise the birth rate by the granting of financial rewards. Instead, the decline of the population was combated by endeavoring to reduce the infant morbidity and mortality. This was accomplished by appointment of an "Executiv-Comité der Säuglings- und Kleinkinder-Fürsorge," and the aid of the ministry for social administration and of the local health bureaus. The 104 consultation centers for mothers were further developed and new centers were added, so that now there are 492 such centers. In addition, seventy-eight supplementary centers were established in rural districts, also thirteen consultation centers for pregnant women. A special scientific committee, with which the leading pediatricians, the heads of the local health boards, and the officials of the ministry and of the municipal bureaus cooperate, has worked out a system according to which in the centers, 515 physicians and 530 trained nurses give professional advice to the mothers of infants up to 1 year of age, all without charge. About 100,000 children were supervised last year, more than the total number of births for the year. The results are satisfactory. Whereas in 1920 the infant mortality was 157 per thousand living births the mortality rate has declined every year except one (1928)—more rapidly, in fact, than the birth rate. The infant mortality rate was 117 per thousand living births for 1925, 106 for 1930 and 91 for 1934, which is a reduction of 45 per cent. The absolute number of deaths among children under 1 year shows a corresponding decrease: 1920, 22,762 deaths, 1925, 15,895, 1930, 11,665, 1934, 8,821. It must not be forgotten, however, that the number of births has declined by 40 per cent. Nevertheless a comparison of the deaths in 1920 (22,762) with the deaths in 1934 (8,821) brings out the fact that the deaths of children under 1 year of age have declined by 63 per cent. Expenditures in the amount of 773,000 Austrian shillings (about \$150,000) were borne by the ministry of health and the next few years will doubtless bring still higher expenditures, because further development of the centers in the rural districts and more particularly in the mountain regions, is an urgent need. The cities, such as Vienna, are adequately provided for. A model institution, which has been studied by the governments of many different countries is the Reichsanstalt für Mutter- und Säuglingsfürsorge, another excellent institution is the Central-Kinderheim der Gemeinde Wien.

Rôle of the Stomach in Hematopoiesis in Anemic Persons

Some time ago, Professor Bence of Budapest, as a guest of the Society of Internal Medicine, delivered a lecture in Vienna on the rôle of the stomach in hematopoiesis, of which the following is a digest. By the single injection of large doses of active liver extract (20 cc.) a remission of several months is regularly effected. This is a sure test of the potency of a liver extract. Bence removed the stomach of hogs and after a few months tested their livers as to the antianemic potency, which was found to be lost. In the gastrectomized animals there developed, from five to six months after the operation, a microcytic anemia such as is occasionally observed also in man following gastrectomy. From nine to twelve months after removal of the stomach, the experimental animals developed a hypochromic blood picture, with reduced diameter of the erythrocytes (3.8 microns). Two animals that were not killed to determine the antianemic potency of their livers, as were the others, survived the operation by seventeen and twenty-one months, respectively. Both these animals presented, during the last months of their existence, a transformation of their microcytic, hypochromic blood picture into a macrocytic anemia with increased color index and diameter of the erythrocytes up to 8.8 microns, at the same time there was a reduction in the leukocyte count and the thrombocytes amounting to from 40 to 50 per cent, together with increase of the bilirubin in the blood serum. At necropsy the spleen and liver were found to be of normal size, and no hemosiderosis, in contrast with the observations on pernicious anemia in man. In all long bones there were found large quantities of active red bone marrow, in which the formation not only of red but also of white blood corpuscles was increased to embryonic proportions. There were also a few megaloblasts. Bence believes that also in man pernicious anemia presents in the beginning stages a microcytic, hypochromic alteration of the blood picture, but it is not open to medical observation.

The liver of the gastrectomized animals (hogs) shows a progressive reduction of its copper content down to a few slight traces while examination of commercial liver preparations discloses that their potency increases in direct proportion to their copper content. In human blood the normal copper level is 0.94 mg per hundred cubic centimeters. During pregnancy it may be increased to 1.94 mg, probably because considerable quantities of copper must be directed to the embryonic liver. In pernicious anemia one observes also an increase of the copper level up to 1.42 mg, also secondary anemia shows such a behavior. On the other hand, in syphilitic anemia and anemia associated with carcinoma, which show no increase in blood formation, low values ranging around 0.5 to 0.7 mg per hundred cubic centimeters are found. Professor Bence holds therefore, to the conception that to the stomach may be assigned a dominant qualitative and to copper metabolism more of a quantitative rôle in hematopoiesis.

The Vienna Emergency Relief Society

The Wiener freiwillige Rettungsgesellschaft, which may be solicited in the event of any accident on the street or in the homes has rendered aid in 15,000 accidents. There were 26,685 patients involved, who were given aid without consideration as to social station, nationality or religious affiliation, all without charge. The recently published report announces an increase in the number of suicides: 339 men, 282 women, two children under 14 years of age. In addition there were 680 men and 872 women who failed in their attempt. Most of the suicides used illuminating gas next came poisoning then hanging, then firearms. The most suicides occurred in April, the next largest number in March and the fewest in September. In factories and machine shops, September is the most dangerous month for accidents, July coming second. The highest figure for accidents

in general was reached in 1934 in July (2,675 accidents in Vienna), next came September with 2,531 accidents, while the fewest occurred in January (1,181). Another task of the Rettungsgesellschaft is to transport to a hospital or to the police station intoxicated persons found injured on the street. In this section wine is the most common alcoholic beverage. August appears to be the most dangerous month for the wine drinkers (seventy-four cases), while Christmas celebrations make December a close second (sixty-three cases). The number of accidents among men is nearly twice as great as among women, likewise in street accidents the proportion remains about the same (630 men, 390 women). Eighty-seven men and seventy women had to be brought to the psychiatric clinic. Of the victims of automobile accidents 1,233 were men and 402 were women (3:1), in railway accidents forty-six men and five women were involved, in street railway accidents, 234 men, 134 women and 22 children. Of the 531 bicyclists suffering accidents 348 were men, 136 women and 47 children (under 14 years).

Professor Dr Anton Eiselsberg

Prof Anton von Eiselsberg, Austria's most eminent surgeon, has celebrated his seventy-fifth birthday and is still in full possession of his mental and physical vigor. When in 1884 he took his doctor's degree in Vienna he had pursued his medical studies in many of the leading universities of Europe. He was Billroth's favorite pupil and became his assistant in 1887. Two years later he became privatdozent, and at the age of 33 he was called to Utrecht and then to Königsberg. In 1901 he accepted a similar position in Vienna, where he did pioneer work for thirty years as physician, instructor, investigator and surgeon. His researches on erysipelas, sepsis, anthrax and tetanus were milestones in the history of surgery. Surgery of the thyroid and of the parathyroids owes its first development to Eiselsberg. He devoted himself particularly to the problem of cancer, and he transplanted the first sarcoma to the rat. His surgical interventions on the cranium made his name known in all countries. At his clinic, of which the emergency station is an important part, the cardiac suture and blood transfusion were perfected in their technique. The railway emergency service owes its existence chiefly to him. He has been an earnest opponent of the abuse of alcoholic beverages and against the antivivisectionists. Eiselsberg founded in Vienna what is virtually a "school" of surgery. His pupils may be found in many of the surgical clinics and hospitals of central Europe. He is doctor honoris causa of many universities, he is the possessor of the Lister gold medal (a high distinction in England) and has been the recipient of countless honors and has held innumerable positions of honor. Evidence of his modesty and retiring disposition may be derived from the fact that he refused to accept the holding of any ceremonies in honor of his seventy-fifth birthday and spent the day in quiet. But all his many admirers express the ardent wish *ad multos annos!*

Increase in Physicians in Vienna

The municipal bureau of health, which exercises supervision over the medical personnel of Vienna, reports that the number of physicians is still on the increase. At the end of 1930 there were 4,651 physicians in Vienna, 475 of whom were women. At the end of 1934 there were 4,732 physicians, 500 of whom were women. The dentists show a similar increase, there having been in 1930 1,726 physician-dentists (*zahnärzte*) and "dentists" (*zahntechniker*) combined, while in 1934 the number had increased to 1,823. There is thus one physician to every 380 inhabitants, and one physician dentist or "dentist" to every thousand inhabitants. It should be noted, however, that of the 4,732 registered physicians about 900 are hospital physicians who have no private practice and who, after completion of their hospital service, will likely settle in the provinces, outside of Vienna.

Marriages

HARRIS HILLMAN PALMER, Orangeburg, N. Y., to Miss Jessie Speirs Travis of Monsey in Spring Valley, June 29.

CLARENCE HOGUE INGRAM JR., Pittsburgh, to Miss Mary Katherine Evans of New Rochelle, N. Y., July 10.

JAMES REY SHOLL, St. Petersburg, Fla., to Mrs. Betty Belcher of Charleston, W. Va., in Chicago, June 2.

HENRY HARRIS DREWRY to Dr. Virginia MacDonald Moore, both of New York, in Elizabeth, N. J., September 4.

WALLACE TREZER SMITH, East Rockaway, N. Y., to Miss Marian M. Walbancke of Richmond Hill, July 21.

WILLIAM FREEMAN to Miss Gertrude Leah Le Clair, both of Worcester, Mass., in New York, October 11.

JOHN WALTER HOUK, Akron, Ohio, to Miss Mary Hammond O'Brien of New Haven, Conn., July 27.

WILLIAM G. HAMM, Atlanta, Ga., to Mrs. Katharine Cathcart Moore of Charleston, S. C., August 28.

WILLIAM O. WUESTER JR., New York, to Miss Janet Evelyn Hampsh in Pompton Lakes, N. J., July 20.

SHERMER HAINES STRADLEY to Miss Margaret Elizabeth Spencer, both of Wilmington, Del., July 1.

WILLIAM M. NETHERY, Lovelock, Nev., to Miss Jessie Mae Elmore of Shreveport, La., September 22.

KENNETH G. KOHLSTAEDT, Indianapolis, to Miss La Verne Freeman of Bloomington, Ind., July 14.

OTIS GARDNER KING, Bluefield, W. Va., to Miss Mayble Isobel Lawrence of Ashland, October 8.

JAMES EDWIN THOMPSON to Miss Ethel Bartlett, both of New York, in Litchfield, Conn., July 6.

EDWIN KENNEDY PROVOST, Nashville, Tenn., to Miss Edith Morgan Cassidy of Cincinnati in June.

PHILIP B. GREENE, Spokane, Wash., to Miss Marjorie Wilcoxson in Springfield, Ill., August 17.

RAY L. RHYMES JR. to Miss Bessie Budhill, both of Houston, Texas, in Shreveport, La., July 1.

WADE BISHOP ELLIS, Buffalo, to Miss Catherine Mowat of Long Island City, N. Y., October 10.

HORACE H. HOLT, Nashville, Tenn., to Miss Elizabeth Abbie Seale of Greenshaw, Miss., July 18.

ALVA A. JACKSON, Florence, Ala., to Mrs. Marguerite Smith in Nashville, Tenn., July 25.

MICHAEL WILLIAM HOLEHAN to Miss Elizabeth Weathersby, both of Memphis, Tenn., July 20.

WILLIAM T. SALTER, Boston, to Miss Eleanor Vallandigham of Chestnut Hill, Mass., June 27.

FRANCIS SAMUEL DIXON to Miss Virginia Waldo Butler, both of Natchez, Miss., September 14.

JAMES WYATTE TARRANT JR., Philadelphia, to Miss Marguerite Sinquefeld, October 15.

JOHN YOUNG O'DANIEL, Erwin, Tenn., to Miss Betty Matthews of Dayton, October 12.

SHELDON C. BAJEMA, Wallace, Idaho, to Miss Lois Horton of Bonners Ferry, August 21.

PETER E. SABATELLE to Miss Vivian Cowart, both of Brooklyn, in Atlanta, Ga., June 18.

WILLIAM B. SWIGERT, Denver, to Miss Ruth E. Anderson of Ogallala, Neb., July 12.

CLIFFORD A. LUTGEN, Auburn, Neb., to Miss Edna Hanke of Nebraska City, July 10.

REUBEN A. MACBRAYER to Miss Myrtle Florence Fox, both of Brooklyn, October 5.

LORENZ TEER, Delhi, La., to Miss Madeline Haughton in Haynesville, June 16.

JOHN C. RIGGINS, Tucson, Ariz., to Miss Rachel Thompson in Bisbee, June 28.

ALLYN KING FOSTER JR., Brooklyn, to Miss Elsa Margareta Nilsson, October 4.

JOHN A. RIEBEL II to Miss Gayle Stevens, both of Hamilton, Ohio, June 30.

KARL M. BECK to Miss Fannie Manley, both of Waukegan, Ill., September 20.

GILBERT E. SCHOENFELD to Miss Fern Niman, both of Detroit, June 2.

BARRETT L. TAUSSIG, St. Louis, to Miss Margaret Humphreys in June.

Deaths

Joseph Colt Bloodgood ♂ adjunct professor of surgery, Johns Hopkins University School of Medicine, Baltimore, and head of the laboratory of surgical pathology, died suddenly, October 22, in Baltimore, of coronary thrombosis. Dr. Bloodgood was born in Milwaukee, Nov. 1, 1867. He received the degree of bachelor of science from the University of Wisconsin in 1888, and that of doctor of medicine from the University of Pennsylvania Department of Medicine, Philadelphia, 1891. The following year he served as assistant resident surgeon to the Johns Hopkins Hospital and then went abroad to study. On returning from Europe in 1893 he became resident surgeon at the Johns Hopkins Hospital. At various times he was assistant instructor, associate in surgery and associate professor of clinical surgery and clinical professor of surgery at Johns Hopkins University School of Medicine. He was one of the founders and a member of the board of directors of the American Society for the Control of Cancer, a member of the American Surgical Association, the Southern Surgical Association, the Society of Clinical Surgery, the American Association for Cancer Research, the American Public Health Association and the Deutsche Gesellschaft für Chirurgie, and a fellow of the American College of Surgeons. He was a member of the Radiological Society of North America which in 1929 awarded him a gold medal for his study of malignant conditions of bone and their diagnosis and treatment by means of x-rays and radium. When the United States entered the World War in 1917 he was commissioned a major in the medical reserve corps of the U. S. Army, he was made a member of the medical section of the National Council of Defense and also of the national medical commission of the American Red Cross. Dr. Bloodgood was assistant visiting surgeon to the medical staff of the Johns Hopkins Hospital and Dispensary and chief surgeon to St. Agnes' Hospital, and was on the editorial board of the *American Journal of Cancer*. He contributed to the periodical medical literature and traveled widely to address public and professional audiences, chiefly on the subject of the early diagnosis and the prevention of cancer.



Acme
JOSEPH COLT BLOODGOOD, M.D.
1867-1935

Mortimer Williams Raynor ♂ White Plains, N. Y., Syracuse University College of Medicine, 1904, professor of clinical psychiatry, Cornell University Medical College, New York, formerly assistant professor of psychiatry and clinical professor of psychiatry, Columbia University College of Physicians and Surgeons, member of the American Psychiatric Association and the Association for Research in Nervous and Mental Diseases, past president of the Medical Society of the County of Westchester, the New York Psychiatric Society and the New York Society of Clinical Psychiatry, served during the World War at one time psychiatrist of the Department of Correction, stationed at Welfare Island, chairman of the executive committee of the Mental Hygiene Committee of the State Charities Aid Association, assistant physician to the Hudson River State Hospital Poughkeepsie 1907-1917, director of clinical psychiatry, Manhattan State Hospital, New York, 1917-1923 and assistant physician 1923-1924, consultant psychiatrist and neurologist, St. Francis Hospital Poughkeepsie, 1915-1917, adjunct associate consultant to the Children's Hospital, New York, 1920-1924, visiting neurologist to the Letchworth Village, Tithells, N. Y., 1923-1924, medical superintendent of the Kings Park (N. Y.) State Hospital, 1924-1926, member of the board of visitors of the New York State Reformatory for Women Bedford 1929-1930, on the staffs of

the Grasslands Hospital, Valhalla, N. Y., and the New York Hospital, medical director of the Bloomingdale Hospital, aged 56, died, October 5.

Frederick Petheram Wilbur ♂ Franklin, N. J., Johns Hopkins University School of Medicine, Baltimore, 1906, executive secretary of the Sussex County Medical Society, formerly member of the board of education and president of the board of health of Franklin, a member of the medical staff of the Alexander Linn Hospital, Sussex, the Newton (N. J.) Hospital and the Franklin Hospital, aged 55, died suddenly, September 8, of angina pectoris.

William W. Jackson, Jonesboro, Ark., Memphis (Tenn.) Hospital Medical College, 1896, member of the Arkansas Medical Society, past president of the Craighead-Ponsett Counties Medical Society, formerly president of the city board of health and member of the state board of health, on the staff of St. Bernard's Hospital, aged 72, died, September 7, of nephritis and myocarditis.

William D. Porter ♂ Cincinnati, Medical College of Ohio, Cincinnati 1887, professor emeritus of clinical obstetrics, University of Cincinnati College of Medicine, past president of the Cincinnati Academy of Medicine, at various times on the staffs of the Bethesda Hospital, Cincinnati General Hospital and the Jewish Hospital, aged 74, died, September 27, of heart disease.

John Bryant ♂ Brookline, Mass., Harvard University Medical School, Boston 1907, member of the New England Pediatric Society, member and past president and secretary of the American Gastro-Enterological Association, served during the World War, aged 54, died, September 19, of cerebral hemorrhage.

Will Lyman Griffin, Shelby, Mich., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1888, member of the Michigan State Medical Society, past president of the Oceana County Medical Society, on the staff of the Shelby Community Hospital, aged 76, died, September 5.

William Shelton Osborn, Osage, Iowa, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois 1904, member of the Iowa State Medical Society, veteran of the Spanish-American War, aged 58, died, September 3, in a hospital at Rochester, Minn., of embolism.

Wilfred G. Riopelle ♂ Beaver Dam, Wis., Marquette University School of Medicine, Milwaukee, 1915, past president of the Dodge County Medical Society, aged 46, died, September 9, in St. Joseph's Hospital, Milwaukee, of heart disease.

Theodore Elmer Jeffery, St. Augustine, Fla., Arkansas Industrial University Medical Department, Little Rock, 1898, member of the Arkansas Medical Society, served during the World War, aged 62, died, September 5, of cerebral hemorrhage.

Thomas William Wilson, New Harmony, Ind., Miami Medical College, Cincinnati, 1887, member of the Indiana State Medical Association, health officer of New Harmony, aged 74, died, September 1, of coronary sclerosis and angina pectoris.

Van Buren Dudley Viets, Youngstown, Ohio, Eclectic Medical Institute, Cincinnati, 1895, member of the Ohio State Medical Association, aged 64, died, August 22, in the North Side Unit of the Youngstown Hospital, of cerebral hemorrhage.

Van Noyes Verplanck, New York, Johns Hopkins University School of Medicine, Baltimore, 1918, member of the Medical Society of the State of New York, aged 44, died, September 11, of gastritis due to cyanide poisoning.

John Morgan Hackley, Miami, Fla., University of Louisville (Ky.) Medical Department, 1891, served during the World War, aged 69, died, September 2, in the Veterans Administration Facility, Augusta, Ga., of bronchopneumonia.

James Vincent Nigrelli, Wakefield, R. I., Tufts College Medical School, Boston, 1932, served during the World War, aged 36, on the staff of the South County Hospital where he died, August 10, of an infection of the throat.

Isidor Topkins, Calton, N. J., Long Island College Hospital, Brooklyn 1899, past president of the Hunterdon County Medical Society, aged 64, died, September 2, at Newark, of coronary sclerosis and pulmonary infarction.

Albert Pfeiffer ♂ Albany, N. Y., L.R.C.P., London and M.R.C.S. England, 1911, served during the World War, director of social hygiene, New York State Department of Health, aged 53, died, September 24.

John C. White, Atlanta, Ga., Southern Medical College, Atlanta, 1889, member of the Medical Association of Georgia, formerly member of the state legislature, aged 76, died September 7, of heart disease.

John H Daugherty, Glendale, Calif., Central College of Physicians and Surgeons, Indianapolis, 1881, aged 76, died, July 12, in the Glendale Sanitarium, of acute suppurative appendicitis and peritonitis

John Arthur True ☉ Spokane, Wash., University of Michigan Homeopathic Medical School, Ann Arbor, 1912, served during the World War, aged 47, died, July 26, in the Deaconess Hospital, of brain tumor

Frank Stage Rarey, Columbus, Ohio, Starling Medical College, Columbus, 1892, member of the Ohio State Medical Association, aged 80, died, September 7, in the Mount Carmel Hospital, of uremia

Thomas Allen Lamb, Alexandria, Va., College of Physicians and Surgeons, Baltimore, 1915, member of the West Virginia State Medical Association, aged 47, died, August 30, in Port Republic

Louis Douglas Stoner, Sophia, W. Va. University and Bellevue Hospital Medical College, 1927 member of the West Virginia State Medical Association, aged 33, died, August 14, of pneumonia

Eugene P Nolan, Chicago, Bennett Medical College, Chicago, 1915 on the staff of St Mary of Nazareth Hospital, aged 54, died, August 16, of arteriosclerosis and coronary thrombosis

Richard Alonzo Napier, Union City, Tenn., University of Nashville Medical Department, 1900, aged 62, died, September 7, in St Thomas Hospital, Nashville, of cardiorenal disease

Lewis Henry Campbell, Bradford, Ont., Canada, M. B., University of Toronto Faculty of Medicine, 1892, Victoria University Medical Department, Coburg, 1892, died, August 19

Clifford Sutherland Losey, Long Beach, Calif., Rush Medical College, Chicago, 1897, aged 60, died, August 11, in the Seaside Hospital, of cerebral thrombosis and arteriosclerosis

Josiah Peet Bixby, Woburn, Mass., Medical School of Maine, Portland 1876, member of the Massachusetts Medical Society, aged 80, died, September 1, of cerebral hemorrhage

Bernard Berens, Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1880, aged 77, died, September 12, of thrombosis of veins of the leg

Robert Thomas Saville, Mineville, N. Y., University of the City of New York Medical Department, 1881, aged 85, died, August 4, of carcinoma of the prostate.

Philip August Bill ☉ San Francisco, University of California Medical Department, 1902, aged 54, died, August 27, of coronary thrombosis and angina pectoris

Joseph Stephen Thorne, North Evans, N. Y., University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1896, died, August 11, of pulmonary tuberculosis

Basile Ivanovich Studensky ☉ New York, State University of Kazan Faculty of Medicine, Russia, 1911, aged 49, died, September 8, of coronary thrombosis

Mary K Baker, New York, University of Minnesota College of Medicine and Surgery, Minneapolis, 1900, aged 68, died, September 15, of multiple sclerosis

Charles Angelo Briggs, Pasadena, Calif., Long Island College Hospital, Brooklyn, 1876, aged 84, died, August 25, of chronic myocarditis, following influenza

Charles Otmer Staats, Spencer, W. Va., University of Louisville (Ky.) Medical Department, 1893, served during the World War, aged 68, died, August 25

LaFayette McClontock Hunter, Little Rock, Ark., Eclectic Medical University, Kansas City, Mo., 1913, aged 47, died, September 3, of angina pectoris

Theodore Tsangaris, Tarpon Springs, Fla., National University of Athens School of Medicine, Greece, 1913, aged 44, died, September 1, of carcinoma

Lucy C Harrison Atherton, Grand Rapids, Mich., Woman's Medical College, Chicago, 1890, aged 79, died, July 16, of pulmonary tuberculosis

James B McEnaney, Larchwood, Iowa, College of Physicians and Surgeons, Keokuk, 1878, aged 80, died, July 4, of myocarditis and nephritis

Russell C Harris, Bethpage, Tenn., University of Louisville (Ky.) Medical Department, 1876, formerly county judge, aged 82, died, August 27

Charles Irwin Taylor, Detroit, Detroit College of Medicine, 1896, aged 71, died, August 10, of uremia and hypertrophy of the prostate

Bureau of Investigation

ORTHOPEDIC FOOTWEAR, INC

A Warning to Physicians

A physician in Mississippi was called on July 30 by one Wilbert Briggs, who showed credentials to the effect that he represented "Orthopedic Footwear, Inc.," 410 Woolworth Building, Providence, R. I. The physician gave Briggs an order for a pair of shoes for his little girl and a so-called Cushion Arch Lift for his wife. The list price of the shoes was given as \$9.50 and of the Arch Lift as \$3.50, but Briggs stated that a special price was made to physicians of \$6.50 and \$2, respectively. Briggs was paid the full amount (\$8.50) and gave a receipt for both the shoes and for the Arch Lift on a duplicate order-blank, on each of which was written "Paid in full." However, printed on the same receipt order-blank was the statement "Pay only amount of deposit to salesman. Pay the balance to the postman."

On August 9, ten days after the order was given, the physician wrote to Orthopedic Footwear, Inc., asking that the order given representative Briggs for a pair of black shoes be changed to white. Orthopedic Footwear, Inc., did not answer the letter until nearly two weeks later—August 22—at which time they

SALESMAN NOT AUTHORIZED TO ALTER PRINTED TERMS ON THIS ORDER

FAMOUS CUSHION ARCH LIFT SHOE

NEW PRICES

| | | |
|-------|---|--------|
| BLACK | — | \$9.50 |
| BROWN | — | 9.50 |
| WHITE | — | 9.50 |

Every Step A Foot Massage

ORTHOPEDICS INCORPORATED 410 WOOLWORTH BLDG. PROVIDENCE, R. I. 1935

NOTICE TO CUSTOMERS—The price on designated below. A deposit is specified on this order is required when the order is taken. Pay Only Amount of Deposit to Salesman. PAY THE BALANCE TO THE POSTMAN. Goods will be delivered via Parcel Post C. O. D.

Name _____

Street _____

City _____ State _____

TO BE DELIVERED SOON AS POSSIBLE Mark Cross Under Size of Shoe Worn

| | | | | | | | | | | | | | | | |
|-------------------|-------|---|-------|---|-------|---|-------|---|-------|----|--------|----|--------|---------|----------|
| Men's [Shoe] Size | width | 6 | 6 1/4 | 7 | 7 1/4 | 8 | 8 1/4 | 9 | 9 1/4 | 10 | 10 1/2 | 11 | Price | Deposit | C. O. D. |
| | | | | | | | | | | | | | \$9.50 | 3.00 | 6.50 |

Customer's Wt. light _____ Lbs. _____

| | | | | | | | | | | | | | | | |
|------------------------|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|--------|---------|----------|
| Children's [Shoe] Size | width | 3 | 3 1/2 | 4 | 4 1/2 | 5 | 5 1/2 | 6 | 6 1/2 | 7 | 7 1/2 | 8 | Price | Deposit | C. O. D. |
| | | | | | | | | | | | | | \$9.50 | 3.00 | 6.50 |

THIS IS YOUR RECEIPT FOR THE DEPOSIT

Salesman's Name _____ Address 410 Woolworth Bldg.

ABOVE COMPLETED AGREEMENT OF PARTIES. NO OTHER STATEMENTS BINDING

TOTAL DEPOSIT PAID _____ BALANCE C. O. D. _____ PLUS POSTAGE _____

Reproduction (reduced) of the order slip used by Orthopedic Footwear Inc. earlier known as Orthopedics Inc. and still earlier known as Wilbert Briggs Inc. The order slip reproduced is a specimen copy sent to the Bureau of Investigation by the company and has been marked by the company to call attention to the fact that the doctor who paid the agent the full price should not have done so. On the duplicate order slip that was left with the doctor agent Wilbert Briggs had written "Paid in full."

stated that they had no record of having received the doctor's orders, and asked him to send them the receipts that he had received and at the same time let them know the exact amount of cash which he had paid to Briggs. The physician sent the receipts as requested and stated the amount that he had paid Briggs. In the same letter he mentioned the fact that several other citizens of his town had paid Briggs amounts varying from about \$2 to \$20 and none had either heard anything regarding their orders nor received any merchandise.

This letter accompanying the receipts was sent on August 26. After waiting another three weeks—until September 14—and getting no acknowledgment from Orthopedic Footwear, Inc., the physician again wrote them, reminding them that he had received no reply. He let them know, also, that he had had photostatic copies of the receipts made before he parted with them and he stated, further, that unless some satisfactory adjustment was made he would take the matter up with the American Medical Association so that other members of the profession could be protected. This letter brought a fairly prompt reply from Orthopedic Footwear, Inc., returning the receipts and calling attention to the statement printed on the receipts

which read "Salesman not authorized to alter printed terms on this order" They also called attention to the further statement at the bottom of the receipt reading "Above completes agreement of parties No other statements binding" Orthopedic Footwear, Inc., emphasized, what has already been mentioned, that the blanks specifically state that persons placing orders should pay only the amount of deposit to the salesman, the balance being paid the mailman The company also stated that they had "written Mr Briggs very strongly," but that they doubted if their letters would reach him, as they had not heard from him for some time and that, in fact, two of their letters had already been returned unclaimed!

The only adjustment that the concern offered read as follows

"Now covering the order for Arch Lifts for Mrs ———, we are willing to mail the Arch Lifts to her C O D balance of \$1 50 plus postage In the case of the little girl, we want to say that the price of the shoes is \$9 50 plus postage consequently, there is a balance due of \$3 00 on same We are willing to mail the pair of shoes C O D \$6 50 plus postage (we must receive at least \$6 50 for each pair shoes mailed from here) The amount of \$3 50 which you will have overpaid on this order will be refunded to you as soon as the order and money have been received from Mr Briggs"

A letter was written by the Bureau of Investigation to Orthopedic Footwear, Inc., referring to the physician's experience and the concern was asked in effect what it intended doing In reply the company disclaimed any moral responsibility and reiterated that the physician was in error in paying agent Briggs in full The letter closed on this note

"We are trying in every way possible to straighten these matters out, and it is our intention to mail the goods to the people as soon as we are paid for them by Mr Briggs" [Italics ours—Ed]

In other words, it seemed to be a case of "Heads I win, tails you lose."

Investigation indicates that "Orthopedic Footwear, Inc." is a Delaware corporation, incorporated Feb 25 1935 It is a later name for what was previously known as "Orthopedics, Inc.," another Delaware corporation incorporated in May 1928 This in turn, was a later name for what used to be called "Orthopedic Shoe, Inc." The president of the company seems to be one Arnold C Messler, while the secretary-treasurer is his wife, M C Messler It is reported that A C Messler had previously been in the jewelry business both in Pawtucket and in Providence, but that the concern went into involuntary bankruptcy The present business is said to consist in retailing shoes through agents and on the mail-order plan from Room 410 in the Woolworth Building, Providence, R I The visible resources of Orthopedic Footwear, Inc., seem to be extremely limited

It is of further interest in this connection to note that the Better Business Bureau of Providence, R I, in its bulletin for May 1935 published an item reading as follows

"Orthopedics, Inc., Woolworth Bldg, Providence, a retailer of shoes selling direct to consumers through agents located in various parts of the country, has been the subject of numerous complaints from people who alleged that shoes for which deposits or full amounts had been paid were not forthcoming from the concern and that in instances where shoes were delivered wrong sizes were received and returned and that no shoes of the proper size or a refund of money had been made Complaints received against the firm have been referred to government authorities Orthopedics Inc is recorded as operated by Arnold Messler M C Messler and M C Littlefield

The physician's experience with Orthopedic Footwear Inc. again emphasizes the risk that is run in paying money to unknown agents of equally unknown concerns If it seems desirable to do business with concerns about which the physician knows nothing, the suggestion should be made that the money be placed in escrow with a local bank, on the understanding that it will be paid over to the mercantile concern when the doctor has had the opportunity of determining whether the merchandise ordered comes up to the claims made for it

Correspondence

HYPERGLYCEMIA AND ARTERIOSCLEROSIS

To the Editor—In a communication from Dr Eli Moschcowitz with the title "Hyperglycemia" (THE JOURNAL, September 28 p 1057) is a criticism of the general opinion that diabetes is a contributing factor in the causation of arteriosclerosis Dr Moschcowitz not only disagrees with that opinion but accuses many writers of confusing arteriosclerosis with the lipid imbibition of the aorta found among other conditions in advanced diabetes and in experimental atherosclerosis in rabbits In suggesting that the arterial lesions found in advanced diabetes are not arteriosclerotic, he attacks the bases on which our knowledge of arterial disease has been constructed and adopts a thesis which no observations published by him or others will adequately support Moreover, he accuses me of calling this lesion 'atherosclerosis' in quotes, as though I had coined a new name for a condition something other than arteriosclerosis It is unnecessary perhaps to restate that the term atherosclerosis is Marchand's (*Verhandl Kong f inn Med Leipzig* 21 23, 1904), that it applies to the important form of arteriosclerosis and that its usage has been accepted universally, even by the opponents of the cholesterol theory of the causation of arteriosclerosis

The positive evidence that disturbances of the cholesterol metabolism are the cause of atherosclerosis can be concisely stated as follows Cholesterol would fulfil all requirements as the etiologic agent if it were a question of a bacterial disease Its constant presence in the lesions of the disease, its isolation from these lesions the reproduction of the lesions in rabbits fed the substance in purity, its constant presence in the lesions of the experimental disease and the failure to reproduce the lesions with any other agent would satisfy the demands for specificity It has been claimed by critics that the rabbit is not a proper animal for atherosclerotic research, since it does not suffer from atherosclerosis naturally This form of reasoning would exclude Banting's experiments on dogs, which gave us insulin, and invalidate most of the animal experimental work with reference to infectious processes It is claimed that the experimental lesions in the rabbit do not always exactly correspond to human lesions To stress the differences and ignore the similarities between the pathology of natural and experimental diseases would be to cast doubt on much of the experimental work on infectious diseases Too meticulous requirements for identity of natural and experimental lesions would be difficult to satisfy in diphtheria bacillary dysentery, cholera, meningococcal meningitis, typhoid and syphilis for example among others There are some differences between the rabbit and human lesions of atherosclerosis The rabbit differs from man anatomically, functionally and posturally The differences in the lesions are for the most part marked by the excessive character of the experimental processes that are rapidly produced by excessive dosage of the substance The closeness of the reproduction of the human lesions in general cannot be denied

I have been able to show that the lesions of human aortic atherosclerosis owe their variety to the relative ability of the cells in these lesions to metabolize cholesterol In youth the power to metabolize cholesterol within phagocytic cells is great and minimal permanent lesions result In the middle period of life this metabolism is slowed and scarring results In old age this metabolism ceases and so-called atheromatous 'abscesses' are the standard lesion (Lear, Timothy Atherosclerosis, the Important Form of Arteriosclerosis, a Metabolic Disease, THE JOURNAL, August 17 p 475)

Finally in no other condition has there been so widespread human experimentation in pathogenesis as was carried out in the feeding of high fat diabetic diets, rich in cholesterol, in the

decade 1920-1930 The results were just as definite as those obtained in the experimental rabbit The relative dosage of cholesterol was smaller than the standard experimental dose in rabbits, and the results were more slowly produced The human lesions, while not as spectacular as the more rapidly produced rabbit lesions, were spectacular enough, particularly in children Moreover, the reverse procedure, i e., the cutting down of the fats in the diet, including cholesterol, resulted in a return to the status quo ante experimentum—absence of xanthomas and of leg artery lesions demonstrable by roentgen examination in children, together with a return to the normal incidence of atherosclerosis

Dr Moschcowitz believes that stresses are the causes of arteriosclerosis It is recognized that stresses are responsible for the selective localization and degree of the lesions Other factors, including particularly aberrations in the function of the thyroid gland, play an important part, but basically atherosclerosis is dependent for its causation on disturbances in the cholesterol metabolism

TIMOTHY LEARY, M.D., Boston

To the Editor—While a letter is too brief a vehicle for the discussion of so disputed a point as the etiology of arteriosclerosis, some statements in the communication of Dr Eli Moschcowitz regarding diabetes and arteriosclerosis call for a reply Few would subscribe to the belief that diabetes mellitus alone is a cause of arteriosclerosis, but the evidence is strong that the metabolic disturbances occurring in the course of diabetes are important factors in the development of arteriosclerosis of the atherosclerotic type

With two statements particularly of Dr Moschcowitz we take issue 1 "To my mind all evidence seems to show that arteriosclerosis is the cause of diabetes rather than the reverse" 2 "When diabetes occurs in arteriosclerosis, the inference is that the capillaries of the islands of Langerhans are affected"

As regards this first point, at least 10 per cent of all cases of diabetes begin in the first two decades of life without any evidence of the existence of arteriosclerosis Indeed, one third of all cases begin before the fortieth year In our experience, diabetic children are not arteriosclerotic at the onset of their disease but may develop arteriosclerosis as the diabetes progresses This development is minimized by adequate control of the diabetes by means of insulin and the avoidance of unbalanced diets high in fat The peak of age incidence of diabetes antedates that of arteriosclerosis The frequency of development of diabetes diminishes after the age of 55 years, although the frequency of arteriosclerosis in the community certainly increases after this age Patients with diabetes of short duration have no more arteriosclerosis than nondiabetic persons of the same age at autopsy But patients with diabetes of long duration show vastly more arteriosclerosis, especially in the hearts and legs, than nondiabetic persons Many cases of diabetes at autopsy show little or no arteriosclerosis of pancreatic vessels, even though vascular damage elsewhere may be severe.

Dr Moschcowitz's second statement is difficult to understand Why depend on inference when direct observation has been made of thousands of islands of Langerhans and their capillaries? More than 20 per cent of diabetic pancreases show no significant pathologic changes (Warren, Shields The Pathology of Diabetes Mellitus, Philadelphia Lea & Febiger, 1930) In many others no vascular changes are seen. Possibly hyalinization of the islands might be interpreted as a vascular lesion, but certainly not as arteriosclerosis

If arteriosclerosis causes diabetes, why is it that after middle life, as the diabetes progresses in duration and the arteriosclerosis increases, the diabetes is so apt to become less severe?

SHIELDS WARREN, M.D.

HOWARD F. ROOT, M.D.

ELLIOTT P. JOSLIN, M.D.

Boston.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed Every letter must contain the writer's name and address, but these will be omitted on request

FREQUENCY OF BOWEL ACTION IN INFANTS

To the Editor—Of what sins of omission or commission am I guilty that so many of the babies that I deliver develop at about 1 week of age a very loose bowel? How am I to prevent it and what is a better treatment than protein milk? Please omit name

M.D. Illinois.

ANSWER.—The writer of the question omits to state whether the babies he refers to are breast fed or artificially fed.

Newly born breast fed babies often have numerous and somewhat undigested stools, though they may gain in weight and show no constitutional effects It has been suggested that this frequency of evacuations is due to an increased fermentation of food in the intestinal tract or to an irritation of the mucosa of the large bowel caused by the fermentation products though as a general thing the increased evacuations have no particular significance This group of infants, as a rule, require no medication though if the condition persists unusually long or constitutional symptoms are present a 1 or 2 per cent solution of casein boiled in water will usually diminish the number and cause a firmer consistency of the stool

A similar mild diarrhea may occur in artificially fed infants if however they are restricted to a four hour feeding period and overfeeding is avoided and the food is properly prepared, with avoidance of an excess of sugar, the number of stools should promptly come to be of normal frequency and consistency If the condition persists a 2 per cent solution of powdered casein, boiled in water, may be added to the day's feeding

URTICARIA FROM FURS

To the Editor—A man aged 28 has been having frequent attacks of urticaria for the last four months He handles furs almost daily The first attack occurred October 1 a few hours after a light evening meal consisting of cheese pickles and beer and was characterized by a generalized wheal formation covering the entire body The wheals persisted especially on the lower extremities and were more marked at night From October 1 to 9 the nocturnal outbreak of wheals was only slight and partial relief was obtained by the use of epinephrine on four occasions and gynergen (ergotamine tartrate) for the remainder of the time Urine examination and blood studies including a Wassermann test were negative From October 9 to 14 urticarial attacks were quite severe October 14 he went to Baltimore where skin tests for sensitivity to furs foods and pollens were found to be negative He was started on nonspecific protein injections at that time 10 cc. injections were given at four day intervals for six times with no noticeable effect November 1 he received whole blood injections six 10 cc. injections being given at intervals of five days This treatment yielded favorable results A second series was started January 14 but the attacks again continued mostly on the lower extremities and on two occasions with severe swelling on one side of the head and face He has been on an elimination diet for the past month with no noticeable result The patient is not of an extremely nervous temperament and he leads a rational wholesome life Can you suggest a possible etiology or any further treatment for these allergic attacks? Please omit name.

M.D. West Virginia

ANSWER.—Urticaria is not a clinical entity It may occur as a result of a large variety of sicknesses, such as hypersensitivity (allergy), serum sickness and certain blood dyscrasias.

Urticaria due to allergy may follow the eating of certain foods that contain protein Eggs, wheat, milk, fish, cheese, chocolate, pork, nuts and berries are the most common offenders, other foods may cause attacks of hives at times. In this particular case it might be wise to eliminate the foregoing foods for two or three weeks

Drugs frequently bring on hives and angioneurotic edema, especially the latter The most frequent causes are the coal tar derivatives, especially amidopyrine acetylsalicylic acid, acetanilid and acetphenetidin Quinine is also an important drug in this connection barbitol preparations are likewise frequent offenders and certain other drugs may cause swellings It is best to eliminate all drugs

Urticaria may also come from contact with furs, silk, hairs dyes and other chemicals and plants of various kinds The history of such contact should be searched In this case the fact that the patient works with furs would indicate a possible hypersensitivity either to a fur or to one of the dyes used in treating the furs Paraphenylenediamine has been especially incriminated Contact or patch tests should be done with suspected furs, dyes, chemicals and silks For such tests the

material is moistened and placed against a normal area of skin and held in place by adhesive plaster for from twenty-four to seventy-two hours. Redness with vesiculation constitutes a positive test.

Avoidance of furs for two or three weeks may be advisable. If there is a hair mattress or a feather pillow, it is wise to avoid these for a time, some cases have been cleared up by this means. In all elimination trials (in order to avoid confusion) it is best to try one thing after another, not at the same time.

If no definite cause can be found for the hives, nonspecific treatment should be tried, autohemotherapy may be given again, peptone and vaccines sometimes relieve. Some cases seem to be due to physical allergy (heat, cold, pressure), Duke has written extensively on this subject.

SWIMMING AS A HAZARD TO PERFORATED EAR DRUM

To the Editor—At some period during early childhood following scarlet fever I had an ear complication. Through misunderstanding the condition received no attention until after the drum had spontaneously ruptured. It was then treated vigorously for a long time with no effect so far as the discharge was concerned. Very gradually growing less the discharge finally stopped when I was about 17. Since that time the discharge has occurred intermittently following a cold. The rupture in the drum is permanent. In 1923 following a swim (I had never been advised not to swim) I began to get very dizzy. The dizziness became so pronounced that confinement in bed for a week was necessary in a hospital. It was then discovered that some form of cellular detritus was forming in the attic of the middle ear. This dropped down packed around the oval window and also caused an engorgement of the blood vessels through mechanical pressure. Roentgen examination showed the mastoid to be hard and sclerotic. Search for cholesterol crystals, polypi or granulations was negative. Bacterial cultures were negative. Diagnosis was made of a perilyabyrinthitis. Syringing was done and the detritus removed which resembled pieces of very thin cartilage. The exact nature was never worked out. From this time on there was no trouble until 1927 when there was a recurrence. Since that time I have had trouble several times a year especially this year during which I have had only short periods of comfort since February. My general health is excellent. There are no familial diseases and very few colds. I do a good deal of strenuous athletics. The treatment has not varied since. I am under constant observation and the middle ear cavity is swabbed out occasionally with 1 per cent yellow mercuric oxide. Recently the Elliot heat treatment has been tried within the nose experimentally. The percentage of hearing in the ear is markedly good considering the amount of destruction present consequently it is desired to keep away from radical operations. I have been seen and treated by many high class men. Any possible advice will be deeply appreciated.

M D Virginia

ANSWER—It is always advisable when a perforation of the drum membrane is present to prevent the entrance of cold water into the ear. Therefore, special precaution must be used when taking a shower bath or when swimming, by placing a fairly large piece of cotton, covered with petrolatum on both sides, into the orifice of the external auditory canal and then putting on a tight fitting rubber cap covering the ears. The danger of getting water into the ear is twofold. In the first place a caloric reaction may be caused producing vertigo, so that drowning may occur. Secondly, an acute infection of the ear is often induced. As long as the hearing is fairly good if there is no cholesteatoma formation, together with the absence of headache or vertigo, no radical operation is indicated. If only a small amount of cholesteatoma is present, and it yields to a few irrigations of the attic with 70 per cent alcohol, operation may often be avoided. If some of the other symptoms mentioned such as severe headaches and vertigo, appear, radical mastoidectomy is usually indicated.

CHILBLAINS

To the Editor—Will you kindly inform me as to the methods that work the best in the treatment of chilblains? The patient I have reference to is a man aged 24 in good health. He works at a filling station and has suffered for the past three winters from chilblains which confine themselves to the toes of both feet and become very severe during the night. Please omit name.

M D Minnesota

ANSWER—The predisposition to chilblains is the important thing to combat. This is due to a tendency to acrocyanosis which in turn is due to faulty circulation or faulty nutrition or a combination of the two and even focal infection may have a share in the persistence of the lesions. Hence the patient's general condition and mode of life should receive careful study. Foci of chronic infection that may lower the patient's resistance should be removed. His diet should be complete and adequate with avoidance of excess of carbohydrate, if the patient is lean or of excess of protein if the

patient has a tendency to intestinal putrefaction. The condition of the peripheral circulation requires improvement which might be secured by vigorous movements of the toes for a few minutes several times daily, while holding the foot well elevated.

Prolonged standing in cold and wet as well as sudden warming of the foot after it has become chilled should be avoided. This may be so difficult for the patient under discussion that it might be necessary for him to change his occupation.

The footwear should be warm, loose fitting and kept dry, no garters are permitted. If the patient has a tendency to damp feet the socks should be changed as often as required. At such changing an alcohol rub might be of advantage.

Systemic medicinal treatment might aim at giving restoratives if there is iron vitamin or endocrine (e. g., thyroid) deficiency. Calcium (lactate) might be tried, if no other medicine seems indicated.

If this prophylaxis has failed and chilblains are present, deep vigorous proximal massage of the whole limb with the use of any desired lubricant—the medication probably is unimportant—and with brief, slow, gentle kneading of the affected part is probably the most important item. Immersion in a warm foot bath, followed by a dash of cold water, may well precede the rubbing. Periodic reversal of the galvanic current while the feet are immersed in warm water adds to the value of this exercise to the blood vessels. A cool evaporating compress most especially at bedtime, gives comfort. Extremes of thermic treatment that may result in aggravation of the paretic vasodilatation must be strictly avoided.

HYPOGLYCEMIA

To the Editor—A woman aged 40 of Irish German descent whose weight is 153 pounds (69 Kg.) and whose height is 5 feet 4½ inches (163 cm.) apparently in good health complains of craving for candy and cakes. She will eat a pound of candy or more at a time and half a cake or more. She will hide the sweets and will obtain them in every way possible. All blood and urine examinations give normal results. She has been under treatment in a hospital on a diet but still craves the sugars. She is ashamed of the craving which has been present for a period of ten years. She often tries to break herself of the habit but is unable. Contrary to her previous treatment I advised her after restrictions had failed to have her candy as she wanted it not to sneak it and to feel free at any time to eat as she liked. Can you advise me as to cause, treatment and prognosis?

L E JEWELL MD, Meridian Idaho

ANSWER—Repeated blood sugar determinations at the time of the patient's greatest craving might be worth trying, with a view to determining the existence of a hypoglycemia due to hyperinsulinism. If present, this might account for acute hunger and craving for sweets. In the absence of such manifestations the probability is that the condition rests on a psychologic basis and should be treated as such. The prognosis depends on the obesity that results, namely, an increased susceptibility to diabetes, hypertension and the degenerative diseases.

EXAMINATIONS AND MANIPULATION IN SACRO ILIAC DISEASE

To the Editor—In *Queries and Minor Notes* in *THE JOURNAL* Dec 15 1934 page 1874 under the heading Subluxation of Sacro Iliac Synchondrosis there was a discussion of various methods of examination and of treatment by manipulation of diseases of the sacro iliac joint. Would you be so kind as to define for me the various tests which you note as being recommended by Dr Lewin namely (1) the fabere test (2) the Gaenslen test (3) the Magnuson manipulation and (4) the Cox manipulation.

R I HARRIS MD Toronto

ANSWER—1 The fabere test is sometimes referred to as the Patrick sign. With the patient lying supine, the right heel is placed just above the left patella. The right knee is allowed to drop toward the examining table. It should drop naturally. When the test is positive the right knee is "hung up", then the left heel is placed above the right patella. This test is indicative of a lesion of the hip joint or of its periarticular structures. The word fabere is not a man's name but is a combination of the first or first and second letters of the words flexion, abduction, external, rotation and extension.

2 In the Gaenslen test with the patient's right leg projecting over the side of the examining table the patient grasps his left knee flexing his knee and hip. He thus firmly secures the left half of the pelvis in flexion. The examiner then forces the right leg and thigh in hyperextension over the edge of the table until the limit is reached. This maneuver produces a sort of towel wringing' rotation movement of the pelvis and causes pain in an inflamed sacro iliac joint. The completion of the test is performed with the left leg projecting and hyperextended after the right side has been hyperflexed.

3 In the Magnuson manipulation, under gas anesthesia the patient is placed on his back so that the limb to be manipulated juts out from the side of the examining table. The limb on the affected side is manipulated as in the Baer maneuver and from this position of hyperflexion is suddenly thrust into the position of hyperextension. The second maneuver consists in the surgeon locking his hands under the patient's lumbar spine and exerting a sudden upward pull in order to increase the lumbar lordosis. A tight binder is then applied.

4 The Cox manipulation is performed without anesthesia. The patient lies prone on the floor. He suspends himself on his forearms, holding on to some object, such as a radiator, and is manipulated as follows. The surgeon grasps both ankles, raising the patient's body from the floor. The patient's body is allowed to sag while sharp, sudden traction is applied to the affected leg. Sometimes an assistant makes a thrust on the sacral region.

PHRENECTOMY IN CHILD WITH TUBERCULOSIS

To the Editor—A child aged 6 years at a sanatorium has an adult type of tuberculous lesion in the right lung field. There is a light apical infiltration and a dense basal infiltration with basal cavitation as determined from roentgen examination. Because this type of disease is peculiarly fatal in childhood and because the left lung is practically clear of disease the question of collapse therapy has been considered. Phrenicectomy has been suggested because of the predominantly basal type of lesion but was rejected because of the likelihood of producing severe deformity of the child as it developed. Can you inform me through the columns of THE JOURNAL as to the youngest patient in whom phrenicectomy has been performed? What deformity has been produced by the operation in young patients as they continue to grow? Theoretically is phrenicectomy likely to produce deformity as the child develops? Is phrenicectomy likely to produce greater skeletal deformity as the child grows than would collapse of the lung by artificial pneumothorax? Please omit name.

M D, Massachusetts

ANSWER—In a girl, aged 8 years, who received phrenicectomy, and a girl, aged 6 years, who received pneumothorax, there has been no visible skeletal deformity, the collapse being present two years and one year respectively. The Germans report collapse therapy performed in infants, even with the childhood type of primary infection, claiming thereby to reduce fatalities incident to a generalized military tuberculosis or a tuberculous meningitis. The phrenicectomy per se will not produce deformity. The type of lesion described in the question is always and of itself accompanied by considerable deformity. In the event of natural healing, this deformity will tend to increase as the child grows. Chest changes of a degree dependent on the extent of the lesion will result from the intrathoracic disease. These changes will be retraction of the chest wall, depression of the supraclavicular and infraclavicular fossa, narrowing of the rib interspaces, flaring of the scapulae, atrophic changes in the muscles and, if continued over a long period of years, a scoliosis of the dorsal spine, but collapse therapy when performed in time will tend to limit rather than exaggerate the deformity. The procedure tends toward a prompt suppression of the disease and consequently toward an amelioration of the deformity resultant on the disease. Phrenicectomy is not likely to produce any greater skeletal deformity than would collapse of the lung by artificial pneumothorax. As to the advisability of collapse therapy, it is a known fact that the adult type of pulmonary tuberculosis in children presents a very poor prognosis. Consequently, in estimating the indication, the question of deformity, which anyway is inherent in the lesion itself, has little weight in face of the usual outlook for a rapid spread of the disease and death.

SCLERODERMA

To the Editor—In Queries and Minor Notes I have often noted a great many important problems solved for the general practitioner. I therefore take the liberty of writing you to ask about a case of scleroderma that has come under my care. A woman aged 34 married and the mother of two children has for the past two years had this disease. She has had a thoracic ganglionectomy thyroid therapy ketogenic diet therapy supported by ammonium chloride also massage and diathermy treatments and pancreatic extract therapy (insulin free). All of these without benefit. What is known about parathyroidectomy in this disease and what other means of therapy would you suggest? Please omit name.

M D Florida

ANSWER—The therapy of generalized scleroderma presents great difficulties and, according to the experience of authorities who have written on the subject, there is no specific form of treatment that is available. Improvement has occasionally been reported after the use of thyroid extract and pancreatic extracts, but it has been found by most observers that almost all methods of treatment have been palliative and not curative. There have been a number of reports of pathologic calcification in the skin of patients suffering from scleroderma. In a case reported by

Basch, Leibovici Durupt and M. Basch (*Bull et mem Soc med d hop de Paris* 50 516 [April 2] 1934) a woman, aged 43, presented a clinical picture of scleroderma complicated by patches of calcification in the skin and about the joints. These changes had been preceded by Raynaud's syndrome. Parathyroidectomy was performed in combination with periarterial sympathectomy of the brachial artery. Some improvement in the condition of the skin is reported, which was attributed to the periarterial sympathectomy. There are further papers on this subject by Wessenbach (*Bull Soc franç de dermat et syph* 40 1439 [Feb.] 1934) and by B. Paggi (*Polichimico [sez. chir]* 41 371 [July] 1934).

TREATMENT OF SYPHILIS—BISMUTH GRIP

To the Editor—Last summer I began antisyphilitic treatment of a 4 plus woman aged 33. I gave her five injections of neoarsphenamine, 0.45 Gm. Each injection caused much generalized aching over the body and each successive injection made the aching much worse. She became discouraged and stopped treatment. This winter she returned for further treatment. I began with injections of a bismuth compound in the hip. These caused the same aching only worse. By the time she had the fifth injection she had to go to bed. All joints were swollen and red, and aching was severe. She had to be turned in bed on a sheet for three days. The treatment was stopped and the aching is slowly leaving and the joints are returning to normal. Is this a Herxheimer reaction? How am I going to treat this patient? She received the neoarsphenamine every sixth day and the bismuth compound every fourth day. If you tell me to give less intensive treatment may one expect a cure in the same length of time or does it take longer?

M D Kansas

ANSWER—In the first place, it is difficult to understand what is meant by a "4 plus woman." It would be much more satisfactory in answering this query if more information were available as to the evidence of the syphilis in the patient. Simply a "4 plus woman" means little when one considers the many possibilities, and also the type of laboratory that may have made the reaction. Probably the generalized aching has nothing to do with syphilis, either after the arsenical injections or after the bismuth injections. It certainly is not a Herxheimer reaction.

It is to be recommended that the patient be very carefully examined. If the blood Wassermann really shows a 4 plus reaction, it might be well to do a lumbar puncture as well, and if evidence of syphilis is really found perhaps start her off on a preliminary course of mercury rubs, if she has the symptoms spoken of, giving her 4 Gm of the 50 per cent official ointment as a rub every night, and considering a course of from sixty to eighty rubs as a course of treatment. Perhaps following this one might try the neoarsphenamine again in small doses, using doses, say, of 0.3 Gm every seven days. We would be much interested to learn if the patient has any further reaction. Frankly, we are inclined to feel that there must be some other explanation for these reactions. It is true that there is a condition known as "bismuth grip." The patient, after having had quite a lot of bismuth injections, begins to have vague symptoms of headache, pain in the bones and muscles, and discomfort of that type, which will continue until the bismuth is stopped. Anything of this sort after arsenic, if it occurs at all, is most unusual, and for it to have come on so acutely at the onset of treatment seems out of all reason.

USE OF INTERFEROMETER IN DETERMINING BENZENE FUMES

To the Editor—March 29 you very kindly sent me some reprints from Queries and Minor Notes giving the effects of naphtha and other constituents of lacquers and in one of these it stated that an interferometer should be used to find out the quantitative determination of benzene fumes. Subsequently I wrote asking where one of these could be obtained, whether they had to be bought or whether they could be rented but I heard nothing from you.

GEORGE N. PRATT M D, Nenab Wis.

ANSWER—The best known type of interferometer is the Zeiss, which is listed in the catalogues of the principal laboratory equipment supply houses. The current catalogue of the Arthur H. Thomas Company (West Washington Square, Philadelphia) contains not only a description of this apparatus but a number of citations from the literature as to various fields of its usefulness. In this country the Barrett Company of New York, producers of benzene and other hydrocarbons, have carried out many tests of hydrocarbon concentrations under industrial conditions, using an interferometer. The U. S. Bureau of Standards possesses extensive accumulated data on the use and worth of this instrument.

It should not be understood that this device is either expensive or readily usable. The initial cost of the instrument is in excess of \$500. Thereafter it may become necessary to obtain calibration from time to time to assure reliable results. The

instrument is of restricted value under many industrial circumstances, owing to the fact that benzene, benzene, naphthas toluene and xylene rarely are used as single entities but as mixtures with various esters, acetates alcohols and glycols. This fact precludes any ready standardization of the apparatus to meet the diversity of vapor conditions likely to be encountered.

HEREDITY IN HYDROCEPHALUS

To the Editor—A married woman aged 29 white has had two pregnancies (five years apart) each of which resulted in a child deformed by the presence of meningococles the first time in the cervical the last time in the lumbar region. Hydrocephalus formed in the first and is also present in this last child (now aged 2 months). The woman's past history is essentially negative and physical examination is negative. The Wassermann reaction is negative and the urine normal. However during pregnancy her appetite becomes voracious and she gained between 85 and 100 pounds (38 and 45 Kg) during each pregnancy which weight she subsequently lost during the year following delivery. Her thyroid is enlarged during pregnancy (noticeably) but no other abnormalities can be detected. Her usual weight is 145 pounds (66 Kg) and she is 65 inches (165 cm) tall. Labor is easy. Is it likely that any further pregnancies will result similarly? Any suggestions as to cause and treatment will be appreciated. The husband appears normal and there is no family history of anything similar. If published please omit name.

M D New Jersey

ANSWER—A review of the literature does not prove that there is a distinct hereditary element in spina bifida and hydrocephalus but enough cases are on record to make one believe that a repetition of these abnormalities cannot be denied. There are many cases on record of large families with only one such deformity. The cause of such monstrosities is not known, but defective germ plasma is generally assumed. A diseased endometrium may cause a defective germ plasma and a diagnostic curettage might be helpful therapeutically. The theories that avitaminosis and endocrine abnormalities are causative of monstrosities have little, if any, present support. Since the patient gained such an enormous number of pounds during each pregnancy, the endocrine theory would seem to be a plausible explanation and treatment along the lines of prevention of obesity offers some hope of cure. Our knowledge of the growth hormones of the anterior pituitary body is not sufficiently large to assign to this organ a role in the production of monstrosities.

EPILEPSY AND PREGNANCY

To the Editor—Within the past year I have inherited two petit mal cases. I delivered the first patient aged 19 years of her first baby. She has been treated by neurologists gynecologists and surgeons for the last ten years. They all had held to the possibility of improvement following delivery of a baby. Her history dates back to a fall of some 12 to 15 feet from a swing at which time she was unconscious for ten or fifteen minutes. I can see no improvement since delivery four months ago and subsequent nursing of the baby. Have I done wrong in permitting the mother to nurse the baby? The second patient a woman aged 29 had one pregnancy nine years ago. She has been having seizures for the last nine years. She also has been to several specialists neurologists psychiatrists and gynecologists. Both patients came to my care taking 1½ grains (0.1 Gm) of phenobarbital twice a day and regular cathartics daily. Both patients are discouraged. Is there anything further to offer them? Please omit name.

M D New York.

ANSWER—There is no justification for believing that pregnancy or parturition will cause cessation of epileptic seizures although during pregnancy there is sometimes a temporary improvement, on the other hand the frequency of seizures sometimes becomes greater during pregnancy. There is no reason for assuming that an epileptic woman should not nurse her child. The situation as to prognosis and therapy is not changed by the fact of parturition.

TREATMENT OF KERATOSIS OF LIP

To the Editor—I have under my care a white man aged 38 suffering from keratosis of the upper lip a patch about 1 cm in diameter. This has been present for the past three years with repeated scaling and peeling. It is not disfiguring but is slightly painful. He has tried various treatments including x rays radium and the electric needle but it returns again. The specialist advises surgery but the patient is afraid of scarring and contraction of the lip. Is surgery necessary? Cold cream is as good a treatment for this condition as anything he has tried. What would you suggest? Please omit name.

M D California

ANSWER—No hint is given as to the kind of keratosis meant. If senile keratosis is intended the location and the patient's age make it an unusual case. Senile keratosis will not resist x rays or radium, if correctly applied. Surgical procedures should not be necessary. It would be wise to have a dermatologist see the patient make the diagnosis and direct the treatment.

INDIGESTION WITH NORMAL ACID VALUES

To the Editor—Will you please comment on the following analysis

| Time | Free Acid | Total Acid | Blood | Bile | Mucus | Lactic Acid |
|-------------|-----------|------------|----------|----------|-------|-------------|
| Fasting | Negative | 5 | Negative | Negative | Trace | Negative |
| 20 minutes | 29 | 44 | Trace | Negative | Trace | Negative |
| 40 minutes | 34 | 55 | Trace | Negative | Trace | Negative |
| 60 minutes | 25 | 41 | Trace | Negative | Trace | Negative |
| 80 minutes | 10 | 24 | Trace | Negative | Trace | Negative |
| 100 minutes | Negative | 30 | Trace | Negative | Trace | Negative |

All the man complains of is a lot of gas and a coated tongue. There is no pain in the stomach. Sometimes a few pains occur in the lower part of the abdomen. He had been taking fifteen drops of dilute hydrochloric acid three times a day for two months when this analysis was made. I would appreciate any comment you can make relative to diet or treatment. The patient is 38 years old and is a mine clerk. If published please omit name.

M D Utah

ANSWER—The complaints of coated tongue and "gas" coupled with relatively normal acid values in the stomach are common. The patient should be given the benefit of a thorough investigation, including a cholecystogram, gastro-intestinal roentgenograms and blood, urine and stool analyses. In addition, a careful inquiry should be made into the patient's past history for evidence of acute or chronic infections or ingestion of alcohol. If no organic lesion is found, diet and bowel regulation should control the symptoms. Fatty, greasy, fried and spicy foods, condiments pies pastry, candy, coffee, tea, alcohol tobacco pork, cabbage and apples should be omitted. Foods allowed include eggs (not fried), milk, toast, cooked fruits and vegetables, boiled chicken or beef and broiled lamb chops and cottage cheese. The bowels should be kept moving regularly. The gastric analysis reveals sufficient acid for normal digestive processes and the ingestion of additional hydrochloric acid does not produce extra benefits.

PLUMBISM IN A CHILD

To the Editor—Recently I have become interested in a case of plumbism in a child aged 16 months. The source of the lead was the paint on the crib and play yard. The roentgenogram shows slight deposits of lead in the bones around the elbow knees and ankles. 1 What is the usual procedure of eliminating this lead from the body? 2 What are the probable effects of the lead if it should be left alone entirely? 3 Is the presence of the lead any contraindication to given serum injections such as toxin antitoxin? 4 Will the presence of the lead tend to accentuate any subsequent fever or illness that the child may develop? Please omit name.

M D Massachusetts

ANSWER—1 Removal of lead from the body (or deleading) may be accomplished by inducing an acidosis or an alkalosis, by deprivation of calcium, or by the administration of parathyroid extract.

2 If the lead is left alone it will probably be gradually excreted from the body over a period of time. A child who harbors lead in the bones and who has been symptom free might again show symptoms of lead poisoning during an acute infection.

3 The presence of lead in the bones would be no contraindication for the giving of serum injections.

4 The presence of the lead would not accentuate any subsequent fever or illness that the child might have. However, the illness might cause the reappearance of the symptoms of lead poisoning.

EFFECTS OF KEROSENE ON SCALP

To the Editor—Your answers to the following questions will be greatly appreciated. 1 What will be the effect of the use on the scalp of deodorized kerosene 87 per cent resorcinol 3 per cent and lanum 10 per cent. 2 What will be the effect of the use of the foregoing on the scalp over a long period of time? 3 What will be the effect of kerosene known and designated as water white kerosene if used in the foregoing proportions in place of deodorized kerosene? 4 What will be the effect of kerosene alone on the scalp? 5 In the event that kerosene is rubbed briskly into the scalp if it is confined by the patient wearing a hat immediately after application would this have a tendency to blister the scalp?

V L CHAMBERS M D Huntington W Va

ANSWER—1 The combination of the deodorized kerosene resorcinol and wool fat makes a good scalp stimulant. A few scalps may be irritated by too much of it for the kerosene is quite strong.

2 Used over a long period the tendency of resorcinol to color the hair green must be considered. This can be avoided by the use in place of it of resorcinol mono acetate.

3 Ordinary white kerosene will have the same effect as the deodorized except in respect to odor.

4 Stimulating.

5 Pure kerosene will blister some scalps even though not covered at once. The kerosene had best be diluted.

TREATMENT OF NEUROSIS

To the Editor—I have a middle aged patient who is moderately neurotic. He lives what neurologists term an 'irritated existence' i. e. there are conditions in his life which seem impossible to change and which are more or less of a constant irritation. He is conscious of his own jumpy condition and during business hours for business reasons, he makes an unusual effort to cover up his condition and to be agreeable. At the end of the day he is all in. Is this the proper way to conduct himself in order to get the best results? Please omit name

M D Missouri

ANSWER.—Without more knowledge of the facts it is not possible to give advice of value. The only alternative to the plan now being followed suggested in the question seems to be that the patient should not "cover up" and should be "disagreeable." This certainly does not seem a more "proper way" to get the best results. It may be suggested that when conditions cannot be changed the best method to be followed is to try to find some activity that will furnish compensatory satisfactions for those which are being missed. Much will depend on the nature of the conditions to be faced. On the other hand, it is possible that conditions alleged as cause for the "irritation" are not the real cause but are merely a convenient peg on which to hang the trouble, much as emotional dissatisfaction and conflicts may be diagnosed as irritable heart, dyspepsia or colitis

MORPHINE IN SOLUTION

To the Editor—In the series of articles on 'Therapy of the Cook County Hospital' appearing in THE JOURNAL the following prescription is given in the article on Pain (THE JOURNAL Dec 22 1934 p 1944)

PRESCRIPTION 13—Morphine Sulphate for Injection
 B Dilute hydrochloric acid 0.05 cc
 Morphine hydrochloride 0.10 Gm
 Distilled water q s ad 10.00 cc.

Concerning this I should like to ask 1 How long will such a solution remain stable and potent if used only infrequently? 2 Can the dose of morphine be increased so that 1 cc would equal 0.015 instead of 0.01 Gm? 3 Can atropine (1 cc. $\frac{1}{500}$ grain) be added to the solution? 4 May the sulphate be used instead of the hydrochloride? 5 Can it be sterilized in the ordinary office electrical sterilizer and kept in an insulin bottle?

M D, New York.

ANSWER.—1 Probably for several months

2 Yes

3 Yes, but only if the material is to be used up in a relatively short period as solutions of atropine salts deteriorate fairly rapidly

4 Yes

5 Yes, but excessive heating should be avoided as solutions of morphine are said to decompose rather readily above 60 C

GASTRIC ACIDITY AND ADMINISTRATION OF HYDROCHLORIC ACID

To the Editor—Can you give me information or references regarding the effect on the acid base balance of the body especially the blood of oral administration of hydrochloric acid in large therapeutic doses and excess doses in normal conditions hypo-acidity and hyperacidity? Also do you know of a good standard for children's gastric acidity comparable to that of Vanzant and Alvarez for adults? My rather prolonged search in the literature has thus far been rather fruitless for these two problems and any aid you can give will be most gratefully received.

MARY LOVELESS M D New York.

ANSWER.—The oral administration of hydrochloric acid in any dose causes a lessening in the reserve alkali of the system in a degree proportional to the size of the dose, and this occurs in normal conditions as well as in hypo-acidity and hyperacidity. Knowledge of the gastric contents of infants and children is still rather meager. In infants, Marriott and his co-workers found the acidity to vary between a p_H of 3 and 4, with an average of 3.75

QUININE IN MULTIPLE SCLEROSIS

To the Editor—I note in THE JOURNAL of May 11 an inquiry with regard to multiple sclerosis. You state that quinine hydrochloride should be used in every case. I have been attending a woman who has had multiple sclerosis for several years. I have tried almost everything but the quinine hydrochloride with no improvement. I should like to know your method and the doses that should be given.

L C BARNES, M D Hamburg Ark.

ANSWER.—Quinine hydrochloride is given by mouth, starting with one-half grain (0.03 Gm) three times daily for one week, then three-fourths grain (0.05 Gm) three times daily for the second week, 1 grain (0.065 Gm) three times daily for the third and fourth weeks and finally 1½ grains (0.1 Gm) three times daily for at least six months. Fluids should be pushed to the maximum at all times

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND STYHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country, March 14. Oral examination for Group A and B applicants will be held in Kansas City Mo. May 11-12. Applications for written examination should be filed with the secretary before Jan. 15. Sec. Dr. C. Guy Lane 416 Marlboro St. Boston

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada, Dec. 7. Sec., Dr. Paul Titus 1015 Highland Bldg., Pittsburgh (6)

AMERICAN BOARD OF OPHTHALMOLOGY St. Louis Nov 18. Asst. Sec., Dr. Thomas D. Allen 122 S. Michigan Ave., Chicago

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St. Louis Jan. Sec., Dr. Fremont A. Chandler 180 N. Michigan Ave. Chicago

AMERICAN BOARD OF OTOLARYNGOLOGY Kansas City, Mo. May 9. Sec. Dr. W. P. Wherry 1500 Medical Arts Bldg. Omaha

AMERICAN BOARD OF PEDIATRICS St. Louis Nov 20. Sec., Dr. C. A. Aldrich 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY New York, Dec. 30. Sec. Dr. Walter Freeman 1726 Eye St. N. W. Washington D. C.

AMERICAN BOARD OF RADIOLOGY Detroit, Dec. 12. Sec., Dr. Byrl R. Kirkin Mayo Clinic Rochester Minn.

ARIZONA Basic Science Tucson, Dec. 17. Sec. Dr. Robert L. Nugent Science Hall University of Arizona Tucson

ARKANSAS Basic Science Little Rock, Nov. 4. Sec. Mr. Louis E. Gebauer 701 Main St., Little Rock. Medical (Regular) Little Rock, Nov. 12. Sec. State Medical Board of the Arkansas Medical Society

Dr. A. S. Buchanan Prescott Medical (Eclectic) Little Rock, Nov. 12. Sec. Dr. Clarence H. Young, 207½ Main Street Little Rock.

CALIFORNIA Reciprocity Los Angeles Dec. 4. Sec., Dr. Charles B. Pinkham 420 State Office Bldg. Sacramento

CONNECTICUT Medical (Regular) Hartford Nov. 12-13. Endorsement Hartford Nov. 26. Sec. Dr. Thomas P. Murdock, 147 W. Main St. Meriden Medical (Homeopathic) Derby Nov. 12. Sec., Dr. Joseph H. Evans 1488 Chapel Street New Haven

FLORIDA Tampa Nov. 11-12. Sec. Dr. William M. Rowlett, Box 786 Tampa

KANSAS Topeka Dec. 10-11. Sec. Board of Medical Registration and Examination Dr. C. H. Ewing, 609 Broadway Larned

KENTUCKY Louisville, Dec. 3. Sec. Department of Health Dr. A. T. McCormack 532 W. Main St. Louisville.

MAINE Portland Nov. 12-13. Sec. Board of Registration of Medicine Dr. Adam P. Leighton Jr. 192 State St. Portland.

MARYLAND Medical (Regular) Baltimore Dec. 10-13. Sec., Dr. John T. O'Mara 1211 Cathedral St. Baltimore. Medical (Homeopathic) Baltimore Dec. 10-11. Sec. Dr. John A. Evans 612 W. 40th St. Baltimore.

MASSACHUSETTS Boston, Nov. 12-14. Sec. Board of Registration in Medicine Dr. Stephen Rushmore 413 State House Boston

NATIONAL BOARD OF MEDICAL EXAMINERS Part III Boston, Nov. 5-7. Ex. Sec. Mr. Everett S. Elwood 225 S. 15th St. Philadelphia

NEBRASKA Lincoln Nov. 19-20. Dir. Bureau of Examining Boards, Mrs. Clark Perkins State House Lincoln

NEVADA Carson City Nov. 4. Sec. Dr. Edward E. Hamer Carson City

OHIO Columbus Dec. 3-5. Sec. State Medical Board Dr. H. M. Platter 21 W. Broad St. Columbus

OKLAHOMA Oklahoma City Dec. 11. Sec. Dr. James D. Osborn Jr., Frederick.

OREGON Basic Science Portland Nov. 16. Sec. Mr. Charles D. Byrne University of Oregon Eugene

SOUTH CAROLINA Columbia Nov. 12. Sec. Dr. A. Earle Booser 505 Saluda Ave. Columbia

TEXAS Houston Nov. 18-20. Sec., Dr. T. J. Crowe 918 Mercantile Building Dallas

VIRGINIA Richmond Dec. 11-13. Sec. Dr. J. W. Preston 28½ Franklin Rd. Roanoke

WISCONSIN Basic Science Milwaukee, Dec. 21. Sec. Prof. Robert A. Bauer, 3414 W. Wisconsin Ave. Milwaukee

Louisiana June Examination

Dr. Roy B. Harrison, secretary, Louisiana State Board of Medical Examiners, reports the written examination held at New Orleans, June 6-8, 1935. The examination covered 12 subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and three candidates were examined, all of whom passed. Three physicians were licensed by reciprocity. The following schools were represented

| School | PASSED | Year Grad | Per Cent |
|---|---|-----------|------------|
| University of Colorado School of Medicine | | (1933) | 83.1 |
| Indiana University School of Medicine | | (1930) | 75.9 |
| Louisiana State University Medical Center | | (1935)* | 80.2 |
| | 81.6 81.6 81.8 81.8 81.9 82.2 82.4 82.6 82.7 83.4 | | |
| | 83.4 83.4 83.5 83.5 83.8 83.8 84. 84.2 84.4 84.5 | | |
| | 84.8 85.3 86.2 86.3 86.5 86.6 88 88.2 89 89.3, | | |
| | 90.2 90.7 | | |
| Tulane University of Louisiana School of Medicine | | (1934) | 81.6 |
| | 82 (1935) 78.9 79 80.1 81.1 81.2 81.4 81.4 81.6 | | |
| | 81.8 82 82.1 82.3 82.5 82.5 82.6 82.8 83 83.3 | | |
| | 83 83.1 83.2 83.4 83.6 83.6 83.6 83.7 83.7 83.9 | | |
| | 83.9 84.1 84.1 84.1 84.1 84.3 84.3 84.3 84.5 84.5 | | |
| | 84.6 84.6 84.7 85 85 85.1 85.1 85.1 85.4 85.4 | | |
| | 85.4 85.6 85.8 85.8 85.9 86.3 86.4 86.4 86.7 86.9 | | |
| | 87.1 87.6 88.1 89 | | |
| University of Cincinnati College of Medicine | | (1933) | 82.6 |
| Baylor University College of Medicine | | (1935) | 77.8, 81.5 |

| School | LICENSED BY RECIPROCITY | Year | Reciprocity |
|---|-------------------------|--------|-------------|
| | | Grad | with |
| University of Maryland School of Medicine | | (1908) | N Carolina |
| Meharry Medical College | | (1932) | Tennessee |
| University of Texas School of Medicine | | (1930) | Texas |

* These applicants have received an M B degree and will receive an M D degree and Louisiana license on completion of internship

Tennessee March Examination

Dr H W Qualls, secretary, Tennessee State Board of Medical Examiners, reports the written examination held in Memphis, March 25-26, 1935. The examination covered 8 subjects and included 80 questions. An average of 75 per cent was required to pass. Twenty-three candidates were examined, 22 of whom passed and 1 failed. The following schools were represented:

| School | PASSED | Year | Per |
|---|--------|--------|------|
| | | Grad | Cent |
| Howard University College of Medicine | | (1930) | 85.8 |
| St. Louis University School of Medicine | | (1934) | 84.6 |
| University of Tennessee College of Medicine | | (1935) | 77.8 |
| 78.5 78.5 79.3 79.4 79.6 80.3 80.5 80.8 81.3 81.5 | | | |
| 81.6 82. 82.8 83 83.8, 84.5 85.8 86.6 87 | | | |

| School | FAILED | Year | Per |
|---|--------|--------|------|
| | | Grad | Cent |
| University of Tennessee College of Medicine | | (1935) | 73.8 |

Book Notices

Obstetrics for the General Practitioner By J P Greenhill B S M D F.A.C.S. Professor of Gynecology Loyola University School of Medicine Chicago. National Medical Monographs. Edited by Morris Fishbein M.D. Cloth Price \$4. Pp 304 with 39 illustrations. New York National Medical Book Company Inc. Doubleday Doran & Co Inc 1935.

The author has developed a small book on obstetrics for the general practitioner. It is brief but not in compendium or notebook style. The book is divided into twenty chapters, which are in logical sequence. For ready reference each chapter in turn is broken up by the conventional headings of etiology, pathology, symptoms, diagnosis, prognosis and treatment. This orderly arrangement contributes materially to the usefulness of the work. There is an especially well chosen group of illustrations, lent by Dr J B De Lee from his textbook.

The chapter on the management of labor is one of the most practical, the one on hydatidiform mole and chorionepithelioma is completely covered from a scientific standpoint but with brevity and clarity, the chapter on placenta praevia is particularly well written and an excellent guide in this dangerous situation.

Greenhill must have debated long with himself before deciding to include a chapter and numerous illustrations on the technic of various methods of cesarean section. He does so "because in many small communities the general practitioner or general surgeon must perform these operations." This is a concession to bad obstetric practice which might better have been omitted in these days of good roads and generally good transportation facilities. Cesarean section is distinctly not an operation for general practitioners or general surgeons, as its high mortality rate attests. The space might profitably be devoted to somewhat more instruction to the general practitioner on the early recognition of conditions often requiring cesarean section.

The chapter on puerperal infection is an excellent one, although containing scarcely enough emphasis on the methods of its prevention and the responsibility of the attending physician in this. Nevertheless, this all appears in the earlier chapter on the management of labor, if the practitioner will read these two chapters together.

The sections on antepartum care and the management of labor occupy only twenty-three pages and include the only discussions on contracted pelvis, postpartum hemorrhage, and asphyxia of the new-born. By contrast, seven pages are devoted to the etiology of abortion and miscarriage, nine pages to polyhydramnios, and slightly more than one page to oligohydramnios. Ten pages are given to syphilis, but gonorrhea is not mentioned specifically. The care of the new-born is mentioned only incidentally. Uterine inertia and hydrocephalus do not appear in the index. Four pages are devoted to the

dystrophia dystocia syndrome and sixteen to local anesthesia in obstetrics, which is recommended throughout the work whenever anesthesia is required. There is no detailed discussion of other anesthetic agents, and analgesia is covered in a sketchy fashion.

The methods of treatment and procedure that are advocated are eminently sound, but it requires knowledge and insight to interpret the directions given. Frequent auscultation of the fetal heart tones is recommended strongly but there is no statement concerning the interpretation of variations in their rate and rhythm. Episiotomy is well discussed and illustrated, but perineal lacerations, even those involving the rectal sphincter, are omitted except for a statement that they should be repaired if the patient's condition permits.

The book is of a convenient size, attractively bound in red and gold, and well printed. With its appearance, and the wise counsel within its pages, it should be a valuable addition to the library of all general practitioners doing obstetric work.

Über die primären Tumoren des Sehnervens und der Sehnervenkreuzung. Inaugural-Dissertation Von Åke Lundberg Med Lic. Paper. Pp 164, with 28 illustrations. Stockholm. Nordiska Bokhandeln 1935.

In this monograph the nature of optic nerve tumors is considered in the light of observations obtained by modern neurohistologic methods. The author studied material from ten cases and in view of the probable embryologic origin of many of these tumors a study of the embryology of the optic nerves was included. In his review of the literature proper credit is given to the important works of Hudson (1912) and of Verhoeff (1922). These authors had decided that most tumors of the nerve itself should be classified as gliomas. The use of modern methods of study may be said to begin with del Rio-Hortega, who found that most optic nerve tumors were oligodendrocytomas. A table of all cases reported since the work of Hudson is included (114 cases). In studying his material the author employed besides the usual stains Holzer's glia stain and Fincher's modification of the Hortega silver and gold impregnation method. The author's ten cases included five tumors of the intra-orbital portion of the optic nerve, two of the intracranial portion and three involving the intracranial portion and optic chiasm. In two cases only postmortem (museum) material was available without a clinical history. In six cases the material was obtained at operation and in two post mortem. The five cases involving the orbital portion of the nerve showed certain similarities in their clinical course. All were in children from 3½ to 10 years of age. In all the principal symptom was unilateral exophthalmos with optic atrophy, which in some cases was simple and in others accompanied by papilledema. All were removed successfully and showed no recurrence after a period of from one to seventeen years. This was in spite of the fact that three tumors could not be removed completely on account of extension through the optic foramen. In two of these cases such extension could be diagnosed preoperatively by roentgenograms showing enlargement of the optic foramen. This relatively benign nature of optic nerve tumors has been noted by other observers, especially Hudson.

The review of published cases involving the intracranial portion of the nerves and chiasm with his own cases is of importance not only to the ophthalmologist but to the neurologist and neurologic surgeon. Such cases are seldom accompanied by exophthalmos and in many cases loss of vision with field changes is the only sign available for diagnosis. Differential diagnosis from other conditions causing optic atrophy is sometimes difficult and the author believes that a number of cases of unexplained blindness are due to such tumors. All his cases but one proved on histologic examination to be gliomas of the type of oligodendrocytoma. In some material a number of astrocytes was found. One case of meningioma involved the intracranial portion of the optic nerve in front of the chiasm. Meningiomas of the intracranial portion must arise in this region tumors behind this point being of necessity gliomas. From his own and other published data in which material was available since the report of Hudson, the author found that seventy-five tumors were gliomas, twenty-nine meningiomas and nineteen of uncertain nature. A characteristic difference between the gliomas and the meningiomas was the age of incidence. Most gliomas involved children, the average age at

time of operation being 12 years, while meningiomas affected older persons, the average age being 25 years. The gliomas involving the nerve always cause loss of vision before exophthalmos is noted, whereas the opposite is the case with meningiomas of the orbital portion. In the case of small children the loss of vision often passes unperceived until exophthalmos occurs. In diagnosis the roentgenograms were only occasionally of value. Intracranial extension of an intra-orbital tumor could sometimes be diagnosed by enlargement of the optic foramen, and in tumors of the intracranial portion erosion of the anterior clinoid processes and undermining of the roof of the optic foramen were sometimes observed as well as calcium shadows in the tumor.

Many other points of interest in this group of conditions are included in the monograph, which presents the most complete review of its subject that has so far appeared.

The Determination and Control of Industrial Dust. By J. J. Bloom, field Sanitary Engineer U. S. Public Health Service and J. M. DallaValle, Assistant Sanitary Engineer U. S. Public Health Service. Prepared by direction of the Surgeon General, United States Treasury Department, Public Health Service. *Public Health Bulletin No. 217.* Paper. Price 15 cents. Pp. 107 with 77 illustrations. Washington: D. C. Supt. of Doc. Government Printing Office, 1935.

At present the workmen employed in the dusty trades form the largest group exposed to any one industrial hazard—a hazard with high morbidity and mortality rates from respiratory diseases as well as systemic poisoning in the case of toxic dusts. The composition, quantity and particle size are the properties producing definite damage. The present bulletin gives the methods and instruments now used for dust studies, the interpreting of results, and their practical applications, especially in regard to control. The volume is meant as a guide to engineers, chemists and others interested in minimizing dust hazards to health. Of the five instruments of choice, that developed largely by the Public Health Service (1922) known as the Greenburg-Smith impinger is recommended as the most adaptable for all around dust determinations, although each of the others has its special field. Probably the bulletin was already in press before a description of the "hot wire" method of Greene was published in England (1934), the inventor of which claims that it is of far greater accuracy. After discussing "the quantification" of dusts, i. e., the determination of quantities present by use of the various instruments, the bulletin details their character and composition, petrographic and chemical examinations, and the application to practical problems. The last six of the twelve chapters concern methods of dust control, principally from the plant engineering standpoint, with various formulas and charts for measuring adequacy, although the last chapter devotes eight pages to personal respiratory protection (respirators, masks and helmets). There is an accompanying bibliography. This whole question is at present in a condition of flux, so that little can be accepted as definitely settled except that there is some definite relation between some inhaled dusts and disease, but studies like the present one are certainly showing the way out, and the authors as well as the Public Health Service are to be complimented on a fine contribution and encouraged to go on.

La maladie des pêcheurs d'éponges nus. Par Skévos Zervos. [Extrait de *Paris médical* No du 4 août 1934.] Cloth. Pp. 29 with 10 illustrations. Paris: Librairie J. B. Baillière et fils. [n. d.]

For many years the sponge fishermen of the island of Calymnos (in Grecian waters) who search for sponges off the islands of Crete and Chypre and in the African seas, have lived in dread of a strange disease, which seemed to attack only them or their fellowmen who worked with fresh sponges. The disease first manifests itself by a sharp stinging pain at almost any portion of the body, but chiefly on the anterior regions. Quickly this initial spot becomes red and swollen and within a few hours may change from red to purple or almost black. Within a short time systemic involvement arises, characterized by headache, nausea, intense fever and chills, sometimes lasting for several days or weeks. The pain is usually general and is most intense about the open wound, which is slow to heal, is prone to necrose, and may eventuate in an abscess. Always healing is slow and painful. Attacks of this character again and again have been the lot of these sponge fishermen. While death is only occasional, the intensity of the pain is such as to make the fishermen continually apprehensive as they go about their work.

This publication is the story of Skévos Zervos's study of this occupational disease. First in 1903 he presented its description to the second Panhellenic Congress, and again in Paris at the Academy of Medicine. In the ensuing years Dr Zervos has established many unusual features of the nature of the disease and its control. The cause was found to be an animal parasite, the "actinion," belonging to the Zoanthes, and homologous to the Actinidea. The parasite is approximately 4 or 5 cm in length. Two rows of minute fingerlike projections occasion the name "actinion," which signifies "ray" formation. The parasite lives attached to the roots of the sponges at the bottom of the sea. As the sponge fisherman uproots the sponges and fills the net bag hung around his neck in front of his body, the disturbed actinion discharges from its mouth its venomous material, which is described as "white, of viscom consistency, like half-dried nasal secretion." The actuality of poison within the parasites is attested by the use of dried actinions by these fishermen for killing off undesirable animals, such as rabid dogs. Dr Zervos describes various types of treatment, such as "cupping" the fresh wound and the application of liquid ammonia. It seems somewhat bizarre that with so large a parasite the fishermen should not long ago have determined the cause of the malady. Whatever may have been their extent of knowledge, much has been accomplished by Dr Zervos in protecting them. Through education, improved therapeutic measures, prevention of infection and careful supervision of the sanitation of boats and docks, this disease never direful, has been brought under control. In gratitude the population has termed its occupational disease the "malady of Skévos Zervos." The author in turn has dedicated his small book to his dear compatriots who have had this disease by the thousand. The challenge of interest is a desideratum of any publication. At every turn this little book extends that challenge. Apparently a remotely situated physician found an unknown disease, he determined the cause, classified the parasite, established the manifestations, created a suitable treatment, and banished the fears of an apprehensive population. Written in a simple, naive style, it contributes its own small bit to the solution of occupational disease problems.

Text Book of Urology for Students and Practitioners. By Daniel N. Flisendrach, M.D., Consulting Urologist to the American Hospital, Paris, France and Harry C. Roitnick, M.D., Clinical Professor of Genito-Urinary Diseases, Loyola University Medical School, Chicago. Third edition. Cloth. Price \$10. Pp. 942 with 711 illustrations. Philadelphia and London: J. B. Lippincott Company, 1934.

This work has had considerable success among students of medicine and busy practitioners. The authors themselves state that their work was written primarily to fulfil the definite need for such a textbook, which would present the whole subject of urology in "the simplest possible manner" to "meet the needs of beginners." This laudable ambition has been accomplished in an admirable manner. One hundred and sixty-two pages are devoted to elementary subjects relative to genito-urinary diseases, 100 pages to the venereal diseases, and the remaining pages to diseases of the genital organs, bladder, ureters and kidneys and to urologic surgery. Diseases of the male genitalia, not infrequently slighted in the past, are covered in a thorough manner. The chapters on venereal diseases are complete and of value to both students and practitioners.

Every effort has been made to facilitate and render quick and sure the teaching of urology. Seven hundred black and white and eleven colored illustrations, many schematic drawings, tables for differential diagnosis, and pictures of operations, step by step, all impress the mind quickly and deeply.

The use of black letter emphasis to the paragraph headings and to important matters may be helpful to some but is confusing and obstructive to smooth, easy reading.

Three new pages on intravenous urography have been added to the chapter on radiography and eight pages on electroresection of the prostate. Otherwise the book shows little change from previous editions. The illustrations are on the whole good and have been drawn from a large number of sources. The style is more that of a compend or outline of urology, presenting the main facts as briefly as possible.

For the student this book has a definite value, and teachers may recommend it with safety and assurance. For the advanced urologist or the research worker or for purposes of reference it is not so useful. However, it fulfils a distinct need.

Nutrition Work with Children By Lydia J Roberts Professor and Chairman of the Department of Home Economics The University of Chicago Second edition Cloth Price \$4 Pp 639 with 18 illustrations. Chicago The University of Chicago Press 1935

Nine years has elapsed since the first edition of this book became available. During that time notable advances have been made in many different aspects of the subject. There have been extended and detailed studies of the growth and development of children. New types of foods have been prepared especially applicable to the child's needs. The Conference on Child Health held in 1930 brought together a considerable number of specialists who by the exchange of their views consolidated opinion on many debatable topics. The new advances have been given careful consideration in the revision of this book, which now constitutes the most extensive and perhaps the best available book on this special subject. The volume begins with an introduction showing the needs for nutrition work, then come definitions of terms and methods of judging nutrition, and analyses of the various studies that have been made of growth at different times and seasons. The causes and effects of malnutrition are considered as well as its prevention and treatment. Then come the constructive features of the volume, which describe the nutrition program in the school, the teaching of nutrition at various grades and other aspects of nutritional work in schools as well as that carried on by special agencies. Each of the chapters is supplemented by a bibliography and there is a fine collection of references to health materials for use in teaching. The index is adequate and indicates the greatly enlarged scope of this work.

Socialization of Medicine Compiled by Julia E Johnsen The Reference Shelf Volume V Number 5 Cloth Price 90 cents Pp 335 New York H W Wilson Company 1935

The H W Wilson Company has for some years prepared under the general title "The Reference Shelf" a series of reference and guide books for debaters on various topics. The present volume on socialized medicine provides two excellent briefs for the affirmative and negative sides of the subject, a fairly extensive but well selected bibliography, definitions to guide debaters in their understanding of the topic to be discussed and then a number of reprints of various articles by physicians, social workers and economists on this subject. These articles are divided into general discussions, affirmative discussion and negative references. It is exceedingly interesting to find the names of John A Kingsbury and Rufus Rorem among those whose articles are put on the negative side. What a gnashing of teeth there will be when these gentlemen find where they have been located! Presumably Mr Kingsbury was put into the negative side because he says he does not advocate the socialization of medicine but the socialization of the payment of medical costs. This would seem to be largely a distinction without a difference.

Maladies de l'intestin III Cancer du rectum (diagnostic traitement chirurgical radiumthérapie soins médicaux) lymphosarcome tumeurs villoses polype solitaire polypose rectocolique fibromes myomes angiomes Par R Bensaude Avec la collaboration de J Charrier chirurgien des hôpitaux et al Paper Price 60 francs Pp 367 with 127 illustrations Paris Masson & Cie 1935

The diagnosis, surgical and radium therapy, and medical management of the significant neoplasms of the rectum and sigmoid colon are discussed in this volume. Bensaude stresses the dictum that cancer of the rectum when uncomplicated does not ordinarily produce cachexia. Particular emphasis is given to the importance of diagnostic proctoscopy. Digital examination is hardly mentioned. The introduction of proctoscopy is attributed to a Parisian surgeon Desormeaux and the German Kussmaul and others who utilized his method are accused of omitting reference to him. Differential diagnosis is treated extensively. Surgical extirpation is the method of choice for carcinoma. Radium is resorted to only in diffuse growths beyond surgical aid. Abdominal perineal and abdominoperineal methods of approach for resection of the rectum and the terminal sigmoid are described. In 40 per cent of operated cases, no recurrence appeared after three years and longer.

A number of cases of rectocolic polyposis displayed clubbed fingers, and this sign is suggested as a diagnostic aid. Colonic polyposis is also associated occasionally with infantilism.

The print is large and readable. The paper and the many illustrations are good. The tests, written by several authors, are uniformly clear and precise. However, an index is lacking and the bibliography is inadequate. The volume is recommended to surgeon, proctologist and internist.

The Principles and Practice of Surgical Nursing By Charles D Lockwood A B M.D. F.A.C.S. and John A Wolfer M.D. F.A.C.S. Associate Professor of Surgery Northwestern University Medical School In collaboration with Mildred E Newton B.S. R.N. Instructor and Supervisor of Medical Nursing Division of Nursing University of California Second edition Cloth Price \$2.75 Pp 371 with 172 illustrations New York The Macmillan Company 1935

The second edition of "The Principles and Practice of Surgical Nursing" has been revised and rewritten by Dr Wolfer and his collaborator Miss Mildred E Newton. The first edition was the work of the late Dr Charles D Lockwood. The monograph is essentially an outline of surgical practice and is similar in many respects to the compends which are found in the hands of senior medical students just before examination time. The book is well written and well illustrated. The subject matter is presented in a simple, direct manner. The authors deserve credit for the care which they have exercised in confining the text to important headings and in avoiding the confusion that commonly arises from attempts to incorporate too much theory or too many disputatious details. The chapter on inflammation has been supplemented and placed at the beginning of the text, and the chapter on the treatment of burns has been rewritten to accord with the present day practices.

It would seem that the most cogent criticism of the book is to be found in the choice of its title. It contains little of the essential principles and practice of surgical nursing but deals almost exclusively with the principles and practice of surgery. It should be received gratefully by instructors who are in search of a clear, concise textbook of surgery for nurses.

Reports of the Committee upon the Physiology of Vision XIV Characteristics of Dichromatic Vision with an Appendix on Anomalous Trichromatic Vision By F H G Pitt Medical Research Council Special Report Series No 200 Paper Price 1s 3d Pp 58 with 20 illustrations London His Majesty's Stationery Office 1935

This report is a rather technical description of investigations of color vision made with the Wright colorimeter. This is a color mixing apparatus by which, as in the Nagel anomaloscope, pure colors are matched by mixtures of their complementary colors. In a series of normal and partially color-blind dichromatic observers, data concerning the discrimination of color luminosity and hue were collected. The report should be read in the original by those interested in color vision.

Handbook of Tuberculosis Schemes for Great Britain and Ireland Eighth edition Paper Price 5/- Pp 169 London National Association for the Prevention of Tuberculosis 1935

This directory of tuberculosis schemes in Great Britain and Ireland is of interest to American physicians mainly in that it indicates the close tie-up in the United Kingdom between preventive and therapeutic phases of the fight against tuberculosis, and also between governmental and voluntary agencies. Rough comparisons may also be made, so far as international comparisons have validity, between provisions for the tuberculosis in the British Isles as compared with similar provisions in this country. In view of the numerous dispensaries and clinics available, even in counties with comparatively favorable tuberculosis death rates, there would seem to be little left for the private practitioner to do as far as tuberculosis is concerned.

The Economic Outlook in Higher Education for 1934-35 By Henry G Badger Assistant Statistician Office of Education United States Department of the Interior Office of Education Pamphlet No 58 Paper Price 5 cents Pp 49 Washington D C Supt of Doc Government Printing Office 1934

This pamphlet is a review of the economic and financial outlook among institutions of higher education for 1934-1935 as seen by the financial officers of those institutions. It appears that for the group studied, the decrease in income which has prevailed for the past two years is about at an end. The reports available from some 500 institutions (53 per cent of those to which inquiries were addressed) would seem to forecast a change of less than 1 per cent from the previous year in expected current and capital receipts, in budgeted expenditures for educational and general purposes, and in the number of staff members or in their compensation.

Medicolegal

Malpractice Medical Books as Evidence, Expert Testimony—The plaintiff suffered a fracture dislocation at the left ankle joint, a so-called Pott's fracture. The physician-defendant treated the injury. His patient was dissatisfied with the result and later was treated by other physicians. She sued the physician who treated her in the first instance. From a judgment in her favor, he appealed to the Supreme Court of Iowa.

The physician-defendant took exception to a ruling of the trial court that permitted the use of medical books when he was under cross-examination. He had not testified that he had examined medical books or that he relied on medical books in general or on any particular book, but on cross-examination he was asked whether he had consulted certain books and how many of those books advised a certain method of treatment. His counsel objected, but the trial court overruled the objection and required the defendant to answer. The Supreme Court held, however, that the trial court erred. It is not competent on cross-examination, said the Supreme Court, for a physician testifying as an expert to go into the contents of medical books when he has not referred to any book or named any book as an authority or one on which he relied. This rule is founded on the fact that the books themselves are not admissible. In this case such cross-examination was inadmissible for the further reason that the witness was asked to give a summary of what certain books taught on a subject, and if the books themselves were not admissible then such a summary likewise was not admissible.

It is error to admit medical books in evidence, the court pointed out, and where plaintiff's counsel in a case read a long extract from a medical book and asked a witness if he had ever read it, the error was not cured by the trial court sustaining an objection to the question, the objectionable matter had been read and could not be eliminated by a ruling sustaining an objection to it. *Etzkorn v City of Oelwein* 142 Iowa 107, 120 N W 636. The Supreme Court, quoting *Birby v Railway & Bridge Co.*, 105 Iowa 293, 75 N W 182, pointed out that data of medicine are constantly shifting with new discoveries and that conclusions which may be considered sound today are repudiated tomorrow, saying—

A medical work may be standard this year and obsolete next. The opinion of the same author changes in the different editions owing to new discoveries and a better understanding of symptoms. The very best works aside from observations are largely made up of the opinions either of the author or of others compiled. It is a well known fact that physicians after research and investigation often differ radically.

The only circumstances under which medical books can be read in evidence is when the witness has based his opinion on them and has referred to them as authorities, and this rule cannot be evaded on cross-examination. *Hall v Murdock* 114 Mich 233, 72 N W 150. This rule is based on the fact that the use of books is an attempt "to discredit the testimony of the witness by 'hearsay testimony of the written or spoken opinion of other persons, whom the jury have no means of examining as to their learning, their honesty, or their sources of special knowledge,' which attempt can be justified on neither principle nor difficulty of cross-examination."

The physician defendant, while testifying on his own behalf, was questioned by his own counsel concerning the usual and ordinary practice of physicians and surgeons in the community in which he treated the plaintiff and in similar communities, at that time, but objections on behalf of the plaintiff were sustained and the defendant was denied the opportunity of stating his opinion concerning the matter. The questions asked, said the Supreme Court, were certainly proper and the trial court erred in sustaining objections to them. It made no difference that the witness was the very physician whose conduct was under investigation. His testimony was admissible, its weight was for determination by the jury.

A medical witness for the plaintiff testified that he had had a hundred cases of Pott's fracture previous to the plaintiff's case. He was then asked "In how many of those did you fail to get reasonably good results?" He was asked also "Well,

have you had any case where the reduction and operation—the reduction of the fracture or operation has not been reasonably satisfactory?" Objections to both of these questions, on the ground that they were immaterial and irrelevant, were overruled by the trial court, but, said the Supreme Court, the answers admitted were certainly immaterial. The cases the plaintiff's witness had had and his experiences as to results in other cases were not criteria in this case. The evidence showed that the kind of injury under consideration was quite liable, even with the best of treatment, to give unsatisfactory results. The question had no bearing on the question of negligence or lack of skill of the defendant.

The trial court erred, the Supreme Court said, in refusing to instruct the jury with respect to hypothetical questions, on the motion of the physician defendant, that "you must determine if all of the facts assumed in the hypothetical question are established by the evidence, and if they are, you may give the answer of the witness to such questions such weight as you may deem it entitled to, but if you find that any fact assumed in any hypothetical question has not been established by the evidence, then you will give no weight or consideration to the answer of the expert to such question." The instruction requested was proper. A jury should be given some rule by which to determine the weight to be given to expert opinion testimony. If the facts stated in the question are not correct or true, it destroys the value of the answer, at least to some extent.

The judgment of the court below was reversed and the cause remanded for a new trial—*Wilcox v Crumpton (Iowa)*, 238 N W 704.

Silicosis Liability of Employer Under Common Law—The plaintiff, an employee of the defendant-company, developed silicosis through the inhalation of dust and other impurities in the defendant's factory. He claimed compensation under the workmen's compensation act of New York, but his claim was dismissed by the industrial board. Thereupon he sued the defendant at common law. He alleged that his exposure to dust and other impurities, which had resulted in the disease from which he suffered, was due to the defendant's failure to exercise reasonable care and to perform its statutory duties in the operation of its factory. The supreme court, appellate division, fourth department, denied the defendant's motion to dismiss the complaint and, on the defendant's appeal, certified to the Court of Appeals of New York the question whether the complaint stated facts sufficient to constitute a cause of action.

The employee's suit was based on the theory that, if silicosis was not an injury compensable under the workmen's compensation act, he had a right to recover damages from his employer in an action at common law. His employer contended that, if an employee ever had had any such right under the common law, it had been abolished by the passage of the workmen's compensation act.

It is true, said the Court of Appeals, that for an "injury" within the meaning of the workmen's compensation act no right of action at common law by an employee against his employer survived the passage of the act. The act, however, defines "injury" as meaning only accidental injuries arising out of and in the course of employment and such disease or infection as may naturally result therefrom and certain occupational diseases named in the act. Silicosis, said the court, is not an accidental personal injury within the meaning of the workmen's compensation act for the inception of the disease cannot be assigned to a determinate or single act, identifiable in space or time, or to "something catastrophic or extraordinary." Silicosis is an occupational disease, it is true, the natural and unavoidable result of conditions of employment, but it is not one of the occupational diseases named in the workmen's compensation act as compensable.

The workmen's compensation act provides that the liability of an employer prescribed by the act shall be exclusive and in place of any other liability whatever to an employee or any one else, entitled to recover damages at common law or otherwise, but this exemption relates only to liability for injuries, including occupational diseases, covered by the act, and silicosis is not so covered. There is still a field, said the court, in which an injured employee may seek damages by action at

common law, when there has been fault on the part of the employer. Accordingly, the Court of Appeals affirmed the order of the court below denying the defendant-employer's motion to dismiss the complaint filed by its employee. The court held that that complaint stated facts sufficient to constitute a cause of action—*Barrencotto v Cocker Saw Co, Inc (N Y)*, 194 N E 61.

Malpractice Indemnity Insurance, Insurer Required to Pay Insured Physician's Traveling Expenses Incident to His Attendance at Trial—The Medical Protective Company issued to a physician an insurance policy in which it agreed to defend him at its own expense against any claim or suit for damages arising from malpractice, error or mistake in the practice of his profession. In applying for the policy, however, the physician agreed to attend, assist and cooperate in the preparation and defense of any claim or suit against him, "without charge to the company."

A malpractice suit against the insured physician was instituted at Akron, Ohio, by one Estella Light, as administratrix, and was set for trial, May 23. Counsel for the insurer notified the insured physician, who was then residing in Longview, Texas, to be present on that date and that it would be well for his wife also to be present, and added

You understand of course that the policy we issued to you obligates you to attend the trial of any case at your own expense. We mention this at this time so there may be no misunderstanding in the matter.

The insured physician did not appear at the trial, and, at the request of counsel for the insurer, the case was continued to October 26.

Counsel for the insurer again notified the insured physician of the date set for trial and requested his attendance. The insured physician thereupon replied that his financial condition made it impossible for him and his wife to be in Akron on the date named. He asked that the case be postponed for from three to six months, when he would be in Akron and would be glad to assist and cooperate with counsel. When the case came up for trial October 26, counsel for the insurer moved for a further continuance, stating that the defendant the insured physician, had informed him that it would be impossible for him to appear, but counsel for the insurer did not inform either the court or the plaintiff of the reason given by the defendant for his inability to be present. The court refused to grant a continuance and counsel for the insurer thereupon withdrew from the defense of the insured physician. Judgment was entered against the physician, in favor of the plaintiff, the administratrix of his deceased patient.

The administratrix of the deceased patient thereafter instituted the present proceeding against the Medical Protective Company, as the insurer which had agreed to indemnify the absent physician-defendant against loss resulting from claims or suits based on malpractice. She asked that the judgment against the absent physician be satisfied from the insurance money that the insurer had agreed to pay. The insurer defended on the ground that the insured physician had committed a breach of his contract by failing to attend the trial and to cooperate with the insurer. It claimed that because of that breach it was under no obligation to pay a judgment against him. But the trial court gave judgment against the insurer, which thereupon appealed to the court of appeals of Ohio Summit county.

The failure of the insured physician to come from Longview, Texas, to Akron, Ohio, to attend the trial of the suit against him, said the court of appeals, and his failure to bring his wife with him at his own expense, did not constitute a breach of the condition contained in the physician's application for insurance. Construing the application and the policy as a whole, they meant, in the judgment of the court, that the physician would make no professional charge for attendance at the trial, but they did not mean that he would undertake to travel a great distance at his own expense in order to attend a trial. Under no possible construction of the application and the policy did the insured physician undertake to bring his wife to a trial, when bringing her entailed a large expense and the insurer had indicated in advance that it would not meet such expense.

When the insured physician notified his insurer that it was a financial impossibility for him to attend the trial at his own expense it was the duty of the insurer, under the provisions of the policy to defray that expense. Furthermore, it was the duty of counsel for the insurer, when the case was called for trial to inform the court not only of the insured defendant's inability to be present but also of the reason for that inability as stated by him. It was the duty of the insurer, too, to inform counsel for the plaintiff in the malpractice case of the reason assigned by the insured for his absence, because plaintiff then would have had an opportunity to assist the insured physician in attending the trial. Failure of the insurer to notify either the court or counsel for the plaintiff in the malpractice case of the reason for the absence of the insured physician estopped the insurer from asserting in its own defense a breach of the condition on the part of the insured.

Judgment against the defendant insurer was affirmed.—*Medical Protective Co v Light (Ohio)*, 194 N E 446.

Practice of Medicine License Not Revocable for Unauthorized Acts of Unlicensed Assistant—The fact that an unlicensed person, employed by a physician to assist him by rendering services that do not constitute the practice of medicine, voluntarily and without the knowledge of his employer goes beyond his proper duties and performs acts prohibited by the statute regulating such practice, does not furnish lawful ground for the revocation of the employing physician's license. A rule to the contrary, said the district court of appeal, fourth district, California, would place in jeopardy the licenses of the most conscientious ethical members of the profession, since it would impose on them liability for unauthorized voluntary and furtive acts of their employees—*Barrett v Board of Osteopathic Examiners of California (Calif)*, 40 P (2d) 923.

Medical Practice Acts Conviction of Crime Involving Moral Turpitude as Ground for Revocation of License—The appellee Porter R. Rodgers, a licensed physician, pleaded guilty in the district court of the United States for the western division of the eastern district of Arkansas to a charge of possessing counterfeit money. He was sentenced to serve three years in the United States reformatory. The execution of the sentence was suspended, first for a period of two weeks, then for approximately three and one-half months and finally for a period of five years. While the execution of the sentence was thus suspended, the state medical board of Arkansas revoked Rodgers' license, under a complaint charging him with conviction of a crime involving moral turpitude. The chancery court set aside the revocation order and the board appealed to the Supreme Court of Arkansas.

"Moral turpitude," said the court, is a well defined and easily understood term. In *Fort v Brinkley*, 87 Ark. 400, 112 S W 1084, the court said

Moral turpitude refers to an act of baseness, villainy or depravity in the private and social duties which a man owes to his fellow men or to society in general but not to such acts as are not of themselves immoral but whose illegality lies in the fact of their being positively prohibited.

Webster defines the term as follows

The quality of a crime involving grave infringement of the moral sentiment of the community as distinguished from statutory mala prohibita.

In view of these definitions, the court had no hesitancy in holding that the crime to the commission of which Rodgers pleaded guilty was a crime involving moral turpitude. Possession of counterfeit money, said the court, with intent to corrupt the currency of the country and with intent to cheat and defraud any person to whom it is uttered is a base and infamous crime.

But although Rodgers had pleaded guilty to a crime involving moral turpitude and been sentenced to serve three years in the reformatory, in the opinion of the Supreme Court of Arkansas, he had not been "convicted" within the meaning of the medical practice act. No final judgment had been entered, because the sentence had been suspended, and Rodgers had not been required to surrender himself for the execution of a judgment. Something still remained to be done before he

could be said to have been "convicted." In the absence of a final judgment of conviction, the board was without authority to revoke his license.

The Supreme Court affirmed the judgment of the court below, setting aside the revocation order—*State Medical Board v Rodgers (Ark)*, 79 S W (2d) 83

Malpractice Gauze Pack Intentionally Left in Abdomen.—The physician-defendant, the chief surgeon of a hospital owned and operated by the defendant Pittsburgh Plate Glass Company, removed the plaintiff's gallbladder and appendix, Nov 18, 1930. Three weeks after the operation the plaintiff was discharged from the hospital to her family physician. The incision did not heal, it continued to discharge pus and a "boil-like" formation developed. In February 1931, about four months after the operation, the plaintiff's condition became so serious that she returned to the hospital, where she was again under the care of the physician-defendant. At that time he alone knew that a gauze pack was in her abdomen. He treated the wound by cleansing it and applying hot applications, but he did nothing toward removing the gauze. After about ten days the plaintiff again returned to her home. On March 11 the wound opened and a gauze pack appeared at the surface. The plaintiff was immediately returned to the hospital, where the physician-defendant opened the abdomen and removed the gauze. The plaintiff thereupon sued the physician-defendant and the company operating the hospital. From a judgment of the trial court in favor of the plaintiff, for \$10,000, the defendants appealed to the Supreme Court of Missouri.

The plaintiff charged the physician-defendant with negligence in leaving the gauze pack in her abdomen and thereafter failing promptly to discover it. The physician testified, however, according to the record, that in the course of the operation there was dangerous bleeding and that "to stop the hemorrhage he fastened this gauze sponge or part of it to the liver and intentionally left it there after he sewed up the wound, except a small hole about as large as a finger left open for the purpose of drainage." He admitted that he made no record to show that he left a gauze pack in the plaintiff's abdomen and that he told no one of his having done so. He admitted, too, that it was not possible to heal a wound with a foreign body in it, and he sought to justify his failure to remove the pack by pointing out that it would have been necessary to open the wound in order to do so and that that might have caused further hemorrhage. But according to the plaintiff's testimony the physician-defendant, when he removed the sponge, remarked "Let's not let that happen again" and requested the plaintiff not to mention it, as it would harm him professionally if she did so.

If the physician-defendant's testimony is believed, said the court, that he purposely left the gauze in the wound to stop a dangerous hemorrhage and that this was necessary and proper treatment it would refute the plaintiff's charge of negligence so far as it was based only on the defendant's duty to remove all gauze before closing the incision. The physician-defendant contended that the plaintiff had complained only of his failure to remove the gauze before closing the incision. He contended, therefore, that the instruction given by the trial court to the jury was in error so far as it permitted the jury to bring in a verdict against him if it found that he was negligent if he permitted the gauze to remain in the plaintiff's abdomen for an unreasonable length of time. With this contention, however, the Supreme Court did not agree. The plaintiff charged negligence based on the defendant's failure to discover in proper time that gauze had been left in the abdomen. Moreover the physician-defendant himself, when he testified that it was proper to leave the gauze in the abdomen in this case, raised the issue as to the length of time it might be left in, while it might not be negligence to leave a gauze pack in the abdomen long enough to stop hemorrhage, it was a grave question of negligence to leave it in for five months.

The physician-defendant objected to the instruction given by the trial court authorizing a finding of negligence if the defendant did not exercise "reasonable skill and care" in failing to remove the gauze. He insisted that the degree of care required of physicians is more accurately expressed as being "such skill and care as is ordinarily possessed and exercised by members

of that profession in good standing practicing in similar localities." But no one can complain, said the Supreme Court, that a given instruction imposes on him a less degree of care than that imposed by law, and the court could not say that an instruction imposing on a physician the exercise of "reasonable skill and care" imposed a higher degree of skill and care than that used by ordinary skilful and careful surgeons in like operations under like circumstances in the same and similar localities.

The judgment of the trial court for \$10,000 against the physician-defendant and the corporation operating the hospital was, in the judgment of the Supreme Court, not unreasonable. It was therefore affirmed—*Null v Stewart (Mo)*, 78 S W (2d) 75

Chiropractic Injunction Not Available to Prevent Illegal Practice.—The Chiropractic League of California petitioned for an injunction to restrain two licensed chiropractors, practicing as partners, from employing certain modes of treatment. What the nature of that treatment was does not appear in the record, but the League contended that the use by the respondents of the modes of treatment complained of was not authorized by their licenses, that it constituted a menace to public health and that consequently it constituted a public nuisance that could be enjoined. From a judgment enjoining them, the two chiropractors appealed to the district court of appeal, first district, division 2, California.

Injunction, said the district court of appeal, is expressly forbidden by the Civil Code, section 3369, as amended by the Laws of 1933, page 2482, as a means of enforcing a penal law, except in a case of nuisance or unfair competition. The practice of the healing art in violation of a statute is not a nuisance per se. Moreover, unless the respondents in this case are not competent to practice the modes of treatment complained of or else such modes of treatment are in themselves injurious to patients, the use of such methods by the respondents would not constitute a nuisance. If such modes of treatment are not a nuisance, a statute forbidding their use would not make them so, since it would not affect the competence of the practitioner or the benefit or harm incident to treatment. The court of appeal could find no evidence to support the finding of the trial court that the use of the methods complained of was dangerous or injurious to health or show that the respondents lacked the skill necessary for the safe use of such methods and treatment and were therefore dangerous to the public. In the absence of a statute expressly authorizing the issue of injunctions in cases such as this, the injunction issued by the trial court was improper. The judgment of the trial court was reversed—*People ex rel Chiropractic League of California v Steele (Calif)* 40 P (2d) 959

Society Proceedings

COMING MEETINGS

- American Academy of Tropical Medicine, St Louis, Nov 20-21. Dr Earl B McKinley 1335 H Street NW Washington D C. Secretary
- American Association for the Study of Neoplastic Diseases Baltimore, Dec. 19-21. Dr Eugene R Whitmore 2139 Wyoming Avenue N.W. Washington D C. Secretary
- American Association of Railway Surgeons Chicago November 13-15. Dr Louis J Mitchell 86 E Randolph St. Chicago Secretary
- American Society of Tropical Medicine St. Louis November 19-22. Dr Alfred C Reed 350 Post Street San Francisco Secretary
- Clinical Orthopedic Society Indianapolis and Louisville, Nov 15-16. Dr J E M Thomson 1307 N Street Lincoln Neb Secretary
- Medical and Surgical Association of the Southwest El Paso Texas Nov 21-23. Dr W Warner Watkins 15 East Monroe Street Phoenix Ariz Secretary
- National Society for the Prevention of Blindness New York, Dec. 5. Dr Lewis H Carris 50 West 50th Street, New York, Managing Director
- Pacific Coast Society of Obstetrics and Gynecology Los Angeles, Nov 6-9. Dr T Floyd Bell 400 29th Street, Oakland Calif. Secretary
- Radiological Society of North America Detroit Dec 2-6. Dr Donald S Childs 607 Medical Arts Building Syracuse, N Y Secretary
- Society of American Bacteriologists New York, Dec. 26-28. Dr I L Baldwin College of Agriculture University of Wisconsin Madison, Wis. Secretary
- Southern Medical Association, St Louis November 19-22. Mr C P Loran Empire Building Birmingham Ala Secretary
- Southern Surgical Association Hot Springs Va., Dec. 10-12. Dr E W Alton Ochsner 1430 Tulane Ave New Orleans Secretary
- Western Surgical Association, Rochester Minn Dec. 6-8. Dr Albert H Montgomery 122 South Michigan Boulevard Chicago Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to *THE JOURNAL* in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below

Alabama Medical Association Journal, Montgomery

5 101 136 (Sept.) 1935

- Renal Calculi E. Burns New Orleans—p 101
Ovulation Menstruation and Finding the Safe Period G F Douglas Birmingham—p 104
Chronic Hoarseness C H Cleveland Anniston—p 119
Value of Local Applications in Diseases of Respiratory Tract C O Lawrence Clanton—p 122

American Journal of Cancer, New York

24: 507 750 (July) 1935

- Varied Pathologic Basis for Symptomatology Produced by Tumors in Region of Pulmonary Apex and Upper Mediastinum J Browder and J A DeVeer Brooklyn—p 507
Angioblastic Meningiomas H Bergstrand and H Olivecrona Stockholm Sweden—p 522
Investigation of Value of Lead Compounds in Treatment of Malignant Tumors Members of the Liverpool Medical Research Organization director M Datnow—p 531
Influence of Caloric Intake on Growth of Sarcoma 180 F Bischoff M Louisa Long and L C Maxwell Santa Barbara Calif—p 549
Susceptibility to Cancer Development in Skin and in Mammary Gland in Two Lines of Inbred Mice L Kreyberg Oslo Norway—p 554
Study of Walker Rat Mammary Carcinoma 256 in Vivo and in Vitro W R Earle Washington D C—p 566
Carcinoma Mammæ Occurring in Male Mouse Under Continued Treatment with Estrin H Burrows London England—p 613
Sacrococcygeal Teratoma Report of Case of Double Tumor in a New Born Infant R R Renner and E Goodsitt Cleveland—p 617
Significance of Abnormal Mitosis in Development of Malignancy W Mendelsohn Baltimore—p 626
Tumors of Nasal and Paranasal Cavities C F Geschickter Baltimore—p 637
Cancer in British Malaya and Philippine Islands F L Hoffman—p 661

Susceptibility to Cancer of Inbred Mice—Kreyberg describes the segregation of 1,200 albino mice from a heterozygous material, by inbreeding of two lines of mice, which as regards tar cancer and breast cancer show opposite reaction. The line with high spontaneous breast cancer incidence shows a low tar cancer incidence and vice versa. The breast cancer line has in the females shown that they are very "cancerous". According to Lacassagne's investigations the males in this line should respond to injections of estrogenic substance with the formation of breast cancer just as readily as the females. Under natural circumstances the males do not develop breast cancer because the adequate stimulus is not produced in the male body. If the cancer tendency of this line were of a general nature, one should expect the potentially cancerous males to respond to another potent carcinogenic principle in the absence of the first. But in this case the males of line 27 have shown no such reaction. They have shown the same low tar cancer incidence as their sisters. It does not seem permissible to designate a certain strain or line of mice as "cancerous" or "cancer resistant" without at the same time designating the special type of cancer that has been investigated. It has been established by this experiment that a certain strain or line of mice may show a very high incidence of breast cancer and at the same time show a relatively low susceptibility to development of tar cancer. It is important to examine the males and the females separately. Vice versa a certain strain or line may show a very high susceptibility to the development of tar cancer and at the same time show a breast cancer incidence close to zero. The nonmanifestation of breast cancer may be caused by a hormone secretion insufficient to produce these tumors, an insufficiency which may be genetically determined as indicated by the experiments of Korteweg and Lacassagne. Tar painting has been shown to be an adequate irritant in the control material and accordingly sufficient for a fair comparison. The results

of Lynch Reinhard and Candee, Korteweg, Dobrovolskaia-Zavadskaja and Olch, and the author indicate that the susceptibilities to different forms of cancer are genetically different. The possible existence of a general cancer disposition, as outlined for man by Cramer, cannot be discussed on the data available from experimental research at the present time. A strain of mice, according to the author's present knowledge, may very well be nonsusceptible to tar cancer and breast cancer and at the same time be highly susceptible to another type of cancer but not showing this susceptibility because the specific, unknown stimulus is not present. Indications regarding a general cancer disposition may, to a certain degree, be obtained if the simultaneous application of a potent tar and a potent hormone preparation in different strains or lines gives different tumor incidences for the two stimuli separately but the total incidence is constant.

Sacrococcygeal Teratoma—Renner and Goodsitt present a case of congenital sacrococcygeal tumor in which there were two distinct tumor masses (1) a cystic mass behind the bone and beneath the skin, which was microscopically benign, (2) a highly malignant teratoma anterior to the sacrum and the coccyx found ten and one half months after birth, causing symptoms of obstruction. There was no anatomic connection between the two masses and apparently no evidence that the second mass arose from the first or from the same anlage as the first. The posterior tumor is believed to have arisen as the result of some defect in development of the spinal cord and vertebral canal, while the anterior tumor most probably arose from the neuroenteric canal or postanal intestine.

American Journal of Medical Sciences, Philadelphia

190 291 434 (Sept.) 1935

- Diagnosis of Periarthritis Nodosa W S Middleton and J C McCarter Madison Wis—p 291
Periarthritis Nodosa (Necrotizing Panarthritis) in Childhood with Meningeal Involvement Report of Case with Study of Pathologic Findings L Krahulik M Rosenthal and E H Loughlin Brooklyn—p 308
*Periarthritis Nodosa Without Peripheral Nodules Diagnosed Ante Mortem A. Bernstein Baltimore—p 317
Mechanism of Decrease of Gastric Secretion with Advancing Years A L Bloomfield San Francisco—p 325
Carcinoma of Breast in One of Homologous Twin Sisters I I Kaplan New York—p 331
Choked Disk in Syphilis of Nervous System B J Alpers and J C Yaskin Philadelphia—p 333
Detection of Tubercle Bacilli in Blood Stream by Loewenstein Technique and Analysis of Loewenstein's Investigations M Siegel New York—p 345
*Bronchogenic Carcinoma Analysis of Fifty Four Cases with Roentgenologic Classification M G Wasch and B S Epstein Brooklyn—p 362
Estimation of Basal Metabolic Rate from Pulse Rate and Pulse Pressure B I Comroe, Philadelphia—p 371
*Angina Pectoris and Heart Block as Symptoms of Calcareous Aortic Stenosis E P Boas New York—p 376
Comparative Study of Geographic Distribution of Rheumatic Fever Scarlet Fever and Acute Glomerulonephritis in North America D Seegal Emily Beatrice Carrier Sergal and Elizabeth L Jost New York—p 383
Isolated Tricuspid Stenosis of Probable Rheumatic Origin Report of Case with Unusual Clinical and Pathologic Findings A B Clements New York—p 389
Variability of Murmurs in Mitral Stenosis N Flaxman Chicago—p 396
Value of Colloidal Sulphur in Treatment of Chronic Arthritis W B Rawls B J Grushkin and A A Resna New York—p 400
Bacterial Flora Associated with Foreign Bodies in Trachea and Bronchi C J Bucher Philadelphia—p 409
Differential Blood Picture of Group of Rural Inhabitants of Alabama H A. Poindexter Washington D C—p 416

Periarthritis Nodosa Without Peripheral Nodules—Bernstein cites a case of periarthritis nodosa without peripheral nodules in which the diagnosis was suspected and verified by biopsy of a muscle before death. The abnormalities encountered were polyneuritis disturbances of vision and hearing, hypertension with evidence from examination of the urine of renal disease fever tachycardia edema anemia with leukocytosis and eosinophilia, a positive Wassermann reaction and the systemic manifestations of a chronic wasting illness. Anasarca at first thought referable to reduced total blood proteins persisted after these had been restored to a normal level. Syphilis was assumed to have no etiologic relationship to the patient's main illness.

The early course of the disease transpired during a period of persistent antisiphilitic therapy. There were wide oscillations of the blood pressure, suggesting the diagnosis of periarteritis nodosa. The rapid progression of hypertension with an initial elevation of pressure followed by a temporary decline and once again steady increase first called to mind the possibility of periarteritis nodosa explaining the symptoms. There was occlusion of a central retinal artery, while the smaller retinal vessels showed only minimal constriction in caliber. Deafness in periarteritis nodosa is uncommon. The otitic involvement was of the nerve type. The auditory nerves may have been attacked in periarteritis nodosa in the same manner as the peripheral nerves.

Bronchogenic Carcinoma.—Wasch and Epstein report fifty-four proved cases of primary bronchogenic carcinoma, with an analysis of the symptoms. Of fifty-one cases studied roentgenographically, a positive diagnosis was made in twenty-three, and in twelve the diagnosis was suggested. Pleural effusion obscured the changes in four. The diagnosis was not made in the remaining twelve cases. Bronchoscopy was done in thirty-one cases, in twenty-six of these the diagnosis was established. Three cases, in which the diagnosis was not made, were unusual in that the lesion occurred in a subdivision of the main bronchus and was, therefore, inaccessible to the bronchoscope, no biopsy was done in two. Bronchoscopy is the most valuable single diagnostic aid. However, since roentgenograms are readily obtained, a roentgen study should be the initial diagnostic procedure. Though the roentgenogram may be negative, bronchoscopy should be urged in all cases in which the clinical picture is suggestive. It is these very early lesions, not demonstrable roentgenologically, that may be most benefited by treatment. The outlook for a patient with bronchogenic carcinoma is discouraging. Until recently, the prognosis was invariably fatal. Within the past few years more encouraging reports have appeared in the literature. The important problem is to diagnose the case sufficiently early to allow surgical intervention or efficient radiotherapy. The disease is now passing into that stage of its history in which the diagnosis is no longer sealed with a forlorn hope, but rather by its early detection opens the possibility of radical or palliative therapy.

Angina Pectoris and Heart Block.—Boas states that of nineteen private patients with aortic stenosis four had classic angina pectoris, illustrating the gradual development of the anginal syndrome with the progress of the aortic narrowing. In the first case the evolution of the symptoms paralleling the advancing valvular lesion is particularly striking. In this case, the necropsy revealed essentially normal coronary arteries. On the basis of the prevalent theory that the anginal syndrome is caused by anoxemia or ischemia of the cardiac muscle, the mechanism in these cases is readily understandable. The blocking of the blood flow to the myocardium takes place at the aortic orifice instead of in the coronary arteries themselves. A casual inspection of some of these valves deformed by calcified nodules reveals how extreme this obstruction can be. Moreover, it impairs the blood supply in the territories of both right and left coronary arteries simultaneously, in contrast to the more localized area of impeded blood flow usually occurring in coronary arteriosclerosis. In the fourth case the anginal syndrome was always more accentuated when, as a result of the appearance of heart block, the heart rate dropped to 40. Because of the narrowed aortic orifice, the heart could not compensate for this slowed rate by increasing the stroke volume, so that relative ischemia of the cardiac muscle occurred. When the aortic orifice is greatly narrowed, rapidly developing heart failure by still further retarding the blood flow through the minute opening may induce an acute myocardial ischemia analogous to that following coronary artery thrombosis and giving rise to identical symptoms. This is illustrated by the sudden death of patients. Angina pectoris has often been noted in patients with aortic insufficiency, and, since all the author's patients had aortic insufficiency as well as stenosis, it might be asserted that it was the incompetence, rather than the narrowing of the valve that was responsible for the cardiac pain. The clinical manifestations of a conduction defect in patients with aortic stenosis, while not as frequent as the anginal syndrome, is not uncommon.

American Journal of Physiology, Baltimore

112 573 728 (Aug) 1935

- Visceropannicular Reflex. D. M. Ashkenaz and E. A. Spiegel, Philadelphia.—p. 573
- Substance in Human Seminal Fluid Affecting Uterine Muscle. Jesse Reed Cockrill, E. G. Miller Jr. and R. Kurzrok. New York.—p. 577
- Comparative Study of Sodium Chloride and Blood Pressure Changes Induced by Adrenal Insufficiency. Trauma and Intraperitoneal Administration of Glucose. W. M. Parkins, A. R. Taylor and W. W. Swingle. Princeton, N. J.—p. 581
- Comparison of Influence of Fasting on Tolerance to Glucose and Galactose. E. M. MacKay, H. C. Bergman and R. H. Barnes. La Jolla, Calif.—p. 591
- Effect of Antidromic Impulse on Response of Motoneuron. R. Lorente de N6. St. Louis.—p. 595
- Determinations of Refractory Periods in Turtle Heart. A. S. Gilson Jr. St. Louis.—p. 610
- Influence of Hyperpnea and of Variations of Oxygen Tension and Carbon Dioxide Tension in Inspired Air on After Images. E. Gelhorn and I. G. Spiesman. Chicago.—p. 620
- Phasic Changes in Coronary Flow Established by Differential Pressure Curves. H. D. Green, D. D. Gregg and C. J. Wiggers, Cleveland.—p. 627
- Peripheral Motor Sympathetic Innervation To and Within the Uterus. S. R. M. Reynolds and S. Kaminester. Brooklyn.—p. 640
- Influence of Progressive Toxic Liver Damage on Dextrose Tolerance Curve. S. Soskin and I. A. Minsky. Chicago.—p. 649
- Lymph Formation During Glandular Activity. Octa C. Leigh. Boston.—p. 657
- Influence of Hyperpnea and of Variations in the Oxygen Tension and Carbon Dioxide Tension in Inspired Air on Nystagmus. E. Gelhorn and I. Spiesman. Chicago.—p. 662
- Influence of Sodium Taurocholate. Hepatic Bile and Gallbladder Bile on Absorption of Oleic Acid from Small Intestine. Cecelia Riegl, K. O. Elsom and I. S. Ravdin. Philadelphia.—p. 669
- Further Studies of Effects of Estrogenic and Galactopoietic Hormones on Mammary Gland of Rabbit. W. U. Gardner. New Haven, Conn.—p. 673
- Study of Comparative Physiology of Glossopharyngeal Nerve. Respiratory Reflex in Rabbit, Cat and Dog. H. A. Teitelbaum and F. A. Ries. Baltimore.—p. 684
- Cooperative Action of Sympathetic Nerve Impulses. Adrenaline and Sympathin on Nictitating Membrane of Cat. A. C. Liu. Boston.—p. 690
- Physical Activity and Blood of Albino Rats. E. C. Schneider and C. B. Crampton. Middletown, Conn.—p. 695
- Carbon Dioxide Content and Combining Power and Hydrogen Ion Concentration of Cervical Lymph. J. W. Heim and Octa C. Leigh, Boston.—p. 699
- Effect of Posture and Prolonged Rest on Cardiac Output and Related Functions. S. A. Gladstone. New York.—p. 705
- Effect of Lactogenic Hormone Preparations on Blood Sugar Level of Rabbits and Monkeys. W. O. Nelson, C. W. Turner and M. D. Overholser. Columbia, Mo.—p. 714

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

34 145 288 (Aug) 1935

- Examination of Mucosal Relief as Diagnostic Aid in Diseases of Gastro-Intestinal Tract. G. W. Holmes and R. Schatzki. Boston.—p. 145
- *Experiment on Effect of Exercise on Heart in Athletes. R. Paterson and Edith Paterson. Toronto.—p. 158
- The Esophagus in Disease of Heart and Aorta. Case Report with Roentgen and Postmortem Findings. J. B. Schwedel and E. B. Gutman. New York.—p. 164
- Acute Influenza Pneumonitis. A. Bowen. Honolulu. T. H.—p. 168
- Initial Lobar Tuberculosis. E. H. Rubin. New York.—p. 175
- Observations on Roentgen Pathology of Ethmoid Labyrinth and Sphenoid Sinuses. D. L. Palmer. Portland, Ore.—p. 181
- Roentgenologic Follow Up of One Hundred and Twenty Five Cases of Peptic Ulcer with Clinical and Laboratory Findings. Roentgen Demonstration of Cases Healed by Medical Treatment, and Those Which Require Surgical Treatment. A. J. Delario. Paterson, N. J.—p. 190
- *Tuberculous Cysts of Knee Joint. A. E. Elliott, San Diego. Calif.—p. 209
- Roentgen Therapy in Hyperplastic Blood Dyscrasia. New Technique for Myeloid and Lymphatic Leukemia. Polycythemia Rubra Vera and Hodgkin's Disease. H. Langer. Pittsburgh.—p. 214
- Role of Roentgen Ray Wavelength in Skin Tolerance. P. C. Hodges. A. Brunschwig and S. P. Perry. Chicago.—p. 234
- Dangers of Roentgenoscopy and Methods of Protection Against Them. VI. Some Studies of Doses Received by Body of the Examiner. E. I. L. Cilley, E. T. Leddy and B. R. Kirklin. Rochester, Minn.—p. 241
- Effect of Exercise on Heart in Athletes.—The Patersons state that a walking marathon race of 31 miles provided an opportunity for making various observations on the response of the heart to exercise. From planimeter measurements of roentgenograms, it was found that the size of the heart decreased after severe exercise in all the subjects observed. This diminution was seen both in the anteroposterior and in the lateral views of the heart and averaged 17.5 per cent in

the former and 125 per cent in the latter. The maximal diminution observed was 30 per cent seen in two cases in the anteroposterior view. This decrease bore no apparent relationship to the increased heart rate, and it persisted after the heart rate had returned to normal. The diminution of the size of the heart, therefore, is not comparable with that which has been shown to occur when the heart is accelerated without physical exertion. The decrease in heart size could not be correlated with the athletic ability of the individuals. No significant changes occurred in the electrocardiograms.

Tuberculous Cysts of Knee Joint—Elliott points out that the diagnosis of tuberculosis of the knee joint is frequently a difficult problem. Even with the history, clinical observations, roentgenograms, tuberculin reaction and guinea-pig tests, a preoperative diagnosis is often impossible. Tuberculosis of the knee joint may be present with entirely negative roentgen signs. On the other hand, all the usual changes characteristic of typical joint tuberculosis may occur in nontuberculous lesions. The diffuse demineralization of the adjacent bone may be present in any inflammatory lesion that involves the synovial membrane and may be as great as that seen in advanced tuberculosis. The marginal erosion described by Fraser, which represents the early invasion of bone at the synovial reflexion, has also been shown by Allison and Ghormley to occur in cases of proliferative arthritis. The subchondral infiltration described by Phemister frequently does not alter the visualized joint margin until late in the disease and even then the roentgen observations may not differ from those of a chronic osteoarthritis of other origin. Invasion and bone destruction of the epiphysis may present changes not distinguishable from syphilis or other infections of the joint. The smooth-walled cysts simulating osteitis fibrosa cystica must also be considered a definite manifestation of joint tuberculosis. The two cases presented show that such tuberculous cysts occur in the knee joint as well as in the hands and feet, as described by Jungling, and in the shoulder and elbow, as described by Van Alstyne and Gowen. However, these cysts are not pathognomonic of tuberculosis and there may be no definite roentgen changes to differentiate them from true osteitis fibrosa cystica. It should be remembered that cysts occurring in the knee joint may be tuberculous in origin, and the discovery of such cysts in a chronic gonitis should indicate an early biopsy to establish the diagnosis.

Anatomical Record, Philadelphia

63:1 100 (Aug 25) 1935

- Morphologic Reaction of Anterior Pituitaries of Mature Female Rats to Prolonged Injections of Pregnancy Urine Extracts J M Wolfe Nashville Tenn.—p 3
- Mechanism of Laryngeal Pitch L H Strong Ann Arbor Mich.—p 13
- Degeneration of Supra Opticohypophyseal System in Diabetes Insipidus C Fisher W R Ingram W K Hare and S W Ranson Chicago—p 29
- Visual Cells of Amphibian Retina in Absence of Epithelial Pigment Layer Myra L Johnson New York—p 53
- Quantitative Cytologic Study of Bone Marrow of Adult Albino Rat J Stasney and G M Higgins Rochester Minn.—p 77
- Occurrence of Cytoplasmic Cell Inclusions in Cervix of Uterus of Rabbit L Loeb and Margaret G Smith St. Louis—p 91
- Sequence of Epiphyseal Union in Skeleton of Mouse with Especial Reference to Phenomenon of 'Lapsed Union' A B Dawson Boston—p 93

Reaction of Anterior Pituitaries of Rats to Injections of Pregnancy Urine Extracts—Wolfe gave twenty mature female rats daily injections of 25 units of pregnancy urine extract for 140 days. At necropsy it was revealed that the weight increases in the pituitaries and the ovaries which such injections induce in short time experiments, had failed to persist in most rats. The weights of these glands had decreased and in some instances had approached the normal or were below normal. The pituitaries which had declined to a normal or an almost normal weight presented a normal relative level of eosinophils which were well packed with granules. In pituitaries in which the weights were still high, these cells were reduced in relative percentage and exhibited loss of granules. There were intermediate variants between these two extremes. The weight and the morphologic changes in the anterior pituitaries were correlated with the weight and the morphologic condition of the

ovaries. Loss of granules and a reduction in their relative percentage was associated with the presence of large corpora lutea in the ovaries. The basophils of all glands were depleted of their granules and their relative percentage remained below the normal level. Injections of pregnancy urine extracts resulted in many mitoses in the chromophobes and a lesser number in the eosinophils. The result was an increase in the total number of cells in the glands. The part played by this factor in increasing the weight of the pituitary is discussed.

Annals of Surgery, Philadelphia

102:321-480 (Sept.) 1935

- Nonoperative Treatment of Peripheral Vascular Diseases M R Reid and L G Herrmann Cincinnati—p 321
- Arterial Spasm in Extremities W J M Scott Rochester N Y—p 331
- Indications for Amputation in Progressive Arterial Obliteration of Lower Extremities L S McKiltrick Boston—p 342
- Relationship of Parathyroid Gland to Calcium Metabolism D P Willard Philadelphia—p 351
- The Ober Operation for Sciatica H W Cave New York—p 357
- *Obstructive Jaundice D P MacGuire, New York—p 360
- Subcutaneous Perforation of Jejunum V S Counseller and C J McCormack Rochester Minn—p 365
- Indications for Gastrostomy and Jejunostomy W H Barber New York—p 375
- Torsion and Volvulus of Stomach with Diaphragmatic Hernia S D Weeder Philadelphia—p 382
- Invisceration R Goldsmith Philadelphia—p 387
- Pneumococcal Peritonitis Analysis of Seven Cases C F Horine Baltimore—p 391
- Penetrating Wounds of Abdomen F J McGowan New York—p 395
- Regional (Terminal) Ileitis H L Bockus and W E Lee Philadelphia—p 412
- *Radium Burns of Rectum V C David Chicago—p 422
- Thermal Burns J Gunn and J A Hillsman Winnipeg, Manito—p 429
- Bleeding Volume in Severe Burns H N Harkins Chicago—p 444
- Pilonidal Cysts and Sinuses L Breidenbach and H L Wilson New York—p 455

Obstructive Jaundice—MacGuire states that to improve the clotting time in obstructive jaundice transfusions of whole blood and dextrose solutions should be administered. A 10 per cent solution of calcium chloride and ampules of calcium agglutinate are also useful since they increase the blood calcium. Chloride deficiency is improved by the introduction of physiologic solutions of sodium chloride and diluted hydrochloric acid solutions by mouth. One drachm (4 cc.) should be given daily in divided doses gradually increasing the amount. Insulin should be administered in cases showing increased blood sugar. The diet consists of various fruit juices and cereals, unless contradicted by some special complication. These patients suffer a fall of body temperature during the operative procedures. This has to be counteracted by using hot laparotomy pads, short exposures and a warm operating room. The loss of fluids, caused by the drainage, must be counterbalanced by the introduction of dextrose and saline fluid. After the first seventy-two hours the drainage tube may be clamped for a certain time each hour in cases in which it is possible to do so. The time factor is one of the most serious considerations because, at best, the patients are poor surgical risks. It is essential to make sure that the drainage tubes, buttons for anastomosis, and syringes are in perfect condition before operating.

Radium Burns of Rectum—David points out that two gross types of reaction to radium irradiation are seen in the rectum: hyperemia and actual necrosis or ulcer formation. Hyperemia, which is practically always observed after any considerable irradiation of the rectum, usually develops in from ten days to two weeks and increases in intensity up to from three to six weeks at which time it slowly recedes. Ulceration or third degree burns may be diffuse or local in which event a persistent indolent ulcer replaces the neoplastic ulcer that was irradiated. Owing to connective tissue contraction, radiating lines of constriction are seen in the mucous membrane surrounding the ulcer, and the mucosa appears smooth and atrophic, without its usual delicate folds. In four of the author's patients the ulcer was over the prostate at the former site of the carcinoma and was firmly adherent to the prostate and immobile. Histologically, the picture was typical of ulcers following irradiation in any part of the body. For purposes of discussion he selected eight cases presenting marked radium burns. In six of them the burns resulted from treatment of carcinoma of the

rectum and in two from treatment of hypertrophy of the prostate and leukoplakia of the rectum, respectively, by the local application of radium. Of the six radium burns following treatment of carcinoma there was suggestive gross evidence of carcinoma in two. In the other four patients the lesion was a flat ulcer with marked scar tissue contraction about it and had no characteristics of a carcinomatous ulcer. When these six radium burn ulcers were examined histologically, three showed definite evidence of carcinoma in the depth of the ulcer under the necrotic exudate, and in two degenerated cells were found in the base of the ulcer, which were histologically suggestive of carcinoma. In the sixth patient, who had a destructive adenoma removed and radium needles planted into the rectum at its base, the resulting burn was not in any way typical of carcinoma and repeated biopsies over a period of five years showed no tumor cells. This patient died of pneumonia and no postmortem examination was obtained. In the five patients having radical removal of the rectum a careful dissection of the specimens for involved lymph nodes showed positive changes in one instance. Pathologically, in these six patients, three showed definite evidence of carcinoma, two probable evidence and one no evidence of tumor cells in the burned area. Clinically, only the one patient with the small burn following irradiation of the destructive adenoma was only moderately uncomfortable. The remaining seven patients were practically incapacitated. The radical removal of the rectum was made very difficult because of loss of the normal cleavage planes by reason of extensive fibrosis and dense adherence of the radium burn to the prostate in three patients, in whom it was necessary to remove the posterior one fifth to one third of the prostate by knife excision to remove the necrotic area of the burn entirely. In the patient with extensive burn following treatment of prostatic hypertrophy, the rectum was split open posteriorly after removal of the coccyx and the burn was thoroughly excised and the adjacent mucosa mobilized to cover the defect as much as possible. All the patients recovered from the operation. One has since died of carcinoma, having local as well as general recurrences. The remaining six are well and free from recurrence, from one to two and one-half years following the operation. It seems evident that, when carcinoma of the rectum is treated by radium and a burn results, carcinoma may still be present in the base of the burn or in the lymphatic nodes and radical removal of the rectum is indicated. If a radium burn in the rectum results from treatment of other lesions, local removal of the burn is the treatment of choice, as applies in radiation burns elsewhere in the body.

Archives of Otolaryngology, Chicago

22: 277-402 (Sept.) 1935

- *Clinical Cases in Which Vertigo Is a Cardinal Symptom J B McMurray Washington Pa.—p 277
- Facial Paralysis O P Bourbon Los Angeles.—p 285
- Faulty Surgical Instruments as Cause of Foreign Body C Jackson and C L Jackson Philadelphia.—p 293
- Correction of Saddle Nose G D Wolf New York.—p 304
- Absorption from Middle Ear E L Ross and R W Rawson Chicago.—p 312
- Tracheotomy for Relief of Laryngeal Obstruction in Children H E Kully Omaha.—p 317

Vertigo as a Cardinal Symptom—McMurray points out that vertigo is not an otologic problem except when it occurs as a complication in cases of acute or chronic suppurative otitis media. The aurist can be of aid in determining the cause of the vertigo, but not more than the ophthalmologist. In many cases of intermittent vertigo of a severe type the hearing and labyrinths are normal so far as can be determined by the present methods of examination. It is possible that the lesion is located somewhere along the labyrinthine pathway on the way either to or from the cerebral cortex. Whether the exciting cause is a disturbance of water metabolism, as suggested by Kopetzky and Dederding, the sensitivity of the nucleus, vestibular nerve or labyrinth itself to sodium, as suggested by Furstenberg, Lashmet and Lathrop, or to toxins from a distant focus or protein sensitization cannot at present be determined. All patients with true vertigo should be thoroughly examined and all possible foci of infection eliminated, as there is sufficient evidence to warrant the conclusion that infection may be the etiologic

factor. In cases of Ménière's symptom complex, if the side of the offending lesion cannot be definitely determined, section of the vestibular nerve does not promise brilliant results.

Archives of Pathology, Chicago

20 337 506 (Sept.) 1935

- Effect of Iodine on Cholesterol Induced Atherosclerosis Dorothy R. Mecker H D Keaten and J W Jobling New York.—p 337
- *Experiments Relative to Vaccination Against Tuberculosis with Calmette Guérin Bacillus (BCG) B J Clawson Minneapolis.—p 343
- Acute Ulcerative Esophagitis Pathologic and Clinical Study of Eighty Two Cases Observed at Necropsy E C Bartels Boston.—p 369
- Lymphomatosis in Relation to Fowl Paralysis J Furth with assistance of C Breedis New York.—p 379

Vaccination Against Tuberculosis with Calmette-Guérin Bacillus—Clawson discusses experiments concerned with immune reactions to determine the safest method of using the Calmette Guérin bacillus in developing resistance to bovine and human tuberculosis. The BCG vaccine was administered as living organisms subcutaneously and intravenously and as heat-killed organisms in the same way. The vaccine so administered was studied in respect to safety and to resistance. No mechanical injuries were observed from vaccinating many animals by each of the four methods. No toxic results, either immediate or delayed, were noted in the normal animals after vaccination. With large doses given intravenously to animals already allergic, extreme collapse and death took place within twenty-four hours, but ordinary doses were not accompanied by toxic effects in the allergic animals. Subcutaneous injections of the vaccine into allergic animals had no ill effects. In allergic animals vaccinated with relatively small doses intravenously, small, nonprogressive tubercles frequently developed in the lungs, liver and spleen. It would seem that vaccination of persons should be limited to those not having a positive reaction to the cutaneous tuberculin test. The frequency and degree of allergy were greater after vaccination by methods in which the living organisms were injected, but even by these methods allergy did not develop in all animals. A relatively small amount of allergy was produced in the animals given subcutaneous injections of heat-killed organisms. No animals vaccinated intravenously with heat-killed organisms became allergic. Severe allergy following vaccination disappeared in about three months. This disappearance of allergy was probably more rapid than in persons in whom allergy is so frequently due to arrested active lesions. But it seems probable that any allergy, especially of the smaller degrees, which develops in the course of vaccination with BCG should not be looked on as a serious handicap. Allergy in association with vaccination and probably with the development of a tubercle has been found to appear in from one to three weeks. If allergy had not appeared in three weeks after the last injection of the vaccine, it was found that it would not occur. Allergy definitely tended to disappear before resistance. The experiments seemed to show that there is no proportionate or necessary relation between allergy and the immune bodies, agglutinins, complement fixing antibodies, opsonins and lysins. In this respect, allergy in tuberculosis seems to differ from the Arthus phenomenon. A high antibody content could be developed in animals without allergy, on the other hand, a high degree of allergy could occur without measurable antibodies. Allergic animals were desensitized so that they failed to give a positive Mantoux reaction, and in the process of desensitization the number of antibodies was greatly increased. Allergy never occurred in animals in which lesions could not be found. Only living organisms injected intravenously produced small, nonprogressive tubercles in the lungs, liver and spleen. As far as safety in the process of vaccination with BCG is concerned all methods are safe except the injection of the living organisms intravenously. Evidence of resistance due to vaccination against the virulent bovine strain of the tubercle bacillus in rabbits and against the virulent human strain in guinea-pigs was shown (1) by a correlated increase in the titers of agglutinins, complement fixing antibodies, opsonins and lysins and (2) by actually preventing or greatly retarding the development of tuberculosis in rabbits and in guinea-pigs after inoculations with virulent strains of tubercle bacilli.

Illinois Medical Journal, Chicago

08: 97 196 (Aug.) 1935

- Role of Surgery in Diseases of Thyroid M Nordland Minneapolis—
p 117
Reconstruction of the Hip F G Dyas Chicago—p 124
Intermittent Gastric Obstruction Following Cholecystectomy C U
Collins, Peoria—p 127
Primary Urethral Calculi Report of Case with Resection of Urethra
N J Heckel and R E Johannesen Chicago—p 130
Herpes Zoster F G Norbury Jacksonville—p 134
Removal of Superfluous Hair by Multiple Electrolysis W A Rosen
berg, Chicago—p 138
Observations on the Public Health Outlook F J Jurka Springfield
—p 140
Roentgenology of the Alimentary Tract M J Hubeny, Chicago—
p 143
Backache in Women S J Lang Evanston—p 147
Muscular Asthenopia. R H Woods La Salle—p 150
Eye and Ear Reflexes Caused by Dental Pathology J Shanks Chicago
—p 152
Symptoms and Diagnosis of Coronary Occlusion J G Carr Evanston
—p 155
Causes of Acute Dilatation of Stomach D Klempner, Chicago—
p 159
Service Program of American Legion P G Armstrong, Chicago—
p 163
Cardiac Review of 1934 N Flaxman Chicago—p 165
Why Mosquitoes Carry Typhoid J H Beard and J R Cain Urbana
—p 177
Stumbling Blocks in Infant Care S J Wilkinson Decatur—p 182
Gastric Secretion in Biliary Tract Disease F Steigmann Chicago—
p 186
Veterans Medical Legislation as It Affects the Medical Profession
E. H. Cary, Dallas Texas—p 189

Journal of Clinical Investigation, New York

14: 505 724 (Sept.) 1935

- *Streptococcal Agglutinins and Antistreptolysins in Rheumatoid (Atro-
phic) Arthritis. J E Blair and Frances A Hallman, New York—
p 505
Sulphur Metabolism in Cystinuria J C Andrews and A Randall
Philadelphia—p 517
Observations on Sodium Chloride Restriction and Urea Clearance in
Renal Insufficiency E M Landis K A Elsom P A Bott and
E. Shiels Philadelphia—p 525
Vital Capacity of Lungs Changes Occurring in Health and Disease
J H Arnett Philadelphia—p 543
Studies on Mechanism of Increased Oxygen Consumption in Patients
with Cardiac Disease H Resnik Jr and B Friedman, Nashville
Tenn—p 551
Studies of Kidney Function in Children I Urea Clearance Values
(1) No Evidence of Kidney Disease (2) After Acute Hematuric
Nephritis Following an Acute Infection (3) in Acute Stage of Hema-
turic Nephritis G E. Cullen W E Nelson and F E Holmes
Cincinnati—p 563
Kidney Function During Normal Pregnancy I Increased Urea Clear-
ance of Normal Pregnancy Margaret Nice, Cleveland—p 575
Serum Lipids in Diabetes Evelyn B Man and J P Peters New
Haven Conn—p 579
Specific Dynamic Action of Carbohydrate and of Protein in Human
Hypothyroidism After Total Ablation of Normal Thyroid Gland
M Landowne, Boston—p 595
Influence of Varying As Vs Intervals on Split First Heart Sounds
Its Bearing on Cause of Split Sounds and Mechanism of First Sound.
C. C. Wolferth and A Margolies Philadelphia—p 605
Comparative Calorigenic Action of Normal and Pathologic Thyroid
Glands Administered in Equi Thyroxine Doses W W Palmer and
J P Leland New York—p 619
Clinical Observations on Events Preceding Appearance of Rheumatic
Fever E. F. Bland and T D Jones Boston—p 633
Further Observations on Leukocytic Response Induced by Intramuscular
Injection of Liver Extract J H Powers with assistance of Cynthia
Van Doren Cooperstown N Y—p 649
Relationship Between Insensible Water Loss and Heat Production in
Patients with Hypothyroidism Compared with Normal Subjects D R
Gilligan and G Edsall Boston—p 659
Response of Guinea Pig's Reticulocytes to Substances Effective in Per-
nicious Anemia Biologic Assay of Therapeutic Potency of Liver
Extracts B M Jacobson Boston—p 665
Assay on Guinea Pigs of Hematopoietic Activity of Human Livers
Normal and Pernicious Anemia B M Jacobson Boston—p 679
Heterophile Antibodies in Pneumonia M Finland J M Rueggesser
and L D Felton Boston—p 683
Metabolic Effects of Human Thyroglobulin and Its Proteolytic Cleavage
Products W T Salter and J Lerman Boston—p 691

Streptococcus Agglutinins and Antistreptolysins in Rheumatoid Arthritis—Blair and Hallman demonstrated agglutinins for hemolytic streptococci in high titer in the serums of a majority of patients (85 per cent) with rheumatoid arthritis. Agglutination of hemolytic streptococci in high titer by a large percentage of serums was not obtained in other chronic arthritides. No correlation was found between the agglutination titer and the age of the patient duration of the disease

number of joints involved or sedimentation rate in cases of rheumatoid arthritis. Antistreptolysin was present in titers above the normal range in the serums of patients with proved infections by hemolytic streptococci and with acute rheumatic fever. There was a tendency for the antistreptolysin titer to return to within the normal range some time after convalescence. Antistreptolysin in titers definitely above normal were found in about one third of the serums from patients with rheumatoid arthritis. With one exception, these high titers accompanied high agglutination titers. The presence of agglutinins for hemolytic streptococci in serums from patients with rheumatoid arthritis is suggestive of an association of these organisms with this disease. Additional suggestive evidence may be offered by the presence of antistreptolysin, when it is found in titers above normal.

Action of Carbohydrate and Protein in Hypothyroidism Following Ablation of Thyroid—Landowne studied the specific dynamic action after the ingestion of from 70 to 95 Gm of carbohydrate in eleven instances on nine patients, at times varying from two to twenty-one months after total thyroidectomy. The average basal metabolic rate at the time of the eleven tests was minus 30.5 per cent. The oxygen consumption increased in each instance after the carbohydrate meal the increase lasting from two to four hours. The average of the maximal increases over the basal oxygen requirements was 16 cc of oxygen per minute, or 101 per cent, and the average total increase was 1,400 cc per minute, or 44 per cent, for the average duration of the experiments (three and a third hours). These results are interpreted as demonstrating the presence of specific dynamic action of hexose in human hypothyroidism following total ablation of the normal thyroid. Although this specific dynamic action appears in percentage to be approximately equal to, it is, on an absolute basis, somewhat less than the average of figures for normals taken from the literature. The specific dynamic action after the ingestion of from 54 to 102 Gm of protein was studied in five instances on four patients, at times varying from four to twelve months after total thyroidectomy. The average basal metabolic rate at the time of the five tests was minus 28.6 per cent. The oxygen consumption increased in each instance after the protein meal the increase lasting at least from six to seven hours. The average maximal increase was 29 cc per minute (20 per cent of the basal oxygen requirement) and the total increase over the observed period (from six to seven hours) was 10,570 cc (16.6 per cent of the basal oxygen requirement), or 14,000 cc per hundred grams of protein. These results are interpreted as indicating the presence of a specific dynamic action of protein in the totally thyroidectomized hypothyroid human subject. The extent of the specific dynamic action is within the range of normal as compared with values found in the literature.

Journal of Experimental Medicine, New York

62: 289 456 (Sept 1) 1935

- Antigenic Relationship Between *Bacillus Proteus* \ 19 and *Rickettsiae*
III Study of Antigenic Composition of Extracts of *Bacillus Proteus*
\ 19 M Ruiz Castaneda Boston—p 289
Modified Method of Obtaining Large Amounts of *Rickettsia prowazekii*
by Roentgen Irradiation of Rats A Macchiavelli and R Dresser
Boston—p 297
Rabbit Pox IV Susceptibility as Function of Constitutional Factors
H S N Greene New York—p 305
Id. Report of an Epidemic P D Rosahn and Chuan K uai Hu New
York—p 331
Immunologic and Chemical Investigations of Vaccine Virus II Chemi-
cal Analysis of Elementary Bodies of *Vaccinia* T P Hughes R F
Parker and T M Rivers New York—p 349
Bartonella Bodies in Blood of Nonsplenectomized Dog J B McNaught
F M Woods and V Scott Rochester N Y—p 353
Protective Action of Type I *Antipneumococcus* Serum in Mice
I Quantitative Aspects of Mouse Protection Test A Goodner and
F L Horsfall Jr New York—p 359
Id. II Course of Infectious Process K Goodner and D A Miller
New York—p 375
Id. III Significance of Certain Host Factors K Goodner and
D K Miller New York—p 393
An Apparatus for Culture of Whole Organs C A Lindbergh New
York—p 409
Rift Valley Fever Report of Three Cases of Laboratory Infection and
Experimental Transmission of Disease to Ferrets T Francis Jr
and T P Magill New York—p 433
Interstitial Bronchopneumonia II Production of Interstitial Mononu-
clear Pneumonia by Bordet-Gengou *Bacillus* D H Sprunt, D S
Martin and J E William Durham England—p 449

Journal of Urology, Baltimore

34: 93 192 (Aug.) 1935

- Paraghioma of the Suprarenal Gland C. M. McKenna and L. E. Hines Chicago—p 93
- Retroperitoneal Cyst Arising in Persistent Metanephros with Congenital Absence of Right Kidney and Ureter L. W. Krauss and R. Straus, Cleveland—p 97
- Squamous Cell Carcinoma Leukoplakia and Concretions of Megalo-Ureter F. M. Cochems and T. P. Grauer Chicago—p 106
- Simple Chronic Ulcers of Urinary Bladder Report of Unusual Case J. A. Lazarus New York—p 111
- Radical Perineal Prostatectomy for Carcinoma H. C. Rolnick, Chicago—p 116
- Leiomyoma of the Epididymis Report of Case and Review of Literature A. H. Spivack New York—p 122
- Primary Carcinoma of Cowper's Gland Report of Case with Review of Literature C. A. W. Uhle and G. F. Archer Philadelphia—p 128
- Rationale of Epididymovasectomy in Genital Tuberculosis H. E. Campbell Foochow, Fukien China—p 134
- Osteomyelitis Secondary to Infections of Genito Urinary Tract Report of Three Cases H. L. Kretschmer and E. A. Ockuly, Chicago—p 142
- Racial Incidence of Urolithiasis E. F. Reaser, Huntington, W. Va.—p 148
- Studies of Rat's Genito-Urinary Tract Quantitative Measurements of Intravesical Volume and Pressure and of Urethral Outflow W. H. Schultz Baltimore—p 156
- Impotence and Frigidity from Standpoint of Psychoanalysis K. A. Menninger Topeka Kan—p 166
- New Device to Facilitate Drainage After Endoscopic Electric Revision A. C. Drummond, New York—p 184
- Ureteral Stone Extractor C. Ferguson Ellis Island N. Y.—p 189
- Self Locking Cystoscopic Stone or Foreign Body Forceps with Detachable Handle. I. Simons New York—p 190

34: 193 288 (Sept.) 1935

- Fibromyxoneurosarcoma of Kidney in Adult J. S. Eisenstaedt Chicago—p 193
- The Cystic Kidney J. F. Geisinger Richmond Va.—p 202
- Tuberculous Meningitis Following Nephrectomy for Tuberculosis Case Report with Review of Literature. J. H. Turner Houston Texas—p 216
- *Ureteropyeloneostomy for Hydronephrosis New Operative Technique Preliminary Report S. Lubash New York—p 222
- Neopraphenamine in So Called Sterile Pyuria W. T. Briggs, Lexington Ky—p 230
- Air Injections to Demonstrate Adrenals by X-Ray G. F. Cahill New York—p 238
- Primary Tumor of Female Urethra with Metastasis to Each Ureter E. C. Shaw, Miami Fla.—p 244
- Congenital Valvular Obstruction of Posterior Urethra H. E. Landes and R. Rall Chicago—p 254
- Congenital Valves of Posterior Urethra V. S. Counsellor and J. G. Menville, Rochester Minn.—p 268
- Further Report on Cure of Hypospadias and Epispadias A. B. Cecil Los Angeles—p 278
- Observations on Emptying of Vasa Deferentia and Seminal Vesicles S. F. Wilhelm New York—p 284

Ureteropyeloneostomy for Hydronephrosis—In performing Lubash's ureteropyeloneostomy, the ureter is removed from its original site as near its insertion to the pelvis as possible, as the strictured area is utilized in its reimplantation. From this point on, the ureteropyeloneostomy of Kuster is carried out. The difference lies in the method of anastomosis. The ureter is incised downward on its anterior and posterior surface for a distance of 2 or 2.5 cm. and, after its insertion into its new mouth at the most dependent portion of the renal pelvis, the straps of the ureter are drawn outward laterally from the pelvis through two very small stab wounds on either side of the new neostomy opening and a mattress suture is employed to fix them in position. The knots are placed outside the renal pelvis. From this point on, Papin's method of trans-renal drainage and resection of the redundant pelvis is carried out. Both the Garceau catheter that splints the new anastomosis and the Pezzer catheter that drains the kidney are brought out through the same nephrostomy wound. Nephropexy is employed if the kidney is mobilized. The author believes that the new features that he has added will help overcome some of the former handicaps of the operation, by reason of the following deductions: (1) there is little or no tension at the new point of anastomosis, (2) the true diameter of the ureteral orifice remains intact, as no sutures through its edges serve to cause shrinkage from scar tissue formation, (3) the two strap-like projections are brought outside the newly established pelvis, preventing any possibility of obstructing valvelike formation and (4) at the same time reducing tension from the point of anastomosis, and (5) no puckering or buckling can occur.

Laryngoscope, St. Louis

45 657 740 (Sept.) 1935

- Investigation on Bone Conduction in the Animal and in the Human H. Kobrak, J. R. Lindsay and H. B. Perlman Chicago—p 657
- *Acute Suppurative Disease of Petrous Pyramid Report of Case with New Operative Approach S. S. Quittner Cleveland and S. W. Gross New York—p 670
- Otitic Meningitis Pseudo Brain Abscess M. Rabbiner, Brooklyn—p 676
- Etiology of Retrobulbar Neuritis J. H. Dunnington New York—p 685
- Present Status of Submucous and Turbinate Operation W. M. Hunt, New York—p 692
- Polyps of Nasal Septum Report of Two Cases R. D. Russell Chicago—p 698
- Observation on Treatment of Osteomyelitis of Skull Report of Case. C. H. Smith New York—p 703
- Cribiform Plate (Olfactory Groove) Meningiomas and Their Early Diagnosis C. A. Elsberg New York—p 712
- Immediate Transplantation of Bone Cartilage and Soft Tissues in Accident Cases W. W. Carter, New York—p 730

Acute Suppurative Disease of Petrous Pyramid—Quittner and Gross believe that the problem of the treatment of otitic meningitis and other intracranial complications lies mainly in their prevention. This implies the early recognition of impending intracranial disease and the institution of measures to prevent further advance of the process. The line of attack must follow the path of infection into the intracranial cavity and this can usually be suspected from the history of the development of the symptoms and a knowledge of the existing pathologic changes. In the case reported the persistence of an elevation of temperature and the leukocytosis following a mastoidectomy indicated the continuance of an infective process. The deep facial pain pointed to the petrous pyramid as the most probable location of the lesion. Deep seated homolateral facial pain, often referred to the temporal region and forward around the eye, is often the first symptom of an infection of the petrous pyramid and may exist without external rectus palsy. This early evidence of localized meningeal reaction may be manifested by an increase of cells in the spinal fluid and an increase in the spinal fluid pressure. The removal of the extradural septic focus and the institution of proper drainage at this time may prevent the development of a frank bacterial meningitis. Clinical signs of meningitis may be lacking even when many cells and organisms are found in the cerebrospinal fluid. This condition prevailed in the case reported, since at the time of the first puncture 8,000 cells and many organisms were found, yet none of the usual clinical signs of meningitis were present. It is highly probable that, had a spinal puncture been done earlier in the preoperative course, the fluid would have yielded an increase in cells without organisms. The optimal time for operative intervention is when meningeal irritation exists without an actual bacterial meningitis. The approach to the petrous pyramid described by the authors proved to afford a satisfactory exposure and adequate drainage. The lesson to be learned from the case reported is the importance of doing a lumbar puncture early when an intracranial complication is suspected following middle ear disease. When a needle of small caliber is used and only enough fluid is removed for the required examinations, the procedure is practically without danger. To delay a lumbar puncture until signs of a frank meningitis develop is to lose valuable time during which an overwhelming invasion of the meninges may occur.

Maine Medical Journal, Portland

26 123 134 (Aug.) 1935

- Discussion of Modern Treatment of Pelvic Inflammation H. M. Goodwin Bangor—p 128

Medical Annals of District of Columbia, Washington

4 209 230 (Aug.) 1935

- Artificial Pneumothorax Its Place in Treatment of Pulmonary Tuberculosis C. P. Cake Washington—p 209
- Treatment of Secondary Anemia S. O. Foster Washington—p 213
- Mycotic Diseases of the Ear Ella M. A. Enlows Washington—p 217
- Hemangioma of the Ovary Report of Case in Child Three and One Half Years of Age. J. P. Shearer Washington—p 223
- Statistical Study of Acute Appendicitis in Washington Hospitals in 1928 and 1933 P. S. Putzki Washington—p 225

Missouri State Medical Assn Journal, St. Louis

32: 351-386 (Sept.) 1935

- Use of Meeholyl in Arthritis O Abel Jr, St. Louis—p 351
Quinidine Sulphate Its Action and Uses P T Bohan, Kansas City—p 353
*Heart Disease in Children H M Gilkey Kansas City—p 356
Relationship of Late Menstruation to Carcinoma of Corpus Uteri R J Crossen and J E Hobbs, St. Louis—p 361
Urinary Incontinence. D K Rose, St. Louis—p 363
Minimal Visual Requirements for Safe Automobile Driving R E Mason St. Louis—p 367
Chronic Appendicitis Diagnosis and Treatment. W H Cole, St. Louis—p 369
Ovarian Therapy in Nose and Throat Surgery E S Connell Kansas City—p 372
Cholecystitis Tetraiodophenolphthalein in Treatment of Certain Selected Cases J S Young St. Louis—p 374

Heart Disease in Children.—Gilkey believes that it may be possible through familial incidence to ascertain what children are most susceptible to cardiac disease and to institute a few preventive measures at an early age and thus possibly obtain better results. The common cold is of great importance (especially during the winter months) and may be the cause of a reactivation with a fatal outcome. Possible danger of colds, sore throats and other infections should be explained and reiterated to the patient. Although there is no positive proof that the routine removal of tonsils prevents primary manifestations or minimizes reactivations of rheumatic fever, the author believes that a clear throat will predispose less to infection of the upper respiratory tract. A careful study of the sinuses is still justified in the type of child included in this study. Tonsillectomy is an important factor in preventing endocarditis. The mortality rate is nearly 50 per cent less in children whose tonsils had been removed before the initial attack. The valve or number of valves involved in rheumatic heart disease has little to do with prognosis as compared to the virulence of the infection, the resistance of the host and the number of reactivations. The average time of manifestation is ten years. Familial incidence is as great as in tuberculosis. The use of intravenous preparations of hemolytic streptococci with the hope of lessening hypersensitivity is still in the experimental stage but offers some hope. Complement fixation may be used as a measure of the antibody content of serum of the patient but is not as reliable as the skin tests to indicate sensitivity.

Nebraska State Medical Journal, Lincoln

20: 321-360 (Sept.) 1935

- Medical Organization or Political Control O J Fay, Des Moines Iowa—p 321
Transurethral Resection of Prostate with Especial Reference to Follow Up A D Munger and E. E. Angle Lincoln—p 326
Early Diagnosis of Syphilis O J Cameron Omaha—p 331
Modern Management of Cases of Peritonitis H H Everett and R H Whitham Lincoln—p 334
Clinical Work at Nebraska Orthopedic Hospital H W Orr Lincoln—p 339
Schiller Test for Cancer of Cervix E C Sage Omaha—p 344
Recent Developments Concerning Tumors of Breast with Especial Reference to Transillumination H H Davis Omaha—p 345
Tumors of Testicle with Particular Reference to Aschheim Zondek Test. F C Hill Omaha—p 346

New England Journal of Medicine, Boston

213 385-446 (Aug 29) 1935

- Herniation or Rupture of Intervertebral Disk into Spinal Canal Report of Thirty Four Cases W J Muxter and J B Ayer Boston—p 385
Syndrome of Anemia Glossitis and Dysphagia Report of Cases W B Hoover Boston—p 394
Epidemic Benign Myalgia of Neck. B F Massell and P Solomon Boston—p 399
Coexisting Intra Uterine and Extra Uterine Pregnancy H H Faxon Boston—p 401
Coronary Occlusion in Community Practice D Halberstam Boston—p 403
Jacob Bigelow M.D. LL.D. C. E. Stellhorn Brooklyn—p 405
Irradiation Treatment of Tumors Late European Developments C. F. Ball Rutland Vt—p 407
How Grievances Are Dealt With Under English Health Insurance Scheme. G F McCleary New York—p 412
Paralytic Treatment Other Than Respiratory Important Rules in After-Care of Poliomyelitis A T Legg Boston—p 415

Public Health Reports, Washington, D C

50: 1125-1164 (Aug 23) 1935

- Sickness Among Male Industrial Employees During First Three Months of 1935 D K Brundage—p 1125
Study of Four Hundred and Fifty Fatal Cases of Heart Disease Occurring in Washington (D C) Hospitals During 1932 with Especial Reference to Etiology Race and Sex O F Hedley—p 1127

Southern Medical Journal, Birmingham, Ala

28 773-866 (Sept.) 1935

- Vascular Changes in Glomeruli of Kidney and Effect on Other Structures of Nephron L. A. Turley and Wilma J Green, Oklahoma City—p 773
Chronic Subdural Hematoma C C Nash Dallas, Texas—p 779
Anatomy of Prostate and Vesical Neck R E. Van Duzen, Dallas, Texas—p 785
Prolonged Intense Heat in Treatment of Pelvic Infections G A Williams Atlanta Ga—p 791
*Trichomonas Vaginalis and Monilia Albicans as Causes of Leukorrhea K J Karnaky Houston Texas—p 795
*Value of Hyperpyrexia in Treatment of Bronchial Asthma K Phillips and S Shikany Miami, Fla.—p 801
Use of Roentgen Ray in Infections R E Myers Oklahoma City—p 814
End Results of Leg Lengthening G B Stephenson and H A Durham Shreveport La—p 818
Pterygium Operation J O McReynolds Dallas Texas—p 823
Technic and Uses of Suspension Laryngoscopy F E LeJeune, New Orleans—p 828
Management of Blood Stream Infection Following Mastoiditis Illustrated with Lantern Slides E G Gill Roanoke, Va—p 830
Newer Knowledge of Vitamins J H Musser, New Orleans—p 834
Chemistry of Vitamins J C Forbes Richmond Va.—p 839
Some Clinical Aspects of Dietary Deficiencies J B Youmans, Nashville Tenn—p 843
The Colon Consideration of Its Important Diseases and Disordered Functions L C Sanders Memphis, Tenn.—p 848
Constipation and Bowel Training F H Lancaster, Houston, Texas—p 851
The Importance of the Private Physician in Public Health Program J A Milne Jackson Miss—p 855

Trichomonas Vaginalis, Monilia Albicans and Leukorrhea.—Karnaky speaks of two common causes of a discharge and a vaginitis. *Trichomonas vaginalis*, a protozoan, and *Monilia albicans*, a fungus. They are often overlooked because a fresh smear is seldom examined in patients complaining of a discharge. Also, few technicians are told to look for these organisms and few are able to recognize them. *Trichomonas vaginalis* is capable of causing a malodorous discharge. Usually in *Monilia* infections spots are seen in the vagina of gynecologic and flakes in that of obstetric patients. In the differential diagnosis of *Trichomonas vaginalis* the discharge increases after the menses and persists despite most methods of treatment, there is constant leukorrhea in most cases, itching around the vulva is common the discharge scalds or burns the thighs whenever it comes in contact with them and local application of gentian violet alone will not clear the infection, the parasite is seen in pregnancy as well as in nonpregnancy, is diagnosed by examining a fresh smear, is not so often seen in stained smears produces a malodorous discharge, is a protozoan and causes itching right after menses and more often during the day. In *Monilia albicans* the discharge increases before the menses and is easily treated, there is a remission in the production of the discharge, itching around the vulva is not so common the discharge apparently does not burn or scald the thighs, gentian violet clears the infection almost instantaneously the parasite is seen most commonly during pregnancy and is not so common in gynecologic patients, is diagnosed by a fresh smear, is seen best in stained smears, apparently does not produce a malodorous discharge is a fungus and causes itching at most any time and more so at night. The dry method of treatment with corn starch is given. It is concluded that a 2 per cent solution of ethyl alcohol gentian violet or a 5 to 7 per cent aqueous solution of gentian violet is better for the treatment of *Monilia albicans*. The male is apparently a source of infection and reinfection. *Trichomonas vaginalis* is a common cause of postoperative leukorrhea. *Trichomonas vaginalis* is recognized as a pathogenic organism.

Hyperpyrexia in Treatment of Bronchial Asthma.—Phillips and Shikany studied the value of hyperpyrexia in fifty cases of bronchial asthma. Practically all other therapeutic factors were eliminated. Clinical biochemical and laboratory

studies were carried out on all patients in order to determine the physiologic and biochemical changes associated with the treatment. Attention has been called to the clinical and laboratory data which indicate a lowered general metabolism in asthma. Improvement followed fever treatments and the clinical results indicate that 82 per cent received definite benefit. Biochemical and laboratory studies, however, indicate that more than 40 per cent of these were possibly only temporarily relieved. At present, after an observation period of six months, 32 per cent seem to have obtained lasting relief. The author believes that ten treatments should be the minimum of a course. It would appear that from twelve to fifteen are possibly still better, but apparently there is no improvement beyond this number. Two treatments a week are preferable. Temperatures maintained above 105 F rectally have no advantage over those ranging from 102 to 105 F. Temperatures sustained for four hours produce results comparable to those extending over longer periods.

Surgery, Gynecology and Obstetrics, Chicago

61:289-432 (Sept.) 1935

- Primary Malignant Tumors of Ovary W T Murphy Buffalo—p 289
Hypoplasia of Kidney R H Herbst and C W Apfelbach Chicago—p 306
Generalized Hypertrophic Pulmonary Osteo-Arthropathy Experimental and Clinical Study Report of Two Cases E L Compere W E Adams and C L Compere Chicago—p 312
Pregnancy Complicating Diabetes Priscilla White Boston—p 324
Compound Colored Alcoholic Solution of Mercuric Chloride for Skin Disinfection J A Vaichulis and L Arnold Chicago—p 333
*Early Diagnosis of Chorionepithelioma A Mathieu Portland Ore., and A. Palmer San Francisco—p 336
*Hyperostosis Frontalis Interna Preliminary Study S Moore St Louis—p 345
Lymphatic Connection Between Gallbladder and Liver R W Bartlett G Crile Jr and E A Graham St Louis—p 363
Reconstruction of Female Urethra S H Harris Sydney Australia—p 366
Pulmonary Embolism Following Trauma J S McCartney Minneapolis—p 369
Treatment of Atonic Bladder W F Braasch and G J Thompson Rochester Minn—p 379
*Traumatic Ossifying Periostitis of the New Born S T Snedecor R E Knapp and H B Wilson Hackensack N J—p 385
Constructive Critical Analysis of Maxillary Sinus Surgery E T Ziegelman San Francisco—p 388
Trigeminal Neuralgia Experiences with and Treatment Employed in Four Hundred and Sixty Eight Patients During the Last Ten Years G Horrax and J L Poppen Boston—p 394
End Results with Watkins Interposition Operation H S Everett Baltimore—p 403

Early Diagnosis of Chorionepithelioma—Mathieu and Palmer report the early diagnosis in a case of chorionepithelioma, in which following the curettage for the removal of hydatid material the patient was absolutely free from symptoms. There was no more bleeding, her blood count increased, the uterus and pelvic contents were normal to palpation, she was in good health and free from complaints and she had gained weight. There was no cough or any sign of lung involvement. The sedimentation rate remained slightly increased and the Friedman test was persistently positive. The authors have been able to follow the continuity of the progress through pregnancy and hydatid mole, chorionepithelioma and eventual cure. The free use of the Friedman test revealed the sequence of events before and after operation. The diagnosis rested entirely on two facts: the history of mole and the persistence of anterior pituitary-like substance in the urine. Whether or not there can be a negative pregnancy test in the presence of chorionepithelioma can be determined only by critical observation of the results obtained in testing for the pituitary substance in many cases of known chorionepithelioma. It may eventually be possible to foretell the degree of the malignant state of a known chorionepithelioma by biologic quantitative assay of the patient's urine. It seems reasonable to believe that in cases of chorionepithelioma, diagnosed early, one need not remove the ovaries. In the authors' case only a supravaginal hysterectomy was done and there was no evidence of extension, recurrence or metastases after two years. In another case, a complete hysterectomy was done because of severe lacerations of the cervix, and the right ovary was removed only because it was firmly adhering to the posterior sheaf of the right broad ligament. The patients were both young women,

and it hardly seemed reasonable to remove ovaries that had all the gross appearance of being normal. The results seem to have justified the procedure. The authors believe that chorionepithelioma may be definitely diagnosed shortly after its inception. Every patient who passes a mole should have her urine examined for anterior pituitary-like substance by the Friedman test monthly for at least a year. In this way a developing chorionepithelioma might be diagnosed early and removed before symptoms appear or before metastases develop.

Internal Frontal Hyperostosis—Moore points out that internal frontal hyperostosis is by no means the medical curiosity that the percentages he gives appear to make it. There is a total of sixty-five cases described in the literature, all but three being either necropsy reports or composed of museum specimens. To this number seventy-two living examples of the condition have been added. In spite of the different degrees or types of the disorder, the cases have an astonishing similarity to one another and there is variation only in the intensity of the symptoms. Against the severity of the syndrome stands the fact that there are many rational therapeutic measures that may alleviate or possibly arrest the disorder. The picture of the syndrome in its complete form has been published by several writers. Description of its less advanced development is something new. Two hypotheses regarding internal frontal hyperostosis have been offered: that there is a special mechanism for the control of calcium metabolism, existing only in the female, and that the disorder of such a mechanism is the cause of the syndrome accompanying internal frontal hyperostosis. There is presented a fruitful field for investigation of the fundamentals that underlie the physiology and chemistry of calcium and fat metabolism, and possibly a heretofore unknown structure with an internal secretion. The disease will be found with greater frequency if it is sought for. It is possible that investigation of this disorder may throw much light on neuropsychiatric pathology. There is a question as to whether or not the unknown causative factor that produces the syndrome does not also give rise to the neuropsychiatric symptoms as well as the hyperostosis. Internal frontal hyperostosis as a name for this syndrome suffers from the drawback inherent in using a single feature of a disorder to designate the whole. It is possible that the hyperostosis, though the surest sign, is the least important manifestation of the disease.

Traumatic Ossifying Periostitis of the New Born—Snedecor and his associates describe a new type of birth injury in a series of breech extractions. They conclude that the injury is probably due to (1) too strong traction on the extremity, (2) a twisting pull on the leg due to inability on the part of the obstetrician to rotate the line of traction with the rotation of the fetus as it accommodates its large diameters to those of the birth canal, (3) the inability to bring both feet down so that traction may be equally distributed and (4) the too hasty attempt to complete the delivery. In these injuries immediate roentgen examination is negative. The calcium deposit becomes visible only after one or two weeks. Recovery took place spontaneously in all the cases observed by the authors. Recovery time seems to be in direct proportion to the extent of the injury—from four to twelve weeks—and no permanent disability has resulted. In two cases the infants were followed until they walked. A tearing or stripping of the periosteum of the femur or humerus occurs most often at its weakest point of attachment, the epiphysis, and the maximal strain of the traction is imposed on the proximal epiphysis. If the trauma is more severe, the authors observed that the stripping follows down the shaft with further subperiosteal hemorrhage, as in one of their cases. Osteomyelitis and epiphysitis were both suggested in their first case. Fracture was the opinion of one roentgenologist. Sarcoma was also considered. In truth, the lesion is similar to myositis ossificans, which has its etiology in some instances, at least, in torn periosteum. A rapid proliferation of the periosteal osteophytes takes place with deposition of calcium. The roentgenologically visible periosteal injury is but part of the hemorrhage from muscle and fascial tearing. Heretofore, the cause of pain, limitation of motion, swelling and dislocation of the injured part, which are the chief clinical observations have been attributed to injury of soft tissues only.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

47: 319-388 (Aug-Sept.) 1935

- Granuloma Annulare E O Halliwell and J T Ingram—p 319
Calcinosis Report of a Case of Calcinosis Universalis M Bolam—p 340

British Journal of Ophthalmology, London

10: 481-544 (Sept.) 1935

- Study of Central and Peripheral Light and Dark Adaptations with Varying Backgrounds R Pickard—p 481
Unilateral Anophthalmos with Cyst Case K Kanda—p 512

British Medical Journal, London

2: 327-364 (Aug 24) 1935

- Correlation of Radiologic and Operative Findings in Chronic Appendicitis W L Harnett and C Galstaun—p 327
Benign Neoplasms of Bronchus Records of Nine Cases H V Morlock and A J S Pinchin—p 332
Some Points in Connection with Sclero-corneal Trephining R H Elliot—p 334
Progressive Postoperative Gangrene of Skin A J Blaxland—p 336
*Persistent Headache During Lactation Report of Five Cases and Commentary J H Beilby—p 337
*Prevalence of Weil's Disease in Certain Occupations J M Alston and H C Brown—p 339

2: 365-438 (Aug 31) 1935

- Some Comments on Medical Training and Practice and Their Regulation E W Monsarrat—p 365

Persistent Headache During Lactation—Beilby presents five cases of persistent headache associated with the nursing period which characteristically disappears on weaning. Of varying severity, it is usually frontal, being described as "behind the eyes", but it may affect the whole head, with spasms referred particularly to the occipital region, commencing typically at or after the first week of the puerperium. None of the patients were primiparas. No pathologic basis was traceable for this symptom. Pregnancy and parturition were normal, the urine was normal before and after confinement, except in one case in which there was a trace of albumin during the later months (summer). There was no rise in blood pressure during the puerperium; the fundi were normal. There was no uncorrected visual defect. Except in one case there was no anemia. Drugs at best gave only temporary relief. The persistent headache appears to occur chiefly among those of poorer circumstances and/or poorer physical condition, in whom nursing is an added burden. Dental caries is more likely part of the same condition than a causative factor. Treatment is prophylactic—that is, antepartum therapy with suitable diet, vitamins, iron and calcium, or, when this has been neglected or through circumstances impracticable, similar treatment applied with a view to improving the general condition during the puerperium or, finally, weaning if the symptoms justify it.

Weil's Disease and Certain Occupations—Alston and Brown state that nine of forty-five sewer workers, who were not aware of having had any form of jaundice, showed significant serum agglutinins for *Leptospira icterohaemorrhagiae*. Evidence is given that protective antibodies are present in specimens of human serum that show agglutinins. Prophylactic inoculation of those exposed to risk appears to offer a means of prevention of this disease, and work on the preparation of a suitable vaccine in a medium containing no foreign protein is in progress.

Clinical Journal, London

64: 309-352 (Aug.) 1935

- Dyspepsia J J Conybeare—p 309
Coh Infections of Urinary Tract T E Hammond—p 317
Pleural Effusions and Associated Lung Lesions R Ellis—p 325
Acute Intussusception in Infants F Forty—p 330
Obstetric Difficulties in General Practice S G Luker—p 333
Observations on Erythema Nodosum W D MacKinnon—p 339

Erythema Nodosum—MacKinnon states that his records show that erythema nodosum had its greatest incidence about the time of an influenza epidemic, cases occurred before, during

and after the epidemic, but mostly before. Erythema nodosum occurred when an epidemic of whooping cough coincided with an epidemic of influenza. But in an extensive epidemic of whooping cough, when no influenza was present, there were no cases of erythema nodosum. Mumps occurred when influenza was prevalent and there were cases of erythema nodosum. In a large epidemic of mumps, however, no influenza was present and no cases of erythema nodosum showed up. Thus measles, whooping cough and mumps do not seem to be associated with erythema nodosum as is influenza and yet the author points out that in his experience epidemics of measles and whooping cough are more productive of tuberculosis than epidemics of influenza. Nine chickenpox epidemics were invariably accompanied by cases of herpes zoster, but only three, which occurred in association with influenza, showed any cases of erythema nodosum. Yet erythema nodosum seems to be closely connected with chickenpox and with herpes zoster. He concludes that erythema nodosum was not associated with acute manifestations of rheumatism, although the majority of the patients were of a rheumatic diathesis. The maximal incidence of erythema nodosum was in years in which the apex of incidence also occurred in other diseases, which are known to be due to the "filtrable viruses."

East African Medical Journal, Nairobi

12: 127-158 (Aug.) 1935

- Preliminary Notes on Control of Flies J P McMahon—p 128
Relationship of Yaws and Syphilis Are They Two Diseases or One? J A Carman—p 135
Ancylostomiasis in Digo District H D Tonking—p 149

Indian Medical Gazette, Calcutta

70: 421-480 (Aug.) 1935

- Record of Five Years Antenatal and Infant Welfare Work on Estates in Malaya J G Reed—p 421
Investigations on Cerebrospinal Fever in Nasirabad (Rajputana) During Period 1931 to 1934 Part I E A R Ardesir—p 435
Infective Warts and Their Treatment L M Ghosh and P A Maplestone—p 441
Snake Venoms in Pharmacology and Therapeutics R N Chopra and J S Chowhan—p 445

International Journal of Psycho-Analysis, London

10: 263-398 (July) 1935

- Early Female Sexuality E Jones—p 263
Psychoanalysis of Space P Schilder—p 274
Genesis of Feeling of Unreality C P Oberndorf—p 296
Reassurance as Means of Analytic Technique Melitta Schimideberg—p 307
Passivity Masochism and Femininity Marie Bonaparte—p 325
Phallic Passivity in Men R Loewenstein—p 334
Some Aspects of Time Difficulties and Their Relation to Music Sybille Yates—p 341

Irish Journal of Medical Science, Dublin

No 116: 337-536 (Aug.) 1935

- *Treatment of Cervical and Broad Ligament Fibroids D J Cannon—p 518
Fibroma of Ovary D J Cannon—p 522

Treatment of Cervical and Broad Ligament Fibroids

—Cannon describes several cases and gives the following principles for the treatment of cervical and broad ligament fibroids: 1 In the case of large cervical fibroids growing from the posterior cervical wall or of large broad ligament tumors that have become retroperitoneal, the uterus should be removed with the tumor. 2 In order to minimize the amount of bleeding from the uterine vessels during the process of enucleation of the tumor the aim should be to remove the uterus by a right-to-left or left-to-right procedure before attempting enucleation of the tumor. 3 In the case of cervical tumors that are not too large and are growing from the anterior cervical wall or of broad ligament tumors that have not yet established retroperitoneal relationships, the uterus may be left, provided there is not much blood loss during the process of enucleation and that hemostasis of the myomatous bed can be secured. 4 During the removal of either a cervical or a broad ligament tumor, injury to the ureters can be avoided by working inside the capsule of the tumor. 5 Should a patient with a large fibroid complain of pain and abdominal tenderness whether the temperature is raised or not, infection of the tumor should be

considered and preliminary vaccine treatment followed by a preoperative injection of nuclei to stimulate leukocytosis should be instituted 6 If the intestine is markedly adherent to the tumor that is suspected of being infected and it is believed that the adherent intestine is the cause of the infection, instead of being separated from the tumor it should be resected if possible. 7 Should spreading peritonitis supervene in spite of all precautions, as patients die not so much from peritoneal toxemia as from intestinal toxemia, treatment based on the best current thought in regard to the pathologic changes of the condition should be instituted 8 Unless mechanical obstruction is evident, operative intervention should be postponed as long as possible.

Journal of Laryngology and Otology, London

50: 649 728 (Sept.) 1935

- Origins of Hearing—Random Variation or Convergent Evolution—Study of Auditory Organ and Its Swim Bladder Connections in Fishes H M Evans—p 649
Recent Advances in Electrophysiology of Hearing C S Hallpike.—p 672

Journal of Neurology and Psychopathology, London

15 289 384 (April) 1935

- The 'Dreamy State' as an Epileptic Aura, with Remarks on Occurrence of Elaborate Mental States at the Beginning of Epileptic Fits M Levin—p 289
The Frog Child Congenital Lesion of Corpus Striatum? R G Gordon—p 297
Blood Vessel Tumors of the Brain, with Particular Reference to Lindau Syndrome G S Hall—p 305
Acute Toxic Chorea Case. R G Gordon and R M Norman—p 313
Unusual Size of Intraventricular Spongioblastoma in Case of Tuberculous Sclerosis L C Cook and A Meyer—p 320
Laurence-Moon Biedl Syndrome Report of Two Cases Pauline Klenerman—p 329

16 196 (July) 1935

- *Observations on Motor Phenomena of Hysteria I M Allen—p 1
The Brain of the Mental Defective Part III Width of Convolutions in the Normal and Defective Person W R. Ashby and R M Stewart—p 26
Respiratory Rhythm in Normal and Psychotic Subjects A S Paterson.—p 36
*Some of the Structural Abnormalities Presented by the Brains of Thirty One Certified Mental Defectives R J A Berry—p 54
I Barrier Permeability to Bromide and Protein Content of Cerebrospinal Fluid S Katzenelbogen—p 70
II Barrier Permeability to Bromide and Sodium Chloride Content of Cerebrospinal Fluid S Katzenelbogen—p 73

Observations on Motor Phenomena of Hysteria—Allen investigated fifty-nine patients, who were subjected to hysteria, with particular reference to the disturbances of motor function. The essential and primary effect in the motor system is inhibition of the motor impulse to the muscle or group of muscles which in the normal subject would contract in response to that impulse. Inhibition of the motor impulse arises at the unconscious level of higher cortical functions and is produced by either a conflict in the personality, both sides of which are excluded from consciousness, or by that factor in a conflict which is excluded from consciousness to allow the other factor to control the conscious life of the personality. The immediate motor effect is inhibition of agonists and is followed by contraction of antagonists or of fixation muscles. According to the degree of inhibition, the clinical effects, in order of lessening severity, are flaccidity of muscles in the part concerned, flaccidity of muscles with contraction of fixation muscles and failure of agonists to contract followed by contraction of antagonists. The last is the most common motor phenomenon. These effects are produced in the same way whether the original motor impulse arises as a result of voluntary effort, voluntary effort at command or in response to a sensory stimulus as in eliciting the plantar reflex. The stretch reflex acts normally in the muscles of the hysterical limb, although, when the muscle is flaccid, tone is usually below the threshold at which the reflex comes into action and repeated or prolonged stretch is needed to bring it above that threshold. Local motor phenomena arise as a result of inhibition of agonists, contraction of antagonists, the application of stretch to agonists and contraction of agonists in that order. Hysterical tonic paralysis, tonic paralysis with contracture, tonic paralysis with tremor, tremor with minimal tonic paralysis and tremor are described as they occur in the hysterical subject, and their development is shown to

depend on the sequence of effects of local motor phenomena. Attention is drawn particularly to the clinical effects of these phenomena in the face, abdominal muscles and lower limb. The effect of hysterical motor phenomena on tendon reflexes and the plantar reflex is described. The need for attention to every detail in the examination and interpretation of the plantar reflex is stressed.

Abnormalities Presented by Brains of Mental Defectives—From a study of thirty-one defective brains Berry observed that the defective brain is 20 per cent smaller than that of the lowest normal, that even within this low standard the range of variation is considerable and that there is a measurable disproportion between the main prerolandic and postrolandic cortical constituents, this disproportion being particularly noticeable in the parietal region. In view of the anatomic position of the parietal lobe relative to the cuneus, superior temporal lobe and postcentral gyrus—that is, to the cortical areas at which visual, acoustic and somesthetic impulses are received first—it seems impossible to doubt that, when the parietal lobe is underdeveloped, as in these defectives, the reception, association and coordination of impressions derived from the organs of special sense must be so impaired as to result in serious mental deficiency. There is, therefore, an adequate neurologic explanation of the mental status of the present series of cases. Bolton's insistence on the importance of an adequately developed and well proportioned prerolandic effector area (frontal lobe) in all normal mental activities fully bears out the present investigation and particularly the irregularities between the frontal effector area and the rest of the brain. In persons with brains so irregularly developed and so lacking in the proper proportions of receptor and effector cortices—that is, in defectives—there must necessarily be a diminished sensibility to and perception of the external world around them. They thus have to rely far too much on purely bodily stimuli from within, with results that profoundly alter their mentality and may even make them react to their human environment in an abnormal or asocial manner, and this defectives—especially the lower grade ones—most certainly do.

Journal of Tropical Medicine and Hygiene, London

38 213 224 (Sept 2) 1935

- The Spirochete of Infective Hemorrhagic Jaundice Found in Rats in Rome F Marchesi—p 213
Ulcer Syndrome in Tropical Africa. A A F Brown—p 215

Lancet, London

2: 355-410 (Aug 17) 1935

- Morbid Anatomy of Caries of Thoracic Spine in Relation to Treatment. H J Seddon—p 355
*Control of Whooping Cough with Serum and Vaccine Uses of New Skin Test. D Paterson R H Bailey and R G Waller—p 361
*Pregnancy Test in Relation to Death of Ovum. P M F Bishop—p 364
Thrombo-Angitis Obliterans (Buerger's Disease) Gassing as an Etiologic Factor J B McDougall and J H Crawford—p 366.
*Thrombosis of Pampiniform Plexus D McGavin—p 368
Congenital Malaria Report of Case in One of Twins N C Tanner and R F L Hewlett—p 369
Effect of Sudden Severe Anoxemia on Function of Human Kidney R A McCance—p 370

2: 411-464 (Aug 24) 1935

- Rheumatism and Its Results K D Wilkinson—p 411
Indications and Results of Phrenic Nerve Operations H M Davies.—p 418
Cardiac Hypertrophy in Experimental Nephritis J B Duguid.—p 421
Resection of Rectum with Restoration of Continuity C A Pannett.—p 423
Rheumatic Heart Disease and Vitamin C C B Perry—p 426

Serum and Vaccine in Whooping Cough.—Paterson and his associates made an attempt to produce a satisfactory test that could be used in the consulting room to show (1) whether a child has had an infection of the Bordet-Gengou bacilli on some previous occasion and (2) whether specific treatment in a noninfected child had been of any avail after a course of injections. The vaccine is injected intradermally into the flexor surface of the forearm, the result being read after twenty four and forty-eight hours. A positive test is seen as an area of hyperemia round the site of the injection, ranging in size from a sixpence to a shilling in diameter. It is transitory in nature,

and some experience is required to make accurate readings. It should be seen in twenty-four and forty-eight hours and tends to disappear after this. Just as a marked reaction may be expected in adults with the Mantoux test, the same marked reaction may be expected in adults with this pertussis test, and smaller quantities, even 0.05 cc., will give a definite positive. The authors' procedure of active immunization varies slightly from that recommended by Sauer in that three biweekly injections are made instead of three weekly ones. Alternate arms are used each time, the deltoid region being injected the first week and the triceps region the second week, the deltoid region again being used the third week. Skin tests are performed before, during and after the injection. The skin tests become positive approximately one week after the last injection. This appears to show that, contrary to what Sauer claims for the vaccine, an allergic state is developed which gives a hypersensitiveness to the skin in from three to four weeks after the initial dose of vaccine, and the child then shows a positive skin test. This gives the physician some idea as to whether or not the treatment is effective and agrees with the result of vaccination in other diseases. Whether or not immunization is complete then it is difficult to say. Possibly it reaches its height at four months, as Sauer suggests.

Pregnancy Test in Fetal Death—Bishop states that, when intra uterine death is suspected clinically, a negative pregnancy reaction will confirm this suspicion, but a positive reaction may still occur as long as three months after the death of the ovum and cannot therefore be accepted as showing that the fetus is still alive. A comparison between the estrogenic reaction and the Aschheim-Zondek and Friedman tests shows that the former becomes negative considerably sooner after fetal death than the latter. It may, however, still be positive three weeks after the death of the ovum, so that a positive result is by no means certain evidence of a living embryo. The results obtained in the cases investigated throw no fresh light on the factors that regulate the secretion of gonadotropic hormones by the placenta.

Thrombosis of Pampiniform Plexus—McGavin cites two cases of thrombosis of the pampiniform plexus because its apparently spontaneous occurrence is not familiar and the sufferers are liable to be treated by orchidectomy. Both patients were of middle age, and in both the left side was affected. In neither was there an obvious exciting cause, such as trauma or infection, nor had there been any history of preceding varicocele or an abnormal position of the testicle. In neither case were the seminal vesicles diseased, nor were there firm nodules or softened areas in the prostate. Active spermatogenesis was proceeding in one case, and there was no reason to believe that it had been stopped in the other. Microscopically the walls of the vessels in both spermatic cords gave evidence of degeneration. In one patient the pain was of sudden onset, whereas that of the other began more gradually. The pain of the one was brought on by standing, while that of the other was increased by coughing or lifting. If the patient is examined soon after the onset, epididymo-orchitis is most likely to be simulated, whether of the gonococcal, the coliform or the uncommon acute tuberculous type. Torsion of the spermatic cord may be suggested, although in the thrombosis there would not be the associated shock, and the testis would be well in the scrotum and not acutely tender. A diffuse hematocele of the cord would give a history of sudden onset of severe pain during some effort. Cases that are seen a few weeks after the onset are liable to be diagnosed as tuberculous epididymo-orchitis. In these the mode of onset, the short history, the absence of any beading of the vas and the negative rectal examination would be valuable points. The probable freedom of the tail of the epididymis from involvement may also be useful, but a hematogenous tuberculous epididymitis starting in the head is a possibility that impairs the value of this criterion. These later cases may occasionally resemble malignant disease of the epididymis. The importance of recognizing a thrombosis of the pampiniform plexus lies in its bearing on treatment. Should it be confused with certain other diseases there is a possibility of an unnecessary orchidectomy. This is especially to be avoided, since the microscopic appearances suggest that active function continues in the testicle on the affected side.

Tubercle, London

16: 529 576 (Sept.) 1935

- Course Complications and Prognosis of Open Pulmonary Tuberculosis in Children E. Cochrane—p. 529
Occurrence of Chrysiasis Following Treatment by Gold Salts Note W. C. Fowler—p. 539
Prevention of Tuberculosis in Childhood by Methods of Separation G. G. Kayne—p. 541

Quart Bull., Health Org., League of Nations, Geneva

4 129 322 (March) 1935

- Syphilis Treatment Part I Enquiry in Five Countries Carried out Under Auspices of the Health Organization of League of Nations Part II Recommendations H. Martenstein—p. 129
*Blood Culture of Tubercle Bacillus According to Loewenstein I Report on Detection of Tuberculous Bacillemia by Loewenstein Method A. Calmette and A. Saenz—p. 257
Id II Tuberculous Bacillemia A. S. Griffith—p. 283
Id III Report on Investigations Regarding Loewenstein Technique of Cultivating Tubercle Bacilli from Blood, K. A. Jensen—p. 304

Detection of Tuberculous Bacillemia by Loewenstein Method—Calmette and Saenz assert that the culture medium of Loewenstein is superior to all the mediums so far proposed for the culture of tuberculous bacilli of human, bovine or avian origin. Of 936 blood samples, seeded on to this medium in about 6,000 tubes, subject to careful observance of Loewenstein's directions, there were only twelve positive results. The blood samples were obtained from ninety patients presenting acute or chronic tuberculosis, fourteen rheumatism and thirty dementia praecox. If consideration is limited to the blood cultures with samples from tuberculous patients, the positive results total 1.58 per cent. The appearance of the cultures showed every case to be one of invasion of the blood by small numbers of microbes only. In most cases, the isolated strain was of a human type. Cultures with thirty-seven blood samples from patients suffering from acute or chronic rheumatism and eighty-three blood samples and sixty cerebrospinal fluid samples from patients suffering from dementia praecox remained negative. The considerable difference between the percentage of the authors' positive results with 166 tuberculous patients and that of Loewenstein, and their complete failure with patients suffering from rheumatism and dementia praecox cannot be attributed to errors of technique, to differences in the sensitiveness of the culture mediums or to insufficient cooperation between clinics and laboratory. They never obtained the luxuriant appearance of the cultures of Loewenstein's own laboratory or the positive results noted on direct examination of the centrifugation deposit in cases of dementia praecox, erythema induratum and polyarthritis. The method of Loewenstein is less sensitive as a means of detecting tuberculous bacillemia than inoculation into the guinea-pig. The latter method, when used in connection with patients suffering from progressive forms of tuberculosis, yielded a higher percentage of positive results than blood cultures. The authors believe that the processes through which the blood passes in Loewenstein's method and the laking, successive washings and repeated centrifugation to which it is subjected, are injurious to the preservation of the vitality of the bacilli. They conclude that Loewenstein's theories concerning the alleged inhibitory effect of hemoglobin on the cultures are not justified and that the seeding on Loewenstein's egg medium of pure blood yields more frequent and more reliable positive results.

Japanese Journal of Gastroenterology, Kyoto

7 1 56 (April) 1935

- Studies on Uric Acid Excreting Function of Liver in Renal Disturbances Report I Experiment in Case When Kidneys Are Mechanically Disturbed S. Matsumoto—p. 1
Id Report II Experiment in Cases of Renal Disturbances Provoked by Drugs S. Matsumoto—p. 7
Id Report III Experiment by Perfusion of Liver of Rabbit S. Matsumoto—p. 9
Studies on Metabolism of Inorganic Salts and Water in Hepatic Disturbances Report I Metabolism of Inorganic Salts Clinical and Experimental Study on Changes of Amounts of Calcium Magnesium Potassium and Sodium in Blood in Cases of Hepatic Disturbances II Shigemitsu—p. 12
Id Report II Experimental Study on Amounts of Calcium Magnesium Potassium and Sodium in Various Organs in Cases of Hepatic Disturbances H. Shigemitsu—p. 19
Existence of Substances Promoting Liver Function in Blood and Urine Report I Blood in Cases of Disturbances of Renal Function Mizuta and T. Matsuura—p. 23

Presse Médicale, Paris

43: 1297 1312 (Aug 17) 1935

- Properties of Staphylococci in Diphtheria Bacillus Carriers R Dulis couet and B Ballet—p 1297
 *Lymphatic Colon Bacillus Depot in Enterorenal Syndrome H Cam bessédès and J Bourgeois—p 1300

Lymphatic Colon Bacillus Depot—Cambessedès and Bourgeois state that there are three steps in the establishment of certain urinary infections the intestinal, the intermediary and the renovesical. Less is known about the intermediary than about the others, but it is believed that the mesenteric lymph nodes are largely involved. They investigated this factor by direct injections of colon bacilli into the mesenteric ganglion followed by search for the germs in the urine and in the blood. The optimal quantity to be injected was found to be 0.1 cc. of a twenty-four hour culture diluted 1:10. Urine was obtained from the rabbits thus inoculated by sterile bladder puncture or by catheterization. Nineteen animals were used in these investigations. Ten showed a variable delay of from two to seven days before verifiable colon bacilluria set in. Three died rapidly of peritonitis from technical errors. Three showed local septic complications. And, finally, three showed no pathologic sequels whatever. Similar investigations on cats gave comparable results. In the second part of their studies the authors tried to find bacteria in the blood and to determine the moment of appearance and duration of the bacteremia. The rabbit and the cat were again used. The passage into the blood stream was apparently rapid—one hour after intraganglionic injection the blood culture was positive. The cultures become negative after twenty-four hours. Finally the agglutinative properties of the serum were studied. These were found to be unreliable and of no diagnostic value. The authors believe that the combination of these studies is indicative of an intermediary stage.

43: 1329 1344 (Aug 24) 1935

- *Cardiac Disorders of Arteriovenous Aneurysms N Kisthinos—p 1329
 Variations of Drug Activity Gabriel and R Leven—p 1330
 Hemostatic Action of Human Milk. L Lindenfeld—p 1332

Arteriovenous Aneurysms—Kisthinos states that the rapidity of appearance of cardiac disorders is in direct proportion to the size and caliber of communicating vessels. The first and dominant symptom is tachycardia. The mechanism was investigated by experimental observations on dogs by producing anastomoses between arteries and veins of different sizes and locations. In all instances the tachycardia produced was considerable and occurred promptly except for the mesenteric vessels, in which tachycardia was of slower evolution. The conception that tachycardia is due to increased venous pressure was tested on dogs. This pressure was found invariably raised in the presence of arteriovenous aneurysms. Abolishing the communication resulted in prompt fall of venous pressure and subsidence of tachycardia. Another interesting symptom is lowering of the diastolic pressure. It is believed that this change is responsible for the subsequent hypertrophy and dilatation of the heart and its eventual failure.

43: 1361 1376 (Aug 31) 1935

- *Tissue Reflections of Hyperparathyroidism in Scleroderma. R Leriche and A Jung—p 1361
 Significance of Crepitan Rales in Pulmonary Tuberculosis A Jousset—p 1363
 Maximal Urea Concentration and Uremia by Oliguria P Buzeu—p 1363

Hyperparathyroidism and Scleroderma—Leriche and Jung believe that scleroderma is the skin manifestation of lesions that produce an abnormal calcium content of the skin following a skeletal osteolysis due to hyperparathyroidism. The parathyroid is the initiating factor, the osteolysis the intermediary one and cutaneous atrophy the result. Patches of involved skin were studied for calcium content by biopsy and were found to contain from 20 to 30 per cent more calcium than normal skin from other regions. Furthermore, the calcium content of the fat in regions adjacent to a sclerodermic plate was almost double that found in fat from normal regions. Roentgenograms of the bone show a diffuse decalcification. The conclusion is obvious that scleroderma is a cutaneous form of chronic hyperparathyroidism and that it is as such a disease of the skeleton as of the skin.

Polichinico, Rome

42: 509 572 (Sept 15) 1935 Surgical Section

- Spontaneous Torsion of Spermatic Cord T Tosonotti—p 509
 *Frequency and Significance of Erythrocytosis in Gastroduodenal Ulcers. L Ugelli—p 544
 Ganglionectomy in Thrombo-Angitis Obliterans and Brown Test Results P Valdoni—p 559

Significance of Erythrocytosis in Gastroduodenal Ulcers—Ugelli examined the blood of ninety-two patients suffering from gastroduodenal ulcers, the presence of which was confirmed at the operation in all cases. The presence of erythrocytosis was proved in 74 per cent of the patients suffering from duodenal ulcers, in 40 per cent having gastric ulcers and in 40 per cent of a group of persons that had had gastric resections performed from seven months to three years before the hematologic examination. In two patients presenting gastric disturbances associated with hyperchlorhydria there was no erythrocytosis. The author states that the presence of erythrocytosis is of value in the diagnosis of gastroduodenal ulcers. He discusses several hypotheses on the genesis of erythrocytosis and states that it does not originate in gastric hypersecretion. Both erythrocytosis and gastric hypersecretion are manifestations of the hypervagotonic constitution that is characteristic of ulcerous patients.

Siglo Medico, Madrid

96: 289 318 (Sept 7) 1935

- Bilateral Reno Ureteral Lithiasis P Cifuentes—p 290
 *Hypochloremia and Hyperemesis in Pregnant Women A de Tena y Molera—p 297
 Hemolytic Photo-Erethism (Increase of Hemolysis of Blood Serum by Influence of Light) A de la Granda and F Vegas—p 302

Hypochloremia and Hyperemesis in Women After Operation—In the treatment of nonacidotic vomiting in pregnant women and in nonpregnant women after operation, de Tena y Molera resorted to rechloridation of the patients by means of intravenous injections of hypertonic salt solution in daily doses of from 5 to 15 cc. The treatment lasted for two or three days after complete disappearance of vomiting. The author concludes that the treatment is of value, for he obtained satisfactory results in 88.8 per cent of his eleven cases. In all cases in which it gives good results, marked hypochloremia exists. The fact that hypochloremia disappears when vomiting stops seems to point out that the condition is the cause of vomiting. The mechanism of the production of vomiting is explained by a disturbance of the equilibrium of the colloids in the blood serum, which, after having been altered in their structure, act either as toxic or as foreign substances by stimulating the vomiting centers in the brain or the nerve ends of the stomach. Hypochloremia in pregnant women is due to hyperchloruria that originates in disturbance of the osmoregulating functions of the kidney by action of the hormones or of gravidotoxic substances. In nonpregnant women after operations, it is due to the absorption of chlorides by the tissues especially by traumatized tissues. Hyperazotemia is not necessarily associated with chloropenia, generally the content of urea in the blood is below normal.

Deutsche medizinische Wochenschrift, Leipzig

61: 1425 1464 (Sept 6) 1935 Partial Index

- *Sterility in Women as Result of Functional Disturbance A Mayer—p 1425
 Roentgenologic Aspects of Psittacosis Pneumonia L Stehr—p 1429
 Pain in Insufficiency of Diaphragmatic Hiatus F Kuhlmann—p 1432
 Present Status of Cultivation of Bacillus of Leprosy W Kikuth and D H Verfurth—p 1435
 Dilatation of Stomach L Roemheld—p 1438

Sterility as Result of Functional Disturbance—Mayer points out that many sterile women are entirely free from local disorders. Moreover, diseases of the blood and the metabolism and endocrine disturbances producing sterility are not increasing, and yet the incidence of sterility is greater. The author thinks that in view of these facts a further searching for anatomic causes of sterility will be of no avail and that functional factors should be given attention in connection with the problem of female sterility. He points out that late marriages may be responsible for an increase in sterility, particularly in women with hypoplasia of the genital apparatus. In this connection

it is pointed out that the regular marital sex intercourse frequently causes an after-maturation of the hypoplastic uterus but the possibility of such an after-maturation is of course much less probable if the women are older at the time of marriage than if they are comparatively young. The author concedes that frigidity does not necessarily cause sterility, but thinks that it is an important factor in some cases. Psychic factors likewise play an important part in conception. The author calls attention to the possibility of sperma intoxication as the result of too frequent intercourse, to the possibility of a premature rupture of the follicle, to the period of physiologic sterility and to the fact that sterility frequently follows the prolonged use of contraceptives. He concludes that hitherto the problem of sterility has been given a too mechanistic interpretation. He thinks that in most instances it is a complicated functional disturbance, in which somatic as well as psychic factors play a part.

Deutsche Zeitschrift für Nervenheilkunde, Berlin

138: 1 104 (Aug 26) 1935 Partial Index

- *Etiology of Infectious Polyneuritis G Deusch—p 1
- Nycturia as Centrally Conditioned Functional Disturbance of Sympathetic Nervous System A Jores and H Beck—p 4
- *Isolated Spastic Spinal Syndrome of Lead Poisoning G Straube and H W Kalbitzer—p 17
- Course of Galvanic Skin Reflex in Unilateral Lesions of Brain K W Essen and H H Podestà—p 34
- *Acute Visceral Disturbances After Operations for Brain Tumors B Schlesinger—p 75
- *Diagnostic Value of So Called Extracreatinuria F Robert—p 94

Etiology of Infectious Polyneuritis—According to Deusch, polyneuritis is usually caused by toxic or infectious processes, but if such causes cannot be found, the disorder is sometimes diagnosed as idiopathic polyneuritis. The author considers this diagnosis inadvisable pointing out that careful search will usually disclose an infectious cause. He describes the clinical history of a man aged 26, in whom a typical polyneuritis with motor and sensory tetraparesis and ataxia of the type of peripheral pseudotabes developed following a phimosi operation that resulted in suppuration of the surgical wound and was accompanied by the development of furuncles on the thighs. The patient recovered following treatment with a bacterial autolysate, massage, faradization and baths. The motor and sensory disturbances subsided at first slowly and later quite rapidly. The author considers especially noteworthy the fact that the polyneuritis involved all four extremities that the symptoms were quite severe and that the oculomotor and the trigeminal nerves were involved. The fact that the patient recovered in a comparatively short time indicates that even rather severe polyneuritides of infectious origin may have a comparatively favorable prognosis.

Isolated Spastic Spinal Syndrome of Lead Poisoning—Straube and Kalbitzer point out that, in view of the affinity of lead for the nervous substance the possibility of an isolated spastic spinal syndrome cannot be denied. In this event the influence of the lead would be restricted to the central neuron of the chief motor tracts and there would result only a degeneration of the pyramidal tracts without involvement of the second motor neuron or of the sensory tracts. The authors assert that such cases are rare but they cite one case in which they had to decide whether this condition is possible. They reach the conclusion that in rare cases lead poisoning may result in an isolated spastic spinal paralysis.

Visceral Disturbances After Operations for Brain Tumors—Schlesinger calls attention to the fact that after intracranial interventions particularly those near the brain stem functional disturbances occasionally develop in the region of the sympathetic vagus nucleus or of its superordinated diencephalic centers which in turn may lead to dangerous even fatal, visceral disturbances (Cushing-Hess). In the lungs these disturbances become manifest as an abnormal permeability of the vascular walls with resulting pulmonary edema and in the region of the esophagus, stomach or duodenum as loss of substance, which may appear in all the transitional stages from hemorrhagic erosions to penetrating ulcers with their sequels. In one of the two cases described by the author (meningioma of the posterior cranial fossa) the severe pulmonary edema that developed in complete cardiac sufficiency and had a tendency

to relapse could be effectively counteracted by a puncture of the ventricle. The second patient whose history is reported died of a gastric hemorrhage. In this instance the tumor, a basofrontal meningioma, had no relations to the brain stem, however a chronic increase in the cerebral pressure had apparently produced a functional disturbance in the nerve centers mentioned.

Diagnostic Value of Extracreatinuria—Robert points out that aminoacetic acid has been found helpful in the treatment of progressive muscular dystrophy by a number of investigators. He states that, since it was discovered that creatinuria occurs in many disorders but can be increased by the administration of aminoacetic acid only in cases of progressive muscular dystrophy (so-called extracreatinuria), aminoacetic acid has been used also for diagnostic purposes. Although the author was able to corroborate the favorable action of aminoacetic acid in progressive muscular dystrophy, he gained the impression that the so-called extracreatinuria is not specifically characteristic for progressive muscular dystrophy. He describes a case of hyperthyroidism combined with amyotrophic lateral sclerosis. The examinations for creatine-creatinine revealed a considerable reduction in the total creatinine elimination in the course of an increased creatinuria. Following the administration of aminoacetic acid the creatinuria was increased. The author concludes that the so-called extracreatinuria is not restricted to progressive muscular dystrophy.

Klinische Wochenschrift, Berlin

14: 1233 1272 (Aug 31) 1935 Partial Index

- *Gargling W Haase—p 1244
- Cure of Severe Case of Athrombopenic Purpura with Cutaneous Necroses and Symptomatic Agranulocytosis J Schmidt—p 1245
- *Experimental Studies on Calcium Therapy of Allergic Conditions P Kallós and Liselotte Kallós Deffner—p 1247
- *Modification of Reid Hunt's (Acetonitrile) Test by Antithyroid Protective Substances K Fellingner and O Hochstadt—p 1250
- So Called Anaphylatoxin Produced by Kaolin or Starch A Lumière and P Meyer—p 1251
- Piercing Pains in the Side in Children E Nassau—p 1252

Gargling—Haase calls attention to the fact that several authorities have rejected the use of gargles in the treatment of inflammations in the region of the pharynx, not only because it is in direct opposition to the rule that inflammatory processes should be kept quiet but also because it causes pain and the action of the antiseptic fluid is only slight. The author describes roentgenologic studies conducted in order to demonstrate to what extent the gargling fluid comes in contact with the pharyngeal structures. By means of roentgenograms made in the course of gargling with contrast mediums and after contrast visualization of the tonsils, he was able to show that the gargling fluid reaches, under the most favorable conditions, the palatine arch and the upper tonsillar pole but not the tonsils or the posterior pharyngeal wall. He considers this an added reason for dispensing with the use of gargles in the treatment of inflammations in the region of the pharynx.

Calcium Therapy of Allergic Conditions—Kallós and Kallos Deffner cite experiments proving that the efficacy of calcium therapy in allergic conditions is the result of a lessened permeability of the marginal layer of the cells particularly of the capillary walls, and of a reduction of the irritability of the sympathetic nervous system. This explanation was accepted by a number of investigators who had been able to demonstrate that calcium prevents shock. However, the authors point out that the literature reports no studies on the effect of calcium on the antigen-antibody reaction that underlies the allergic condition. Since they had seen favorable effects from calcium therapy in numerous cases of allergy, they decided to give their attention to the antigen-antibody reaction. They made their tests on the isolated horns of the uteri of guinea-pigs that had been rendered allergic to horse serum, and they summarize their observations as follows: 1 Calcium gluconate exerts no harmful effects on the isolated uteri of guinea-pigs that have been sensitized against horse serum, even if it is used in strong doses and for long periods. 2 If specific antigen is added to the uterus horns that contain antibodies the anaphylactic contraction does not develop when calcium is present. 3 That the contraction does not appear is merely a result of a modification of the smooth musculature, for the antigen-antibody reaction,

which otherwise is always accompanied by an anaphylactic contraction of the uteri, takes place unhindered in the presence of calcium gluconate 4 The simultaneous administration of antigen and calcium permits specific desensitization of the uteri without producing an anaphylactic contraction 5 An existing anaphylactic contraction of the isolated uteri can be released instantaneously by the administration of calcium 6 The results of these experiments show that the calcium therapy of allergic conditions is well founded

Modification of Reid-Hunt's (Acetonitrile) Test by Antithyroid Protective Substances—Fellinger and Hochstädt base their studies on the following considerations The administration of thyroxine confers on white mice a considerable resistance to the highly toxic acetonitrile. If the antithyroid protective substance is biologically antagonistic to thyroxine, the simultaneous administration of the antithyroid protective substance and of thyroxine should cancel this protective action, or at least weaken it, so that the acetonitrile would exert its fatal action in spite of the administration of thyroxine In surveying the results of their experiments, the authors find that the various arrangements of the test give more or less the same results, that is, there is a more or less strong antagonistic action of the antithyroid protective substance against the active principle of the thyroid, either in the form of thyroxine injections or by the internal production of thyrotropic hormone However, the action of the antithyroid protective substance was considerably stronger against the thyrotropic hormone than against thyroxine In trying to explain this observation, the authors point out that, although the ether-soluble antithyroid protective substances act on the thyroid hormone, they act even more strongly on the thyroid itself or on its regulatory mechanism (thyrotropic hormone or hypophysis)

14: 1273 1304 (Sept. 7) 1935 Partial Index

Infectious Disorders and Adrenal Cortex S Thaddeu —p 1275

*Indications and Contraindications to Auto-Urotherapy M Krebs —p 1284

Further Studies on Formulation of a Biologicochemical Blood Circulation K Bingold —p 1287

*Renal Elimination of Vitamin C in Experimental Nephritis F Pinotti —p 1289

Electrometrical Determination of Iodine in Blood and Tissues H Paal and G Motz —p 1291

Chemical Changes in Serum During Formation of Complement F Silberstein F Rappaport and R Pistiner —p 1293

Auto-Urotherapy—Krebs points out that auto-urotherapy has been found effective in allergic conditions (hay fever, asthma, migraine, urticaria and so on), in certain spastic conditions and in whooping cough The injection of the patient's own urine is not always effective, as it failed in from 25 to 33 per cent of the cases He thinks that auto urotherapy will remain unreliable as long as there is no method that will indicate the curative value of the urine So far no active substance has been isolated from the urine, but studies have disclosed differences between effective and ineffective urines These studies were concerned with the determination of the acetones and the reductases The author found that the effective urines had reduced amounts of acetone substances and increased amounts of reductases, and occasionally increased amounts of both acetone substances and reductases It was found also that the ferment reactions can be influenced by age, infections, time of day, exercise, massage, sweating cures, starvation and medicaments The advisability of auto urotherapy cannot be determined on the basis of the diagnosis of the disorder alone, the quality of the urine, particularly the amount of acetone substances and of reductases, must also be considered Reduced reductase content together with increased or reduced amounts of acetone substances contraindicates auto-urotherapy

Elimination of Vitamin C in Experimental Nephritis—Pinotti studied the renal elimination of cevitamic acid on guinea-pigs in which nephritis had been produced by the administration of uranic acid or corrosive mercuric chloride The animals were killed during various stages of the poisoning and the kidneys were subjected to histologic examination It was found that the animals eliminate normal amounts of cevitamic acid during the stage of congestion of the glomeruli If the animals are killed when the elimination of the cevitamic acid commences to increase or is at its height, the glomeruli are

no longer in the stage of congestion but the disease is already further advanced Gradually the elimination of cevitamic acid returns to normal values As the increased elimination of cevitamic acid is apparently dependent on the glomerular system of the kidney and as guinea-pigs with scurvy do not exhibit an increased elimination of cevitamic acid during any stage of nephritis, that is, the scorbutic organism with its capillary disturbances does not have the capacity to reduce cevitamic acid, it appears probable that the capillary walls have reducing capacities The author hopes to corroborate this assumption by further experiments

Medizinische Klinik, Berlin

31: 1189 1224 (Sept. 13) 1935

Epidermophytosis O Grütz —p 1189

Occupational Disorders in Form of Eczema-like Eruption H T Schreus —p 1192

*Significance of Focal Infection in Treatment of Eczema A M Memmesheimer —p 1198

Neurodermatitis Its Relation to Eczema and Justification for the Term Neurodermatitis G Stimpke —p 1199

Alopecia of Legs W Schonfeld —p 1201

*Attempts at Desensitization in Menstrual Intoxications H Géber —p 1203

Mycosis of Hands and Feet with Especial Consideration of Mycotic Dysidrosis S Ballagi —p 1204

Focal Infection in Eczema—According to Memmesheimer, an eczema develops if some injurious irritant comes in contact with an organism that is hypersensitive to it This indicates that, in addition to the irritant, the condition of the skin or of the organism is of vital importance The sensitivity of the skin may be congenital or acquired In this study the author gives his attention to acquired sensitivity, which may develop suddenly, after injuries, burns and the like, or gradually In the gradual development, focal infections play an important part The author reports that, of ninety-eight patients with eczema who were carefully observed and examined for the presence of focal infections, eighty-two had focal infections The dental foci were most frequent, then followed in the order of their frequency the foci in the tonsils and the accessory sinuses, the intestinal tract, the urogenital tract, the respiratory tract and various other sites The author states that of seventy six cured patients, in whom the infectious foci had been detected and treated, only ten had a relapse within a year, while of fifteen in whom no focus had been detected, six had a relapse He concludes that a focal infection may have been overlooked in the group of fifteen patients He stresses the necessity of careful observation of each patient and concedes that the treatment is often extremely wearisome and trying He expresses the hope that further studies will reveal that the treatment of other hypersensitivity diseases (including asthma and hay fever) can be benefited by attention to focal infections

Desensitization in Menstrual Intoxication—Geber calls attention to the fact that menstruation in some women is accompanied by so-called menstrual exanthems These cutaneous changes appear in various forms, as papules, herpes blisters, erythemas, urticaria or even pemphigus-like eruptions These manifestations have in common that they are of an inflammatory nature and that they appear and disappear with the menstruation They are frequently accompanied by general indisposition, severe, uncontrollable headaches, vomiting, convulsions, articular pains and other conditions, but these general manifestations may also be mild or entirely absent On the other hand, the general symptoms may exist in the absence of cutaneous lesions The author points out that in former studies he has demonstrated experimentally that all these symptoms, the general as well as the cutaneous, are due to the fact that certain substances for which these women have a hypersensitivity enter into the blood stream during menstruation For instance, when he injected the serum withdrawn during an attack of menstrual urticaria into the same woman during the intermenstrual period an urticarial eruption resulted The serum that had been withdrawn during the intermenstrual period or several days before the onset of the menstruation did not have this effect Moreover, the serum from one woman did not produce urticaria in other women, nor did the serum from other women elicit an urticaria in the woman who was subject to menstrual urticaria The author points out further that, in collaboration with another

investigator, he has proved that menstrual herpes is an allergic condition. Reasoning that the various disorders that concur with menstruation might be of an allergic nature, he decided to try desensitization. For this purpose he employed the serum of each patient, which had been withdrawn during the most severe stage of the disorder. The blood was withdrawn under sterile conditions, centrifugalized and conserved with several drops of a 0.3 per cent solution of phenol. The serum prepared in this manner could be kept for several months without losing its efficacy. During the intermenstrual period the patients were given twice daily at two sites intracutaneous injections of from 0.2 to 0.4 cc of the serum. The injections were always made at the same sites, usually on the back. After eight or ten injections the sites were changed. In some cases, desensitization was accomplished after from twelve to fourteen injections, that is, during one intermenstrual period, while in others two or three series of injections were necessary. In two women relapses occurred after nine and eleven months, respectively, but renewed desensitization was again effective.

Monatsschrift f Geburtshülfe u. Gynäkologie, Berlin

100:1 124 (Aug) 1935 Partial Index

Pregnancy in Isthmus of Uterine Tube M Randazzo—p 17

Remarks on Surgical Sterilization of Women K Ehrhardt—p 29

*Biologic and Roentgenologic Demonstration of Metastases in Malignant Chorionepithelioma E Stockl—p 33

Clinical Aspects of Surgically Treated Tumors of Adnexa O Wolf—p 41

Demonstration of Metastases of Chorionepithelioma

—Stockl reports that the biologic test of the urine according to the method of Aschheim-Zondek has proved to be a reliable control method, which indicated the presence of living and growing chorion tissue in the organism and thus determined the prognosis of the case observed by him. The positive outcome of the Aschheim-Zondek reaction fifty-seven days after the combined radium and roentgen irradiation led to the discovery of numerous pulmonary metastases in the roentgenogram. In spite of the application of large doses of roentgen rays and of additional radium irradiation, the microscopic examination of the uterine mucous membrane disclosed tumor tissue in the form of vascular infiltrations. The author points out that these anatomic observations indicate the great resistance of the chorion cells against radiant energy particularly roentgen rays. He concludes that the combined application of radium and roentgen rays in cases of intra-uterine chorionepithelioma may be considered a radical method of treatment only if large doses of rays are applied.

Monatsschrift für Kinderheilkunde, Berlin

63:1 241 320 (Aug 19) 1935 Partial Index

Pathology of Tuberculous Meningitis I Acid Base Equilibrium and Osmoregulation D von Möritz—p 245

*Aspects of Homogeneous Triangular Shadow in Right Upper Pulmonary Field in Nurslings Y Yamaoka and T Nakaya—p 252

Pathogenesis of Spasmophilia G O Harnapp—p 262

*Local Insulin Lesions During Childhood A Schlüter—p 303

Triangular Shadow in Right Upper Part of Thorax in Nurslings—Yamaoka and Nakaya report that they observed a peculiar shadow in the roentgenogram of the thorax of two nurslings. The shadow covered a small triangular space in the right upper pulmonary field. In the first nursling, a girl aged 8 months, a troublesome cough had existed six weeks previous to hospitalization. In spite of many therapeutic measures, the shadow remained unchanged for six months. Finally, in view of a positive Wassermann reaction, antisyphilitic treatment was instituted and after that the pulmonary shadow decreased in size. The second case concerned a nursling aged 10 months, who at the time of the discovery of the triangular shadow had had a bronchitis of one week's duration. The shadow increased gradually until it reached the apex and then remained stationary for four months. After that a massive shadow developed in the middle and lower sections of the right side of the lung. Following an attack of measles, the massive shadow disappeared and a honeycombed outline appeared in its place. The necropsy revealed infiltrations in the right upper and lower lobes and massive postmorbilious bronchiectasis formation. The authors mention several factors that might possibly cause such shadows (atelectasis infiltrations mediastinal

pleurisy, hypertrophy of the thymus and stasis in the superior vena cava) and point out that the necropsy in the second case indicated that a pneumonic infiltration had caused the shadow. Since in the first case the shadow responded to antisyphilitic treatment it is possible that the shadow was caused by some syphilitic process either outside or within the lung. The authors concede that their observations are insufficient to arrive at a definite conclusion regarding the origin of such shadows.

Local Insulin Lesions During Childhood—Schlüter calls attention to the fact that prolonged insulin therapy may result in atrophy or in hypertrophy of the subcutaneous fat tissue at the site of injection. Atrophy is the most frequent form. He reviews the literature on this form, mentioning the various etiologic explanations that have been suggested, and then states that he himself observed this atrophy of the subcutaneous fat tissue in a girl, aged 11, who had had severe diabetes since the age of 5. The child had depressions at the sites of injection on both thighs. Moreover, the subcutaneous tissues were hardened and small infiltrates were palpable. The fat tissue had completely disappeared in these regions. Then the author states that circumscribed hypertrophy of the fat tissue is extremely rare. After citing several cases from the literature, he describes two cases of his own observation. The first concerned a boy, aged 7, who had received antidiabetic treatment since his third year. After three years of treatment he exhibited on both thighs at the sites of injection a cushion-like elevation of the skin. In spite of alternation of the sites of injection, the swellings remained. The second case observed by the author was that of a girl, aged 13, who had received insulin injections for the last thirty months. The swellings that had developed at these sites disappeared gradually in the course of nine months after the sites of injections had been changed. The reason why in some cases there results an atrophy and in others a hypertrophy from insulin injection has not been definitely explained as yet. The author thinks that the term "lipodystrophy," which was first applied by Depish to the atrophic form, can be applied also to the hypertrophic form.

Münchener medizinische Wochenschrift, Munich

82 1431 1472 (Sept 6) 1935 Partial Index

Work Metabolism and Constitution R Kost—p 1431

*Combined Serotherapy and Chemotherapy of Lobar Pneumonia F Stein—p 1434

*Congenital Cystic Kidney and Blood Pressure. H Willer—p 1437

Foundations of Critical Evaluation of Curative Results in Stomatitis Aphthosa Some Diagnostic and Etiologic Points W Hertz—p 1438

*Limitations and Dangers of Fasting Cures W Eisenberg—p 1441

Return of Intestinal Activity After Abdominal Operations E Seifert—p 1444

Combined Serotherapy and Chemotherapy of Lobar Pneumonia—Stein employed the combination therapy by administering a protein-deficient, highly active polyvalent pneumococcal serum which is directed principally against the pneumococci of types I and II, and an injectable 20 per cent solution of quinine. He describes six cases in which he used this combination therapy with good success. In surveying the effects his attention was drawn to two factors: (1) the critical defervescence before the seventh day and the consequent early detoxication of the patient, and (2) the fact that, in spite of the early defervescence, the pathologic anatomic course developed in the usual manner. In answer to the question whether the results he obtained are actually ascribable to the combination therapy, the author cites investigators who obtained favorable results with the use of quinine injections and others who found serotherapy effective, but he also cites factors which indicate that in his cases the good results were caused by the combination therapy. He points out that the advancement of the pathologic anatomic process in spite of the early defervescence was also noted by the observers who found quinine therapy or serotherapy alone effective. He advances evidence that the manner of application of the serum and the quantity of quinine are important. He observed that, when the intramuscular injection of the serum failed to accomplish the desired results, the intravenous injection was effective. He says that the daily dosage of quinine should not be less than from 1 to 1.5 Gm.

Congenital Cystic Kidney and Blood Pressure—Willer reports the clinical histories of five patients with congenital cystic kidney. All patients reached a comparatively high age (53 to 65), which is important for the estimation of possible circulatory effects of the renal disturbance. The author studied these cases carefully in order to find an answer to the question: Is there a nephrogenic hypertension? He points out that in the patients whose circulatory organs were free from pathologic changes no increase in blood pressure had been found in the course of a prolonged clinical observation, although the rest nitrogen values were rather high. He calls attention to his former studies on cases of amyloid contracted kidney, congenital renal defect and contracted kidney, in which he proved that the various theories regarding the renal origin of hypertension did not withstand criticism, and he shows that these cases of congenital cystic kidney bear out the same conclusion. He reasons that, if such extensive exclusion of renal tissue and the consequent accumulation of waste products produce no increase in blood pressure, it appears unlikely that much less extensive parenchymal impairments, observed in secondary inflammatory or in true vascular contracted kidney, should do so. The author believes that the interrelations between renal damage and hypertension must be of a different nature, assuming that in case of concurrence of renal defect and hypertension the latter is either the primary condition or is a coordinated process.

Limitations and Dangers of Fasting Cures—According to Eisenberg, fasting is a valuable therapeutic method or at least a therapeutic adjuvant. He found that fasting is of great help in some acute infectious diseases, high blood pressure, bronchial asthma, eczemas, gout, rheumatic disturbances, gastrointestinal disturbances and obesity. However, he stresses that the fasting cure has limitations and may involve danger. Its indiscriminate use by lay persons is inadvisable. He also warns physicians against using the method carelessly. Fasting should never be instituted unless a definite diagnosis has been made. Patients with cancer should not fast because of the tendency to cachexia. In pulmonary tuberculosis fasting is inadvisable since it may lead to reactivation. However in tuberculosis of other organs, fasting has been known to be helpful. In patients with diabetes, fasting counteracts the glycosuria, but this improvement is only temporary, for the sugar elimination usually returns when food is taken again. Occasionally a fasting cure is followed by an increase in the tolerance and furunculosis, gangrene and increased blood pressure, which frequently appear as sequels of diabetes, are favorably influenced by fasting. Hysterical patients should never be subjected to a fasting cure, and most mental disturbances, particularly manic psychoses and paranoia, contraindicate fasting cures. In exophthalmic goiter, fasting may be tried only if the patient is obese. In severe myocardial disturbances fasting is inadvisable, but it may be tried in the milder forms and it must be interrupted at the first unfavorable signs. In uterine myomas fasting has been advised by some, but the author saw no favorable effects from fasting in this condition, neither did his observations corroborate the suggestion that a fasting cure is helpful in stimulating a poor appetite; in fact, he warns against subjecting emaciated neurasthenic patients who lack appetite to fasting cures even if they are subject to constipation, which ordinarily is considered an indication for a fasting cure. Chronic gonorrheal arthritides are refractory to fasting, although many other forms of arthritides react to this treatment quite favorably. The management of a fasting cure requires conscientious supervision. Especial attention must be given to the heart. Although patients with valvular lesions and with coronary sclerosis tolerate the fasting cure quite well, it is important to give proper attention to the cardiac function of patients with rheumatism, tonsillitis, inflammation of the renal pelvis, or syphilis. If myocardial disturbances appear in such patients, the proper medication and bedrest should be instituted at once and, if the pulse rate remains 120 or higher for several days, the fasting cure must be interrupted. The author is unable to make definite statements regarding the duration of a fasting cure, but he thinks that they should last longer than four weeks only in rare instances. The diet at

the end of the fasting cure should be adapted to the individual case, for, although fruits may be advisable in the obese patients with a tendency to constipation, patients with gastro-intestinal or biliary disorders would require a blander diet.

82 1473 1514 (Sept 13) 1935 Partial Index

*Treatment of Gastric and Duodenal Ulcers That Perforate into Free Abdominal Cavity. H. von Haberer—p. 1473

*Changes in Psychic Mood in Alterations of Acid-Base Equilibrium. F. Hoff—p. 1478

Epidemiology of E. Dysentery (Kruse-Sonne). M. Christ—p. 1479

Experimental Studies on Biologic Behavior in Metabolism of Protein of Bran and Potatoes. A. Bickel, R. Sander and J. Schilling—p. 1482

Löhr's Cod Liver Oil Method in Practical Surgery. H. Jenio—p. 1485

*Treatment of Epilepsy with Antirabic Vaccines. M. Nikolic—p. 1493

Treatment of Perforating Gastric and Duodenal Ulcers—Von Haberer shows that, in the treatment of gastro-intestinal ulcers that perforate into the free abdominal cavity, strict adherence to a certain surgical method is no longer justified. The chief concern should not be the choice of the intervention but the coping with the dangerous results of the perforation in a manner that takes account of the conditions existing in the individual case. As the chief aim must be to preserve the endangered life, it will often be necessary to be satisfied with simple sewing over, and any reflection as to whether this intervention will be permanently adequate will have to be given up. However, the author thinks that there is a considerable number of patients in whom, in consideration of the still favorable circulatory conditions (good blood pressure and so on) it is permissible to resort to resection in spite of the perforation and generalized peritonitis. In these cases resection is preferable because it not only blocks the source of the peritonitis but also removes the focus as such and, if done as a large resection produces conditions that, on the basis of present-day knowledge, are most likely to prevent a recurrence of the ulceration. If the cases are well chosen the resection produces favorable immediate as well as permanent results.

Psychic Moods and Acid-Base Equilibrium—Hoff cites instances in which, as the result of the experimental alteration of the acid-base economy, there appeared changes in the psychic mood. He observed that an acidotic alteration resulted in a depressive mood. Moreover patients with a diabetic acidosis often are ill tempered and depressed, even if there are no disturbances in the consciousness. Psychiatrists know that anxiety, fear, hallucinations and paranoid disturbances appear during the precomatose period. The author thinks that the psychic disturbances that develop during the menstrual period may likewise be connected with the acidotic alteration in the metabolism that exists at the onset of the menstrual period. In this connection he calls attention to the high incidence of suicides during this period. He points out that an acidosis exists during the febrile stage of infectious diseases, when the patient is usually depressed, whereas the period of convalescence, when the patient is in a more cheerful mood, is characterized by an alkalosis. He concedes that the complicated interconnections of the sympathetic regulations doubtless play a part in these psychic processes and that the changes in the acid-base economy are only a link in these complicated interrelations, the glands of internal secretion and the mineral economy of the organism also playing important parts. Nevertheless, he thinks that his observations throw more light on the difficult problem of the interrelations between somatic and psychic processes.

Treatment of Epilepsy with Antirabic Vaccine—In reply to an inquiry as to whether it would be permissible to administer antirabic vaccine to an epileptic patient who had been bitten by an apparently healthy dog, Nikolic advised not only the usual dose but also a certain dose of the stronger, cerebral type of antirabic vaccine in order to test the effect on the epilepsy, a measure that had been suggested by several institutes. On three successive days the patient was given one ampule each of the prophylactic antirabic vaccine and on the six succeeding days one ampule each of the stronger antirabic cerebral vaccine. During three months following this treatment he did not have an epileptic attack, although formerly he had attacks sometimes twice daily. His psychic and somatic condition has considerably improved. He feels well and is able to work. The author thinks that it cannot be doubted that this

improvement in the epilepsy is causally related to the administration of the antirabic vaccine. He points out that the therapeutic success is probably chiefly due to the endotoxins of the fixed virus. He thinks that the antirabic vaccine may be used with hope for success in all forms of epilepsy that are not the result of a trauma during extra-uterine life or of tuberculous disease.

Wiener klinische Wochenschrift, Vienna

48: 1127-1150 (Sept. 13) 1935

- *Allergy in Diphtheria J Siegl—p 1127
Arthritic Lumbosacral Lumbago A Saxl—p 1131
Figures and Remarks on Problem of Heredity of Tuberculosis K Schubert—p 1134
Conservative Operation of Chronic Inflammatory Cecal Tumors W Goldschmidt and F König—p 1137
Singer's Animal Experimental Method for Demonstration of Castle's Principle A W C G Kamerling—p 1140

Allergy in Diphtheria—Siegl shows that, concerning the nature of immunity in diphtheria, the opinion predominates which considers it a purely antitoxic process. However it is nevertheless probable that there are other possibilities of defense against diphtheria in addition to the formation of antitoxin. Observations by the author and by Hamburger on the immunobiologic behavior of twenty children who recovered from diphtheria spontaneously disclosed that in three fourths of these cases cure resulted without the appearance of demonstrable quantities of antitoxin in the blood. These observations indicate that the organism does not require antitoxin formation even in case of active invasion by diphtheria bacilli. The author points out that similar observations were made by Rosling and thinks that efforts should be made to detect the factors that, in the absence of antitoxin, are responsible for this defense against infection with diphtheria bacilli. The possibility of an allergization has been considered repeatedly by earlier investigators. In this connection the author calls attention to observations made by Behring and Haymann and to the so-called pseudo-reaction that occasionally develops in case of the diphtheria toxin reaction according to Schick. It was assumed by some that the pseudoreaction is the manifestation of a specific sensitization. Later, this pseudoreaction was regarded as being in causal relationship with tuberculosis or tuberculin sensitivity. The author concluded that the pseudoreaction in the Schick test is not of uniform origin but that it may be of specific as well as of nonspecific origin, that is, it may be caused by a former contact with diphtheria bacilli or by various nonspecific factors. He describes tests made on persons with positive and negative tuberculin reactions, studies on the specificity of Zoeller's antitoxin reaction and observations made in the course of inoculations with Löwenstein's prophylactic diphtheria ointment. He concludes that the existence of a specific diphtheria allergy within the scope of the general defense against diphtheria cannot be doubted. He thinks that diphtheria immunity comprises a complex of different defense mechanisms, of which only certain ones can be detected as yet.

Zeitschrift für klinische Medizin, Berlin

128 343-454 (Aug. 17) 1935 Partial Index

- *Aleukemic Myelosis with Aspects of Panmyelophthisis C. Henschen and A. Jezler—p 343
Pathophysiology of Fat Metabolism in Renal Diseases A. I. Odinov and S. N. Guschtschina—p 358
*Influence of Liver Extract on Disordered Cholesterol Metabolism. A. O. Schally—p 365
Thyroid and Cholesterol Metabolism A. O. Schally—p 376
Functional Diagnosis of Cardiac Insufficiency D. D. Pletnew—p 386
Electrocardiographic Aspects of Myocardial Anoxemia Caused by Acute Anemia P. Radnai—p 401
Pathology of Pernicious Anemia Therapeutic Results with Oral Administration of Powder from Colon of Hogs Therapeutic Considerations of Colitis Gravis W. Schemensky—p 428

Aleukemic Myelosis with Aspects of Panmyelophthisis—Henschen and Jezler report the clinical history of a man, aged 56 in whom, although the clinical aspects corresponded to those of hemorrhagic aleukia the pathologic anatomic aspects indicated the opposite, that is, a hyperactivity of the blood-forming organs. As an aleukemic myelosis the case likewise takes a unique position, because during a long period of obser-

vation the circulating blood never contained preliminary myeloid forms. Moreover, the results of splenectomy in myelosis could be watched for a considerable length of time. The authors think that, although such cases have not been reported as yet, they probably are not as rare as might be assumed. However since the qualitative and quantitative inhibition of the transfer of leukocytes between the site of formation and the peripheral circulation is nearly always accompanied by a corresponding one of the erythrocytes and thrombocytes, such disorders were generally diagnosed as aleukia, aplastic anemia or panmyelophthisis, and it was overlooked that the presence of tumors of the spleen and the liver does not fit into the symptomatology of these disorders. In such disorders, it is advisable to think of the abnormal "panmyeloparetic" forms of leukemia. The relations between leukemia and aleukemia are often closer than may be expected on the basis of the nomenclature. To be sure, if complicated methods of examination cannot be employed, only a probability diagnosis can be made. It is possible, however, that further improvement of the functional tests might better the prospects for a more exact diagnosis. The authors point out that the flooding out of the blood cells from the blood-forming organs or the inhibition of this process is still problematic and that, until this problem is understood, all conclusions regarding the state of the bone marrow which have been arrived at on the basis of the peripheral blood picture, will remain unreliable.

Influence of Liver Extract on Cholesterol Metabolism

—Schally demonstrates that parenterally administered liver extract normalizes the reduced as well as the increased cholesterol content of the serum. He concludes from this that the liver plays an important part in the cholesterol metabolism. The functional disturbance of the liver, which presumably exists in case of abnormal cholesterol metabolism and which probably is a causal factor in the pathogenesis of true lipid nephrosis, can be largely compensated for by the administration of liver extract and thus the essential symptoms of nephrosis can be counteracted. It is assumed that an endocrine function of the liver effects this metabolic regulation.

Thyroid and Cholesterol Metabolism—Schally investigated the cholesterol metabolism in disturbances of the thyroid function, particularly in hyperthyroidism. He found that the cholesterol content of the serum is reduced in the majority of cases of hyperthyroidism. The more severe the disturbance the lower the cholesterol value. All therapeutic measures that produce an improvement in the hyperthyroidism also increase the cholesterol content. This increase is especially noticeable following strumectomy, in which case the cholesterol value often increases above the normal value. The author considers it possible that there is a causal connection between the reduction in the cholesterol content and the general symptoms of hyperthyroidism. He says that, if liver extract is administered without regard to the thyroid, an increase in the cholesterol content can be effected, and this increase is accompanied by an improvement in the general symptoms. To be sure, the reduction in the cholesterol content exists not only in cases of hyperthyroidism but also in other disorders of the thyroid that are not accompanied by an increase in the basal metabolic rate. The author differentiates between qualitative and quantitative dysthyroidisms. Whereas the basal metabolic rate is only an indicator of the quantitative dysthyroidisms, the reduction in the cholesterol content exists in both types of dysthyroidism. The author concludes that the thyroid exerts an inhibiting influence on the cholesterol metabolism.

Pulverized Colon of Hogs in Treatment of Pernicious Anemia

—Schemensky discusses aspects that induced him to resort to the administration of pulverized colon in cases of ulcerative colitis reasoning that the anemia developing in the course of this disorder is the result of the severe changes in the colon and that a substitution therapy might influence the condition favorably. However the author did not have a sufficient number of cases of ulcerative colitis to permit a definite conclusion regarding the value of this treatment. Later he decided to try pulverized colon in the treatment of pernicious anemia, and in all twenty cases in which he tried this treatment he obtained the same results that are observable following treat-

ment with liver or with stomach preparations. The improvement in the blood picture was perhaps somewhat slower than in the case of liver and stomach preparations, but the subjective improvement was about as rapid and was already noticeable before the blood picture had improved. The myeloid complications, from the slightest paresthesias to the severest disturbances in walking, were greatly improved. The preparation was produced from hog colon by drying in the vacuum and was defatted by means of petroleum ether. The preparation has an agreeable flavor, and the patients take it in bouillon without objection. The average dose is one teaspoonful five times a day. The minimal dose is one teaspoonful three times a day and the maximal dose is two teaspoonfuls five times a day. The author states that another clinic has used the colon preparation with good success in the treatment of pernicious anemia. He also makes suggestions regarding the probable mode of action of the preparation.

Zentralblatt für Gynäkologie, Leipzig

59: 2097 2160 (Sept 7) 1935

- Cavernous Hemangioma or Venectasias of Urethra O Hajek—p 2099
 Urinary Incontinence and Its Surgical Treatment by Gobel Stoeckel's Method C Stanca—p 2101
 Case of Granulosa Cell Tumor Carcinoma of the Bladder and Uterine Myoma in Woman Aged 57 G Optitz—p 2104
 *Case of Vesicovaginal Fistula of Rare Etiology N J Ljubimow—p 2108
 Bilateral Ureterovaginal Fistula Implantation into Bladder Seven and Eleven Months After Injury E. von Graff—p 2110

Vesicovaginal Fistula of Rare Etiology—Ljubimow states that the vesicovaginal fistulas are rarely caused by coitus and cites a report indicating that among 448 cases only one was caused in this manner. He says that according to Knauer's statement these injuries are most frequently longitudinal tears in the posterior wall of the vagina or in the posterior vaginal vault. Injuries of the anterior vaginal wall are comparatively rare and injuries of the wall of the urinary bladder are extremely so. The author reports the clinical history of a woman who, for ten years, since her first coitus, had had urinary incontinence. The anamnesis revealed that the first coitus had been extremely painful and followed by bleeding and involuntary discharge of the urine. The physician who was consulted at this time made no gynecologic examination and, since no other medical aid was requested, the urinary incontinence persisted for the following ten years. Then she was admitted to the author's clinic and the examination disclosed at the site at which the anterior vaginal wall adheres to the cervix uteri a fistular opening measuring two and one-half fingerbreadths. The fistula was repaired and the involuntary discharge of the urine ceased. Sexual intercourse was not resumed until cicatrization had been completed, but, after that, coitus caused no pain and the fistula did not reopen. This case is noteworthy not only because of the etiology, localization, size and duration of the fistula, but also because it must be assumed that during the ten years of the duration of the fistula coitus took place through the fistula into the urinary bladder. This explains the bleeding at every coitus and the subsequent pains in the lower part of the abdomen.

Acta Obstet. et Gynec Scandinavica, Helsingfors

15: 233 341 (No 3) 1935

- Hormone Therapy of Menstrual Disturbances and Its Theoretical Foundations A Westman—p 233
 *Difficulties During Dorsal Position in Pregnant Women G Ahltop—p 295

Difficulties During Dorsal Position in Pregnancy—Ahltop reports the history of a woman, aged 23, who during the last half of her first pregnancy experienced the following symptoms when lying on her back: increase in the pulse rate, reduction in the blood pressure and pulse pressure, difficulty in breathing and a feeling of discomfort and tension in the upper part of the abdomen. Roentgenoscopy revealed a reduction in the volume of the heart. A series of examinations disclosed that these symptoms developed only when the pregnant uterus rested against the right posterior part of the peritoneum. A survey reveals that during pregnancy, particularly during the latter half, there exists an increased predisposition for circulatory disturbances, and experiments on animals disclosed that

compression of the inferior vena cava causes reduction in the blood pressure and increase in the pulse rate. The author thinks that the symptoms in the described case (and in one previously reported) may be explained by the fact that the pregnant uterus compresses the vena cava more or less completely and probably pushes the diaphragm upward at the same time. In this connection he investigated the symptoms commonly present when pregnant women assume the dorsal position and also the spontaneous changes in the sleeping position during the second half of pregnancy. He found that of 653 pregnant women 197 (30 per cent) had some symptoms when lying on the back (pains in the abdomen or back, stronger movements of the fetus, palpitation and so on). In forty-two women (64 per cent) lying on the back was impossible, and more than one third of pregnant women changed their sleeping position during the second half of pregnancy. In another group of 189 patients it was found that in almost all cases the symptoms disappeared completely after parturition. The author points out that there is a parallelism between the fairly common feelings of discomfort and the grave symptoms exhibited by the patient whose history is described.

Hospitalstidende, Copenhagen

78 861 888 (Aug 20) 1935

- *Pathologic Changes in Spinal Cord and Especially in Spinal Ganglia in Case of Pernicious Anemia and Cancer Metastases, the Latter Causing Hemorrhagic Zoster L Einarson—p 861
 Biochemical Investigations in Psychiatry I Relation Between Blood Sugar and Spinal Fluid Sugar (0/0 Quotient) as Indicator in Differential Diagnosis Between Emotional Psychoses and Process Psychoses. G V Bredmose—p 878
 Tuberculous Sclerosis Combined with Pringle's Disease Recklinghausen's Disease and Psychic Symptoms Case S Petersen—p 883

Pathologic Changes in Spinal Cord in Pernicious Anemia and Cancer Metastases—In Einarson's patient, a woman aged 58, with marked pernicious anemia and myelopathy for five years, objective symptoms of gastric cancer set in one year before death, an exanthem appeared in the lumbar region eighteen days before death and developed into a typical hemorrhagic herpes zoster. There were more or less marked pathologic changes in the spinal cord, and attention is called to the pronounced antagonism between the Nissl elements and the lipid pigment substances. In most of the ganglia examined both normal cells were seen and cells showing general chronic changes (lipoid degeneration, secondary vacuolization, atrophy and nuclear pyknosis). Cancer metastases were located in the four ganglia from the eleventh dorsal to the second lumbar vertebra, corresponding to the extent of the herpetic eruption, and in these ganglia there were not only general chronic changes in all the cells but also toxic vacuolization and coagulation necroses. The general chronic changes are ascribed mainly to the pernicious anemia and possibly in part to a general intoxication from the gastric cancer, the grave acute changes limited to the four ganglia are attributed to the direct influence of the cancer metastases in the ganglia.

Norsk Magasin for Lægevidenskapen, Oslo

96: 905 1040 (Sept.) 1935

- Trauma of Head Analysis of Four Hundred and Seventy Two Cases Treated in Royal Victoria Hospital Montreal A Torkildsen—p 905
 Fractures of Transverse Process of Lumbar Vertebrae. W F Baastad—p 936
 *Investigations on Content of Vitamins A and D in Liver of the New Born K U Toverud and F Ender—p 947
 Unusual Attempt at Suicide L E. Volodarsky—p 961
 Treatment of Restricted Rotation of Hand After Poorly Healed Fractures of Radius R Ingebrigtsen—p 963

Vitamins A and D in Liver of the New-Born—Toverud and Ender found a variation of from 0.2 to 517 blue units per gram of liver in the vitamin A content of the liver in ninety-seven new-born infants, the average value in the forty-seven premature infants being 47.6 and in the fifty full term infants 28.8. The highest values occurred in the cases in which the mother's diet during pregnancy had had the highest carotene and vitamin A content. Tests of the vitamin D value in forty-four cases showed completely negative results in twenty-four smaller amounts in fifteen and larger amounts in only five in these five there had been abundant vitamin D in the mother's diet during pregnancy.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 105, No 19

CHICAGO, ILLINOIS

NOVEMBER 9, 1935

MATERNAL MORTALITY AND MORBIDITY

CANADIAN CHAIRMAN'S ADDRESS

JOHN R FRASER, M.D.
MONTREAL

The meeting this year is one of peculiar importance, marking as it does the first occasion on which these two great national medical associations have met in joint session. These are anxious times, great problems of economic and social import are in process of solution, and much thought is being expended on the development of schemes for social betterment. It is only natural that some reflection of these activities should be manifested in the proceedings of these meetings.

The world over, if one may judge by published reports, there is an awakening to the fact that obstetrics has failed to keep pace with the progress attained by other branches of medicine in lowering the death rate.

Eardley Holland,¹ recently addressing the Royal Sanitary Institute in London, put the situation fairly before the country when he said:

The failure of the mortality rate to yield one decimal point to the sustained attack which has been directed against it, but its tendency rather to react in the opposite direction, has endowed it with an air of mystery and malignity. The 1933 figure of 45 deaths per 1000 births is 7 per cent higher than the figure for the preceding year, and 15 per cent higher than that of twenty years previously. There is nothing obscure about maternity mortality. Its etiology both in principle and detail is well known, and the way it can be remedied is, to a certain section of the medical profession at all events, perfectly clear. There is no lack of knowledge, but only an obstinate neglect of the application of known facts.

These are the words of one of England's greatest obstetricians.

In order to approach this great problem from as broad a point of view as possible, it is well to familiarize oneself with the situation as it is known to exist.

A remarkable array of reliable information has recently become available for this study. Reports by government departments, medical bodies and private agencies have been presented. Four outstanding documents deserve special emphasis:

1 The report of the Children's Bureau, United States Department of Labor.²

2 The interim and final reports of the Departmental Committee of Maternal Mortality 1930-1932 of the British Ministry of Health, London.

Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.

¹ Holland, Eardley. *Lancet* 1: 973 (April 27) 1935.

² United States Department of Labor. Children's Bureau publication.

3 The Canada Year Book, 1932.

4 The report on Maternal Mortality in New York City, New York Academy of Medicine, 1933.

The United States Children's Bureau analyzed all the maternal deaths occurring in thirteen states for 1927, and in the same states with the addition of two others for 1928. The states in question are well distributed geographically and may therefore be considered representative of the country at large. In these states during the period reviewed the deaths of 7,537 women were assigned to puerperal causes by the United States Bureau of Census, in accordance with the international list of causes of death. This number of deaths was 26 per cent of the 29,298 deaths from puerperal causes in the entire United States birth registration area for two years. As there were 1,176,603 live births in these thirteen states during this time, these 7,537 deaths gave a maternal mortality rate of 64 per 10,000 live births. One third of these women had not advanced to the third trimester of pregnancy.

The detailed causes of death are shown in chart 1. That 40 per cent of all the deaths were of women who had such obvious and unmistakable signs of sepsis that there could be no question as to how they should be classified shows clearly the serious condition presented by this cause of maternal death.

In the report of the registrar general for England and Wales, as quoted by Bonney,³ it is clear that the death rate directly and indirectly attaching to pregnancy and labor has unfortunately changed very little in the last seventy years.

Hon. Neville Chamberlain set up a departmental committee of the ministry of health in 1928 to study and bring in a report on maternal mortality and morbidity in England. This final report was returned four years later, in 1932. The basis of the report was an investigation into the actual circumstances of a large number of maternal deaths, an enquiry never before attempted on so large a scale. In all, 5,805 cases were investigated. It was found advantageous to classify these cases into two great groups:

Class 1 Deaths directly due to child bearing.

Class 2 Deaths due to an independent cause concurrent with pregnancy or childbirth in which child bearing contributed to or accelerated death or was present merely as an incident.

In Canada, for example, in 1930 there were 243,495 live births with a total mortality of 1,405, a rate of 58 per thousand live births, a similarly high maternal death rate.⁴ In a footnote in the Canada Year Book of 1932 there is the significant statement that, as compared with 1929, the number of maternal deaths shows an increase of sixty-eight, or 51 per cent, for

³ Bonney, V. *Roy Soc (Sect. Obst. & Gynaec.)* 12:75 (July) 1919.

⁴ Canada Year Book 1932.

1930 The chief causes given are puerperal septicemia, albuminuria and convulsions, puerperal embolism, and sudden death in the puerperium

What is true of the country at large can readily be shown to be true of any individual section or community in it, for example, the report of the maternal mortality

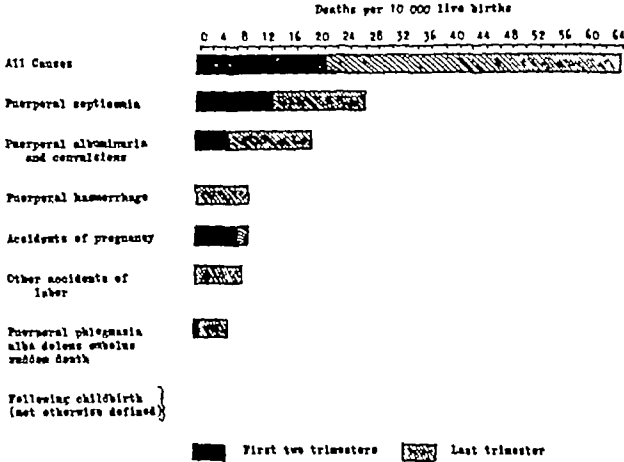


Chart 1—Maternal mortality rates by cause and by trimester of pregnancy

in New York City as prepared by the New York Academy of Medicine for the years 1930-1932 When analyzed in the light of a causative factor underlying each death it is seen that the following conclusions may be drawn, as emphasized by the New York group in the summary

- 1 The inadequacy of antepartum care
- 2 Lack of appreciation by those concerned of the gravity of apparently mild symptoms
- 3 The high incidence of operative intervention, more than 45 per cent of the series
- 4 The selection of the wrong treatment or ill advised therapy
- 5 The high incidence of cesarean section and its death rate
- 6 Medical incapacity

Obstetric practice, generally speaking, has undergone much change in the last thirty years At the present time many women exhibit a willingness, even an eagerness, to have their babies born in a hospital At the same time it is true, and will be for a long time to

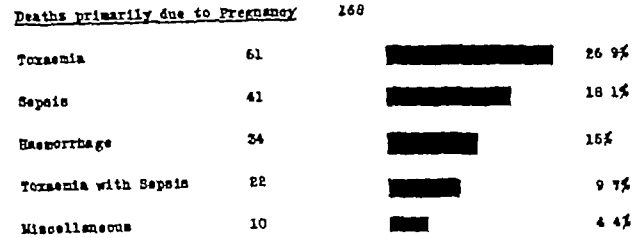


Chart 2—Deaths primarily due to pregnancy at the Royal Victoria Hospital

come, that the large part of midwifery practice will be conducted in the home This basic fact must always be remembered in any study of maternal mortality

It is true that in many instances this is perfectly safe, provided conditions in the home are reasonably good and favorable, but the case which in the antepartum period can be recognized as abnormal should be handled in the hospital The results of home obstetrics

are not widely known, for accurate figures are not easily obtainable It is possible, however, to derive some such knowledge through the study of reports of the outdoor service of maternity hospitals and the large nursing services, such as those which exist in England

In an effort to answer this question, Thomas Eden⁵ published the tabulated results of the Queen's Institute of District Nursing These midwives, who work not privately but for county nursing associations, attend large groups of women in different parts of the country It will be observed that their mortality rate is less than one half of the national rate The most striking feature, moreover, is the low mortality from sepsis, less than one fourth of the national sepsis rate

The report on maternal mortality in the city of Aberdeen for 1918-1927⁶ is of interest in this regard In domiciliary practice the mortality in the midwives' practice was 1 per thousand births and in that of physicians, 17 per thousand births, while in institutions it amounted to 4.5 per thousand births At a first glance these figures would seem to support the contention that home delivery was decidedly safer than institutional and that midwives were safer than physicians That this is not the case, however, is readily seen when it is realized that in all serious or abnormal conditions the patients are transferred to a physician or sent to the hospital

Institutional practice, though handicapped in many communities by being compelled to deal with all types

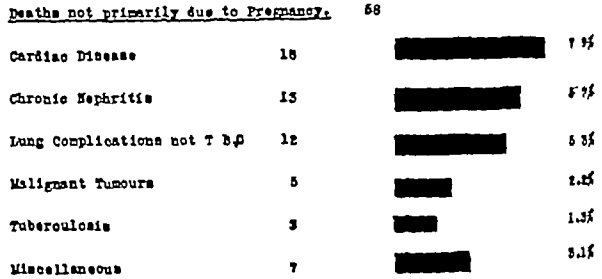


Chart 3—Deaths not primarily due to pregnancy at the Royal Victoria Hospital

of emergencies, can equal or improve on the statistics of home service The East End Maternity Hospital in London maintains a joint outdoor and indoor service. For the period 1925-1929 the exceedingly low death rate of 0.48 per thousand births was recorded

During the period 1906-1934 in the Royal Victoria Maternity Hospital, Montreal, there were in the combined outdoor and indoor delivery services 48,752 confinements with a total of 246 maternal deaths, a rate of 5 per thousand deliveries These deaths were divided into two great groups (1) those due primarily to pregnancy and (2) those not primarily due to pregnancy These results are of more than usual interest when it is considered that 38 per cent of the cases admitted were emergencies One hundred and two of the patients were primiparas and 124 were multiparas

The influence of age on mortality is clearly shown in table 10

Operative delivery was necessary in 73 per cent of this series

In this study no special attention will be directed to the influence of abortion as a causative factor, although

⁵ Eden, Thomas Brit M J 1 399 (March 11) 1933
⁶ Aberdeen Report Scottish Board of Health 1928

one realizes the increasingly large part it is playing in every country in swelling the mortality tables

It is difficult in every case to track down the actual cause of death, as one frequently finds more than one influencing factor, however, in all summaries three groups of conditions seem preeminently responsible, namely, sepsis, toxemia and hemorrhage, acting either singly or in combination. A better appreciation of the importance of the recognition of the early manifestations of toxemia and hemorrhage, together with the institution of more active therapy, will in the future do much to lessen the dangers of these two conditions.

The problem *par excellence* awaiting solution is, however, the matter of infection, puerperal infection including under that term septicemia, pyemia, phlebitis and all its other manifestations. Undoubtedly the figures would be even higher if they included all cases in which bacterial invasion of the birth canal determined the final issue. Again, often in the lists of

TABLE 1—Maternal Death Rate in England and Wales, 1848-1917

| Year | Births | Deaths Attaching to Child birth | Deaths per 1 000 Live Births | Deaths by Sepsis | Number of Deaths by Sepsis per 1 000 Births | Percent age of Deaths by Sepsis Relation to Total Deaths |
|------|---------|---------------------------------|------------------------------|------------------|---|--|
| 1917 | 668,346 | 3 236 | 4.8 | 916 | 1.3 | 28 |
| 1916 | 784,520 | 3 918 | 5.0 | 1 147 | 1.4 | 28 |
| 1915 | 814 014 | 4 259 | 5.2 | 1 253 | 1.5 | 29 |
| 1914 | 879 090 | 4 498 | 5.1 | 1 422 | 1.6 | 31 |
| 1913 | 881,890 | 4 290 | 4.8 | 1 173 | 1.3 | 27 |
| 1912 | 872 737 | 4,321 | 4.9 | 1 280 | 1.4 | 28 |
| 1911 | 881 138 | 4,322 | 4.9 | 1,334 | 1.5 | 30 |
| 1910 | 896 962 | 4 277 | 4.7 | 1 274 | 1.4 | 29 |
| 1909 | 914 472 | 4 000 | 5.0 | 1 465 | 1.5 | 31 |
| 1908 | 940,383 | 4,521 | 4.8 | 1,390 | 1.4 | 30 |
| 1907 | 918 042 | 4 672 | 5.0 | 1 465 | 1.5 | 31 |
| 1906 | 935 681 | 4 944 | 5.2 | 1 640 | 1.7 | 33 |
| 1905 | 929 293 | 5,164 | 5.5 | 1 734 | 1.8 | 33 |
| 1904 | 940,509 | 4 205 | 4.4 | 2,003 | 2.1 | 47 |
| 1893 | 89,957 | 5 194 | 5.7 | 2 356 | 2.6 | 45 |
| 1889 | 881 648 | 3 492 | 4.0 | 1 060 | 1.8 | 47 |
| 1870 | 792 787 | 3,875 | 4.9 | 1 492 | 2.8 | 33 |
| 1860 | 684 048 | 3 173 | 4.6 | 918 | 1.4 | 31 |
| 1850 | 689,881 | 3 173 | 5.1 | 1,238 | 1.8 | 39 |
| 1858 | 655 481 | 3 131 | 4.8 | 1 068 | 1.6 | 34 |
| 1837 | 663,071 | 2 787 | 4.2 | 836 | 1.2 | 30 |
| 1840 | 657 453 | 2 688 | 4.4 | 1 067 | 1.6 | 37 |
| 1855 | 630 043 | 2 910 | 4.7 | 1 079 | 1.7 | 36 |
| 1854 | 634 400 | 3 009 | 4.7 | 954 | 1.5 | 31 |
| 1853 | 612,391 | 3 063 | 5.0 | 780 | 1.3 | 26 |
| 1852 | 624 012 | 3 247 | 5.2 | 972 | 1.5 | 30 |
| 1851 | 615,665 | 3,290 | 5.3 | 1 004 | 1.6 | 30 |
| 1850 | 593,422 | 3,252 | 5.5 | 1 113 | 1.8 | 34 |
| 1849 | 578 150 | 3,339 | 5.8 | 1 160 | 2.0 | 35 |
| 1848 | 563 039 | 3 445 | 6.0 | 1,360 | 2.4 | 39 |

conditions not directly due to, but associated with, pregnancy, such conditions as pneumonia may, though classed separately, frequently be but a conspicuous part of a sepsis. Embolus is often a part of a mild pelvic sepsis.

In the section on puerperal sepsis in the ministry of health report one reads that it is widely held that puerperal sepsis occurs more frequently in maternity hospitals than in domiciliary practice. This is a natural survival from the days when epidemics in institutions were common and of alarming magnitude. It gains weight from the fact that major obstetric difficulties are dealt with in hospitals and naturally carry a high death rate from infection. Unfortunately the Aberdeen report of 1928 gave some support to this contention. There is definite evidence, however, to show that the majority of septic deaths do not occur in epidemics but rather in an isolated or sporadic fashion. Even more important is the conclusion drawn in the British report that the occurrence of sepsis after normal labor is no greater in the hospital than in the home.

When due attention is concentrated on these predominant sporadic infections and on the incidence rather than on the death rate (which is apt to be influenced by other factors), the case bears a different aspect. In three large centers of maternity work, viz., Queen Charlotte's Hospital, the Elsie Englis Hospital

TABLE 2—Deaths Directly Due to Child Bearing

| | First Series | Second Series |
|---|--------------|---------------|
| Sepsis | 616 (38.0%) | 1 111 (36.3%) |
| Eclampsia | 218 (13.0%) | 336 (10.6%) |
| Operative shock etc. | 145 (9.0%) | 319 (10.4%) |
| Antepartum hemorrhage | 125 (7.5%) | 243 (8.1%) |
| Postpartum hemorrhage | 92 (5.7%) | 204 (6.7%) |
| Other toxemias including chorea and mania | 99 (6.2%) | 180 (5.8%) |
| Embolism | 113 (7.0%) | 206 (6.8%) |
| Abortion | 163 (10.5%) | 410 (13.4%) |
| Extra uterine gestation | 20 (1.2%) | 55 (1.8%) |

TABLE 3—Deaths not Primarily Due to Pregnancy

| | First Series | Second Series |
|---------------------------------|--------------|---------------|
| Lung disease (not tuberculosis) | 153 | 209 |
| Heart disease | 98 | 189 |
| Chronic renal disease | 40 | 59 |
| Pulmonary tuberculosis | 26 | 57 |
| Cerebral hemorrhage | 18 | 26 |
| Scarlet fever | 4 | 5 |
| Unclassified | 65 | 201 |

in Edinburgh and University College London, it has been the custom for the last two or three years for all pyrexial cases occurring in the hospital or outpatient practice to be bacteriologically investigated as soon as they occur. In each center it has been found that the incidence of infection by hemolytic streptococci has been consistently higher among the women delivered at home than among those delivered in hospitals, and that in spite of the fact that in the "district" only normal booked cases are dealt with, whereas in the hospital "emergency" and abnormal deliveries are also undertaken, and an opportunity for contagion is frequently present.

While, therefore, the committee is fully alive to the threat of contagious infection in maternity hospitals

TABLE 4—Causes of Maternal Deaths in Canada in 1930

| | |
|--|-------|
| Accidents of pregnancy—total | 89 |
| (a) Abortion | 20 |
| (b) Fetal gestation | 40 |
| (c) Others under this title | 20 |
| (d) Abortion self induced | 3 |
| Puerperal hemorrhage | 179 |
| Other accidents of childbirth | 133 |
| (a) Cesarean section | 33 |
| (b) Difficult labor | 29 |
| (c) Other surgical operations and instrumental delivery | 27 |
| (d) Uncontrollable vomiting | 27 |
| (e) Rupture of uterus in labor etc. | 20 |
| Puerperal septicemia | 501 |
| Phlegmasia alba dolens puerperal embolism sudden death in puerperium | 143 |
| Puerperal albuminuria and convulsions | 300 |
| Following childbirth (not otherwise defined) | 50 |
| Puerperal diseases of the breast | |
| Total | 1 400 |

and would emphasize the need for constant vigilance and improved methods of avoiding it, it takes the view that this is not the outstanding cause of infection by *Streptococcus haemolyticus* or of septic infection following normal labor.

Again the British report emphasized the very significant fact that 20 per cent of all deaths follow a normal labor. If these infections were brought to the genital tract of the women during or after labor, as is

probable in the light of recent research, it is a very significant fact, for it means that much of it can and should be avoided

In the past these organisms were regarded as having been preexistent in the birth canal or transferred there by the attendant from other cases. Doubtless on occasion this happens, but is it by any means the common occurrence?

Taylor and Wright,⁷ in an examination of the vaginal flora of 1,123 women, found *Streptococcus pyogenes* in only 3 per cent during labor, and fever developed in less than one in ten of these. A similar finding is reported by Rose.⁸

Colebrook⁹ is of the opinion that *Streptococcus pyogenes* causing puerperal infection is not present to any extent in the vagina during labor. In a critical investigation of the bacterial flora in the vagina of 855 women examined before delivery, thirteen strains of *Streptococcus haemolyticus* were isolated, only four strains were found complying with the usual tests as applied to known human infections. This reduces the incidence to 0.48 per cent. He concludes with these words: "The vast majority of severe puerperal infections by hemolytic streptococci have been conveyed to the genital tract during labor or after delivery and were not present before delivery."

It is of the greatest interest that by the work of Kanter and Pilot,¹⁰ Paine of Sheffield, and Smith¹¹ of Aberdeen it has been clearly proved that, in cases of puerperal sepsis investigated bacteriologically by them, infection was shown to have occurred by droplet infection from the nose and throat of those in attendance at the time of confinement.

TABLE 5—Maternal Mortality in New York per Thousand Live Births (1930-1932)

| Year | Total Maternal Mortality | Puerperal Sepsis | Other Puerperal Causes |
|------|--------------------------|------------------|------------------------|
| 1930 | 5.49 | 2.15 | 3.34 |
| 1931 | 6.12 | 2.30 | 3.76 |
| 1932 | 5.98 | 2.44 | 3.54 |

TABLE 6—Distribution of Deaths by Cause

| Cause of Death | Number | Per Cent |
|------------------------------------|--------|----------|
| Total | 2,041 | 100.0 |
| Septic abortion | 302 | 12.8 |
| Abortion | 95 | 4.7 |
| Ectopic gestation | 120 | 5.9 |
| Hemorrhage | 197 | 9.7 |
| Puerperal septicemia | 610 | 25.0 |
| Albuminuria and eclampsia | 231 | 11.3 |
| Pernicious vomiting | 14 | 0.7 |
| Phlegmasia alba dolens and embolus | 89 | 4.4 |
| Accidents of labor | 171 | 8.4 |
| Accidents of puerperium | 8 | 0.4 |
| Extrapuerperal causes | 344 | 16.9 |

It is known that infections have occurred when people with beginning throat infection were in attendance at labor or when the patient herself had a respiratory infection. Often in the routine culture of the throats and noses of interns and nurses a pure

culture of streptococcus is demonstrable. It is therefore evident that there may be several sources, such as the woman herself, her husband, or a nurse or physician attendant at the labor.

Another aspect of the problem is clearly fundamental and ultimate, viz., the standard of health and physical capacity of womanhood, which may be favorable or

TABLE 7—Mortality per Thousand Live Births (National)

| Year | Sepsis | Other Causes | Total |
|-----------|--------|--------------|-------|
| 1911-1915 | 1.42 | 2.61 | 4.03 |
| 1916-1920 | 1.51 | 2.61 | 4.12 |
| 1921-1925 | 1.40 | 2.60 | 3.99 |
| 1926-1931 | 1.72 | 2.52 | 4.25 |

TABLE 8—Midwifery Results of the Queen's Institute of District Nursing

| Year | Cases Attended | Total Mortality per 1,000 | Mortality from Sepsis per 1,000 | Proportion of Cases in Which Physician Was Called per Cent |
|--------------------------------------|----------------|---------------------------|---------------------------------|--|
| 1926 | 56,868 | 1.50 | 0.26 | 19.0 |
| 1927 | 53,502 | 1.30 | 0.20 | 25.0 |
| 1928 | 60,077 | 1.00 | 0.44 | 25.2 |
| 1929 | 63,131 | 2.10 | 0.63 | 23.4 |
| 1930 | 66,003 | 2.00 | 0.53 | 27.5 |
| 1931 | 66,570 | 1.70 | 0.46 | 27.0 |
| Average of six year period 1926-1931 | | 1.70 | 0.42 | |

unfavorable to normal pregnancy and childbirth. One cannot expect a low maternal mortality rate unless the women subjected to the strain and stress of the function of childbirth are themselves healthy and physically fit to undergo it, this consideration must in the long run exert a profound influence on the whole question. Rickets in childhood, tuberculosis, occult nephritis, anemia in young women, rheumatic fever, venereal disease, malnutrition or focal sepsis are serious factors. At no time in the present century have the dire effects of malnutrition been witnessed more clearly than in the past four years.

Considerable emphasis must be placed on the existence or not of toxemia, the general conduct and length of the labor, the time of rupture of the membranes, the amount of handling, the associated trauma, the blood loss and the amount of fatigue or exhaustion that is the result.

Although many men believe that vaginal examinations if carefully carried out offer little risk and are distinctly preferable to rectal examinations as a means of following the course of labor, I believe that as a general rule the consideration of the vaginal canal as a closed cavity throughout labor and the use of rectal examinations as a substitute have been distinct advances in the conduct of ordinary labor. After all, the careful study of a woman up to the time of labor should in the vast majority of cases preclude the necessity for much internal examination.

Of the many contributory factors that influence the development of sepsis, the rising incidence of operative intervention for one reason or another, with the course of labor constitutes one of the greatest of problems—"the prophylactic forceps and cesarean section."

Platt¹² of Iowa, in a masterly report to the White House Conference in February 1931, drew attention to the importance of this question. After showing conclusively the injurious effects on both mother and child of unwise operative intervention with labor, he

7 Taylor, Joan and Wright, H. D. J. Obst. & Gynaec. Brit. Emp. 37: 213 (1930).
8 Rose, J. K. J. Obst. & Gynaec. Brit. Emp. 40: 273 (April) 1933.
9 Colebrook, Leonard. Brit. M. J. 2: 723 (Oct. 21) 1933. Interim and Final Reports. Departmental Committee of Maternal Mortality and Morbidity. London: H. M. Stationery Office, 1930-1932.
10 Kanter, A. E. and Pilot, Isadore. Surg. Gynec. & Obst. 38: 96 (Jan.) 1924.
11 Smith, J. Scottish Scientific Advisory Committee. Department of Health for Scotland. Report I, 1931. J. Obst. & Gynaec. Brit. Emp. 40: 991 (Oct.) 1933.

12 Platt, E. D. Am. J. Obst. & Gynec. 22: 176 (Aug.) 1931.

concluded with this powerful statement "But for permanent and lasting relief a return to first principles is necessary. It should be taught that any interference with normal labor constitutes a definite risk."

Of the whole question of maternal mortality I can think of no single phase which invites the attention of the profession with greater promise of profit than this broad question of morbidity and all that it implies. Lord Playfair wisely said on one occasion "The record of deaths only registers, as it were, the wrecks that strew the shore, but it gives no account of the vessels which were tossed on billows of sickness,

TABLE 9—Maternal Deaths at Royal Victoria Maternity Hospital 1906-1934

| | |
|--------------------|------------|
| Total deliveries | 48 762 |
| Maternal deaths | 246 |
| Investigated cases | 206 |
| Unclassified | 20 |
| Deaths | 246 |
| | 5 per 1000 |

strained and maimed as they often are by the effect of recurrent storms."

A comprehensive view of this whole question is hindered by the lack of a uniform yardstick with which to measure with any degree of accuracy degrees of morbidity. We have suffered a multitude of counselors, for at the present time there are in operation many standards: (1) the British Medical, (2) the British Board of Health, (3) the American College of Surgeons, (4) the Strasbourg Conference Standard

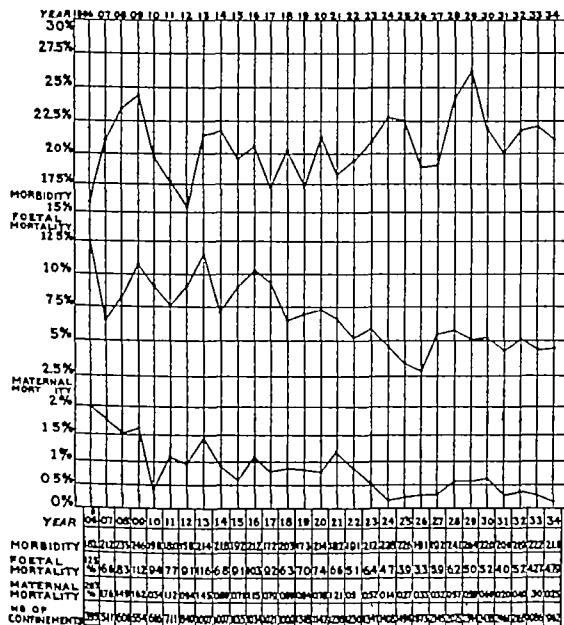


Chart 4—Morbidity and fetal and maternal mortality from 1906 to 1934 at the Royal Victoria Hospital. A single rise in temperature to 100.6 F (after the first twenty-four hours) classes the case as morbid.

Various hospital units throughout this continent have established their own standards of morbidity. For example, in the Chicago Lying-In Hospital every woman is morbid with a temperature of 100 F or more once at any time that she is in the hospital. In the Royal Victoria Hospital, Montreal, a temperature of 100.6 F at any time post partum exclusive of the first twenty-four hours, constitutes morbidity.

Realizing that many complications are of such a nature as to be overlooked if one relies solely on grades of fever, Ward¹³ of New York suggests a wider classification to include all complications in the antepartum, intrapartum and postpartum periods. This is all true, but for a beginning no one standard of

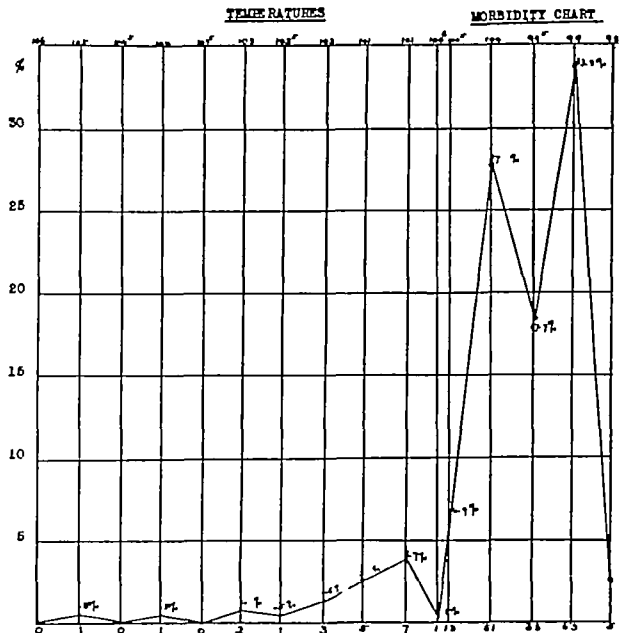


Chart 5—Temperature chart in the morbid cases. Actual number of cases: public 121, private 65, antepartum and postpartum 18, making a total of 204. Morbidity: public 11.5 per cent, private 10.7 per cent, a total of 11.2 per cent.

measurement could be more accurate than the acceptance throughout this continent of a solitary standard of pyrexia, by the profession, as a measure of morbidity. This would be the most constructive step ever taken in the war against sepsis. The morbidity chart would then truly be to the obstetrician what the bone

TABLE 10—Influence of Age on Mortality

| Age | Numbers |
|------------------|---------|
| Under 20 years | 8 |
| Under 30 over 20 | 84 |
| Under 40 over 30 | 112 |
| Under 60 over 40 | 21 |
| Unknown | 1 |

plate has always been to the general surgeon a rigid test of the prevailing technic.

Charts 4 and 5 depict graphically what could be recorded from an institutional point of view in this respect. These charts will quickly answer these very vexing questions:

- 1 The value of any special technic, such as the introduction of antiseptics into the vagina during labor.
- 2 The influence of interference in the course of labor, together with the incidence of morbidity after certain operations.
- 3 The advent of streptococcus carriers.
- 4 The location of the high morbidity centers and therefore of the high mortality centers throughout the country. It would inevitably influence the infantile death rate.

The greatest contribution to obstetrics would be the establishment of a common standard.

The necessity for the antepartum supervision of the primigravida is generally recognized, but the needs of

¹³ Ward G. G. Goff B. H. and Aldridge A. H. Bull. Am. Coll. Surgeons 10:9 11 (March) 1935.

the multipara are not so readily accepted by the public or by the profession. She is looked on as a safe performer and undue supervision is often considered superfluous.

Reports from all hospitals, if carefully scrutinized, will soon disprove this fact.

TABLE 11—Comparative Mortality Risk According to the Number of Children

| Children Born | Average Maternal Risk per 1 000 Births |
|---------------|--|
| 1 | 8.80 |
| 2 | 6.74 |
| 3 | 6.32 |
| 4 | 6.05 |
| 5 | 6.21 |
| 6 | 6.23 |

Leyland Robinson¹⁴ states that the mortality risk for a woman of 40 is three times as great as that for a primigravida of 18. He submits the data in table 11, prepared by Coghlan, and recalls that, obstetrically speaking, old age may approach in a physiologic or pathologic manner, or combined, since few individuals are free from some organic defect or weakness.

Even in the presence of health, tissue changes as a result of physiologic wear and tear reduce the activity of the organs and absorb their reserve power. Such impairment of function will in the course of time reach a point at which the whole reserve power is fully mobilized and the individual is incapable of further effort. Such changes would in particular impose great strain on the excretory system during pregnancy and on the musculature and heart during labor, lowered resistance, incapacity for work, undue sensitiveness to fatigue are the natural sequences.

The action of advancing age on any organic defect or disease is dependent on many factors and especially on the site and nature of the lesion. Many diseases are progressive in character, and their disabling effects increase with age, witness the cardiac and the nephritic.

CONCLUSIONS AND RECOMMENDATIONS

Since puerperal infection still remains directly or indirectly the most conspicuous single cause of death following childbirth, every effort should be expended toward its prevention.

Pathogenic organisms, chiefly of the streptococcus family, must be prevented from reaching the birth canal, irrespective of whether it is from the nose and throat of attendants, the patient herself, her husband, or other patients. Endogenous infection must be cleared up.

The use of masks, properly constructed and applied, must be adopted by all those in close contact with women in labor. No person with respiratory or other infection should be in attendance, and the known carriers of streptococci should be constantly supervised. The day is not far distant when, for these reasons, certain people will not be able to undertake maternity work.

In hospital practice, patients exhibiting any signs of infection must be promptly segregated, and at the time of seasonal infections the utmost care should be exercised in the segregation of all suspects.

The adoption in obstetrics of many of the principles that have been so successfully applied in surgery, for example, the more careful examination of the prospective mother with a view to establishing her ability to

stand the strain of labor will do much toward lowering the mortality rates. Again, more attention must be directed to the mechanical problem in hand, for after all the simple fact remains that, in a normal woman with a normal pregnancy, the presenting part should be in the pelvis in the last month.

The impression is gaining ground that more care is necessary in the education of students and physicians in the supervision of pregnancy, in combating the rising incidence of operative obstetrics such as forceps delivery and cesarean section, and in the building up of a more efficient maternity service.

The provision of antepartum clinics, in itself admirable, cannot in any way be construed as a measure of prevention that will be an infallible guide. It is very necessary that those in charge should have a lively sense of what constitutes a healthy prognosis.

This bespeaks the close correlation of all agencies engaged in this work. Teamwork in obstetrics must prevail.

1390 Sherbrooke Street W

ADRENAL CORTEX EXTRACT

EDWARD C. KENDALL, Ph.D.
ROCHESTER, MINN.

Since the classic work of Addison on adrenal deficiency in patients, the adrenal gland has occupied a position of great importance and fascination. A study of its chemical nature and physiologic function has followed the usual course of studies on the other ductless glands. The first step was the proof that the gland is essential for life. This has been known for many years. The second step was the proof that within the gland some substance or substances are present which can be separated and used in substitution therapy. The work of Hartman¹ and of Swingle and Pfaffner² conclusively established the fact that the life of adrenalectomized rats, cats and dogs can be maintained with an extract of the gland.

About eighteen months ago the separation of a crystalline fraction was reported³ which possessed the essential physiologic activity in dogs and patients. This was given with a diet that contained sodium chloride in amounts slightly higher than normal. Three patients have been maintained with the crystalline material for periods of from fourteen to thirty-six days. When the crystals were withdrawn and the administration of the same amount of salt was continued, definite symptoms of adrenal deficiency developed. These results, and similar experiments on adrenalectomized dogs with the addition of sodium chloride, showed that the typical symptoms which followed removal of the adrenal glands could be controlled by the crystalline fraction separated from protein, epinephrine, phospholipids and all other substances of either an acid or a basic nature.

I shall not at this time report on the chemical nature of the crystalline material other than to say that it is a

From the Section on Biochemistry the Mayo Foundation.
Read before the Section on Surgery General and Abdominal at the Eighty Sixth Annual Session of the American Medical Association Atlantic City N. J. June 12 1935.
1 Hartman F. A. Cortin, Vital Hormone of the Adrenal Cortex, Endocrinology 14: 229 232 (July) 1930.
2 Swingle W. W. and Pfaffner J. J. An Aqueous Extract of the Suprarenal Cortex Which Maintains the Life of Bilaterally Adrenalectomized Cats, Science 71: 321 322 (March 21) 1930.
3 Kendall E. C. Mason H. L. McKenzie, B. F. Myers C. S. and Koelsche G. A. Isolation in Crystalline Form of the Hormone Essential to Life from the Suprarenal Cortex Its Chemical Nature and Physiologic Properties Proc. Staff Meet. Mayo Clin. 9: 245-250 (April 25) 1934.

hydroxy aldehyde which apparently contains twenty-one atoms of carbon and is consequently of high molecular weight. The first crude separation of crystalline material contains more than one substance. The fractionation of this combination of substances into single entities is a difficult matter. The work is now under intensive investigation and will be reported as rapidly as definite conclusions can be made.

THE FUNCTION OF ADRENAL CORTEX EXTRACT

Since 1930, when evidence for the presence of the cortical hormone was obtained, active investigation of the physiologic effect of the extract has been carried out in many laboratories. These results may be summarized by the statement of four theories. Hartman⁴ has suggested the function in general terms that the hormone is an essential cellular agent which is used throughout all the tissues. Britton⁵ has suggested that the function of the adrenal cortex is involved principally in carbohydrate metabolism. Swingle, Pfiffner and others⁶ have suggested that all the symptoms of adrenal deficiency are produced by a decrease in the volume of the blood and that the function of the cortical hormone is to maintain a normal blood volume. Loeb⁷ and Harrop⁸ and their co-workers have suggested that the cortical hormone is involved in the metabolism of sodium chloride.

STANDARDIZATION OF ADRENAL CORTEX EXTRACT

Three methods for the standardization of adrenal cortex extract have been developed. The first method is based on the survival of adrenalectomized animals, or on the growth of young adrenalectomized rats.⁹ The second is based on a determination of the amount of extract necessary to maintain the animal in a normal condition in regard to weight and activity and to hold the blood urea at a level not more than 100 per cent greater than that at the beginning of the experiment.¹⁰ The third method is based on the capacity to perform work. This is measured usually with the rat, either by means of a revolving cage or by direct electric stimulation of a muscle.¹¹

PHYSIOLOGIC ACTIVITY OF ADRENAL CORTEX EXTRACT

Hartman has suggested "cortin"¹² as the name for the extract of the adrenal cortex. It has now been

shown¹³ that adrenal cortex extract can be prepared which will maintain dogs and patients in a normal condition provided the diet contains a slightly increased amount of sodium chloride. Without sodium chloride patients with Addison's disease and adrenalectomized dogs slowly develop weakness and symptoms of adrenal deficiency. In dogs, the urea may be greater than 100 mg in each 100 cc of blood. Administration of large amounts of this preparation of adrenal cortex extract does not reduce the blood urea. However, the administration of sodium chloride with the adrenal cortex extract will promptly restore the blood urea to normal. Sodium chloride alone, in the amounts used with the extract, will not maintain either patients or dogs in a normal condition. For clarity and brevity I shall call such a preparation of adrenal cortex extract A.

A preparation of adrenal cortex may be made from the adrenal gland which is active in the absence of added salt. If a sufficient amount of this preparation is given, the blood urea is reduced to a normal value and the adrenalectomized dog appears to be normal in every respect. Such a preparation may be designated B. When these two preparations are standardized by muscle stimulation it is found that preparation A, with salt, will permit the animal to react in a normal manner. Preparation B, however, may possess but slight activity when measured by this criterion. The most active preparation of adrenal cortex extract is one that combines the physiologic responses of both A and B. At the present time it is impossible to state that the physiologic responses of A and B are caused by the presence of two separate and distinctly different substances. This, however, is suggested by the results. The demonstration that the maximal physiologic response is produced only by the combination of the two solutions, which possess different physiologic activity, obviously complicates the use of a physiologic criterion. This fact, however, may explain some of the discrepancies that have been observed by workers in various laboratories when attempts were made to evaluate the physiologic activity of different preparations of adrenal cortex extract. It has been shown that the action of solution A is concerned principally with the capacity for muscular activity. In its presence, muscles can respond to prolonged stimulation. Solution B has little effect on the muscles, but its action is strikingly demonstrated by its effect on the blood urea and on the retention of sodium chloride.

The retention of sodium chloride by the normal animal organism over long periods, even on a diet that contains a minimal amount of sodium chloride, has been demonstrated.¹⁴ Loeb⁷ and Harrop⁸ have both shown that one of the most striking abnormalities in an animal which has been adrenalectomized is loss of control of sodium metabolism. Sodium chloride is rapidly excreted, and, in order to maintain a normal level of sodium chloride in the blood, it is necessary to give between 5 and 6 Gm of sodium chloride a day to a dog whose body weight is from 15 to 20 Kg.

The investigations of Marine and Baumann,¹⁵ Loeb⁷ and Harrop⁸ and their co-workers have emphasized the intimate relation between the adrenal gland and

4 Hartman F A, Brownell Katharine, A and Lockwood Julia W. Cortin as a General Tissue Hormone. *Am J Physiol* 101: 50-51 (June) 1932.

5 Britton S W, and Silvette Herbert. Effects of Cortico-Adrenal Extract on Carbohydrate Metabolism in Normal Animals. *Am J Physiol* 100: 693-700 (May) 1932.

6 Swingle W W, Pfiffner J J, Vars H M, Bott P A, and Parks W M. Function of the Adrenal Cortical Hormone and Cause of Death from Adrenal Insufficiency. *Science* 77: 58-64 (Jan.) 1933.

7 Loeb R F, Atchley D W, Benedict E M, and Leland Jessica. Electrolyte Balance Studies in Adrenalectomized Dogs with Particular Reference to the Excretion of Sodium. *J Exper Med* 57: 775-792 (May) 1933.

8 Harrop G A, Soffer L J, Ellsworth Read and Trescher J H. Studies on the Suprarenal Cortex. III. Plasma Electrolytes and Electrolyte Excretion During Suprarenal Insufficiency. *J Exper Med* 58: 17-39 (July) 1933.

9 Grollman Arthur and Eror W M. Studies on the Adrenal. II. The Preparation of an Active Extract of the Hormone of the Adrenal Cortex. *J Biol Chem* 100: 429-439 (April) 1933.

10 Pfiffner J J, Swingle W W, and Vars H M. The Cortical Hormone Requirement of the Adrenalectomized Dog with Special Reference to a Method of Assay. *J Biol Chem* 104: 701-715 (March) 1934.

11 Harrop G A, Pfiffner J J, Weinstein Albert, and Swingle W W. A Biological Method of Assay of the Adrenal Cortical Hormone. *Proc Soc Exper Biol & Med* 29: 449-451 (Jan.) 1932.

12 Heron W T, Hales W M, and Ingle D J. Capacity of Skeletal Muscle in Rats to Maintain Work Output. *Am J Physiol* 110: 357-361 (Aug.) 1934.

13 Kooy R. Standardization van cortine thesis. University of Amsterdam, 1934. Everse J W, and DeFremery P. On a Method of Measuring Fatigue in Rats and Its Application for Testing the Suprarenal Cortical Hormone (Cortin). *Acta brevica Neerlandica* 2: 152-153 1932.

14 The Council on Pharmacy and Chemistry has adopted the general term adrenal cortex extract and this is used throughout the paper to denote an active extract of the adrenal cortex.

13 Kendall E C, Mason H J, McKenzie B F, Myers C S, and Allers W D. Recent Developments in the Investigation of the Hormone of the Suprarenal Cortex. *Proc Staff Meet. Mayo Clin* 10: 245-246 (April 17) 1935.

14 McCollum E I. Personal communication to the author.

15 Marine David and Baumann E J. Duration of Life After Suprarenalctomy in Cats and Attempts to Prolong It by Injections of Solutions Containing Sodium Salts Glucose and Glycerol. *Am J Physiol* 81: 86-100 (June) 1927.

mineral metabolism, and the work of Rogoff and Stewart,¹⁶ Zwemer¹⁷ and others has shown that Ringer's solution or sodium chloride will increase the period that animals survive after adrenalectomy. Some significant results have recently been obtained which still more strongly indicate the great importance of normal mineral metabolism. Mr. Allers¹⁸ has shown that life could not be maintained in two adrenalectomized dogs with sodium chloride alone. There was loss of weight, loss of strength, and, although the sodium chloride and urea contents of the blood were within normal limits, there was a progressive decline in the bicarbonate and sugar of the blood. Administration of sodium bicarbonate, or of a sodium salt of an organic acid such as sodium citrate, brought about a rise in the alkali reserve to normal and coincidentally a rise in the blood sugar to normal. With a balanced diet that contained about 6 Gm of sodium chloride, 5 Gm of sodium citrate and a small amount of potassium, two dogs have been maintained, one for eighty-four days and one for 115 days. The dogs both increased in weight, one by 25 per cent and the other by 10 per cent. These dogs were thoroughly studied before the present diet was given. It was shown that typical symptoms of adrenal deficiency developed, as did abnormal values for urea, chloride, bicarbonate and sugar in the blood, unless adrenal cortex extract or the diet outlined was given. When the experiment was started, one dog had a blood urea of 175 and the other of 55 mg per hundred cubic centimeters. The survival periods of these two dogs set a new record. Mere survival, however, does not seem to be the most significant result. These dogs were in an excellent condition throughout the many weeks during which adrenal cortex extract was not given. By proper diet the sodium chloride, alkali reserve, urea, blood sugar and blood volume may be maintained within normal limits. This observation indicates that adrenal cortex extract is not directly concerned with the metabolism of carbohydrates, protein or fats, since a normal condition can be maintained in the absence of adrenal cortex extract, provided a diet satisfactory with regard to its mineral constituents is used.

RELATION BETWEEN ADRENAL CORTEX EXTRACT AND THYROXINE

A relation between adrenal cortex extract and thyroxine has been demonstrated by Koelsche.¹⁹ He has shown that animals maintained on a minimal daily dose of adrenal cortex extract will develop acute adrenal deficiency if thyroxine is given. Animals that are maintained on an adequate amount of adrenal cortex extract will withstand injection of thyroxine without the usual general systemic reaction and without significant loss of nitrogen. If an insufficient amount of adrenal cortex extract is given, thyroxine produces a systemic reaction that is marked in both intensity and duration. These results indicate a close relation between adrenal cortex extract and thyroxine. Whether adrenal cortex extract will be of value in the treatment of acute hyperthyroidism has not been shown clinically.

It is well known that injections of large amounts of the active constituents of the ductless glands produce symptoms typical of hyperactivity of the respective glands. Experimental hyperthyroidism, hyperparathyroidism, hyperinsulinism, and the toxic effect of theelin are well known. It is interesting that the administration of large amounts of adrenal cortex extract will not produce symptoms that simulate the clinical syndrome seen in cases of hypertrophy of the adrenal cortex. Since the most profound disturbance in the animal organism caused by removal of the adrenal glands is associated with mineral metabolism, failure to produce toxic effects by the administration of large amounts of adrenal cortex extract is in keeping with the view that adrenal cortex extract is concerned with the mineral metabolism rather than with the intermediary metabolism of carbohydrates, fats and proteins. Present knowledge of the chemical nature of adrenal cortex extract also suggests that the syndrome seen in tumors of the adrenal cortex may be due to dysfunction and the production of an abnormal substance rather than to an excessive production of the normal constituents of the cortex.

CLINICAL RESULTS WITH ADRENAL CORTEX EXTRACT

By the use of preparations of adrenal cortex extract possessing the physiologic activity that has been described, a large number of patients with Addison's disease have been treated at the Mayo Clinic, and during the past two years no patient has died under our direct observation from adrenal deficiency alone. In three cases, however, the survival of the patient has resulted in the development and extension of tuberculosis in various parts of the body, in one caseiliary tuberculosis developed, in another there was an exacerbation of pulmonary tuberculosis, and in the third tuberculosis of the spine developed with abscess formation. The first two patients died with tuberculosis as the principal cause of death, and, as Snell²⁰ has pointed out, it seems highly probable that patients with Addison's disease which is adequately controlled with adrenal cortex extract may develop tuberculous lesions in other parts of the body, and this adds greatly to the difficulties of treatment. Two patients with severe Addison's disease which was controlled with adrenal cortex extract have undergone major operations—one nephrectomy and the other a spinal bone graft. Three patients have been operated on for tumors of the adrenal glands, definite symptoms of adrenal deficiency were present after the operation, and the patients probably would not have survived without adequate treatment with adrenal cortex extract. These results are evidence that surgical operations, even in the presence of Addison's disease, are now possible.

Before the isolation of insulin, surgical operations on the diabetic patient were attended with a high mortality. Experience has shown that surgical intervention in Addison's disease has a far greater risk than in diabetes.²¹ Even the type and duration of the anesthesia are of great importance. By the use of a satisfactory preparation of adrenal cortex extract, which is now available, the surgeon can operate without undue risk on patients with Addison's disease, and operations on tumors of the adrenal gland itself may dramatically,

16 Rogoff J. M. and Stewart G. N. The Influence of Intravenous Injections of Ringer's Solution upon the Survival Period in Adrenalectomized Dogs. *Am. J. Physiol.* 84: 649-659 (April) 1928.

17 Zwemer R. G. The Adrenal Cortex and Electrolyte Metabolism. *Endocrinology* 18: 161-169 (March-April) 1934.

18 First reported at a meeting of the Research Club of the Mayo Foundation April 5 1935.

19 Koelsche G. A. Relation of the Suprarenal Cortical Hormone to Nitrogen Metabolism in Experimental Hyperthyroidism. *Proc. Staff Meet. Mayo Clin.* 9: 55-57 (Jan 25) 1934.

20 Snell A. M. The Changing Relation of Tuberculosis to Addison's Disease. *Proc. Staff Meet. Mayo Clin.* 10: 337 (May 29) 1935.

21 Greene, C. H. Walters, Waltman and Rowntree L. G. Surgical Operations in Addison's Disease. *Ann. Surg.* 98: 1013-1017 (Dec.) 1933.

bring about restoration to a normal condition²² For the group of patients under our observation, adrenal cortex extract has proved to be as specific and useful in Addison's disease as is insulin in diabetes²³

ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF LOBAR PNEUMONIA

FRANCIS G BLAKE, MD
MARION E HOWARD, MD
AND
WINIFRED S HULL, MD
NEW HAVEN, CONN

The present paper is based on the treatment of forty-two cases of lobar pneumonia with artificial pneumothorax between December 1933 and April 1935. Special emphasis will be laid on (1) the method of treatment evolved during the course of the study, and (2) an attempted definition, still tentative, of the conditions under which artificial pneumothorax would appear to be therapeutically useful.

LITERATURE

Artificial pneumothorax was apparently first used in the treatment of pneumonia during the influenza pandemic of 1918-1919 at Takoma Park, D. C., by Rood,¹ who was sufficiently impressed with the results obtained in the treatment of three cases to write "The use of this operation as a therapeutic measure in selected cases is worthy of further trial." A little later Friedemann² in Berlin and Wynn³ in Birmingham, England, used the procedure in the treatment of lobar pneumonia. During the ensuing decade only three papers⁴ on the use of artificial pneumothorax in lobar pneumonia appeared, although the method was tried⁵ during this period in prolonged and complicated cases of broncho pneumonia in infants and children. In 1932, however, following Coghlan's⁶ stimulating report on the treatment of six cases of acute lobar pneumonia, a widespread study⁷ began, the results in 124 cases of acute

pneumonia having been recorded down to the present time. Of the 124 cases, ninety-three have been subjected to analysis.⁸

In general the procedure followed has been that used by Friedemann.² Thus, thirty-four of the ninety-three patients received only one treatment, usually in the neighborhood of from 300 to 500 cc., forty-six received only two treatments usually given from eighteen to forty-eight hours apart, while only eleven received a third and only two a fourth. Furthermore, only nine patients were given a total of more than 1,000 cc. of air, the maximum amount given being 1,650 cc. in each of two cases. From these data it would seem that insufficient air was introduced to cause more than a moderate collapse or retraction of the involved lobe in the great majority of the cases. As will appear later, the method of treatment which has been evolved during the course of our study differs considerably from that generally used.

The four most frequent clinical effects reported are prompt relief of pleural pain, relief of dyspnea, diminution, often striking, in the general toxic phenomena of the disease, and a critical fall in temperature shortly after the induction of artificial pneumothorax, sometimes permanent, though often only temporary. Clear evidence is lacking, however, that pneumothorax treatment serves to cure the disease, since in the majority

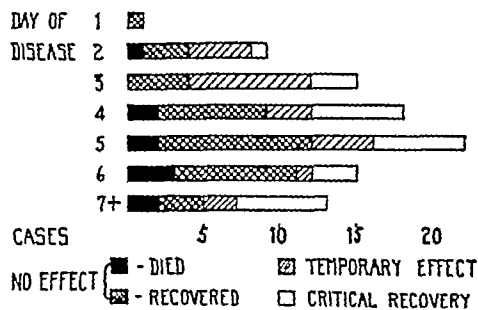


Fig 1—Effect of artificial pneumothorax on the course of lobar pneumonia in ninety three cases recorded in the literature.

of the recorded cases in which treatment was not started until the fourth day of the disease or later, approximately one half failed to exhibit any apparent modification of the natural course and outcome of the disease, and prompt critical recovery without relapse appears to have occurred in only one of nine cases treated on the second day of the disease and in only three of fifteen treated on the third (fig 1).

SELECTION OF CASES

In the selection of cases for treatment it seemed to us of importance to direct our efforts primarily to a study of the effect of artificial pneumothorax on the early stages of pneumonia. Consequently all patients with unilateral pneumonia admitted to the medical service of the New Haven Hospital not later than the third calendar day of the disease during the period covered by this report have been treated without selection, twenty-four in number. The remaining eighteen patients in whom treatment was begun on the fourth or fifth day of the disease,⁹ were arbitrarily selected.

Summarized data concerning the cases are presented in the tables.

⁹ In this analysis six cases of bronchopneumonia, three cases in which the day of the disease was unknown, and the twenty-two cases previously reported by ourselves¹ have been omitted.

⁹ Treatment was attempted in three additional cases but extensive pleural adhesions prevented the introduction of air into the pleural cavity and they are consequently excluded from the series.

22 Walters, Waltman, Wilder, R. M. and Kepler, E. J. The Supra renal Cortical Syndrome with Presentation of Ten Cases. *Ann Surg* 100: 670-688 (Oct.) 1934.

23 Experimental work reported by Harrop and his co-workers concerning the necessity for administration of sodium bicarbonate as well as sodium chloride for the maintenance of dogs after adrenalectomy (Harrop, J. A., Saffer, L. J., Nicholson, W. M. and Strauss, Margaret J. *Exper Med* 61: 839 [June] 1935).

From the Department of Internal Medicine, Yale University School of Medicine and the Medical Service of the New Haven Hospital. Aided by a grant from the Research Fund of Yale University School of Medicine and gifts from Mr. Howard L. Goodhart and Mr. Robert W. Huntington.

Read before the Section on Practice of Medicine at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.

1 Rood, A. D. *New York M J* 109: 493 (March 22) 1919.

2 Friedemann, U. *Deutsche med Wchnschr* 47: 443 (April 21) 1921.

3 Wynn, W. H. *Lancet* 2: 493 (Sept. 2) 1922. Birmingham M. Rev. 1: 321, 1926.

4 David, O. *Deutsche med Wchnschr* 47: 802 (July 14) 1921. Schottky, P. *Med Klin* 19: 1298 (Sept. 23, 30) 1923. Taylor, A. B. *Practitioner* 127: 389 (Sept.) 1931.

5 Ibrahim, M. and Duken, J. *Arch f Kinderh* 84: 241 (July 20) 1928. Klotz, J. *Monatschr f Kinderh* 42: 312 (Jan.) 1929.

Duken, J. *Klin Wchnschr* 2: 2195 (Nov. 22) 1930. Jahr, J. and Neumann, R. *ibid* 2: 2200 (Nov. 22) 1930.

6 Coghlan, J. J. *Lancet* 1: 13 (Jan. 2) 1932.

7 Papers on this study include: Perloff, S. and Topercer, M. *Wien klin Wchnschr* 45: 1508 (Dec. 2) 1932. Guadarrama, L. *Medicina Mexico* 12: 141 (March 25) 1932. Viswanathan, R. *Lancet* 2: 760 (Oct. 1) 1932.

Anderson, H. G. *Chinese M J* 46: 769 (Aug.) 1932. Li, H. K. *ibid* 48: 886 (Sept.) 1932. Moorman, L. J. *South M J* 27: 233 (March) 1934. Internat Clin 4: 118 (Dec.) 1934. Lieberman, L. M. and Leopold, S. S. *Am J M Sc* 187: 315 (March) 1934.

Behrend, Albert and Cowper, R. B. G. *Artificial Pneumothorax in Treatment of Lobar Pneumonia*. J. A. M. A. 102: 1907 (June 9) 1934. Blake, F. G., Howard, Marion E. and Hull, Winifred S. *Tr A Am Physicians* 49: 119, 1934. Hines, L. E., and Bennet, D. *Artificial Pneumothorax in the Treatment of Acute Lobar Pneumonia*. *Arch Int Med* 55: 100 (Jan.) 1935. Holmes, F. G. and Randolph, H. *Ann Int Med* 8: 1008 (March) 1935.

METHOD OF TREATMENT

The technic employed has been that commonly used immediately following the preliminary examination of the patient an x-ray film¹⁰ of the chest is taken to confirm the clinical diagnosis and to make certain that the pneumonia is unilateral. Following a preliminary dose of morphine, artificial pneumothorax treatment is started. Treatments are ordinarily given with the patient in the lateral position with the pneumonic side

are taken after every 50 to 100 cc of air has been introduced, the treatment being continued until the desired intrapleural pressure is attained. If (for any reason) it is found necessary to have the patient in the prone or sitting position during the treatment, the mean pressure should ordinarily be raised to about 4 cm higher than the desired level in the lateral position, since the pressure will fall approximately 4 cm whenever the patient changes from the prone to the

TABLE 1—Cases Treated in Preconsolidative Stage Within Twenty-Four Hours After Onset

| Pneumothorax Treatments | | | | | | | | | | | | | | | | | | | |
|-------------------------|-------------|-------------------|----------------|------|-------------------|-------------------|--------------|----------------------|-------------------|--|----------------------|-------------------|----------------------|-------------------|-------------------------------------|--------------|-------------------------------|-----------------------|---------------------------|
| Clinical Data | | | | | | Begun | | Initial Series | | Maintenance Refills | | Total | | Results | | | | | |
| Patient | Sex and Age | Pneumococcus Type | Blood Cultures | Site | Pleural Adhesions | Hours After Onset | Calendar Day | Number of Treatments | Amount of Air Cc. | Rise in Mean Intrapleural Pressure, Cm | Number of Treatments | Amount of Air Cc. | Number of Treatments | Amount of Air Cc. | Clinical Course Following Treatment | Calendar Day | Agglutinin First Appeared Day | Spread to Other Lobes | Complications |
| R. A. | ♂ 30 | V | — | L L | + | 6 | 1 | 2 | 2 600 | —4.5 to +3.5 | 1 | 300 | 3 | 2,900 | Prompt recovery by rapid lysis | 13 | — | — | None |
| W M. | ♂ 33 | IV | — | L L | — | 9 | 2 | 4 | 2,150 | —5.5 to +5.5 | 6 | 1 275 | 10 | 3 425 | Prompt recovery by crisis | 23 | — | — | None |
| J S. | ♂ 45 | XVIII | — | L L | + | 18 | 2 | 4 | 2 200 | —7 to +3 | 2 | 500 | 6 | 2,750 | Prompt recovery by crisis | 3 | 6 | — | None |
| W L.* | ♂ 32 | I | — | L L | — | 24 | 2 | 4 | 2,025 | —7 to +3.5 | 1 | 75 | 5 | 2 700 | Prompt recovery by crisis | 3-4 | 13† | — | Acute alcoholic psychosis |

* Severe alcoholism.
† In this and subsequent tables — indicates no agglutinins developed. ? indicates agglutinins may have appeared a day or two earlier as tests were omitted on some days.

TABLE 2—Cases in Which Treatment Was Begun Between Twenty-Four and Forty-Eight Hours After Onset

| Pneumothorax Treatments | | | | | | | | | | | | | | | | | | | |
|-------------------------|-------------|-------------------|----------------|---------|-------------------|-------------------|--------------|----------------------|------------------|---------------------------------------|----------------------|---------------------|----------------------|-------------------|--|--------------|-------------------------------|-----------------------|--------------------------|
| Clinical Data | | | | | | Begun | | | | Initial Series | | Maintenance Refills | | Total | | Results | | | |
| Patient | Sex and Age | Pneumococcus Type | Blood Cultures | Site | Pleural Adhesions | Hours After Onset | Calendar Day | Number of Treatments | Amount of Air Cc | Rise in Mean Intrapleural Pressure Cm | Number of Treatments | Amount of Air, Cc | Number of Treatments | Amount of Air Cc. | Clinical Course Following Treatment | Calendar Day | Agglutinin First Appeared Day | Spread to Other Lobes | Complications |
| R F | ♂ 20 | V | — | L L | — | 26 | 2 | 5 | 2 300 | —10 to +5.5 | 1 | 150 | 6 | 2,450 | Much improved recovered by lysis | 4-7 | 10 | — | None |
| A. M. | ♂ 33 | I | — | L L | — | 30 | 2 | 2 | 1 100 | —4 to —1 | 1 | 500 | 3 | 1 600 | Improved short relapse recovered by crisis | 5 | — | — | None |
| V G | ♀ 33 | I | — | R U | — | 31 | 3 | 5 | 2 150 | —10 to +1.5 | 3 | 625 | 8 | 2,775 | Markedly improved recovered by crisis | 5 | 10? | — | None |
| D T | ♀ 21 | VII | — | L L | — | 33 | 2 | 4 | 2 500 | —4.5 to +1.5 | 2 | 400 | 6 | 2,000 | Markedly improved recovery by lysis | 3-5 | 7? | — | Sterile pleural effusion |
| H K | ♀ 23 | ? | — | R U | — | 36 | 2 | 3 | 2,850 | —2.5 to +2 | 0 | 0 | 3 | 2,850 | Prompt recovery by rapid lysis | 2-4 | — | — | None |
| F H * | ♀ 39 | XII | — + — | R U M L | — | 33 | 3 | 3 | 2,025 | —8 to 0 | 7 | 1,600 | 10 | 3 625 | Much improved recovered by lysis | 4-6 | 9 | — | Sterile pleural effusion |
| E E † | ♀ 33 | V | — + — | L L | ++ | 44 | 3 | 4 | 1,075 | —2 to +2.5 | 1 | 125 | (1 tr) † 5 | 1,300 | Not improved recovered by lysis | 6-7 | 6 | — | None |
| T G | ♂ 49 | I | — + — | L L | ++ | 45 | 3 | 4 | 1 950 | —8 to +1 | 2 | 200 | 6 | 2 150 | Not improved recovered by crisis | 8 | 8 | — | None |
| H T | ♂ 36 | II aty | — | R U L | ++ | 46 | 3 | 3 | 1 000 | —8 to —1.5 | 0 | 0 | 3 | 1 000 | Not improved recovered by crisis | 8 | 7 | — | None |

* Rheumatic heart disease.
† Initial treatment attempted on second day failed because of adhesions but resulted in a traumatic pneumothorax.

up, since the intrapleural pressure established with the patient in this position does not become lower in any other position that the patient may subsequently take. Air is allowed to flow in under the negative pressure developed during inspiration until the intrapleural pressure has nearly reached the atmospheric level, when a slightly positive pressure is used. Pressure readings¹¹

lateral position with the pneumothorax side up. If, during the treatment, the patient complains of a dragging or pulling pain, adhesions may be suspected and the treatment may be interrupted. Following the first, second or third treatment, as seems indicated, another x-ray film is taken to determine the degree of collapse of the lung and the presence or absence of pleural adhesions.

The procedure followed with respect to the frequency, rate and volume of pneumothorax treatments has been evolutionary and empirical and will be illus-

10 We are indebted to Dr. Hugh M. Wilson for his valuable assistance in the roentgenographic studies.
11 All intrapleural pressure readings are expressed in centimeters of water and represent the true intrapleural pressure, i. e. the distance in centimeters between the water levels in the two arms of the manometer.

TABLE 3—Cases in Which Treatment Was Begun Between Forty-Eight and Seventy-Two Hours After Onset

| Pneumothorax Treatments | | | | | | | | | | | | | | | | | | | |
|-------------------------|-------------|-------------------|----------------|------|-------------------|-------------------|--------------|----------------------|------------------|-------------------------------------|----------------------|------------------|----------------------|------------------|---|--------------|--------------------------------|-----------------------|---------------|
| Clinical Data | | | | | | Begun | | Initial Series | | | Maintenance Refills | | Total | | Results | | | | |
| Patient | Sex and Age | Pneumococcus Type | Blood Cultures | Site | Pleural Adhesions | Hours After Onset | Calendar Day | Number of Treatments | Amount of Air Cc | Rise in Mean Int apical Pressure Cm | Number of Treatments | Amount of Air Cc | Number of Treatments | Amount of Air Cc | Clinical Course Following Treatment | Calendar Day | Agglutinins First Appeared Day | Spread to Other Lobes | Complications |
| R C | ♂ 38 | VII | — | L L | — | 52 | 3 | 1 | 2 220 | —8 to +1.5* | 3 | 1 000 | 4 | 3 220 | Prompt improvement relapse recovered by lysis | 6-7 | 9 | — | None |
| A C | ♂ 20 | I | — | R L | — | 54 | 3 | 2 | 650 | —6 to —1 | 1 | 400 | 3 | 1 050 | Prompt recovery by crisis | 4 | 5† | — | None |
| T F | ♂ 47 | XXVIII | — | R L | — | 56 | 3 | 4 | 2,300 | —10 to —1 5 | 2 | 1 000 | 6 | 3,300 | Prompt recovery by crisis | 3-4 | — | — | None |
| R D | ♂ 44 | V | — | R U | — | 60 | 3 | 2 | 750 | —7 to —3 | 0 | 0 | 2 | 750 | Prompt recovery by crisis | 4 | 8 | — | None |
| J F | ♂ 17 | VIII | — | L L | — | 61 | 3 | 2 | 650 | —8 to —0 5 | 1 | 300 | 3 | 950 | Prompt recovery by crisis | 4 5 | 6 | — | None |
| G S | ♀ 20 | I | — | L L | — | 64 | 4 | 2 | 2 100 | —5 0 to +2 5 | 1 | 300 | 3 | 2,400 | Temporary improvement relapse type I serum on 6th day recovered by crisis | 6 | — | R U | None |
| Ho T | ♂ 47 | ? | — | R L | ++ | 50 | 3 | 1 | 550 | —4 to +2 | 0 | 0 | 1 | 550 | Not improved recovered by lysis | 6-9 | — | — | None |
| M C | ♀ 28 | I | — | R U | ++ | 50 | 3 | 4 | 1 675 | —3 to +2 | 1 | 400 | 5 | 2 075 | Short relapse recovered by crisis | 5 | — | — | None |
| F M | ♂ 34 | I | — + | L L | ++ | 51 | 3 | 2 | 2 800 | —7 5 to +2 5 —2† —1 525 | —2 | 2,800 | 2 | 2,800 | Progressively worse died | 8 | — | R L | None |
| J H | ♂ 32 | I | — | R U | ++ | 52 | 3 | 2 | 1 550 | —6 to 0 | 1 | 300 | 3 | 1,850 | Not improved recovered by crisis | 6 | 9† | — | None |
| H McV | ♂ 47 | VII | — | R L | ++ | 53 | 3 | 2 | 2,800 | —4 5 to 0 | 2 | 500 | 4 | 3,300 | Not improved recovered by lysis | 9-11 | 10 | R U | None |
| D G | ♂ 37 | I | + — | L L | ++ | 54 | 3 | 2 | 500 | —9 to —2.5 | 0 | 0 | 2 | 550 | Not improved type I serum 6th and 7th days, recovered | 7 | — | — | Empyema |
| B G | ♂ 30 | I | — | R L | ++ | 64 | 4 | 3 | 2,300 | —5 to +1 5 —2† —850 | —2 | 2,800 | 3 | 2,800 | Not improved recovered | 8 | — | — | Empyema |
| W S | ♂ 13 | II | — | L L | ++ | 66 | 4 | 2 | 800 | —6 to —1 | 1† | 280 | 3 | 1 085 | Not improved recovered by crisis | 8 | 0 | R U | None |
| R P | ♂ 29 | VII | — + — | R L | ++ | 67 | 4 | 2 | 1,850 | —4 0 to +4 | 0 | 0 | 2 | 1,850 | Not improved recovered by lysis | 7 9 | 18† | R U? | None |

* In prone position collapse incomplete
† Air removed from pleural cavity
‡ Right side

TABLE 4—Cases Treated Later Than Seventy-Two Hours After Onset

| Pneumothorax Treatments | | | | | | | | | | | | | | | | | | | |
|-------------------------|-------------|-------------------|----------------|------------|-------------------|-------------------|--------------|----------------------|------------------|---------------------------------------|----------------------|------------------|----------------------|--------------------------|--|--------------|---------------------------------|-----------------------|---------------|
| Clinical Data | | | | | | Begun | | Initial Series | | Maintenance Refills | | Total | | Results | | | | | |
| Patient | Sex and Age | Pneumococcus Type | Blood Cultures | Site | Pleural Adhesions | Hours After Onset | Calendar Day | Number of Treatments | Amount of Air Cc | Rise in Mean Intrapleural Pressure Cm | Number of Treatments | Amount of Air Cc | Number of Treatments | Amount of Air Cc | Clinical Course Following Treatment | Calendar Day | Agglutinins First Appeared, Day | Spread to Other Lobes | Complications |
| F R. | ♀ 20 | V | — | R U | — | 78 | 4 | 2 | 600 | —8 to —1 | 0 | 0 | 2 | 600 | Prompt improvement relapse recovered by crisis | 7 | 0 | — | None |
| M S | ♂ 44 | V | — | R M | ++ | 80 | 4 | 4 | 2 400 | —4 to +1 | 2 | 700 | 6 | 3 100 | Not improved recovered by crisis | 8 9 | 8 | R U | None |
| J Sy | ♂ 44 | I | — | R U | ++ | 80 | 4 | 3 | 2,150 | —5 to +0.5 | 3 | 750 | 6 | 2,900 | Not improved recovered by crisis | 7-8 | 0 | — | None |
| R Co | ♂ 19 | I | — | R L | ++ | 80+ | 4 | 3 | 2 510 | —4.5 to +1 | —1† —500 | 3 | 2,510 | Progressively worse died | 7 | — | L L | None | |
| E K. | ♀ 40 | I | — | L U | ++ | 80+ | 4 | 4 | 1 400 | —5.5 to +2 | —2† —150 | 4 | 1 400 | Not improved died | 25 | — | R M | Empyema | |
| S C | ♀ 35 | V | — | R L | ++ | 82 | 4 | 4 | 2 050 | —7 to +1 | 1 | 250 | 5 | 2,300 | Not improved recovered by crisis | 7 | 9† | — | None |
| J G | ♂ 41 | I | + | R U M L | ? | 84 | 4 | 1 | 350 | —4 to —1 | 0 | 0 | 1 | 350 | Very severe died | 5 | — | — | None |
| A. W | ♀ 50 | IV | — | L U | + | 85 | 4 | 3 | 1 000 | —3 to +3 | 0 | 0 | 3 | 1 000 | No improvement died | 6 | — | — | None |
| A V* | ♀ 30† | I | + | L U | + | 85+? 4+? 3 | | | 1 000 | —4 to +1 | 0 | 0 | 3 | 1 000 | No improvement, died | 10 | 7 | R L | None |
| R Pa* | ♂ 57 | I | + | R U | — | 85+? 4+? 4 | | | 2 900 | —4.5 to +5 | —3† —1 000 | 4 | 2 900 | No improvement died | 8 | — | L L | Empyema | |
| H S | ♂ 29 | I | — | L L | ++ | 89 | 4 | 3 | 2 300 | —8.5 to +1 | 0 | 0 | 3 | 2,300 | Not improved recovered by crisis | 6 7 | — | — | None |
| S M | ♀ 48 | IV | + | R L | — | 90+* 4+? 5 | | | 2 600 | —3 to +1.5 | 0 | 0 | 5 | 2,600 | No improvement died | 6 | — | L L | None |
| J L. | ♂ 47 | VIII | + | L L | ? | 90 | 5 | 3 | 675 | —3 to +5 | 0 | 0 | 3 | 675 | No improvement died | 6 | — | R M | None |
| H M | ♂ 55 | XXVIII | + | R U L L | + | 108 | 5 | 1 | 300 | Not determined | 0 | 0 | 1 | 300 | Moribund died | 6 | — | L U | None |

* Also treated with type I serum
† Air withdrawn

trated by early, intermediate and recent cases in the series (figs 2 to 5)

In the beginning it was hoped that two initial treatments of approximately 300 to 500 cc each, given six

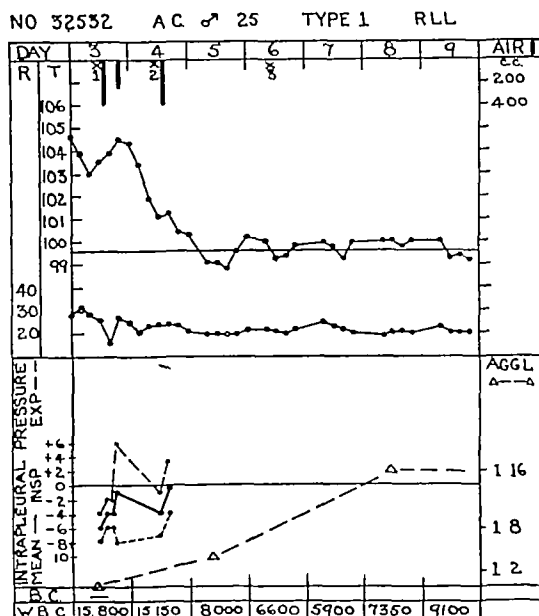


Fig 2 (A C)—Illustrating the procedure followed in the first nine cases treated. Day indicates calendar day of disease x over figure indicates time x ray films were taken vertical lines show the number volume and frequency of pneumothorax treatments intrapleural pressure readings at beginning and end of each treatment serum agglutins blood cultures and leukocyte counts are shown in the lower portion of the chart. Prompt recovery in this case of doubtful significance in view of early appearance of serum agglutins

hours apart and followed, if necessary, by a third treatment eighteen hours later, might be sufficient to accomplish the desired result. This procedure was found to

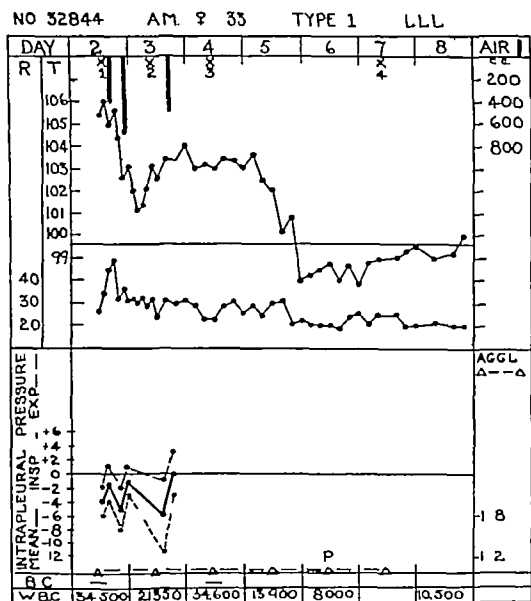


Fig 3 (A M)—Illustrating temporary improvement with relapse under inadequate treatment

establish a mantle pneumothorax without selective collapse of the involved lobe and to raise the mean intrapleural pressure to -3 to -0.5 cm. It appeared to be satisfactory in the first two cases treated, one of which is illustrated by A C (fig 2, table 3). By the

time nine cases had been treated, however, it had become apparent that this procedure was inadequate, since, following temporary clinical improvement, relapse was found to occur as the intrapleural pressure fell (A M, fig 3, table 2), provided antibodies had not appeared in the blood, as was subsequently found to have happened in the first two cases.

In view of these results the procedure was changed, as illustrated by V G (fig 4, table 2). From three to five initial treatments were given at intervals of approximately four hours in order to establish a mean intrapleural pressure in the neighborhood of $+1$ cm. to $+2$ cm and to induce a complete collapse of the whole lung on the involved side, provided adhesions did not interfere. The first three treatments were ordinarily of 500 to 800 cc each. Subsequent treatments were given at irregular intervals in an effort to maintain a positive intrapleural pressure and complete collapse of the lung until permanent recovery seemed assured or further treatment inadvisable. Gradually a further modification was tried, in which the initial treat

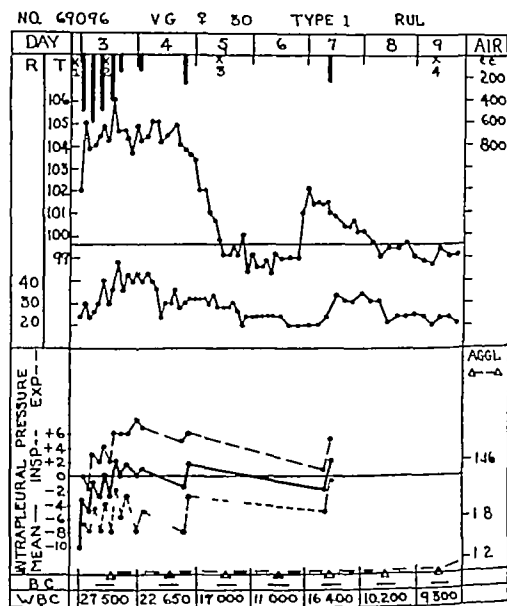


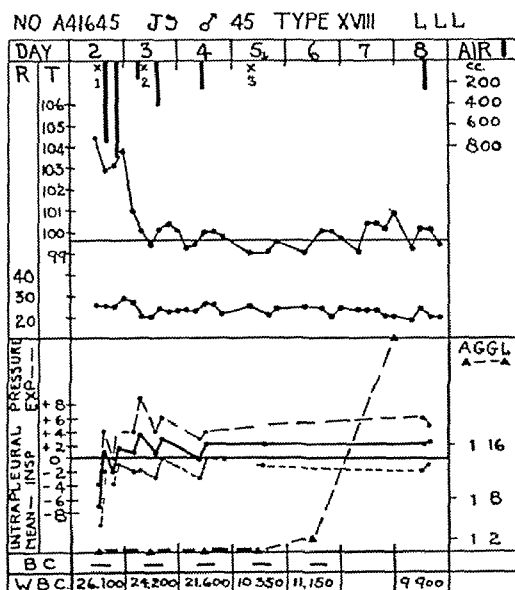
Fig 4 (V G)—Illustrating change in procedure to frequent small initial treatments serving to raise mean intrapleural pressure to positive level. Transient elevation of temperature on seventh day coincident with falling intrapleural pressure

ment was increased in amount and the early refills were given at somewhat less frequent intervals. At the same time, with the purpose of avoiding temporary increase in dyspnea, the rate of introduction of air was cut down from an average rate of approximately 30 to 40 cc per minute, which had been previously used, to an average rate of 10 to 15 cc per minute. At this slow rate, large amounts of air can apparently be administered without difficulty. This procedure, as used in recent cases, is illustrated in R A, figure 5, table 1.

The volume of air required to raise the mean intrapleural pressure to $+1$ cm to $+2$ cm has been found to vary greatly from case to case and cannot at present be correlated with any measurable factors, nor can it be predicted. Ordinarily it will range from 1,800 to 2,400 cc. The time required for the large initial treatment consequently will vary. If 1,800 cc is given and it is administered at an average rate of 12 cc per minute, the treatment will take two and one-half hours to complete. The rate of fall in intrapleural pressure

restlessness, dyspnea and toxemia, has been well described by others¹² and our experience is in harmony with theirs, this subject will not be elaborated here and attention will be directed toward the effect of pneumo-

Review of the forty-two cases treated suggests that the most important factor influencing the results, apart



thorax therapy on the course, duration and outcome of the disease

GROUP A *Treatment Begun Within Twenty-Four Hours After Onset*—Data concerning the four cases in this group are shown in table 1. It will be seen that all four patients were treated with large initial amounts of air, the mean intrapleural pressure being

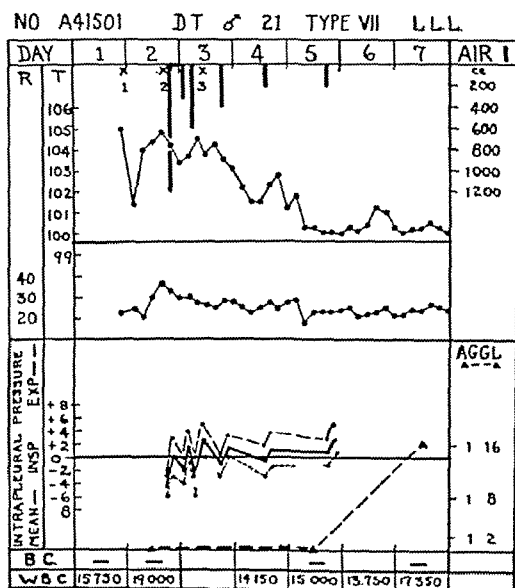


Fig 7 (D T)—Patient did not have pleural adhesions. Pneumothorax treatment was begun thirty three hours after onset. Prompt clinical improvement with recovery by lysis.

raised to the positive level. Complete collapse of the whole left lung occurred in all but J S in whom adhesions between the parietal and the visceral pleura

LOBAR PNEUMONIA—BLAKE ET AL

Jour A M A
Nov 9 1935

over the uninvolved left upper lobe prevented collapse of this lobe. All four patients recovered promptly without further extension of the pneumonia and without complications, except for a transient acute psychosis in W L, a patient suffering from severe chronic alcoholism. The course of events in R A, shown in figure 5, and in J S, shown in figure 6, serves to illustrate the results obtained in early cases.

GROUP B Treatment Begun Between Twenty-Four and Forty-Eight Hours After Onset—Data concerning the nine cases in this group are shown in table 2. In the first six cases without adhesions all but A M (fig 3), who was treated early in the series, received initial pressure adequate to raise the mean intrapleural pressure to atmospheric level or above and to collapse the whole lung on the involved side. All showed prompt clinical improvement with relief of distressing symptoms. Recovery was rapid in H K and apparently accelerated in all but R F, who nevertheless was much improved.

COMMENT
The observations on the use of artificial pneumothorax in the treatment of forty-two cases of lobar pneumonia that have been presented appear to indicate

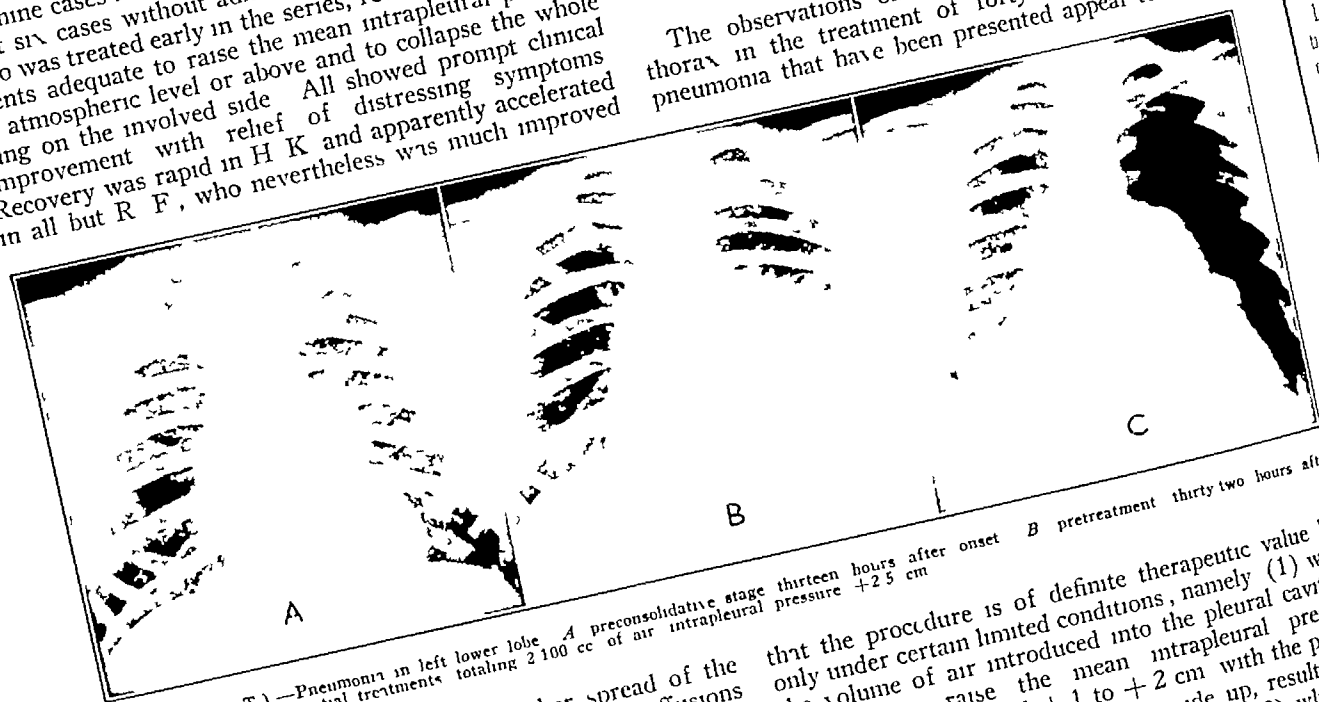


Fig 8 (D T)—Pneumonia in left lower lobe. A preconsolidative stage thirteen hours after onset. C after three initial treatments totaling 2100 cc of air intrapleural pressure +2.5 cm.

symptomatically. None showed further spread of pneumonia. In two cases sterile pleural effusions developed that were sufficiently large to warrant withdrawal by aspiration. No notable effect on the symptoms or course of the disease resulted in the three cases in which pleural adhesions were present, presumably because the adhesions interfered with adequate collapse of the involved lung. Three patients in group B (F H, E E and T G) showed a transient bacteremia following the institution of pneumothorax therapy apparently without ill effect. The course of events in D T¹³ without adhesions is shown in figures 7 and 8 as illustrative of the results obtained in this group. Presumably a more prompt recovery would have ensued if treatment had been instituted on the first day of the disease in the preconsolidative stage (fig 8 A).

GROUP C Treatment Begun Between Forty-Eight and Seventy-Two Hours After Onset—The fifteen cases in this group are summarized in table 3. Of the six patients without pleural adhesions four recovered promptly by crisis, G S¹⁴ with spread to the opposite side but relapsed, G S¹⁴ with spread to the opposite side, A C (fig 2) R D and J F, however, showed antibodies in the blood on the fifth, third and sixth days, respectively, so that early recovery may have been the

that the procedure is of definite therapeutic value but only under certain limited conditions, namely (1) when the volume of air introduced into the pleural cavity is sufficient to raise the mean intrapleural pressure promptly to a level of +1 to +2 cm with the patient in the lateral position, pneumonic side up, resulting in complete retraction of the affected lung, (2) when the

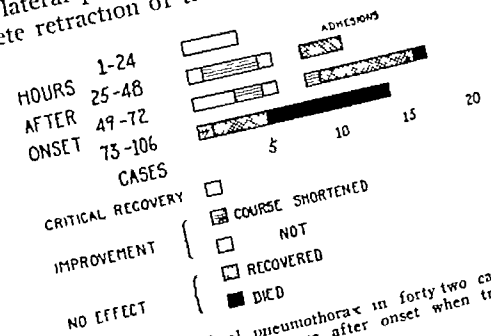


Fig 9—Effect of artificial pneumothorax in forty-two cases of lobar pneumonia grouped according to time after onset when treatment was started.

frequency of refills is sufficient to maintain the mean pressure at this level and the lung is retracted until the danger of relapse is past, (3) when treatment is instituted early in the disease, i e, certainly within less than seventy-two hours after onset, probably within less than forty-eight hours in most cases, (4) when the pleura is free from adhesions that interfere with retraction.

¹³ This patient was treated through the courtesy of Dr John H Bumstead.
¹⁴ This patient was treated through the courtesy of Dr Theodore S Evans.

one of the most
the time factor i
summarizes the r
Experimental
is which artific
have been
described in a
respiratory m
t artificial pneu
retracted is su
of the lung on ti
disease is not
thorax therapy,
support the view
reason takes
ment. Conse
that pneumotho
retracted lung n
re at present.

1. Artificial p
to induce and
the involved
pleural cavity
the air when
when treated
2. There is a
of curative
treat.
3. Further
pneumonia is
or statistical
Howard A

AB
On August 2
the more c
had for some
treated with
the and by the
7 the per
the safety
T
cases
mean that we
not entirely
the size of
adhesions
symptoms re
changed by
the air
On the other
the
only per
a very
the
the

tion of the involved lung. The signal importance of the time factor is clearly shown in figure 10, which summarizes the results in the forty-two cases treated.

Experimental observations bearing on the mechanism by which artificial pneumothorax exerts its apparent effects have been presented elsewhere¹⁵ and will not be discussed in detail here. In brief, they show (1) that respiratory motion of the involved lung can be abolished by artificial pneumothorax, provided the amount of air introduced is sufficient to cause maximum retraction of the lung on the treated side, (2) that antibody production is not demonstrably accelerated by pneumothorax therapy, and (3) that there is little evidence to support the view that relief of a hypothetical bronchial occlusion takes place following pneumothorax treatment. Consequently the theory that the effects of artificial pneumothorax depend on immobilization of the infected lung would appear to be the most acceptable one at present.

CONCLUSIONS

1 Artificial pneumothorax, when administered so as to induce and maintain complete collapse of the lung or the involved side, would appear to be a useful therapeutic procedure in the treatment of lobar pneumonia but only when used early in the disease, preferably within twenty-four hours after onset.

2 There is no evidence to support the view that it is of curative value later than seventy-two hours after onset.

3 Further trial of artificial pneumothorax in lobar pneumonia is desirable and should be carried out before any statistical analysis of results obtained is warranted.

789 Howard Avenue

ABSTRACT OF DISCUSSION

DR. ALFRED STENGFL, Philadelphia. When Friedman's and later the more convincing paper of Coagland appeared it was hard for some physicians to believe that this disease could be so treated safely and effectively. One thing established by them and by those who have followed, was that pneumothorax properly performed may be done in cases of lobar pneumonia with safety. That circumstance may have led to some of the erroneous conceptions to which the earlier papers led. The results that were obtained for example in Coagland's work were entirely too good to be believed and it seems probable that some of the earlier results obtained in cases of pneumonia advanced beyond the first day or two probably represented spontaneous recoveries of persons who were not unfavorably influenced by the pneumothorax but who would have recovered without it. Unless this treatment is used very early in the disease the chances of its doing definite good are not brilliant. On the other hand I cannot believe that there is not something fundamental and radical that pneumothorax does in a case of early pneumonia. The authors put aside the thought that there is any speeding up of formation of antibodies by pneumothorax and the explanation must be sought elsewhere. I believe that the way in which this subject must be pursued in the future for the elucidation of these points is by animal experimentation. Much may be added by the trial and error method in further clinical studies but to obtain a real solution of the mechanism that operates here, a well thought out and rather extended series of investigations bearing on many factors that might conceivably enter into the subject will be required. This treatment is not yet on a basis that should permit the medical profession to assume that, because certain people have obtained occasionally brilliant results this is a treatment to be performed by those who know little more about the details of it than that pneumothorax has been done and that the patients have recovered. The selection of cases the training in the giving of pneumothorax and a great many other factors enter into it. I think that it would be rather unfortunate if this should be accepted now as being an established treatment for

pneumonia to be practiced broadcast or widespread. Much more work must be done before it can be accepted as a routine.

DR. JESSE G. M. BULLOWA, New York. Since the publication of Coagland's paper I have applied pneumothorax in the treatment of pneumonia forty-two times in thirty-one cases before the seventy-second hour. The extent of pneumothorax was controlled by repeated roentgenograms. In my experience I have encountered little from which to infer that pneumothorax treatment of pneumonia, even when applied on the first day of the illness, has beneficially influenced the progress of the disease and some things that lead me to believe that the reduction of the aeration area may be definitely detrimental and add the disadvantages of anoxemia to the toxemia and the possible bacteremia. I have seen an extension of the lesion in the lobe that was involved, and an extension of the lesion to another lobe on the side under collapse, happen in a patient suffering from pneumonia due to pneumococcus type VIII treated on the third day. The lower lobe was involved and collapsed. The temperature came down slightly and on the sixth day though collapsed the left upper lobe became involved and the temperature rose. The contralateral side became involved in three cases as exemplified by a patient suffering from pneumonia due to pneumococcus type V, in whom the pneumothorax was induced at the nineteenth hour for involvement of the left lower lobe. Good collapse occurred but there was no favorable influence on the temperature and pulse from the repeated introduction of large amounts of air. The heart became displaced to the right. On the second day the blood culture became positive. Extension to the right lower lobe was found in a roentgenogram taken at the thirty-fifth hour. The patient then had to have air removed from the left side because of respiratory distress. He became delirious. On the fourth day type V antiserum was begun and he was placed in the oxygen chamber. He required a million units. Had he been treated with serum on the first or second day he would have required only several hundred thousand units. He recovered. In five cases the blood has been invaded during treatment. There has not been dramatic relief of pain in every case. There has been more frequent delirium than usual in the pneumococcus type I pneumonias. The problem of pneumonia is the bacteremia. If there is no bacteremia, it is amazing how much a patient will stand and yet recover. In reference to the eighteen patients with type I pneumonia, six of whom died with bacteremia, I have had 239 cases due to pneumococcus type I treated on the fourth and fifth day with specific serum but without pneumothorax. Thirty-three patients died 139 per cent. This treatment is not a treatment for general practitioners or for those who have little experience with pneumonia or few facilities for treatment. Of 100 cases of seven different types of pneumococcal pneumonia, in which no specific treatment was given, some terminated on the first or second day. Many cases of type I terminated on the fifth, sixth or seventh day. Most of the cases terminated between the fourth and twelfth day. The curve for each type was somewhat different. Until the appearance of such a chart is changed by a treatment for pneumonia, that treatment cannot be said to be beneficial.

DR. FRANCIS G. BLAKE, New Haven, Conn. We have made a considerable number of studies on patients concerning the mechanism involved. We have found no evidence of any accelerated production of antibodies nor evidence in support of the view advanced by Holmes and Randolph that the induction of pneumothorax induces crisis by expelling exudate from occluded bronchi. We have been able to demonstrate by fluoroscopic study in a considerable number of patients that there is complete immobilization of the inflamed lung so far as respiratory movement is concerned. It is our opinion that this is probably the mechanism by which artificial pneumothorax exerts its effects. Our eighteen cases of type I pneumonia six of which were fatal were late cases or there were adhesions and type I serum also was given in three cases. In our experience, as already stated the treatment of pneumonia, after the third day with artificial pneumothorax accomplished nothing in the way of cure. I agree with Dr. Stengel that it is too soon to use the method widely because all the conditions under which it is or is not beneficial are not yet known.

AN ANALYSIS OF LIVING PATIENTS
WITH PRIMARY MALIGNANT
BONE TUMORSWILLIS C CAMPBELL, MD
MEMPHIS, TENN

The object in this discussion is to analyze 100 cases of malignant bone tumor in which apparent cures have been effected, fourteen of which are from my private records. Eighty-six are from the Sarcoma Registry of the American College of Surgeons, of which eighty-five are accepted five-year cures, seventy-four are osteogenic sarcoma, ten are Ewing's sarcoma, and one is myeloma. One is a doubtful case of osteogenic

Classification of Primary Bone Tumors

| | | |
|---------------------|---------------------|--|
| 1 Osteogenic tumors | Benign | <ul style="list-style-type: none"> { Osteoma { Osteochondroma { Chondroma { Giant cell |
| | Malignant (sarcoma) | <ul style="list-style-type: none"> { Osteolytic { Chondromyxosarcoma { Chondroblastic { Chondrosarcoma { Fibrosarcoma { Osteoblastic |
| 2 Nonosteogenic | (All malignant) | <ul style="list-style-type: none"> { Endothelial myeloma { (Ewing's) { Myeloma { Periosteal fibrosarcoma |

sarcoma and is not accepted. Of 125 patients with primary malignant bone tumors from my private records there are thirty living and well at the present time but only the fourteen cases in which sufficient time has elapsed to determine probable results and in which I am reasonably certain of the diagnosis will be considered.

Primary malignant tumors are classified for study as (1) osteogenic those derived from any of the elements which are factors in the formation of bone, and (2) nonosteogenic, from tissue residing in bone but in no measure connected with the formation of bone, as marrow cells, endothelium of lymph and blood vessels, and connective tissue. The classification of primary bone tumors is best illustrated by the accompanying table.

Of the fourteen cases under discussion there were ten osteogenic and four nonosteogenic sarcomas. The number of patients with osteogenic sarcomas of the different types who are living and well may be enumerated as follows: osteolytic sarcoma in children, none, osteolytic sarcoma in adults, three, primary chondromyxosarcoma, two, secondary chondromyxosarcoma, two, chondroblastic sarcoma, two, chondrosarcoma, one, and osteoblastic osteogenic sarcoma, none.

In no case of the typical osteolytic osteogenic sarcoma in the young did the patient live more than two years from the time of onset. This tumor is evidently a clinical entity, the most primitive type being composed largely of embryonic cells, and is quite a different tumor from the medullary tumor of adults, often designated as osteolytic. Of nine adult patients with osteolytic osteogenic sarcoma there are three living and well, twelve, twelve and four years later. It is doubtful whether this type in adults should be placed at this point in the chronological order of evolution, as some

of the cases show a much higher tissue development than osteolytic osteogenic sarcoma of children.

CASE 1—H L, a white man, aged 22, had had pain and tumefaction over the lower extremity of the left tibia for four months. Roentgenograms showed a distinctive medullary process, which had in places destroyed the cortex with apparently no reactive changes in the bone. At biopsy the bony shell of the cortex was found to be very thin and in areas destroyed. Within the cortex was a distinct cavity, which was partially filled with apparent grayish yellow granulation tissue that completely covered the osseous surface. A block was taken and frozen sections were made which revealed a malignant tumor, fibrosarcoma, this was later confirmed by a permanent section. The patient is now living and well more than twelve years later. The leg was amputated at the junction of the upper and middle thirds.

CASE 2—A Negro woman, aged 39, noticed a knot on the left leg just below the knee four years before admission. One year previously she fell about 2 feet and thinks she broke her leg as she could not walk for several months. When the patient was examined, she walked with crutches. There was a tumefaction of the knee and soft tissue of the upper extremity of the left tibia, the growth extending anteriorly and laterally about 3 inches above the surrounding surface of the skin. Roentgenograms demonstrated cystic changes of the upper extremity of the left tibia resembling a giant cell tumor which had broken through the cortex. May 16, 1923 an incision was made over the tumor, the upper extremity of the tibia was exposed and the cortex broken through. Within the bone was a very soft pale gray tumor containing no bony material. The cortex was broken through on the lateral and posterior surface with the tumor protruding. All tumor tissue was curetted out of the bone and the wound closed without drainage. A microscopic examination was made by several pathologists who made the diagnosis of "round cell sarcoma," definitely malignant. Such a term is now obsolete, but as there was every evidence of a malignant condition, such as mitotic figures and disorderly arrangement the limb was amputated above the knee, May 24. Recovery was uneventful and the patient is living and well more than twelve years later.

From the roentgenogram I thought that the tumor was probably a giant cell tumor or osteoclastoma and



Fig 1—Osteolytic type of osteogenic sarcoma occurring in a young person which in the author's experience is fatal in 100 per cent.

treated it accordingly, amputation was not done until pathologists agreed as to its malignant condition. In this case there is some doubt as to whether this was not originally a giant cell tumor, though there were no giant cells present. There may also be some question as to malignancy, but it is my opinion that the tumor was malignant though not to a high degree.

CASE 3—E C, a man aged 30, admitted May 21, 1931, for one year had noticed pain and disability in the left knee which had gradually increased with some loss in muscle control. Recently the pain had become more severe. On examination there was tenderness of the external condyle of the left femur and in the popliteal space with some fullness. Extension was possible to 160 degrees and flexion to 80 degrees. Roentgenograms showed multilocular cysts in the outer condyle and in the lower end of the shaft. The cortex expanded and was broken through posteriorly. May 22 an

incision was made for biopsy over the lateral surface of the leg beginning at the condyle and extending upward for a distance of about 7 inches. The bone was chiseled through and the tumor mass was found occupying both condyles and about 6 inches of the shaft. The posterior portion of the external condyle was destroyed and the tumor was invading the popliteal space for a short distance. As there was considerable doubt as to malignancy, the entire tumor was removed from the interior

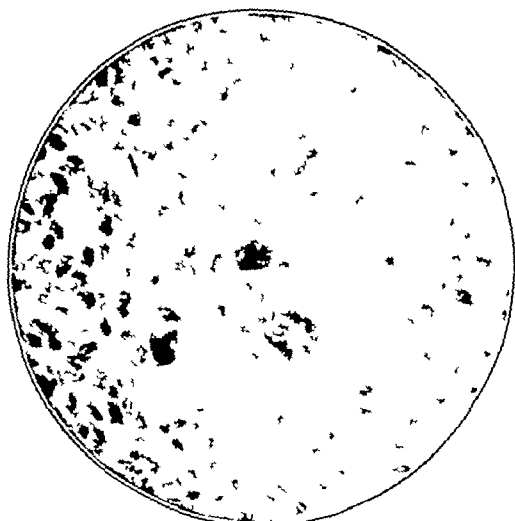


Fig 2—Embryonic type of osteolytic sarcoma occurring usually in the young but occasionally in adults. Note large tumor giant cells.

of the bone and was composed microscopically of semisolid bluish pink, semitranslucent glistening elastic tissue. As the microscopic examination indicated a malignant condition, amputation at the junction of the upper and middle thirds of the thigh was carried out, May 24. Convalescence was uneventful and the patient is now living and well after four years.

Two cases were osteogenic sarcoma (cases 4 and 5) in which the diagnosis was primary chondromyxosarcoma, being composed of a preponderance of cartilage and myxomatous tissue, both patients are living and well, eight and one-half and six years later, respectively.

CASE 4—T R E, a man, aged 51, admitted Nov 1, 1925 had injured the left ankle two and one-half years previously, followed by moderate pain and swelling. For one year there had been increased swelling and a rapidly growing tumor. Overlying the external malleolus of the right ankle there was a tumor mass $3\frac{1}{2}$ by $3\frac{3}{4}$ inches slightly ovoid, the overlying skin slightly blue, and rubbery in consistency, the tumor was not painful to pressure and was apparently continuous with the bone. Movements of the ankle were normal. November 2 a biopsy was done, a diagnosis of malignant tumor was made from frozen sections. Amputation was performed. The laboratory of the Baptist Hospital reported a typical chondromyxosarcoma. The patient had an uneventful recovery and has been living and well for a period of eight and one-half years.

CASE 5—L H, aged 19 years, was admitted Jan 3 1929. April 28 1928 there was onset of pain in the upper third of the right tibia with gradual swelling and increase in pain. There was a history of trauma one month prior to onset. The patient had been operated on three times. There was continuous drainage of serosanguineous fluid. Examination showed a fungous, cauliflower like growth of about 5 by $2\frac{1}{2}$ inches projecting from 1 inch to 3 inches above the skin surface of the upper third of the anterior aspect of the tibia secondarily infected, and bleeding easily. The patient was very anemic with hemoglobin of 44 per cent. Biopsy was performed January 5, a frozen section revealed chondromyxosarcoma. Amputation was done at the same time. The tumor was of short duration—nine months—but had been operated on three times without metastasis, which has been noted in a number of cases in which cures have been effected by amputation. The patient is living and well after a period of six years.

The Sarcoma Registry confirmed the diagnosis, eight of ten experts agreeing that the tumor was a very malignant osteogenic sarcoma of the same character as diagnosed.

Six patients had osteogenic sarcomas that were apparently secondary to a preexisting lesion in the bone of whom two are living and well.

CASE 6—Miss B S, aged 28 admitted Dec. 8, 1927, complained of pain and swelling in the right knee, which she had noticed one year before. The swelling gradually increased, pain became very severe and was present day and night. Weight was maintained and the appetite was good. The patient walked with the knee flexed. Apparently attached to the lower third of the femur was a hard round mass about the size of a baseball to which the skin was not attached. There was pain on pressure, motion was limited to from 100 to 160 degrees by pain. Roentgenograms showed a circumscribed osseous tumor with destructive changes in the center. December 9 a longitudinal incision was made over the medial aspect and a tumor was exposed, which was apparently surrounding the shaft of the femur. A frozen section did not settle the question of malignancy. The wound was closed. A later report confirmed the malignant condition and amputation was carried out at the junction of the upper and middle thirds of the thigh. The final diagnosis was osteogenic sarcoma (chondromyxosarcoma). From the roentgenogram it was very suggestive that the new growth developed on a former benign osteoma, but from the history it was equally indicative that the tumor was primary and if an osteoma was present, the patient was unaware of it.

CASE 7—Mrs C R C aged 38, admitted Sept 14, 1930, complained of pain in the lower left jaw that had been present since March 1930. After a few weeks a small enlargement appeared on the back portion of the lower jaw. All teeth had been extracted two years previously. Roentgen treatment had been given for two months. Examination showed a rounded enlargement about three-fourths inch in diameter, of the descending ramus of the left lower mandible slightly tender, with no palpable glands. October 2 an incision was made over

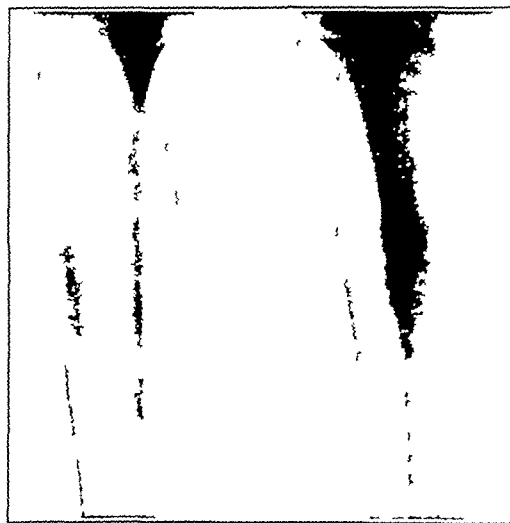


Fig 3—Osteogenic sarcoma in youth aged 19 of nine months duration. Apparent cure by amputation.

the alveolar process. The tumor consisted of fibrous, bony tissue and cartilage arising from the outer table and medulla of the mandible. The entire tumor, outer table and medullary contents were excised for about 2 inches. The tumor did not appear malignant. It recurred in two months with a fungating mass. This was excised with about 4 inches of bone. March 25, 1931, there was a third recurrence at which time the entire right jaw including the condyle was removed on the right and on the left to the ascending portion leaving the joint on the left side intact. There has been no recurrence. The diagnosis was osteogenic sarcoma of the chondromyxosarcoma type.

MALIGNANT BONE TUMORS—CAMPBELL

1498

The pathologist and the Sarcoma Registry with one dissenting voice agreed to the diagnosis of osteogenic sarcoma. I believe, however, that the tumor was secondary to a low grade inflammatory process, as there was some condensation of bone which did not resemble a

Of our series of osteogenic sarcoma, there are three cases in which the diagnosis was chondroblastic osteogenic sarcoma, a type of tumor that apparently arises from the epiphysis during adolescence, but to me it is somewhat doubtful whether it is materially different from more common types, such as chondromyxosarcoma and osteoblastic sarcoma

CASE 8—B H, aged 16 years, admitted Dec. 5, 1931, had had a slight injury several months previously by bumping the leg with a block of wood. Three months before, pain had begun in the left knee on weight bearing. An enlargement was noticed, which had gradually increased, and the pain had become more severe. The patient walked with a limp in the left leg. A firm tumor involving the upper end of the tibia, which was materially increased in size, was very painful on deep pressure. There was full range of motion in the knee. The inguinal glands were not enlarged. There was increased local temperature. Roentgenograms showed condensation, mottling and destruction, with erosion of the cortex and radiating striae of bone into soft tissue, very suggestive of osteogenic sarcoma. The lungs were normal. December 7, biopsy resulted in the report of osteogenic sarcoma, very malignant. Amputation was done above the left knee. Coley's toxin was efficiently

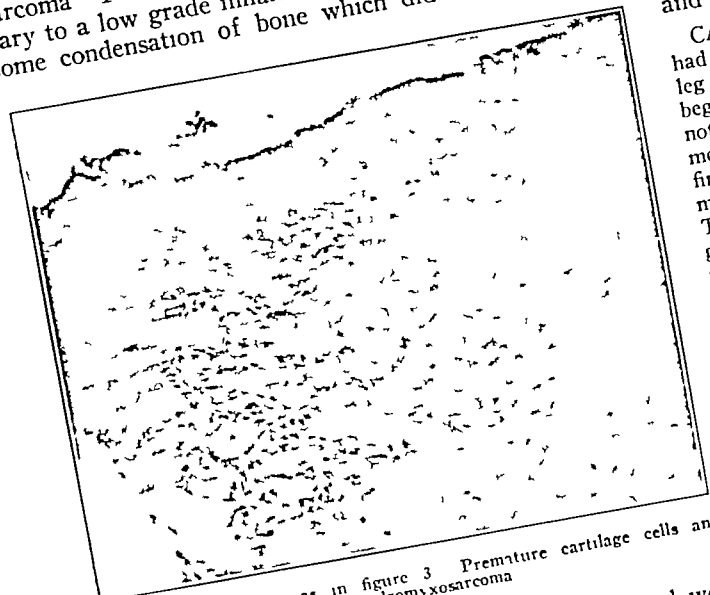


Fig 4—Same case as in figure 3. Premature cartilage cells and myxomatous tissues typical chondromyxosarcoma

sarcoma in this region. The patient is living and well over a period of three years, which is some indication of a successful result but not sufficient to be regarded as a cure. The case is interesting in that there were a number of recurrences and a number of operations

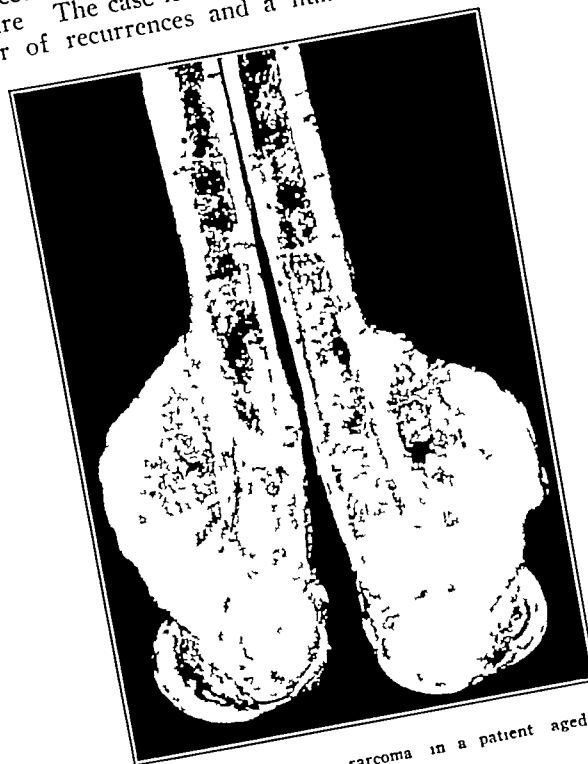


Fig 6—Growth resembling typical fibrosarcoma but in other sections showing few cartilage cells and myxomatous tissue

administered for a period of two years with uneventful recovery. The patient is living and well four and one-half years after the operation.

This case was observed early with a history of only three months' duration, however, the process was probably present with symptoms for some time before medical aid was sought. A diagnosis might probably have been made at a much earlier date if the patient had presented himself.

CASE 9—H E B, a man aged 22, admitted May 12, 1932, had noticed a small tender mass over the upper portion of the right tibia three months previously. This became painful and increased in size. When examined by an intern at the Baptist Hospital in Memphis, Tenn. one month previously, the roent genograms made were negative. The patient was dismissed to return in one month. During the past month the mass had become larger and more painful. Examination revealed a firm nodular mass on the lateral surface of the upper extremity of the right tibia which was not very tender, and gave no local heat. On admission the roentgenogram showed condensation suggestive of a malignant condition. May 16, at operation, incision revealed a firm, nodular tumor about 1 inch in diameter arising from the tibia. The portion removed for biopsy was found to be malignant. Section of the tumor was firm and grayish and had the consistency of cartilage. Gross and

Fig 5—Secondary osteogenic sarcoma in a patient aged 28 living five years

which have been noted in those in which cures have been effected. This group is of especial interest, as the tumors apparently arise in secondary osseous lesions, which may be removed and thus the tumor prevented. This is similar to the prophylaxis of carcinoma.

microscopic pathologic changes were similar to those in case 8. Amputation was done at the middle of the thigh. The permanent section was diagnosed by all experts of the registry as osteogenic sarcoma. Our pathologist regarded the tumor of the chondroblastic type of osteogenic sarcoma, and two experts of the registry as chondrosarcoma. Other members of the registry confirmed the diagnosis osteogenic sarcoma. The patient returned to our clinic Feb 16 1933, showing definite recurrence in the stump as indicated by a large nodular mass which surrounded the amputated end of the femur. Disarticulation was done at the hip the pathologic nature of the tumor being the same as the original. There has been no recurrence and the patient is living and well three years later.

This case, just as case 8, was observed comparatively early but radical treatment should have been instituted one month earlier when first observed by the intern. The metastasis in the stump might not have occurred if efficient treatment had been carried out at that time. This is another case in which there has been recurrence with a certain arrest over a longer time than usual and a possible cure.



Fig 7—Very early osteogenic sarcoma of chondroblastic type amputated in midthigh patient living and well after three years. Early amputation in such cases gives relatively excellent prognosis. A April 13 1912 B May 14 1932

CASE 10—B C G a man age 38 admitted Aug 11, 1919, had been struck on the left leg by a buggy wheel in a runaway, May 12, 1918. At first he was able to walk one block, then he was in bed for one or two weeks and on crutches for four weeks. The diagnosis made by Dr Johns of Stuttgart, Ark. was fracture of the fibula which was confirmed by a roentgenogram. After two weeks only occasional pain was felt until the following spring when he noticed enlargement of the outer aspect of the left leg just below the knee and pain became more severe and radiated to the interior aspect of the leg. Examination revealed an irregular hard mass on the upper third of the left fibula about 3 inches in diameter. A roentgenogram demonstrated a transparent mass in the soft tissues and erosion of the upper extremity of the fibula. An encapsulated mass with the upper third of the fibula was excised. It was composed of large lobes, apparently hyaline cartilage. Microscopic examination showed that the tumor was composed of hyaline cartilage. The diagnosis was chondroma. March 10 1920 the tumor had recurred and was of the same character but much more extensive, about three times the former size. The entire tumor was again resected with much difficulty. October 27 the tumor had again recurred and the limb was amputated at the junction of the middle and lower thirds of the thigh. As the tumor showed some myxomatous degeneration and grew so rapidly with recurrence twice after apparent excision the tumor has been classified as a chondrosarcoma.

since hyaline cartilage predominated. The tumor may also be regarded as a chondromyxosarcoma.

This type of tumor, especially in a man of his age, is not very malignant and possibly in the early stage the tumor was a benign chondroma in which there was a



Fig 8—Same case as in figure 7. Recurrence of tumor of amputated stump of femur which required disarticulation at hip joint.

secondary stage. The registry classifies the tumor as an osteogenic sarcoma.

Of the periosteal fibrosarcoma group, three are dead and one is living.



Fig 9—Same case as in figures 7 and 8.

CASE 11—Mrs G L S admitted May 27 1932 had a recurrent tumor of the heel since the age of 4 with four or five recurrences and operations for excision the last operation being performed in 1929. On examination the operative scar on the inner side of the left ankle below the internal malleolus showed soft tissue swelling extending from the scar down under the os calcis back to the achilles tendon and forward to the region of the scaphoid. Nodular enlargements were present

in the tumor mass, with the superficial veins dilated, and were tender to pressure. Motion was limited in dorsiflexion and eversion. Roentgenograms demonstrated apparent invasion of the os calcis on the inferior aspect. There were no signs of malignant tumor of the bone. On admission, biopsy demonstrated malignant fibrosarcoma of the large spindle type, which was confirmed by a permanent section. June 3 amputation was

extremity of the right tibia with marked destruction in the region of the internal malleolus. There was some new bone production and swelling of the soft parts and marked osteoporosis of the bones of the foot. February 18 a frozen section was indicative of a malignant condition. Amputation was done at the junction of the upper and middle thirds of the leg. Coley's toxin was given for four months. There has been no evidence of recurrence and the patient is living and well eight years after amputation. All experts of the registry agree as to the diagnosis of Ewing's tumor.

This patient was much older than those in which this tumor usually occurs.

CASE 13—E. L., aged 12 years, admitted May 20, 1931, had pain in the ankle two years before and noticed tumor one year before. November 1930 an incision was made for an abscess and again in 1931. The wound had not healed and there was a discharging area. There was a large soft tumor mass at the lower end of the left tibia with draining ulcerated areas. There was severe pain on attempted motion of the ankle. Roentgenograms revealed extensive destruction with expansion of the lower fourth of the shaft of the left tibia with marked lipping at the junction of the shaft with the tumor. May 21 a diagnosis of malignant tumor was made from a frozen section. Amputation was done at the lower third of the left thigh, followed by irradiation and Coley's toxin for a period of six months, after which the patient was advised to use Coley's toxin at home but carried it out in a desultory manner.

An uneventful recovery followed, with no recurrence to the present time (the patient is living and well after four years). This tumor had also been operated on on two previous occasions, evidently with a diagnosis of osteomyelitis, which is a common error in Ewing's tumor. There is much difference of opinion among the members of the registry, five in favor of Ewing's tumor and three in favor of osteogenic sarcoma. Our pathologist believes the tumor to be Ewing's tumor. Irradiation in all probability would have resulted in differentiation, as all Ewing's tumors respond favorably to some extent, but it was thought that the safest procedure was to amputate at once. The registry classifies this as Ewing's tumor.

CASE 14—J. O. T., a man, aged 21, admitted Aug 3, 1930, had been operated on elsewhere April 13, 1930, for acute osteomyelitis of the right tibia, and holes were drilled in the bone with relief. In the latter part of May there was a recurrence with afternoon temperature of about 99 F. One week before admission pain was more excessive and the temperature reached 100. The leg became swollen and very tender and the local temperature increased. Examination of the right leg showed a healed scar about the middle third. There was tenderness to moderate pressure over the middle third of the shaft, and thickening of the bone with increased local temperature. Roentgenograms revealed condensation and slight enlargement of the middle third of the tibia with evidence of three drill holes from the former operation. August 4, operation was carried out with decompression of the tibia over the middle third, a portion of the bone about 4 inches in length and about three-fourths inch in width being removed, material resembling pus was present in the medullary cavity, which was curetted, local detritus being gently removed and sent to the laboratory.



Fig 10—Chondrosarcoma. Note that the tumor is well encapsulated. Not included in report of cases as patient declined treatment.

done through the junction of the upper and middle thirds of the leg.

This tumor is comparatively rare, as there were only four in our series of 125 primary malignant bone tumors. The prognosis of this tumor is said to be better than any other type of malignant bone tumor and is practically the same as fascial sarcoma of the extremity with the same prognosis.

Of twenty-one patients with endothelial myeloma (Ewing's tumor), three are living and well eight, five and four years later, respectively.

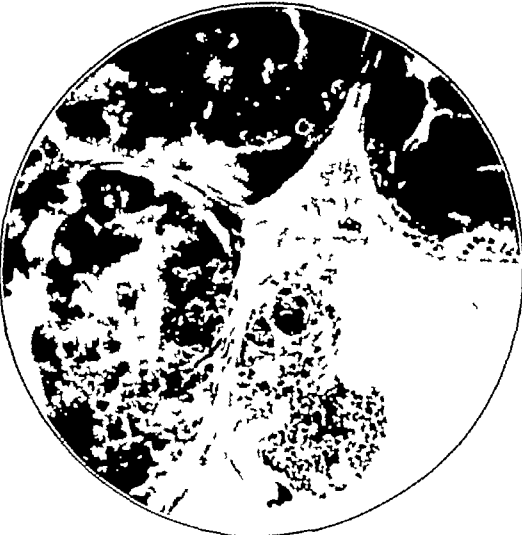


Fig 11—Osteogenic sarcoma chondrosarcoma type approaching adult hyaline cartilage.

CASE 12—A. L. M., a man, admitted Feb 17, 1927, complained of pain in the right ankle one year before. A tumor appeared about Dec 1, 1926, and had grown rapidly since, with no fever or intermittent attacks. He walked with crutches. The tumor of the ankle, most marked on the anterior medial aspect, was 'rubbery' on palpation, not definitely encapsulated and apparently connected with the tibia. There was slight local heat. Motion was limited about 25 per cent in all directions. Roentgenograms showed a tumor of the lower

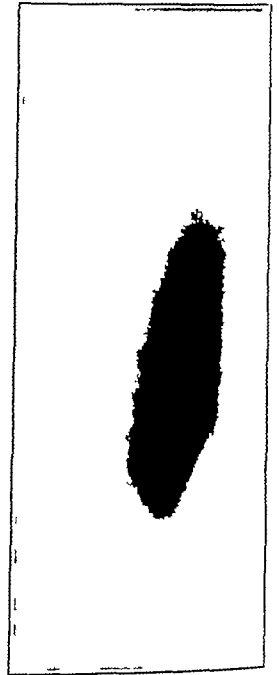


Fig 12—Typical osteoblastic osteogenic sarcoma occurring in a boy aged 12 years, which was fatal within a few months. Recovery has not occurred in any of our cases of this type.

for examination. A petrolatum gauze pack was put on the wound. The diagnosis was osteomyelitis. Culture was negative. August 26 a permanent tissue report gave a diagnosis of definite malignant tumor, osteogenic sarcoma. The patient was advised to return for further study. September 8 the patient returned with more pain and marked tumefaction. Roentgenograms demonstrated excessive bone production and tumefaction of the soft parts. The wound was discharging serosanguineous fluid but no pus. A malignant growth was suspected. A second biopsy was made which grossly did not appear malignant, and more tissue was taken for further study. Amputation was deferred. In the meantime roentgen treatment and Coley's toxin were instituted and have been rigidly and efficiently maintained for a period of eighteen months. The tumor rapidly receded, the wound healed and the bone returned to about normal with the exception of some permanent condensation.

The report of the registry is most interesting. Five observers make a diagnosis of Ewing's tumor, one of malignant tumor, probably Ewing's, and one simply of sarcoma, and one does not believe the tumor to be malignant. When one takes into consideration the evidence of the experts, combined with the fact that the tumor responded so rapidly to radiation, the diagnosis is very suggestive of Ewing's tumor.

Of the fourteen cases there are ten registered and one pending registration, and three were seen before we were registering every case as a routine.

The statement has been made that those who are cured by amputation or excision often give a history of several previous operations prior to final radical treatment. Of these fourteen cases, seven gave a history of

amputation was at or above the joint proximal to the tumor which suggests that all amputations should be proximal to the affected bone.

The fact that many of the successfully treated patients had undergone previous and often extensive local operations is an argument in favor of biopsy.

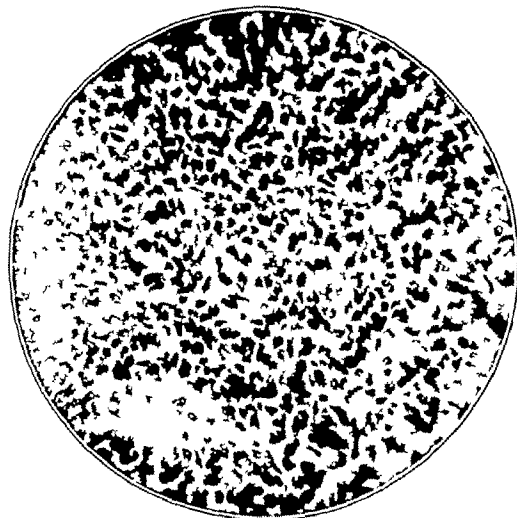


Fig. 14.—Same patient as in figure 13. Masses of polyhedral cells and scant intracellular substances; few mitotic figures.



Fig. 13.—Ewing's tumor in lower extremity of tibia, an unusual site. Note lifting which is characteristic also of osteogenic sarcoma. Patient is living and well after four years.

Ewing regards biopsy as a dangerous procedure that materially increases the chances of metastasis.

The prognosis is better in adults as the age advances, though of less frequent occurrence. Seven patients were above 30. Seven were below 30.

From the history, age and clinical symptoms there were five cases that we regarded as highly malignant and we are fortunate that these patients are still living. They are patients 5, 8, 9, 13 and 14. Nine cases on account of adult age, history and other indications should give a high percentage of recoveries. In nine cases from five to fifteen years has elapsed without recurrence, in five cases from three to four years, these are included in the report, for if two years elapses after apparent cure with no evidence of metastasis the chances are that the five year period will be reached.

There are no cases of osteoblastic or osteolytic tumors in children to report, as all nineteen cases of osteoblastic and nine cases of osteolytic have ended fatally, except two recent cases. These types we have found to be more common in children, with practically 100 per cent mortality. Also, Ewing's tumor is of frequent occurrence in childhood, but the prognosis is not as poor. The pathologic reports and an analysis of the five year cures of the Bone Sarcoma Registry are omitted for the sake of brevity.

The problem of bone tumors is analogous to cancer but by far more difficult, as malignant tumors of bone are less frequent but much more malignant. The results at present, as is well known, are far from desirable, but there has apparently been some improvement during the past decade from the impetus given to the study of the subject by the Sarcoma Registry, though there are no previous or reliable data for comparison. However, a concentrated effort by members of the profession, especially those of this section, who treat a majority of the bone lesions of this country, could probably do much to improve the present status of primary malignant bone tumors.

869 Madison Avenue

previous operations. Of sixty-three patients who died, six had a history of previous operations. However, a large percentage presented themselves for treatment in the latest stages after extensive destruction. In five cases the point of amputation was above the tumor through the same bone, and in seven the point of

ABSTRACT OF DISCUSSION

DR. HENRY W. MEYERDING, Rochester, Minn. The fact that Dr. Campbell's cases were all carefully followed up, that he had the roentgenograms and the microscopic sections passed on by himself, his pathologist, and then, in most instances, verified by the Registry of Bone Sarcoma, puts this paper above the average presented on the subject of sarcoma of the long bone. I believe that he states correctly that it is only through earlier diagnosis that more satisfactory results from treatment are going to be obtained. I have advocated for years biopsy at least in all suggestive bone lesions. The value of a biopsy depends on its interpretation by the pathologist, and it is well known that one cannot always depend on pathologic opinion. Furthermore, before attempting surgery, one should roentgenograph the chest for pulmonary metastasis. I favor biopsy and do it in every suspected bone lesion. A diagnosis of a malignant state is no longer sufficient. The pathologists grade the degree of the malignant condition, and at times that proves of value in deciding the possible point of amputation. Many patients come to the clinic with apparently small tumors, of either the osteogenic or Ewing type, and the routine examination shows evidence of pulmonary metastasis. It is believed that further knowledge along the line of radiosensitivity of the cells and improved technic in irradiation will be of value in the future. However, at present, roentgen and radium treatment have not been very encouraging, although in the case of Ewing's tumor a therapeutic test by irradiation is almost as conclusive and satisfactory as a pathologic opinion. Dr. Campbell has shown a case of malignant transformation of an apparently benign lesion that later proved to be malignant. I have seen that happen when all the data possible were at hand—x-ray, history, serologic test and pathologic opinion, all of which were negative only later to find that the true nature of the tumor was brought out by evidence of metastasis to the lungs. In a series of Ewing's tumors recently gone over, I find that a high proportion had been previously diagnosed as osteomyelitis. In every case of osteomyelitis in which suspicion of Ewing's tumor arises, I would be in favor of a therapeutic test by irradiation. I believe that the classification as shown by Dr. Campbell the registry classification, has done much to simplify and to permit a more readily understood differentiation of bone tumors.

DR. BRADLEY L. COLEY, New York. Dr. Campbell is to be congratulated for setting the example of registering his cases and referring to them by their registry diagnosis. The ultimate accomplishments of the Bone Sarcoma Registry are hard to predict. I agree with Dr. Campbell that the most valuable place for the use of toxins is in the treatment of endothelial myeloma. I would emphasize the fact that, until some dramatic discovery changes our entire conception of the bone sarcoma problem, improved results must be looked for in the education of the public and the profession, so that these conditions are suspected, investigated roentgenographically, their presence proved or disproved and proper treatment instituted at the earliest possible moment. When the profession accepts and follows the dictum that persistent pain in an extremity or in any part of the skeletal system calls for the tentative diagnosis of bone sarcoma until such is disproved, physicians will begin to see these cases at a period when treatment may offer a more hopeful prognosis, and the end results will be improved. At present I believe that the following statements are justified: 1. Ewing's sarcoma is both radiosensitive and toxin sensitive and irradiation should be used for the local lesion and toxin for its systemic effect and especially to prevent generalization of the disease. Irradiation by high voltage roentgen therapy with the single dose technic, is then followed by intensive toxin treatment. Irradiation alone has produced few, if any five year survivals. Radical surgery is therefore probably indicated for accessible lesions after radiation therapy has produced the maximal regression. This period may roughly be taken as from four to six weeks. 2. Osteogenic sarcoma is best treated by early amputation. At the present time results of irradiation do not justify its being offered as first choice. However, for osteogenic sarcoma in young children there is more reason to substitute it for immediate amputation, since the latter almost never produces a cure. Toxin therapy has been of value after amputation for osteogenic sarcoma in preventing the development of pulmonary metastases. I use it as a routine after all

amputations. 3. The results of irradiation alone have been distinctly inferior to those of radical surgery for operable osteogenic sarcoma. However, in my experience, irradiation has often produced marked palliation, and I invariably give it a trial in all cases when the lesion is inoperable or when radical surgery is refused. Further efforts should be made to develop a method of irradiating these patients that will offer a more favorable outlook. May I point out the opportunity that is open to orthopedic surgeons, who are most apt to see the sarcoma cases, to play a leading part in the fight to control this disease. Dr. Campbell stands almost alone among orthopedic surgeons as a careful student, an experienced clinician and a valued contributor to this field, which seems to me so definitely to belong in the realm of orthopedics.

DR. WILLIS C. CAMPBELL, Memphis, Tenn. There is sufficient evidence to warrant the use of Coley toxins combined with radiation in Ewing's tumor, but in osteogenic sarcoma without amputation in these cases there was no beneficial result. Possibly there may be some value in the toxins after amputation, but it is difficult to carry out unless the patient can be under clinical supervision for a year after amputation. One patient is living four years after amputation and Coley toxins have been efficiently administered for eighteen months while another patient is living and well after three years without toxins. I am employing the toxins after amputation in osteogenic sarcoma when possible, but the value can be determined only by the results in a large series of cases after amputation with and without this treatment. No one man can accumulate a sufficient number, and it is only by cooperative efforts by such groups as members of this section that conclusions can be reached. The mortality is so high in the more malignant types that a thorough test of this or any other method should be made. Dr. Coley and others have produced sufficient evidence to warrant a scientific investigation of this treatment in a large number of cases.

STEREOSCOPIC FUNDUS PHOTOGRAPHY

CHAIRMAN'S ADDRESS

ARTHUR J. BEDELL, M.D.

ALBANY, N. Y.

The highway of health is lined with memorials erected to those who have advanced the art and science of medicine. Every discovery in medicine and surgery is commemorated, some by large imposing structures, others by small tablets, but to the historian every one recalls important facts, so that this avenue is life's most famous road. To the multitude certain mementoes appeal, while the specialist is particularly interested in those most closely associated with his division of the healing art.

Ophthalmologists gaze with wonder and admiration at the pyramids built in memory of great anatomists, pathologists, physicians and mathematicians but stand spellbound before the cenotaph raised in recognition of the many who conceived and developed the ophthalmoscope, with grateful hearts they approach the cluster of marble shafts memorializing the originators of the slit lamp and then pass down the thoroughfare to a few broken, moss-covered pillars placed in remembrance of the photographers of the fundus. Symbols of attempts that ended in disappointments, they have acted as inspirations to those who in the heat of the midday sun looked with awe on them, took new courage and finally achieved success.

In the quiet of the evening we think of the men who have labored and who are now working in this part-

Read before the Section on Ophthalmology at the Eighty Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.

Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

ticular field. We look about and find collected near the great monuments many stones that make an impressive mound constructed as a tribute to the pioneers who were filled with a natural longing to preserve the appearance of fundus changes.

There is a piece for Roseburgh, who in 1864 attempted to photograph the fundus of an animal, here a block for Noyes and another for Liebreich, they failed, but their failures led others to greater effort. To one side a marble slab for a former chairman of this section the beloved scientist Lucien Howe, who described his unsuccessful efforts in 1887, while a short distance farther along there is a relic for Bagnieres of France recording his work in 1889, and a bright rock signifies that Gerhoff in 1891 succeeded in taking a fairly good photograph.

We pass many year miles where the rubble and talus indicate long periods of investigations, unsatisfactory results and heart-breaking frustrations before we reach the polished granite column elevated in recognition of Dimmer of Vienna who in 1899 electrified the ninth International Congress of Ophthalmology with his marvelous pictures. His cumbersome apparatus was expensive and its manipulation so technical that only one was built but his photographs were not duplicated for several years.

To Salomonsen, whose excellent camera is used by several there is a special tablet, and in this isolated section we find the notations of Wolff, Thorner and others who aided in bringing us all nearer the realization of our dreams.

Nordenson brought some clear photographs to the Washington congress in 1922.

With the exception of Dimmer, almost all the investigators associated with our present methods are living. They are scattered over the world from Nordenson in Sweden to Pavia in Argentina, from Wessely in Germany to Guist in Vienna and in America from Von Der Heydt in Chicago to scores in other cities. The work is steadily growing in importance and in value, for a host of clinical ophthalmologists are preserving their observations for posterity to examine and appraise.

Three atlases of photographs have appeared, the first by Dimmer and Pillat in 1927, my own in 1928 and Guist's in 1934. The same year a monograph was published by Nordenson. The literature is far too voluminous even to summarize.

Direct color photography has attracted attention and some excellent pictures have been presented, but because of the expense and the difficulty of reproduction it is as yet not popular. Eventually, drawings will be supplanted and even the most skilful artist forced to admit the superiority of photographs. For several years I have been taking colored photographs.

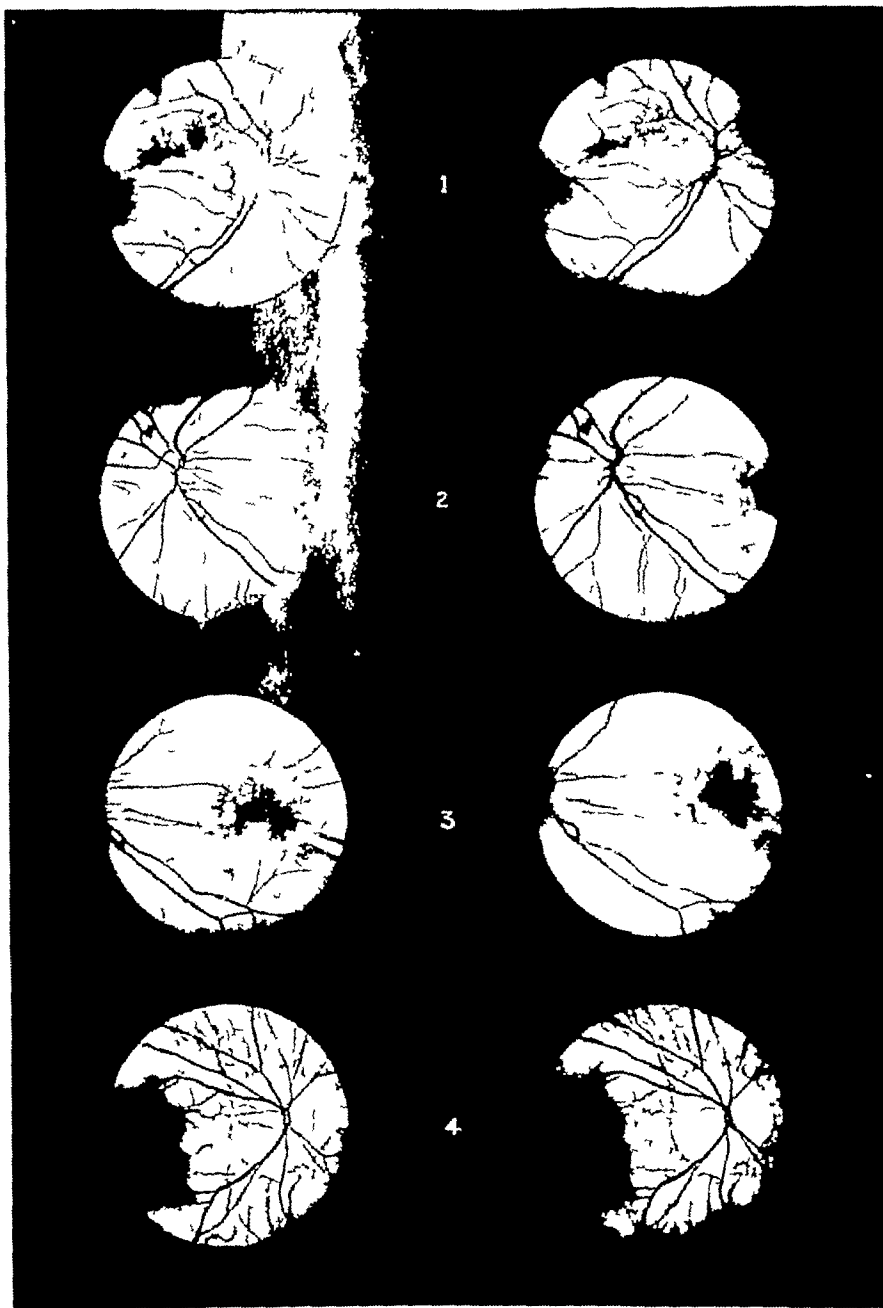


Fig. 1—Choroideremia and high myopia. 1 Right eye choroideremia. 2 Left eye choroideremia. 3 Macular region of left eye choroideremia. 4 Compound myopic astigmatism dark macular region.

Pavia and Baillart, working independently, have made moving pictures of the fundus, which so far have proved to be surprising but not especially enlightening.

The obelisk from which an effulgent light is radiated and the Mecca toward which all disciples of permanent accurate records make their pilgrimage is that reared in 1926 to Nordenson for his photographing ophthalmoscope, and it is here along this beaten track that we

linger and in solitude examine the archives of photography of the fundus

Stereoscopic fundus photographs were first mentioned in the literature by Metzger in 1927. Some of mine, taken from a collection which was started Oct 2, 1926, were submitted for publication on March 15, 1927. There are three methods of taking these photo-

ment is limited, for a satisfactory negative cannot be secured unless the pupil is at least 7 mm in diameter and, for the finer detail, 8 mm. It is impossible with this camera to take pictures of the cardiovascular-renal group in which the pupil cannot be fully dilated.

If one refers to some of the rare ophthalmoscopic appearances that have been presented at recent sessions of this section, one can readily appreciate the value of stereoscopic fundus photographs in choroideremia and angioid streaks.

CHOROIDEREMIA

C. W. F., a man, aged 45, with choroideremia, was first examined and photographed on March 15, 1934. He had worn glasses fifteen years the last pair for four years. He thought that he had perfect vision until about one year before examination, at which time he noticed dancing bubbles before both eyes and shortly thereafter found it impossible to get around after sunset. Until that time he had been active in sports, including baseball. He had typhoid when he was a child, scarlet fever in early adult life, an operation for mastoiditis and also one on the right kidney. He presented no evidence of venereal infections and the Wassermann reaction was negative.

The right eye (1, fig 1) was normal externally. Vision was 18/200. The pupil measured 4 mm and was regular and reacted normally to light and in accommodation. The pale disk was slightly oval with a thick uneven nasal margin and a shallow central excavation. The retinal vessels divided and passed as an upper and lower branch, these again subdivided and continued without unusual course or caliber changes. Several fine vessels extended over the disk, but there were no chorioretinal ones. Both arteries and veins were about half their normal size, but neither system showed irregularity of the lumen or unusual distribution. The choroid was almost entirely absent, although careful examination with red and blue light disclosed faint remnants in isolated regions, as about the disk, where a delicate pattern suggested the choroidal vessels and a thin uneven coat of retinal pigment. The latter varied from a dense, dark reddish brown irregular area between the disk and the macula to a weblike barely visible shading. Surrounding the macula the pigmentation was somewhat triangular and almost twice as long as the disk in its greatest diameter.

The darkest portion was the pyriform or flattened oval of the macula itself, which was sharply differentiated in the photograph but not so clearly distinguished when seen with the ophthalmoscope. In the periphery of the fundus were scattered flecks of pigment. The white sclera dominated the picture.

The left eye (2 and 3, fig 1) externally was normal and the vision was 6/200. The fundus was almost snow white, the sclera was visible throughout with the exception of a few scattered pigment areas the disk, and the macula. The dull

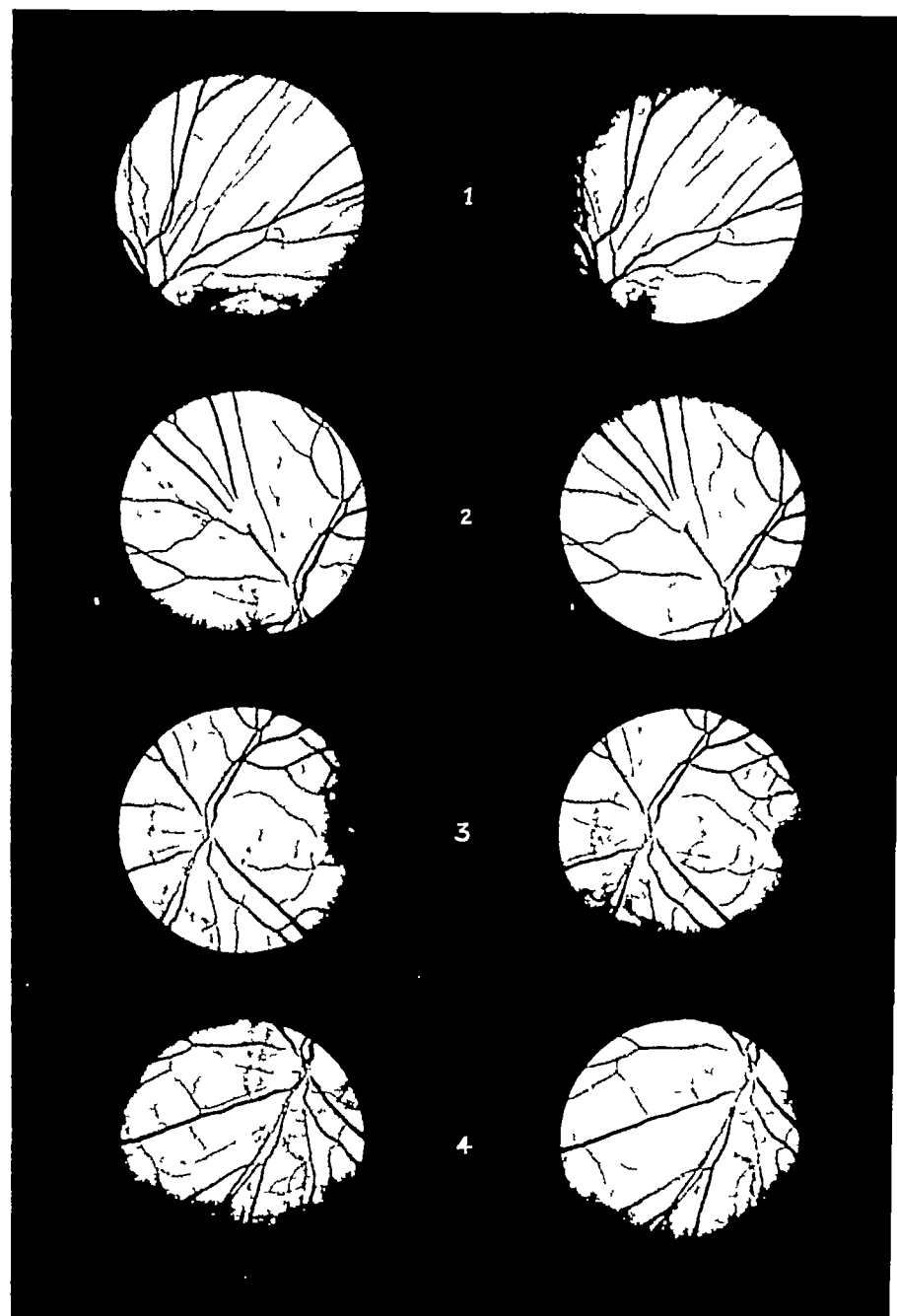


Fig 3—Angioid streaks 1 Right eye, superior nasal quadrant 2 Left eye upper nasal sector
3 Left eye disk and macula 4 Left eye inferior nasal quadrant

graphs one by the use of the Wessely apparatus, in which the camera remains fixed and the patient's eye is moved, another, the method I introduced, in which the position of the camera is changed and the eye remains fixed on an object held by an assistant, and the third, the absolute, by which the two pictures are taken at the same time by the Nordenson stereoscopic camera. Unfortunately, the range of usefulness of the instru-

gray disk was slightly oval and on the temporal side faded into a faintly pigmented zone while the nasal edge was clearly separated from the retinal pigment which was about one-third the disk diameter in width. The brownish pigment that partly encircled the disk was thin, in places absent and two dark flecks lay beneath the retinal vessels in proximity to it. The vessels divided after passing through the central excavation into a superior and inferior branch and from these major subdivisions large and small ones extended over and beyond the disk. The arteries and the veins were measurably smaller than those in the right eye. The dark macula was almost round, about one third of the disk in diameter and surrounded by a triangular zone of what appeared to be pigmentation but which was in reality the remaining part of the normal retina. The edge of the region was not distinct. All the blood vessels to the macula came directly from the retinal supply, there were no chorioretinal ones.

The field of vision in each eye was very small, ranging from 2 to 5 degrees from fixation.

ANGIOID STREAKS

Angioid streaks of the ocular fundus are neither common nor understood, although 106 cases seem to have been reported in the literature.

C. S., seen Dec 22, 1930, had vision in the right eye (1, fig 3) of 20/15. The total refractive error was $+50 \times 90^\circ$. The pupil measured 3 mm and was regular and active. The media were clear. There were definite brownish pigmented granular streaks surrounding and radiating from the disk. They were all beneath the retina. The upper nasal sector showed the pathognomonic discolored streak extending to the peripheral mottled area.

The patient has been examined at various times since then and the last photographs were made on Nov 3 1934. At the time of the first visit and at subsequent examinations, no changes were found anywhere in the skin of the body.

The detailed examination of the left eye (2, 3 and 4, fig 3) showed that there was an oval disk as measured on the photograph 6.25 mm \times 9 mm. All measurements were so made and must not be considered as ophthalmologic approximations but as true comparatives. The disk surface was slightly uneven and there was no central excavation. The veins and arteries were comparatively straight and all passed over dark, cellular-like brownish channels. These so-called streaks were beneath the retina, either in the deep choroid or between the choroid and the sclera. They were without the regularity of vascular channels resembling neither the straighter retinal vessels nor the more tortuous ones of the choroid. The channels were broadest near the disk. In places as for instance on the temporal side they were close to the edge of that structure whereas to the nasal side they were separated by a band which was almost 2 mm wide. The superior temporal projection extended obliquely up and out for 15 mm and although it

seemed to taper from the center to the periphery it was of unequal width showed a variable pale surrounding stripe and merged into a wider area of similar appearance, devoid of any form even remotely suggesting a blood channel.

Almost directly above the disk there was another streak, which was about 15 mm long. This streak was attenuated and ended in a fainter but otherwise identical zone. To the superior nasal side one of the widest streaks extended about



Fig 4—Allergic fundus reactions. 1 Petechial hemorrhages of retina. 2 Absorption. 3 Another shower of blood. 4 Quiescent allergic retinitis.

22 mm gradually narrowing until it also was lost in the peripheral discolored region.

The remaining part of the fundus was somewhat mottled. Dark specks were within two disk diameters of the broad band that surrounded the nerve head. There was a very definite ampuliform dilatation to the inferior nasal side of the disk. The extensions from this were very granular, in places the pigment seemed to be absent and the reduction in the width of the streak was very striking. Scattered about the disk were

several granular spots of the same appearance but in no way connected with the streaks themselves. The macula was uninvolved and the field of vision unchanged.

The streaks do not seem to be blood channels, for there are no canals like them. They are not reduplications or folds because they are not elevated, and simple wrinkling does not explain the granular appearing areas

that as yet neither the cause nor the structural changes have been correctly explained. The correlation of the photographs and the pathologic condition are essential to the solution of the problem.

ALLERGIC REACTIONS

Allergic reactions are so bizarre that some one recently said that they explained many of the common general phenomena attending disease. If so, there are many ocular manifestations that have as yet escaped detection.

C B, a married woman, aged 52 seen Sept 25 1934, complained of poor vision in the left eye, which had been noted for eleven days.

With the exception of a slight overfulness of the veins and a faint irregularity of the lumen of the arteries, the right eye was normal.

Vision in the left eye was 20/30. The pupil measured 3 mm and was regular and active, and the media were clear. The entire retina was edematous and overspread with superficial striate and somewhat deeper, rounded hemorrhages. The veins were distended but not over tortuous and in places partially hidden by the overlying retina. The arteries were irregular in the lumen, some of them very small, others of normal caliber. The macula was a clearly outlined, irregular dark oval surrounded by deep retinal hemorrhages, a shower of petechial hemorrhages (1, fig 4).

December 6 the patient was again seen. The edema of the retina was decidedly less and the arteries were about the same, but the retinal hemorrhages had all disappeared (2 fig 4).

Fifty three days later the patient returned after having had a left lower molar tooth extracted under procaine hydrochloride. Her physician, Dr A C Hagedorn, reported her blood pressure 143 systolic 78 diastolic, blood sugar was 120, urea nitrogen, 14, platelets, 222 000 per cubic millimeter, coagulation time seven and one-half minutes, bleeding time, two minutes. The blood count showed eosinophils of 15 per cent. The fundus was spattered with blood and unless the photographs were analyzed it might readily have been considered the same as on her first examination. A careful inspection showed however, that the striate and rounded hemorrhage were in different places (3 fig 4). Nothing but photographs could record the multiple petechiae and so clearly demonstrate the changes that had taken place in this fundus.

D H, a man, aged 21, was seen April 21, 1930 following an automobile accident, eight days before which resulted in a fracture of the third and fourth lumbar vertebrae. The right eye showed marked subconjunctival and lid ecchymoses. The pupil measured 4 mm and was regular and active. The media were clear, and the nerve head was completely obscured by thick white edematous swellings which looked like irregular balloons of various sizes and prominence. There were several superficial hemorrhages over them. The arteries were normal.

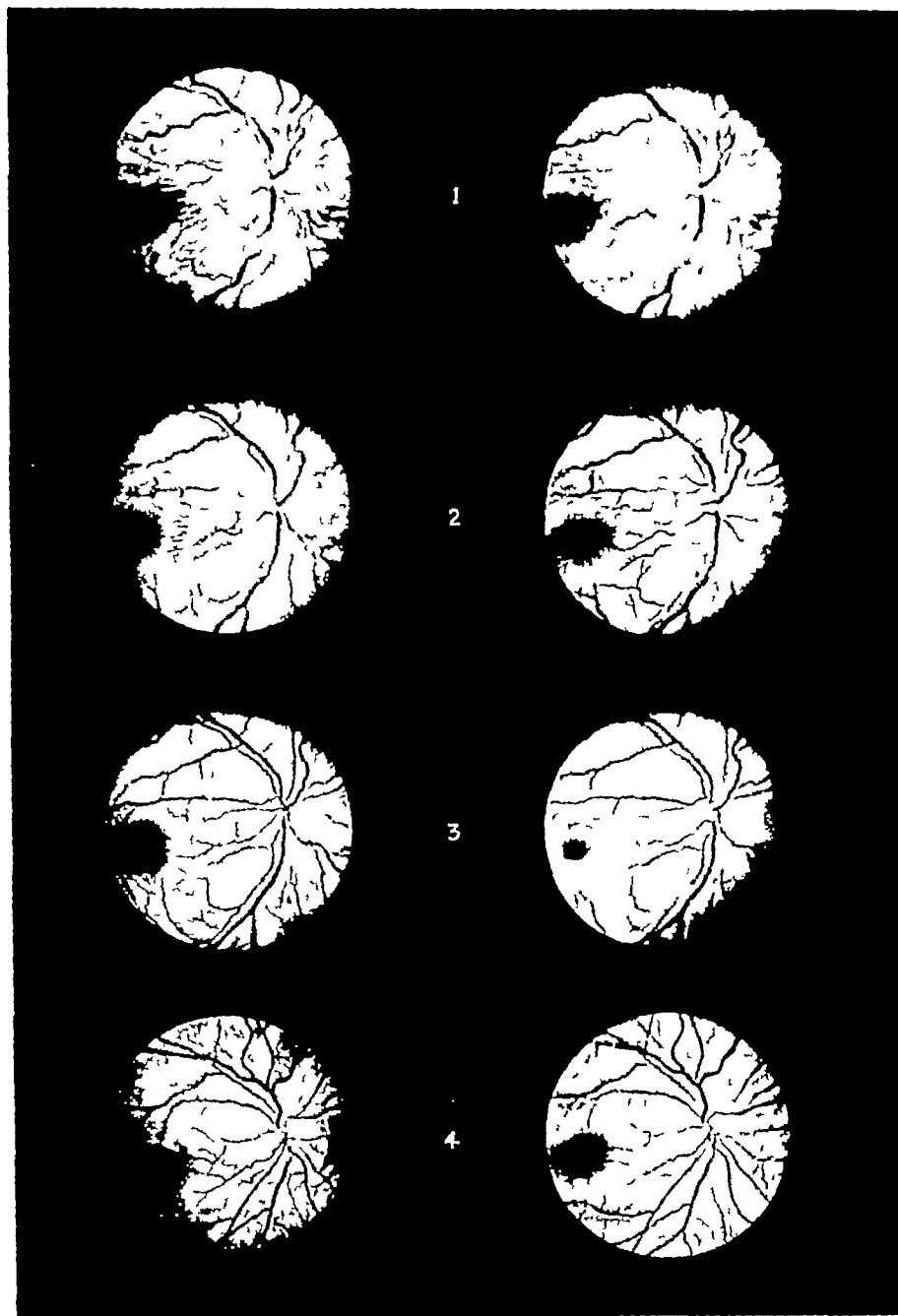


Fig 5—Papilledema 1 Active stage swollen disk with exudate 2 Subsiding less marked 3 Complete recovery 4 Unilateral stationary disk elevation

in the periphery. They give the impression of bands of atrophy over or into which red-brown debris is dispersed. Certainly the actual stereoscopic photographs in this case will, if the patient is kept under observation long enough, help in the final solution of a curious anomaly. Some cases of angiod streaks are coincident with pseudoxanthoma elasticum, others with osteitis deformans and many without any general disease, so

but the veins were at least twice their normal width. There was slightly less change in the left eye.

I suggested that he had an allergic reaction as a result of the tetanus antitoxin that had been administered. This was confirmed a few hours later when a generalized urticarial eruption appeared. There was a rapid decrease in the retinal swellings, but it was not possible to bring him to Albany until June 9, at which time it was found that the disk was almost perfectly round and the veins were fuller than the somewhat narrowed arteries. The disk was pallid. On the temporal side were several areas of grayish yellow, brilliant remnants of the former edema and in the vitreous, overlying the macula, were many fine gray, pin-point dots (4, fig 4).

These two cases are presented to arouse greater interest in the subject of allergy.

PAPILLEDEMA

Papilledema in either the progressive or the retrogressive stage offers an excellent subject for serial stereoscopic photographs, a clinical method little practiced and less appreciated and yet the most valuable of all records.

A. M., a girl, aged 12 years, seen March 17, 1934, in consultation with Dr. E. E. Hinman, had had an acute nasopharyngeal infection and an acute otitis media on the left side with rather extensive mastoid involvement. At the time of examination the temperature was 106.2 F and with the exception of partial paresis of both external rectus muscles, externally the eyes were normal. There was a marked bilateral papilledema.

It was possible, April 7, to bring her for photographs. The disk was about twice its normal size and elevated at its greatest point about 4 diopters (1, fig 5). The central excavation was maintained and the papillomacular bundle was definitely depressed. The arteries were very small in places entirely obscured by the edema. The veins were distended, partially covered by vascular exudate and whitish yellow streaks which were greatest on the sloping sides of the elevation. There were a few minute hemorrhages and many dilated capillaries.

April 24 there was considerable reduction in the swelling of the disk with almost complete disappearance of exudate, and practically all the excessive vascularization had disappeared except at the superior border (2, fig 5). The veins were about two thirds of their normal diameter. In the lower nasal quadrant the course of the major vein remained hidden by the overlying edema. The disk was less swollen, projecting about 2.5 diopters. Almost all the larger arteries could be traced over the disk. The central excavation was maintained and the papillomacular bundle was distinct.

June 1 after cerebral taps by Dr. Gilbert Horrax the vision was restored to 20/15. The disk was seemingly of normal size, one-half as large as when first examined and although the

nasal side remained definitely elevated it was normal in color outline and consistency (3, fig 5). The left eye followed the same course as the right from the day she was first seen until the last examination, a steady decrease in compression signs.

DETACHMENT OF THE RETINA

Ophthalmic literature is replete with studies and reports on the operative results in detachment of the

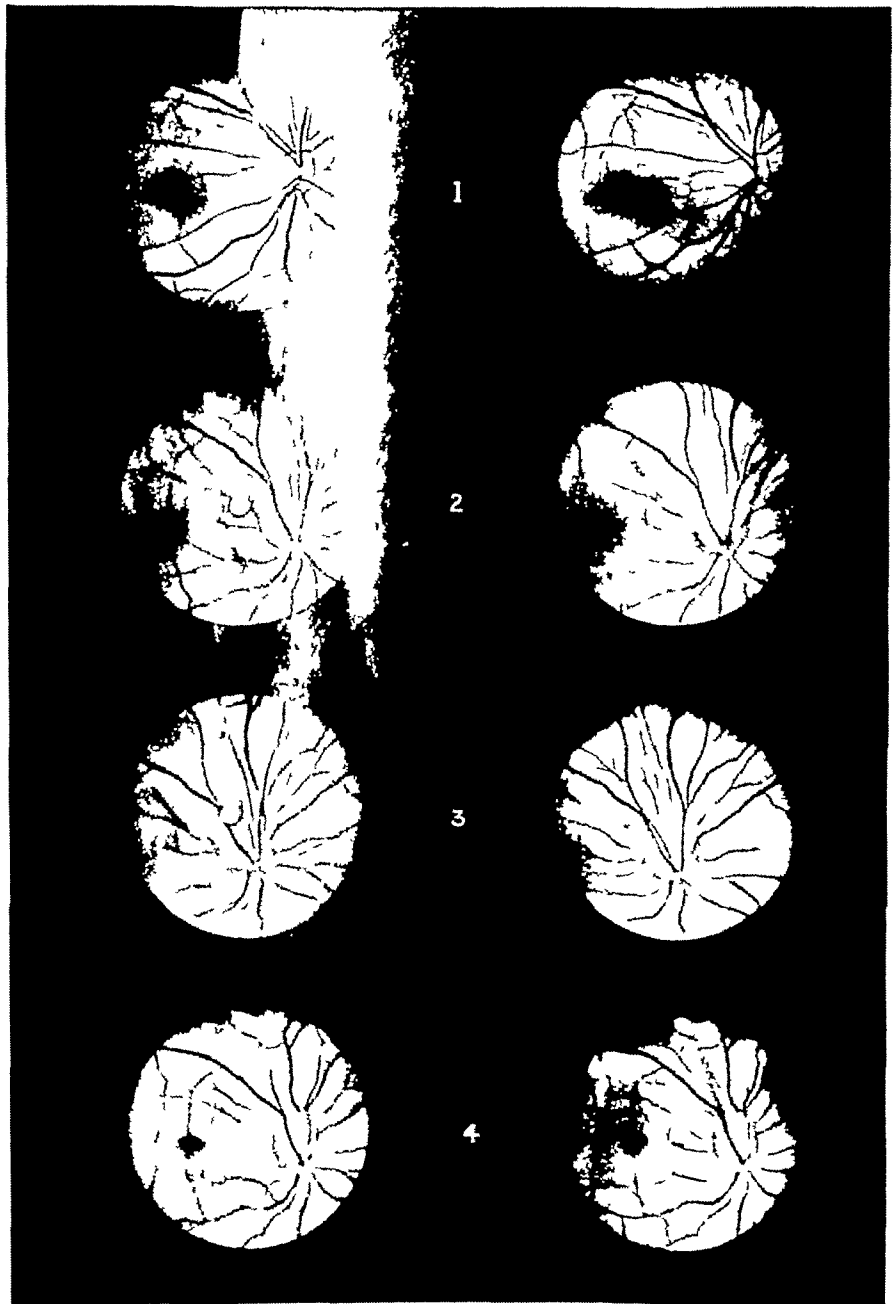


Fig 6—Detachment of the retina. 1 Myopia normal fundus. 2 Horseshoe-shaped detachment about disk. 3 More extensive separation. 4 Funnel-shaped disk, ridge detachment projection.

retina, and yet I present this spontaneous retinal detachment because of its unique photographic history.

J. S., a boy, aged 10 years, first seen Feb 20, 1924, had compound myopic astigmatism, with normal fundi. Refraction was done again Jan 7, 1927, at which time there was a considerable increase in the myopia, and the vision was brought to 20/20. There was no annoyance until shortly before a visit on Oct 27, 1931, when the distance vision was blurred, he had

a slight frontal headache after close application and a tendency to hold things closer to his face. The distance vision was 3/200 with his old correction 20/100, with a $-6.50 = -2.50 \times 15^\circ 20/40$, left eye 4/200 with a $-6.50 = -3.00 \times 165^\circ 20/30$? At that time a fundus photograph was taken (1 fig 6) simply as a matter of record and not because there was any gross or unusual change. The disk was perfectly round with a clearly outlined scleral ring and an incomplete pigmented

the eye was normal. A large U-shaped rounded elevation surrounded the lower two fifths of the nerve (2, fig 6). The upper arms were widely separated. The blood vessels on the lower part of the nerve head were intimately associated with the roll. The central excavation was overshadowed by a thin gray, somewhat indefinitely outlined membrane. The portion of the disk in the opening of the U was edematous and its contour indistinct. The difference in level between the highest point of the roll and the other portions of the retina was about 3 diopters. The macular area was small surrounded by specks of gray edema. The field of vision was very markedly contracted varying from the 25 degree to the 5 degree point of fixation.

December 24 the elevated pale U-shaped area was not as sharply contrasted with the rest of the edematous retina which in many places, especially above was striated (3, fig 6).

March 17, 1933 the arms of the U were more acute. The superior opening was narrow and in places where the retina had been striated there was a distinct folded, prominent detachment which widened peripherally, was of very uneven surface and in places showed broad white bands. The contrast between the elevated circumpapillary ridge and the rest of the retina was less distinct so that the blood vessels, particularly those which were formerly in the upper half of the disk, were partly concealed in a deep hole, which was not the central excavation of the nerve head but a depression in the folds of the detached retina. Practically the entire upper half of the retina was detached. The surface was very uneven with many white streaks some straight others curved and all of unequal width. The vessels were adherent to the angulated retinal surface. There were many radiating wrinkles about the macula (4 fig 6).

Externally the eye was normal. September 11. The upper portion of the former U-shaped roll was almost closed by a very prominent, unevenly surfaced, localized detachment of the retina (1, fig 7). The ridge about the disk was pale the depression was marked and the effect on the retinal vessels was still more striking. The impression was that the vessels were fixed and that the retina was bulging forward so as to change their relationship to the region of the nerve. It is quite important to understand that the disk itself had not been visible since the first stage of this widespread retinal detachment. The upper two fifths of the retina showed a series of broad white bands with white

central streaks (2, fig 7). These seemed to be acute angulations of the retinal surface for the retinal vessels passed over them and were always kinked as they followed the acute retinal edge. The great difference in the various levels is well depicted in the photographs.

Jan. 26 1935 the vision of the right eye was 1/200 and unimproved by any glass. The field of vision was bizarre, in only a few isolated areas was light perceived. The entire



Fig 7—Detachment of the retina. 1 Prominent fold about and above disk. 2 Sharp angulation of detachment, white retinal streaks. 3 More generalized flatter. 4 Left eye ridgelike white line sloping detachment.

arc limited to the nasal side. Several branches of the arteries came out of a large central excavation. The inferior vein showed four branches the superior two. The subdivisions of both arteries and veins were not noteworthy. The fundus pigment was somewhat granular and the macula was clearly and distinctly outlined.

Thirteen months later Dec 11 1932 the vision of the right eye was reduced to 20/200 with correcting lens. Externally

retina was so greatly detached that although the light colored ring surrounding the region of the disk was still visible, there were no gross undulations in its surface, and the broad white subretinal bands had disappeared (3, fig 7)

On this day, retinal changes were for the first time discovered in the left eye. The vision was reduced to 2/200 and with correcting lens 20/30. The round disk was sharply outlined by a scleral ring and had a small deep central excavation. There were several branches of the rather straight retinal vessels. A line about six disk diameters long extended from the inferior border of the disk obliquely up and to the nasal side. In places this was a thin streak while in other parts particularly toward its termination, it widened and became whiter. There were several small irregular white flecks near the line and to the upper side of it. The line was the sharp angle of that part of the retina which was most detached, and as the retina sloped on each side it gave the impression of a ridge pole on which taut canvas was stretched (4, fig 7). The choroid circulation was clearly seen. The field of vision was markedly and irregularly contracted.

And so, after this hour of quiet meditation, we leave the isolation of the sector devoted to ophthalmoscopy and again pass down the highway of health with higher aims and a greater desire to add to the luster of our particular specialty, by individual effort and greater familiarity with all the discoveries in medicine and in surgery.

344 State Street.

THE PSYCHIATRIC HOSPITAL AS AN INSTITUTE OF LEARNING

C C BURLINGAME, M.D.

Psychiatrist in Chief, the Neuro-Psychiatric Institute of the Hartford
Retreat and Associate in Psychiatry, Columbia University
College of Physicians and Surgeons, New York
AND

CARL PHILLIP WAGNER, M.D.

Senior Psychiatrist, the Neuro-Psychiatric Institute of the Hartford
Retreat and Assistant in Psychiatry, Columbia University
College of Physicians and Surgeons, New York
HARTFORD, CONN.

It has long been evident to those familiar with mental illness that one very great weakness in the system of institutional care of the mentally ill lay in the fact that the patient, already retreating from reality, by reason of his admission to a hospital became even more completely isolated from community life. Because of the simplified environment, the uncomplicated routine and the lack of usual and normal contacts with outside life the patient tended to become even more desocialized.

We may be presumptuous in undertaking to develop a psychiatric hospital as an institute of learning, but we have proceeded on the theory that fundamental progress could best be made by first regarding all psychiatric hospitals as places for education and reeducation of individual patients and that pedagogic methods under medical guidance should eventually dominate these institutions for both the acute and the chronic patients, not primarily to increase the scholastic knowledge of the patient but for the development of personalities and the emotional stabilization through training and rational psychotherapy.

April 1, four years ago, in accordance with this theory, the old Hartford Retreat was started toward the goal of making the institution into an educational center with as normal an environment as possible. On the premise that people were sent to hospitals because

of their inability to adjust themselves to community life the natural therapeutic approach seemed to be the reeducation of the patient, and it followed, of necessity, that to do this it was necessary to surround him gradually with an environment both physical and personal which would more exactly approximate the normal environment of a normal person.

Naturally, the accomplishment of such an ideal concept has been replete with difficulties. The physical plant had to be adapted to the purpose of an educational institution, the body of employees, professional and nonprofessional, had to be trained to accept the theory and to equip itself for carrying it out. Hence it became necessary to rebuild the physical plant and to create an entirely different attitude in the personnel through a long continued, consistent program of staff education.

One cannot emphasize too strongly the important part that the personnel plays in such a scheme, every one knows that personal associations in environment have a great deal to do with shaping personality, and our objective was, therefore, to select employees for their education, intelligence and capacity to offer something to the patient both in the way of actual instruction and more subtly, but just as really, by a pattern of intelligent normality. In passing, we might say that attendants have been supplanted by psychiatric aides who, according to our requirements, must be at least high school graduates and capable of grasping the psychological factors in the didactic and clinical training concentrated in the aides' six months' period of orientation. This training program extends through the entire rank and file of the organization.

We mention these things as a necessary prelude to an explanation of the things actually being done, so that the philosophy behind it all will be understood, with no philosophy as a basis, the entire structure is meaningless, but, with the educational concept, the objective of which is the development of latent capabilities, the chiseling off of rough and unsocial character defects, the development of a feeling of responsibility, the nurturing of the competitive spirit, and in short the evolution of a normal, healthy attitude toward life, then all these things take on a new meaning. They have meaning because they are in accord with the best educational principles and because we use as a part of our method an approximation of normal community conditions.

It will be noted in a survey of the curriculum that we have dispensed with many forms of so-called occupational therapy which have been identified with institutions for years. Perhaps we have bent backward in an avoidance of anything smacking of institutionalism, but we have not missed these, and we have supplanted them by things more nearly like what these people may expect in the community.

A curriculum is offered which will make for a well rounded and well balanced personality and which provides training along the lines of vocation, avocation, cultural pursuits, physical recreation and social interest.

While we are thus providing educational facilities for the patient at the hospital, we particularly try to project the goal and purpose of these pursuits beyond that period and to stimulate enough interest in these activities so that he will follow many of them through life in much the same way as many of us continue certain cultural, intellectual and vocational pursuits after school or college.

We try to develop good habits of industry by planning a daily program which requires regular hours of

study Courses are provided that will help the individual become more efficient in his vocation or that start his training and interest in a new vocation suitable to his personality These courses are supplied by some of the leading universities of the country under the supervision of an educational director at the hospital Extension courses in business, economics, finance, insurance and government are offered in which the patient is responsible for his work directly to the university Classes in shorthand and typewriting are provided at the hospital As the patient's condition improves and his work becomes more advanced, he is sent to one of the local business schools, where he may get additional instruction along the lines of bookkeeping, accounting, secretarial work and other subjects related to business Under this procedure, it will be noted, the sharp line of demarcation between institution and community life is gradually wiped out

We offer classes in horticulture, including botany, the study of plants and plant life, and landscape gardening, in these courses the patient is provided with regular classroom work In the greenhouse he is given a chance to carry out his ideas in the designing and developing of landscapes in miniature and to learn the practical fundamentals of gardening

Classes in costume designing and the knitting of garments and fashionable accessories, domestic science and interior decorating supply splendid avocational training and frequently serve a very practical purpose as well There are classes in dietetics and party service, in which patients are taught to make dishes that are both attractive and palatable, here again the training is both avocational and practical

From the cultural point of view, patients are instructed in art classes which include sketching, clay modeling, sculpturing and painting Along with these a lecture course in the history and appreciation of art is given by one of the professors of a local university One can readily realize the value that these classes have as a medium of self expression, of creation and of establishing feelings of satisfaction through achievement

Still adhering to the theory of maintaining normal conditions, the library is a very essential adjunct to our educational scheme Through it we provide guided reading in history, music, economics and government in conjunction with classes in these subjects In addition to these reference books, the library contains most of the classics and a good supply of current books on biography, history and fiction Instead of filling our library with books which are old or about which people have stopped talking, we have an arrangement with the publishers to receive advance copies so that our new books may be reviewed in our hospital publication and our patients actually reading them before they can be procured outside This has a good effect, and we find patients taking considerable pride in discussing the newest books with their visitors Superficially a small thing, but one of the small things that prevents the patient from feeling "out of things"

Our physical education courses are offered to supply recreation while the patient is in the hospital to keep him in good physical condition and to create proficiency in sports, so that after developing sustained interest on his return home he is able to meet his friends on a common basis in sports and will be able to engage in competition which will be stimulated by success We offer training in golf, badminton, squash, swimming and other similar physical exercises

Many individuals come to us handicapped by an undeveloped capacity for social activities We devote our evenings to social functions and to amusements such as up-to-date moving pictures, plays, concerts, dances and bridge parties For the person who has been too busy to learn to dance and to play bridge, class instruction is provided so that when he leaves the hospital he is able to enter into the more popular types of social activities with his friends

Here again we must revert to the importance of personnel in putting into actual practice the concept behind the entire scheme We had to train our instructors to think of an individual with personality problems rather than of disease entities such as schizophrenia or manic depressive insanity Shyness, timidity, and ideas of reference can no longer be thought of as symptoms of schizophrenia but must be considered as personality problems based on feelings of inadequacy and fear of frustration With this attitude the therapist no longer feels that he is offering a certain type of occupation which has a beneficial effect on schizophrenia but that he is giving a special type of training which will help the patient to overcome certain personality defects and make a better social adaptation The psychiatrist may help him to understand his attitudes and reactions, but it is the job of the instructors and social directors to give him training in social poise, in cultural pursuits and even in his occupation in order to help dissipate the feeling of inferiority and to overcome his inadequacies

So far we have discussed briefly the various courses But before these courses could be given it was necessary to create the proper surroundings to carry out the educational idea Classrooms were provided in which patients are assembled in small groups In these classrooms an atmosphere of learning predominates and the serious business of study is the accepted type of behavior The patients are scheduled to spend regular hours in classes for study under the direction of an educational supervisor, with practice periods in short hand and typing or in group discussions in some of the subjects previously mentioned

Carrying still further the conception of normal community life, we have built a small street of shops with a beauty parlor and a book shop These are all separated from the main hospital building so that it is necessary for the patient to leave his room and go outside to visit the beauty parlor or the library or to make purchases of cigarets, cosmetics and soft drinks, which are provided at the tuck shops and soda fountain We do not have to point out the significant difference to patients between going out and selecting their own purchases as compared to the usual routine of "dispensing"

In the Modern Made, a little dress shop for women, we display the latest style in lingerie, negligees, lounging pajamas and gowns The dress shop is not used primarily as a salesroom but it does give us the opportunity to introduce costume designing, sewing and knitting, and the garments stimulate interest in our patients Our modiste discourages the purchase of finished gowns and attempts to induce the patient to buy material and make the garment in which she is interested New styles are purchased at the beginning of each season and a fashion show is held which stimulates further interest in the art of knitting and making fashionable accessories such as hats gloves and purses

Needless to say the therapeutic value of this approach is strengthened because of its subtlety, the patient does

not get the impression that we are offering something for the treatment of mental diseases. Throughout we avoid this approach, every one is loath to consider himself as suffering from mental disease, but nearly every one is willing to admit that he is having difficulty in meeting certain problems in life, and it is on the basis of offering training and education to meet these problems that these things are offered to the patient. The educational approach conveys to the patient the idea of remolding certain personality deviations, whereas a general psychiatric approach may imply to the patient a picking up of the broken pieces of a shattered personality and arranging them again.

The atmosphere of learning and endeavor that permeates the entire community and the purposeful, objective attitude of the patient adds impetus and power to the efforts of the physician in trying to gain the cooperation of the patient. Each is striving for a personal objective, and yet it is a common objective, and somehow this community of spirit and of purpose binds all together on a sound basis of cooperation, and the desire for social approval supplies an incentive for the patient to make his personal contribution toward the spirit of the community life.

A schedule of classes throughout the day is given in the tables.¹ A schedule is selected and arranged to meet the needs of each individual patient (table 3). Each of these classes is taught by an instructor qualified in his particular subject, whose chief interest is to develop an aptitude in his special field. These instructors work closely in conjunction with the psychiatrist in charge of a case. Any difficulty that a patient may encounter in mastering the subject, as well as any mental aberration, is discussed with the physician.

After an exhaustive physical and psychiatric examination patients are assigned to a certain group, according to age, mental and physical condition and cultural interests. In this way each patient has an opportunity to associate with others who are congenial and interesting. As soon as possible he is assigned to classes and commences his course of study along lines that have a definite continuity and purpose.

For the patient who is too ill at the time of admission to cooperate in organized classes, instruction is given in his room. With improvement he goes to small classrooms in the various halls where the work, although still simple, becomes a bit more advanced. Gradually as the patient's condition continues to improve he is promoted from class to class until he enters one of the higher groups. On reaching the condition whereby he can circulate from one class to another, he is given a balanced program of organized classes and physical education in which the emphasis is placed on learning and on increasing one's efficiency.

The patient understands that promotion from one class to another depends on the effort and skill with which he is able to perform his assigned tasks. Likewise, the evening social functions are graded, and the patient knows that with improvement he will be allowed to attend functions of the higher social group.

During the patient's interview with the psychiatrist his personality and emotional problems are discussed in detail. Through these therapeutic interviews an attempt is made to reevaluate his emotional bias, and a new approach to his problem is formulated. As a practical adjunct to psychotherapy, the patient is given an

opportunity to try the theoretical solutions gained in therapeutic interviews in the concrete field of reality in this small community. In this way he has the advantage of solving his problem from a theoretical point of view and at the same time is given the added advantage of solving his difficulties through a new approach on a definite training basis.

We do not mean to imply that we are wedded to any particular form of psychotherapy. The entire scheme is based on the triad of sound physical medicine, education or reeducation as the case may be, and recognized psychiatric methods, all combined to treat the individual as he is and not to fit him into a scheme that is inflexible and not adapted to his particular needs. Every plan must be flexible enough to meet the individual's needs if it is to have value.

These three agencies, education, physical medicine and psychiatry, are not separated into water-tight compartments but are blended together so that one reinforces and strengthens the other. Every morning the instructors of the various classes, the social directors and the librarian meet with the psychiatrists and report the activities of the day before, making note of any special interests or aptitudes a patient may display and reporting any unusual reactions or conduct. This constantly keeps the physician in touch with the progress that each patient is making and informed of any difficulties that he may be encountering in his effort to make a good social adaptation.

The knowledge thus acquired is considered in conjunction with the information that the psychiatrist gains from the patient during his interviews, and if some of the theoretical solutions meet with failure on a practical basis the problem can again be approached from a new angle on the following day until, through this combination of therapeutic interviews and actual experience in living, the patient's problems are solved.

With this plan we have found that it has become much easier to interest our patients and keep them occupied throughout the day. They feel that there is a definite purpose in all the activities prescribed and that it is not just a matter of putting in time until the physician's next visit. We have observed that in such an environment hospital care becomes more acceptable to the patient as well as to his relatives, and they often come for treatment earlier with minor problems of maladjustment or before a frank psychosis is fully developed. We hope at some later time to report that by getting the patient under treatment and by giving him a well balanced program of training some of the frank psychoses may be prevented and the patient returned to the community.

CONCLUSION

Under this plan, when the patient does recover, the process of returning him to the community with a large segment of his life removed, out of touch with the times and conditioned to being guided and regimented is largely eliminated. The patient is never completely insulated from the normal processes of living and he is encouraged to continue making his own decisions and to develop his own initiative in our own little community. It is a small gap to step over from that community to life in the outside world.

We have purposely refrained from the use of the term "occupational therapy," because we believe that this plan embodies a much broader concept, it is, we believe, a reeducation, a training for the competition of life.

200 Retreat Avenue

¹ Because of lack of space this article is abbreviated here by the omission of the tables. The complete article appears in the authors' reprints.

ABSTRACT OF DISCUSSION

DR EDWIN G ZABRISKIE, New York I present the attitude of an outsider looking in. I have seen these earnest men hard at work on their comprehensive scheme, and, while it has been successful so far as my own experience goes, it predicates and insists on an intensive follow up of the individual patient, to prevent him from getting into a jam. Then the very looseness, or apparent looseness, of the organization at times leads to conditions that are not always best for the patient, but I believe that on the whole the plan that they have evolved is a distinct step forward and certainly is much more of a reeducational institution than any I know of around New York.

DR LLOYD J THOMISON, New Haven, Conn. For years occupational therapy, as it used to be known, has been accepted as part of the routine of care and treatment of patients in psychiatric hospitals. The objection that perhaps it had no real therapeutic value was heard from time to time. In addition, both patients and doctors objected to the limitation of crafts and brought out the point that what crafts we had were not things that would be carried away with the patient. Another objection was that it had no connection with vocational rehabilitation. Drs Burlingame and Wagner, in extending their concept of occupational therapy, have done away with these objections, and I believe that in their method there is really true therapeutic value, especially for the psychopathic personalities or the so called neuroses. I can imagine certain cases of depression with retardation in which the suffering might be made more acute when the patient is urged into activities to any great extent, but I am sure that this point is not overlooked in this program. In cases of schizophrenia in which withdrawal more and more from contact with reality seems destined, one might question whether it is right to make the patient go on in contact with reality. But there are so few who know what the destiny of a schizophrenic patient is going to be that I don't believe the objection is valid. Then, when the schizophrenic process becomes arrested, with the method given here there is a great deal of value in rehabilitating such a person. In the more progressive schools and camps, competition is being gradually eliminated. I think that competition has a definite value in education. Some years ago Dr Bryan applied kindergarten methods to some of his more deteriorated patients and obtained good results. I think that going back to the nursery school, beyond the kindergarten, might be a good idea. In reports received from the nurses in training in the Yale School of Nursing I find that after they have had some experience in nursery school work they find that they can do much better work with the psychiatric patients. Nursery school techniques are not techniques to be used only with 2, 3 or 4 year olds or deteriorated persons but in everyday life, and I can imagine that is more or less the technique used by the personnel in this particular setup. I have seen the developments of the past four years in Hartford and I feel that it is one of the main contributions to psychiatry during that time.

DR CARL P WAGNER, Hartford, Conn. I want to comment on some of Dr Zabriskie's remarks with regard to the latitude of courses of training. As he says there are advantages and disadvantages to this and Dr Burlingame and I agree that the advantages do outweigh the disadvantages. We try to study the patient from every standpoint, physical, psychologic and psychiatric. After this, we make an effort to find something that seems to fit the particular individual. To do this it is imperative that there be courses touching a wide variety of subjects. The chart was illustrative of a boy who was very poor in arithmetic; it was the thing he had failed in at school and it was the thing that stood in his way. It was for that reason that mathematics was emphasized in this schedule. Once it is decided what courses the patient is to follow, there is a certain degree of rigidity. There are certain occupational rules, certain social standards, that all are supposed to adhere to in business and social life, and once the patient has made up his mind he should be expected to adhere to it. To rehabilitate a psychiatric patient we think that it is equally important that the fluctuation from one interest to another should be held within certain limits and that his efforts should if possible be concentrated in one direction. Dr Thompson remarked that occupational therapy, of course, has been accepted for years,

and we don't think that it has to be defended. There are many types of occupational therapy that have become associated with mental disease and forms of occupational therapy that have lost their value as hobbies for a normal person. If occupational therapy is going to be used as something to distract a patient why not at the same time give the patient a hobby he can take along home, fill his idle moments with and keep him from going back to the depressive preoccupations or schizophrenic fantasies? Each case must be studied. If the program of activity seems to be driving the schizophrenic patient, who is withdrawing further into his depression, the program has to be altered but the whole scheme must be flexible and must be of a nature to meet the problems of the individual patient. In like manner, if it should drive the schizophrenic patient further into his preoccupations, that too can be corrected by altering the program and trying to find something that will stimulate a spark of interest as a nucleus and from that nucleus develop and eventually broaden the individual's interest.

THE RELIABILITY OF SPUTUM TYPING
AND ITS RELATION TO SERUM
THERAPY

JESSE G M BULLOWA, MD

Clinical Professor of Medicine, New York University Medical College
Visiting Physician, Harlem HospitalWITH THE TECHNICAL ASSISTANCE OF
MILDRED SOMMERS AND EDWARD TURNER
NEW YORK

The serum treatment of pneumonia was first attempted more than forty years ago by Klemperer in Berlin and Elser in New York but could not be successfully introduced until different types of pneumococci were recognized and patients suffering from pneumonias due to specific types were treated with homologous serums.

RECOGNITION OF TYPE

Possibly the most important recent advance in the serum treatment of pneumococcal pneumonia is the more rapid determination of the invading type. This has been accomplished by the introduction and popularization of the direct method of sputum typing based on an observation of Neufeld,¹ published in 1902, that in the presence of homologous serum the capsule of the pneumococcus became swollen.

This method was proposed by Armstrong² three years ago, although it had already been used intermittently by Ettinger-Tulczynska³ in Neufeld's laboratory for a number of years. She employed a dye to outline the capsule and used rabbit's serum. Goodner is to be credited with seeing the importance of the method and Sabin⁴ with demonstrating its value in an ample series of cases at Bellevue Hospital, and with pointing out that diagnostic horse serums, commonly in use in America, were unsuitable.

Read before the Section on Pathology and Physiology at the Eighty Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

This study was in part supported by the Metropolitan Life Insurance Company. The Research Laboratory of the Department of Health, New York City (Dr. William H. Park, director) supplied most of the typing serums employed in these studies. Miss Georgia Cooper checked many cultures. The Lederle Laboratories, Inc. generously gave typing serums for the study.

¹ Neufeld, F. Ueber die Agglutination der Pneumokokken und uiber die Theorien der Agglutination. *Zschr. f. Hyg. u. Infektionskr.* 40: 54-72, 1902.

² Armstrong, R. R. Immediate Pneumococcal Typing. *Brit. M. J.* 1: 187-188 (Jan. 30) 1932.

³ Neufeld, F. and Ettinger-Tulczynska, R. Nasale Pneumokokken Infektionen und Pneumokokken Keimtrager im Tierversuch. *Zschr. f. Hyg. u. Infektionskr.* 112: 492-526, 1931.

⁴ Sabin, A. B. Immediate Pneumococcus Typing. *Directly from Sputum by the Neufeld Reaction*. *J. A. M. A.* 100: 1584-1586 (May 20) 1933.

The Neufeld test is performed by mixing a droplet of the sputum with homologous rabbit serum (this may contain the standard alkaline methylene blue dye), permitting the specimen to stand a few minutes and then observing it under the oil immersion lens. When mixed with homologous serum the capsules are swollen and when mixed with heterologous serum they are unchanged. Serums may be pooled into several

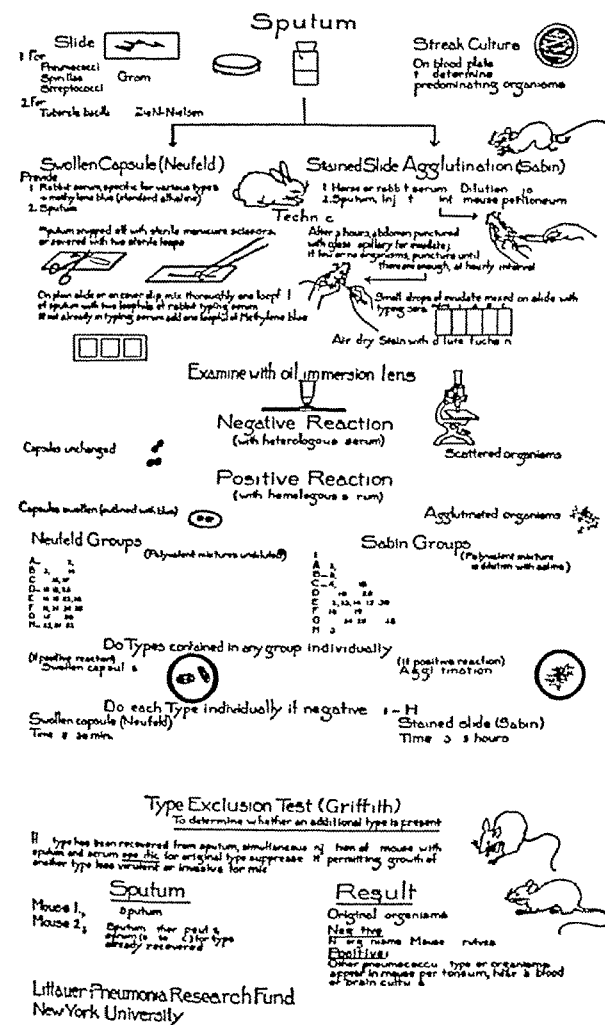


Chart 1—Pneumococcus typing Steps in the swollen capsule (Neufeld) and stained slide agglutination or Sabin technic Group typing and type exclusion

groups so as to save time in typing the upward of thirty types that are now recognized, as shown in chart 1. If a reaction is found in any group, the separate types are studied to find the one responsible for the swelling. This method may also be applied to exudate obtained from the peritoneum of a mouse or when very few organisms are present in cultures. The organisms may be so few that it would be difficult to demonstrate agglutination. The presence of more than one type and the proportional distribution of two types may be determined by this direct examination of the sputum.

The Neufeld reaction has been obtained in sputums that have been preserved several days in the icebox and even in some inadvertently preserved in solution of formaldehyde, tricresol or phenol. The pneumococci in such sputums may not be viable as tested on

mice and accordingly are unsuitable for the mouse technic of Avery or of Sabin. It has also been successfully used by us on the swallowed sputum aspirated from the stomachs of infants.

One hundred successive recent Neufeld examinations of sputum were found to give 76 per cent positive results in our laboratory. This is precisely the frequency of success of Cooper and Walter.⁵ The distribution of the types found is given in chart 2, as well as the results obtained by the Sabin technic from twenty-four sputums that were negative on Neufeld examination after painstaking effort. Though little equipment is required for the test it requires skill, and early negative results should not discourage those beginning to use it.

The stained slide agglutination method of Sabin has the advantage over the Neufeld method that a very few pneumococci in the sputum may multiply in the peritoneum of the mouse, while interfering organisms perish. The typing of the peritoneal exudate may be checked by the organisms causing septicemia in the mouse, as found in broth cultures from mouse heart or brain. Such small amounts of material are required that in three or four hours there may be sufficient exudate to type for thirty-two different types (chart 3).

By these microscope methods of typing we have found that the unclassified organisms constitute at present (1933-1934) only 12 per cent of the pneumococci encountered among adults (chart 4). A report of "group IV" or x type should not be accepted without question and without a second attempt to classify such a pneumococcus either by direct typing of sputum, mouse inoculation (including mouse blood or brain culture) and the patient's blood or lung suction.

The advantages of typing by the microscope method are as follows:

1. The pneumococci are seen. Failure to obtain a precipitate in the Avery method may be due to a total

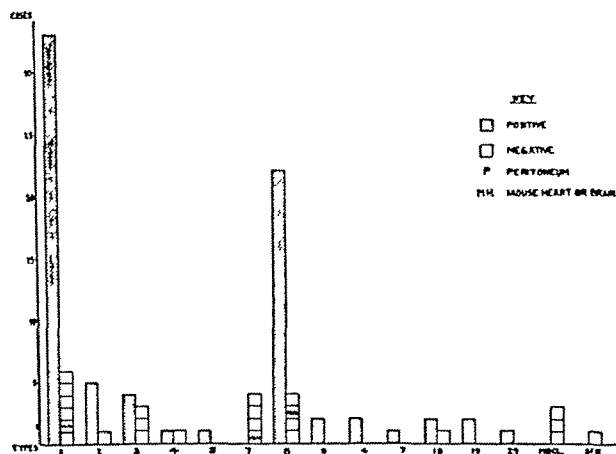


Chart 2—Pneumococci pneumoniae in adults 1933-1934 typing by Neufeld capsule swelling in 100 consecutive patients types obtained by Neufeld seventy six types obtained by Sabin twenty four

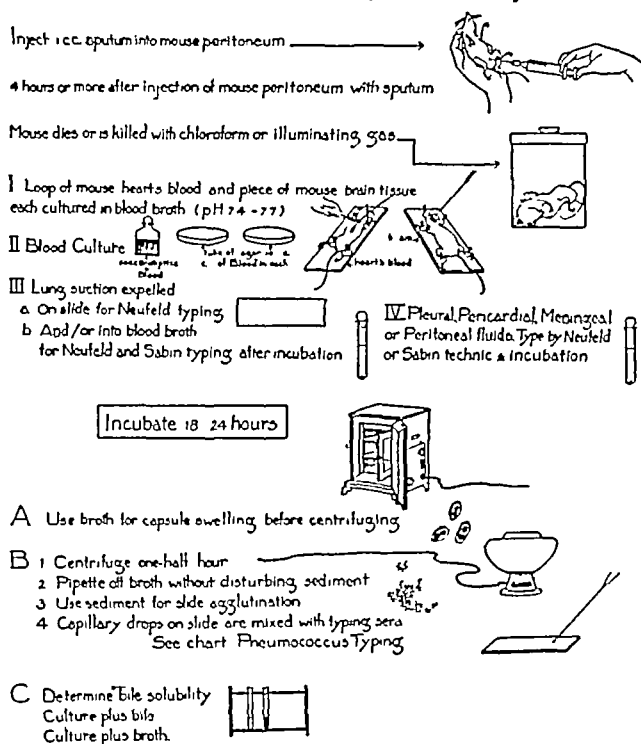
absence of pneumococci in the peritoneal exudate and might be reported as pneumococcus group IV unless care is taken to study the peritoneal exudate microscopically.

2. Because very small quantities of material are needed the peritoneal exudate from a single mouse

5. Cooper, Georgia M., and Walter, Annabel W. Application of the Neufeld Reaction to the Identification of Types of Pneumococci. *Am J. Pub. Health* 25: 469-474 (April) 1935.

is sufficient to type for all the types of pneumococci, with a recheck of the typing, if necessary

3 It is possible to make the very important differentiation directly between type II and atypical type II or type V, and type III and the so-called atypical III or type VIII, without the delay for restudy with dilu-



Littauer Pneumonia Research Fund
New York University

Chart 3—Typing from mouse heart or brain to determine cause of mouse septicemia

tions of the typing serum. These distinctions are not academic but of great practical interest in prognosis and therapy.

The amount of infected pulmonary mucus required for type determination is very small, and frequently sufficient may be collected on a swab after coughing, especially after the patient has been turned on his side, with the affected side uppermost, and urged to cough. Sometimes the mucus adheres to the pharynx or palate and may be removed with an applicator and either directly examined by the Neufeld technic or, after incubation in broth for three hours, injected into the peritoneum of a mouse and typed by the Sabin method.

The character of the sputum in types I and II and its relation to success in obtaining a type was analyzed and it was found that the type might be obtained from all varieties. Sputum flecks obtained by pharyngeal swabbings gave the correct type in 112 out of 154 cases, or 73 per cent. In twelve, or 8 per cent, they gave an incorrect type and in thirty, or 19 per cent, no type at all.

In the presence of clinical consolidation, organisms obtained from the sputum are usually responsible for the pneumonia. Good sputum (which may be very scant and frothy) when the type can be determined gives a high correlation between the types obtained from it and those obtained by the lung suction and/or blood culture. Since pneumococci formerly included in group IV are frequently found in the throats of individuals in apparent health, the importance of discovering these organisms in sputum recovered from patients

with pulmonary consolidation has been doubted, and their etiologic relationship with lesions in the lungs has been questioned.

Two methods of determining the validity of the type obtained from the sputum were available. One was to correlate the recovery of the organism from the sputum with that obtained by transthoracic puncture of the consolidated area, and the other was to correlate the sputum organism with the one recovered from the blood stream. The latter source is subject to the possible slight objection that the source of the blood invasion might be other than lung. A positive result from material aspirated from the lung has greater value over that obtained from the lung through the mouth only in that it is not likely to have been aspirated into the trachea or to be contaminated with mucus from the upper respiratory passages. Certain types of pneumococci are more frequent in the upper respiratory passages than others, but almost all the types from I to XXXII (described by Cooper) have also been recovered by us on lung suction. Negative suction in non-pneumonia patients and from the uninvolved area in pneumonia patients, as well as the failure to recover them from unconsolidated lung in recent postmortem lung suction, show that the normal lung does not usually contain viable pneumococci.

A negative lung suction with our technic may be caused by several circumstances besides lack of skill on the part of those attempting it. Success in securing positive cultures from lung suction has varied with different resident physicians, depending on their skill in locating the maximum consolidation and in their limitation of the indication for lung suction. Some have secured as much as 50 per cent of growths. Physical signs and radiographic evidence of consolidation may be misleading. Even in consolidated areas, few or no viable organisms may be present. There is frequently considerable edema about the main focus, which may not be heavily infected.

We employ a needle of very fine bore and if it becomes occluded in penetrating the thorax we may obtain no lung exudate and consequently no growth. In most instances, when the contents of the syringe are discharged into the broth for culture, a turbid cloud is seen. When the needle is introduced into the lung,

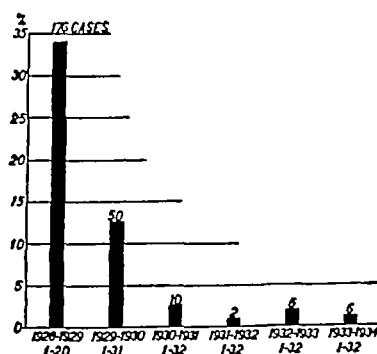


Chart 4—Decline of the x group

Pneumococcus type I lend only slight support to this view, for we found pneumococci in approximately one half of the cases on all days with very little less than half on the seventh and eighth. Twenty-six positive and twenty negative cultures were obtained on the fourth day (chart 5).

6 Thomas H. M. Jr., and Parker Frederic Jr. Results of Anterior Lung Punctures in Lobar Pneumonia. Their Bearing on the Mechanism of Crisis. Arch. Int. Med. 26: 125-132 (July) 1920.

In order to learn how much reliance could be placed on sputum examinations, we analyzed (1) lung suction on 1,255 adult patients, a total of 1,467 times, and (2) our experience with determining the type on 1,000 patients with the clinical and laboratory diagnosis of pneumococcal pneumonia. In almost all cases the diag-

quent blood culture or from another source, e g, chest fluid or postmortem cultures. The type was obtained first from lung suction in 146 of 479 positive lung suction, or 30 per cent. In 11 per cent of all cases in which lung suction was done the type of pneumococcus responsible for the pneumonia was first ascertained from the lung suction.

There were 506 cases in which there was evidence supporting the correctness of the sputum typing. The

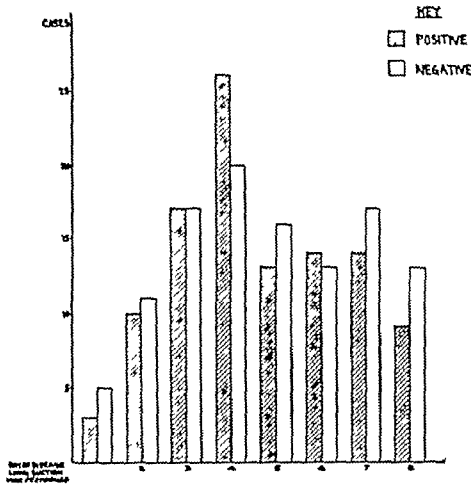


Chart 5—Pneumococcus type I in adults July 1931 July 1934. Two hundred and eighteen lung suction positive and negative arranged according to day of disease lung suction was performed

nosis of pulmonary consolidation was confirmed by radiographic examination and by the clinical course.

1. In the lung suction series, every type was obtained by lung suction during life excepting type XI, XV, XXV, XXVII and XXIX. In some instances it was

TABLE 1—Data on 1,255 Adult Pneumonias with Lung Suctions from July 1, 1931 to June 30 1934

| Sputum Type Not Confirmed by Other Source in 564 Cases | | | | | Sputum Type Confirmed by Other Source in 467 Cases | | | | |
|---|--------------------------------------|---------------------------------------|---|----------------|---|---|--|----------------|--|
| Pneumococcus Type Obtained from | | | | | Pneumococcus Type Obtained from | | | | |
| Posi tive Spu tum Cases | Lung Suc tion Only Cases | Blood Cul ture Only Cases | Lung Suction and Blood Cul ture Cases | Total Cases | Sputum Lung Suction and Blood Culture Cases | Sputum and Lung Suc tion Cases | Spu tum and Blood Cul ture Cases | Total Cases | |
| 511 | 29 | 5 | 19 | 564 | 117 | 295 | 55 | 467* | |

| Result of Sputum Conflicts with Other Tests in Thirty Nine Cases | | | | | | | | | |
|--|--|------------------------------------|--|---------------------------------------|---|--|------------------------------------|--|--------------------------------------|
| Sputum Type Differs from Lung Suction | | | | | Sputum Type Differs from Blood Culture | | | | |
| Blood Culture Positive | | | | | Lung Suction Positive | | | | |
| Agrees with Sputum Cases | | Differs from Sputum Cases | | Blood Culture Negative Cases | Agrees with Sputum Cases | | Differs from Sputum Cases | | Lung Suction Negative Cases |
| 6* | | 0 | | | 1* | | 2† | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Total | | | | | Total | | | | |
| Lung suction performed | | | | | Positive Cases | | Negative Cases | | |
| Cases lung suctioned | | | | | 510 | | 657 | | |
| | | | | | 481 | | 774 | | |
| | | | | | 31.8 | | 65.2 | | |
| | | | | | 38.3 | | 61.7 | | |

TABLE 2—Confirmation of Specific Type in Five Hundred and Forty-Eight Cases

| Confirmation Obtained by | Difference | Cases |
|---|------------|-------|
| Examination of a second sputum | 1 | 113 |
| Lung suction | 11 | 245 |
| Blood culture | 7 | 111 |
| Chest pus | 0 | 9 |
| Spinal fluid | 0 | 1 |
| Postmortem lung cultures or heart's blood | 0 | 34 |
| Several methods | 0 | 35 |
| Total | | 548 |
| Divergent 19 or 3 per cent | | |

type from the sputum agreed with that obtained from the blood or by direct lung aspiration or both in 474, or 93.7 per cent. There were thirty-nine cases in which an additional or different type was involved, but seven of these cannot be said to be definitely contradictory, because there were six in which, though sputum differed from lung suction, the sputum agreed with the blood culture and one in which, though the sputum was different from blood culture, the sputum agreed with the lung suction. Table 1, giving the data, divides the cases into those with sputum not confirmed and those with sputum confirmed.

Lung suction was positive when the blood cultures were negative in 326 of 474 confirmed cases, or 66 per cent, and the blood cultures were positive with negative lung suction in forty-six cases among 211 bacteremic cases, or 21.8 per cent. In thirty of the latter instances

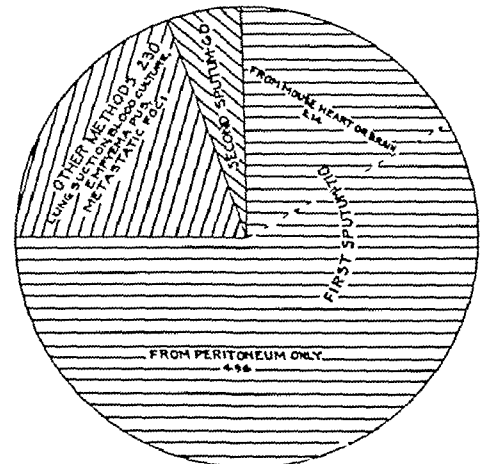


Chart 6—Source of type in 1,000 pneumococcal lobar pneumoniae

Sputum confirmed by lung suction or blood culture in 474 cases (93.7 per cent).
† Sputum not confirmed by lung suction or blood culture in thirty-two cases (6.3 per cent).

the first evidence of etiologic type because the responsible organism was not found in the peritoneum of the mouse injected at the same time that the lung suction was made. In such cases the pneumococcus type was recovered eighteen hours later from the heart or brain of the mouse, or from a second sputum from a subse-

the blood cultures were taken at the same time as the lung suction. In this series, more than one organism was found on lung suction in seven cases.

2. To check the results from the lung suction study, 1,000 consecutive cases of pneumococcal lobar pneumonia of determined pneumococcus type were studied to learn how often the correct type was obtained from the sputum. The cases involved in the two studies overlap.

Five hundred and forty-eight cases yielded a specific type that was confirmed in the way shown in table 2.

Four hundred and fifty-two cases were not confirmed for the reasons given in table 3.

Among 365 cases in which a type was not obtained from the mouse peritoneum, in 204 cases it was obtained from mouse heart or brain.

Among the 1,000 cases the pneumococcus type was obtained in 710 from first sputum, 496 from the peritoneum and in 214 from the mouse heart or brain culture. In sixty it was obtained from the second sputum and in 230 from other sources (chart 6). Thirty-one different types of pneumococci were found distributed as shown in table 4.

In this series of 1,000 cases there were only thirty-three instances of discrepancies in the type obtained by various means. This is shown in table 5 and in chart 7. The types obtained from lung suction and patient's blood culture have been regarded as etiologically

TABLE 3—Confirmation Not Made in Four Hundred and Fifty-Two Cases

| Reason | Cases |
|--|-------|
| No second attempt to type was undertaken because the disease terminated spontaneously or in response to specific treatment | 2,0 |
| Second sputum negative 12, difference 2 | 14 |
| Blood culture negative 34, difference 3 | 37 |
| Postmortem cultures negative 13, difference 1 | 14 |
| Lung suction negative 24, difference 0 | 30 |
| Sterile chest fluid | 11 |
| Blood cultures and lung suction as well as second sputums negative 6, difference 2 | 67 |
| Divergent 14 or 3 per cent | 4,2 |

TABLE 4—Distribution of Types in One Thousand Cases Observed Prior to June 30, 1934

| Type | Cases | Type | Cases |
|-------|-------|--------|-------|
| I | 253 | XVII | 8 |
| II | 79 | XVIII | 24 |
| III | 115 | XIX | 16 |
| IV | 65 | XX | 11 |
| V | 60 | XXI | 13 |
| VI | 29 | XXII | 10 |
| VII | 69 | XXIII | 3 |
| VIII | 68 | XXIV | 3 |
| IX | 25 | XXV | 2 |
| X | 8 | XXVI | |
| XI | 6 | XXVII | 2 |
| XII | 14 | XXVIII | 9 |
| XIII | 8 | XXIX | 5 |
| XIV | 45 | XXX | 2 |
| XV | 1 | XXXI | 3 |
| XVI | 4 | XXXII | 4 |
| Total | 879 | Total | 121 |

TABLE 5—Conflict Cases

| | Cases |
|---|-------|
| Sputum disagrees with lung suction | 0 |
| Sputum agrees with lung suction but additional type | 8 |
| Sputum disagrees with blood culture (one postmortem) | 4 |
| Sputum agrees with blood culture but additional type | 4 |
| Lung suction blood culture of abscess type found in second sputums | 5 |
| Two sputums differ | 1 |
| One sputum two types | 3 |
| Peritoneum correct and mouse heart incorrect in 22 confirmed cases conflict cases | 2 |
| Total | 33 |

related to the disease in the patient for obvious reasons. The type obtained from the mouse's heart, when different from that obtained from the peritoneum, has been given precedence, but in two of twenty-two con-

firmed cases this was incorrect. In fourteen cases the correct type was obtained by lung suction, in four cases from blood culture, in one case from chest pus and in one case from a gluteal abscess. In eight cases there

TABLE 6—Conflict Cases*

| Case | Divergent First Sputum | | Lung Suction Determining Type Second Sputum | | Lung Suction | Post Mortem |
|------|------------------------|-------------|---|-------------|--------------|----------------|
| | Mouse Peritoneum | Mouse Heart | Mouse Peritoneum | Mouse Heart | | |
| | Mouse Peritoneum | Mouse Heart | Mouse Peritoneum | Mouse Heart | | |
| 1 | I | I | —(4) | — | VII+ | I* (chest pus) |
| 2 | VI (1) | VI (2) | — | — | I*(3) | |
| 3 | XXIII | XXVIII | — | — | I*(1) | |
| 4 | — | XXVIII (2) | — | — | I*(1) | |
| 5 | — | — | XIII | — | IV+ | |
| 6 | III+ | III+ | — | — | III+ | |
| 7 | — | XXVIII | I+ | — | I+ | |
| 8 | —(1) | VI (3) | — | II*(4) | II*(9) | |
| 9 | —(1) | IX (3) | VII*(4) | — | VII*(2) | |
| 10 | III+ | — | — | — | III+ | |
| 11 | VIII | XXVII | — | — | III+ | |
| 12 | XXIII | — | XXIII | IV+ | IV+ | |
| 13 | — | VIII (3) | — | — | XIV*(2) | |
| 14 | II*(2) | II+ | — | — | I | II*(1) |

| Case | First Sputum | | Second Sputum | | Blood Culture Determining Type | | Post Mortem |
|------|------------------|-------------|------------------|-------------|--------------------------------|---------------|-------------|
| | Mouse Peritoneum | Mouse Heart | Mouse Peritoneum | Mouse Heart | Lung Suction | Blood Culture | |
| | Mouse Peritoneum | Mouse Heart | Mouse Peritoneum | Mouse Heart | Lung Suction | First | |
| 1 | V+ | — | V+ | — | V+ | V+ | |
| 2 | B Fr | B Fr | V+(4) | V+(5) | V+(1) | V+ | |
| 3 | —(2) | XII (3) | — | — | IV+ | — | |
| 4 | IV+ | — | — | — | — | — | |
| 5 | VIII | — | — | — | — | — | |
| 6 | IX | IX | — | — | — | — | |
| 7 | — | — | — | — | — | — | |
| 8 | — | — | — | — | — | — | |
| 9 | — | — | — | — | — | — | |
| 10 | — | — | — | — | — | — | |
| 11 | — | — | — | — | — | — | |
| 12 | — | — | — | — | — | — | |
| 13 | — | — | — | — | — | — | |
| 14 | — | — | — | — | — | — | |
| 15 | — | — | — | — | — | — | |
| 16 | — | — | — | — | — | — | |
| 17 | — | — | — | — | — | — | |
| 18 | — | — | — | — | — | — | |
| 19 | — | — | — | — | — | — | |
| 20 | — | — | — | — | — | — | |
| 21 | — | — | — | — | — | — | |
| 22 | — | — | — | — | — | — | |
| 23 | — | — | — | — | — | — | |
| 24 | — | — | — | — | — | — | |
| 25 | — | — | — | — | — | — | |
| 26 | — | — | — | — | — | — | |
| 27 | — | — | — | — | — | — | |
| 28 | — | — | — | — | — | — | |
| 29 | — | — | — | — | — | — | |
| 30 | — | — | — | — | — | — | |
| 31 | — | — | — | — | — | — | |
| 32 | — | — | — | — | — | — | |
| 33 | — | — | — | — | — | — | |
| 34 | — | — | — | — | — | — | |
| 35 | — | — | — | — | — | — | |
| 36 | — | — | — | — | — | — | |
| 37 | — | — | — | — | — | — | |
| 38 | — | — | — | — | — | — | |
| 39 | — | — | — | — | — | — | |
| 40 | — | — | — | — | — | — | |
| 41 | — | — | — | — | — | — | |
| 42 | — | — | — | — | — | — | |
| 43 | — | — | — | — | — | — | |
| 44 | — | — | — | — | — | — | |
| 45 | — | — | — | — | — | — | |
| 46 | — | — | — | — | — | — | |
| 47 | — | — | — | — | — | — | |
| 48 | — | — | — | — | — | — | |
| 49 | — | — | — | — | — | — | |
| 50 | — | — | — | — | — | — | |
| 51 | — | — | — | — | — | — | |
| 52 | — | — | — | — | — | — | |
| 53 | — | — | — | — | — | — | |
| 54 | — | — | — | — | — | — | |
| 55 | — | — | — | — | — | — | |
| 56 | — | — | — | — | — | — | |
| 57 | — | — | — | — | — | — | |
| 58 | — | — | — | — | — | — | |
| 59 | — | — | — | — | — | — | |
| 60 | — | — | — | — | — | — | |
| 61 | — | — | — | — | — | — | |
| 62 | — | — | — | — | — | — | |
| 63 | — | — | — | — | — | — | |
| 64 | — | — | — | — | — | — | |
| 65 | — | — | — | — | — | — | |
| 66 | — | — | — | — | — | — | |
| 67 | — | — | — | — | — | — | |
| 68 | — | — | — | — | — | — | |
| 69 | — | — | — | — | — | — | |
| 70 | — | — | — | — | — | — | |
| 71 | — | — | — | — | — | — | |
| 72 | — | — | — | — | — | — | |
| 73 | — | — | — | — | — | — | |
| 74 | — | — | — | — | — | — | |
| 75 | — | — | — | — | — | — | |
| 76 | — | — | — | — | — | — | |
| 77 | — | — | — | — | — | — | |
| 78 | — | — | — | — | — | — | |
| 79 | — | — | — | — | — | — | |
| 80 | — | — | — | — | — | — | |
| 81 | — | — | — | — | — | — | |
| 82 | — | — | — | — | — | — | |
| 83 | — | — | — | — | — | — | |
| 84 | — | — | — | — | — | — | |
| 85 | — | — | — | — | — | — | |
| 86 | — | — | — | — | — | — | |
| 87 | — | — | — | — | — | — | |
| 88 | — | — | — | — | — | — | |
| 89 | — | — | — | — | — | — | |
| 90 | — | — | — | — | — | — | |
| 91 | — | — | — | — | — | — | |
| 92 | — | — | — | — | — | — | |
| 93 | — | — | — | — | — | — | |
| 94 | — | — | — | — | — | — | |
| 95 | — | — | — | — | — | — | |
| 96 | — | — | — | — | — | — | |
| 97 | — | — | — | — | — | — | |
| 98 | — | — | — | — | — | — | |
| 99 | — | — | — | — | — | — | |
| 100 | — | — | — | — | — | — | |

* The symbol indicates divergent type + indicates etiologic type and — indicates no pneumococcus type. Figures in parentheses indicate day of observation. Hem Strep = Streptococcus beta B Fr = Friedlander bacillus.

was divergence in the results from two sputums, in three a single sputum gave two types.

From the data in this group of cases we found that in 445 cases (with evidence from a different source than the sputum) the type obtained from it was responsible for the illness, and that in thirty-three cases there was either a significant divergence or doubt because of an added type (table 6). In only twenty-two of these cases was the sputum type incorrect or misleading. The eleven remaining cases, though

7 Because of lack of space this chart has been omitted from THE JOURNAL. The complete article appears in the authors' reprints.

divergent in the results obtained in mouse peritoneum and mouse heart, were not definitely incorrect, they may have been double invasions with one type unconfirmed. Even if the entire group were to be considered erroneous there would be 488 cases in which the type obtained from the sputum was confirmed and thirty-three cases in which it was incorrect or misleading, or 57 per cent. This is approximately the percentage obtained from the lung suction study, which included cases observed over a much longer period.

The development of agglutinins in pneumonia patients, if they have been previously absent, supports the reliability of sputum typing. It has not been

TABLE 7—Relation of Agglutinin Detection to Mortality in Pneumococcal Pneumonia Type I Sixty Four Serum Treated Bacteremias 1929-1932

| | Lived | Died | Mortality per Cent | Total |
|--------------------------------|-------|------|--------------------|-------|
| Always — or transient ± | 5 | 8 | 54.5 | 11 |
| Varying — ± + and so on | 7 | 8 | 53.3 | 15 |
| Always + or ± for about 2 days | 28 | 10 | 26.3 | 38 |

stressed because stimulation of antibodies may occur from foci in the upper respiratory passages. A group of recovered non-bacteremic non-serum cases in which agglutinins were found after they were not detected on a previous examination were selected from the records. In the forty confirmed cases, agglutinins were found in twenty-six, or 65 per cent, of the cases, in seventy-seven unconfirmed cases they were present in forty-two cases, or 54 per cent, 11 per cent fewer instances.

Although sputum typing is 93 per cent correct, blood cultures should be taken in all cases of pneumonia. A recent study of the influence of blood invasiveness on mortality in different types⁸ emphasizes the importance of blood invasion in prognosis and the variation in invasiveness of the different types. The mortality rate and the incidence of bacteremia were approximately the same in almost all types. Rosenbluth⁹ and Cecil and Plummer¹⁰ had previously made similar observations.

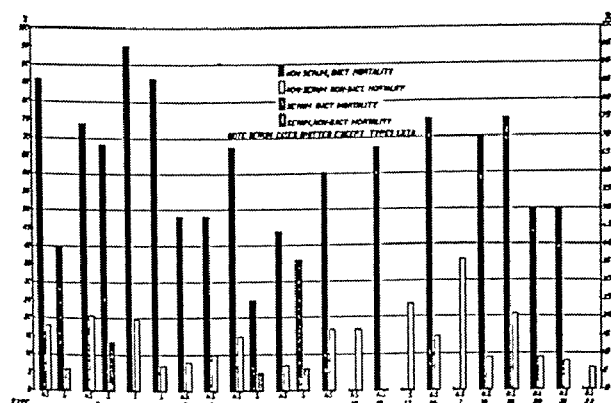


Chart 8—Mortality in pneumococcal pneumonias, bacteremic and non-bacteremic cases, 1928-1934

A study of our experience during six years, embracing 2,058 cases (chart 8) shows the incidence of death in the bacteremic and nonbacteremic cases for nineteen different types. It is seen that the occurrence of

8. Bullowa J C M and Wilcox, Incidence of Bacteremia in the Pneumonia and Its Relation to Mortality Arch Int Med 53: 558 573 (April) 1935

9. Rosenbluth M B Relation of Bacteremia in Lobar Pneumonia to Prognosis and Therapy J A M A 90: 1351 (April 28) 1928

10. Cecil R L and Plummer Norman Pneumococcus Type II Pneumonia J A M A 98: 779 (March 5) 1932

bacteremia is a crucial factor in determining the fate of the pneumonia patient. The effect of serum on the invaded and the noninvaded cases of four types, I, II, VII and VIII, is given for comparison and shows a definite reduction of death rate, greatest in types I and VII.

The following considerations show that the serum treatment of the pneumonias is a specific treatment depending on the correctness of typing. Cases in

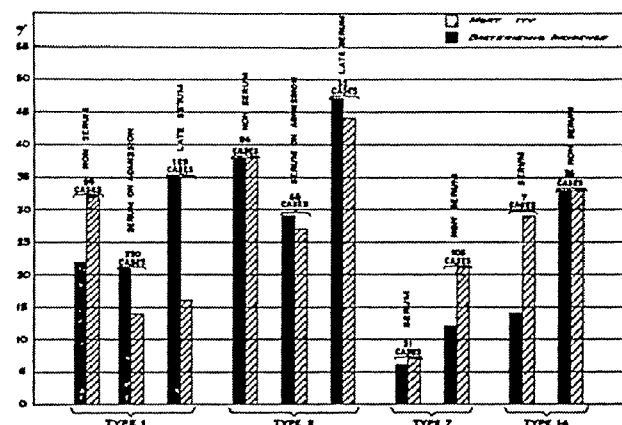


Chart 9—Littauer Pneumonia Research Fund of New York University Harlem Hospital Station Adult pneumococcal pneumonias types I, II, VII and XIV bacteremic incidence (black column) and total mortality (black and white striped column) in treated and untreated cases

which the pneumococcus type has been different from the type responsible for the illness, as the result either of errors or omissions to obtain the correct type, have not been benefited by the homologous serum when it has been used.

At Harlem Hospital, patients admitted to the pneumonia service with definite consolidation are given two doses of serum for types I and II pending the determination of the type from the sputum, blood or lung. In those cases in which the pneumonia is due to type I or II there has been a definite improvement and a lowered incidence of bacteremia, but other patients have been neither benefited nor harmed. This is shown in chart 9.

When the correct type is being treated there is a quantitative relation between the amount of serum used and the onset of defervescence. Large doses are more effective in severely ill patients than small doses. This was shown in numerous observations. When the amount of antibody administered is measured by the appearance of agglutinins in the blood stream, it is found that the recovery rate in type I patients is higher in those revealing it than in patients in whom it has not been demonstrated, as shown in table 7.

Finally, the nonspecific shock reactions with chill and rise of temperature and subsequent fall are rarely elicited with well refined serums, the administration of serum is frequently followed by a fall of temperature, pulse and white blood cells, in crises induced early in the disease. The natural termination is thus simulated.

CONCLUSIONS

1. The pneumococcus obtained from the sputum of patients ill with pneumonia is the type responsible for the disease in over 93 per cent of the cases in which confirmatory evidence was obtained by blood cultures, lung suction or metastatic foci.

2. The correct type is obtained from the first sputum in 71 per cent of the cases, from the peritoneum in

49.6 per cent of the cases, from the mouse's heart or brain in 21.4 per cent of the cases, and from the second sputum taken one or two days later in 5 per cent.

3 The Neufeld reaction gave the pneumococcus type in 76 per cent of cases.

4 The λ group, or "type IV," is found to be responsible for only 1.2 per cent of cases.

5 The incidence of bacteremia and the death rate are roughly parallel in most types of pneumococcal pneumonia.

6 Serum reduces the death rate in bacteremic and nonbacteremic cases and prevents bacteremia in some types of pneumococcal pneumonia.

7 The action is specific and not a general protein therapy.

62 West Eighty-Seventh Street

ABSTRACT OF DISCUSSION

DR WILLIAM H PARK, New York. It seems strange that physicians do not use good antipneumococcus therapeutic serums for the newer types when they are available. So far as I know, of the frequent types, type III is the only one in which serum may not be of benefit. In the Children's Division at Bellevue Hospital I have a bacteriologist who has been definitely working with the physician in charge of the children's service, and her results have been remarkable. Miss Vinograd has found that in 96 per cent of 106 cases the Neufeld reaction gave apparently a correct result and that the completion of the test never took more than two and a half hours, and frequently only half an hour. When one thinks of the previous mouse tests, which took twelve hours or more, and the new improved Sabin test, which took from four to eight hours, one is impressed by the speed of the Neufeld test. With the Neufeld test, however, as Dr Bullova said, the technician has to have considerable experience always to escape making mistakes. Even now Miss Cooper, who would probably rank among the first at making these tests, obtains occasionally from the hospitals reports of types of pneumococci of which the examiner is not quite sure and, on testing, she finds a different type. In the first place she has shown that one should not use immune horse serum but rabbit serum. One has to learn in a sort of uncanny way, to decide whether the material is sufficiently good to test or not. When I stated that in 96 per cent of the cases Miss Vinograd had a correct result, that doesn't mean that in 96 per cent she found pneumococci because in some cases the pneumonia was not due to the pneumococcus. Most examiners with some months or a year of experience get quick and accurate typing results.

DR S W SAPPINGTON, Bryn Mawr, Pa. My results confirm those of Dr Bullova with respect to the reliability of sputum typing. The Neufeld method made typing easy and rapid, but proof was needed that the pneumococcus type found in the sputum was the causative organism. This proof has apparently been found in the type recovered by the simple and satisfactory procedure of lung puncture or suction. In a series of sixty cases of lobar pneumonia, Dr Favorite and I obtained fifty-four, or 90 per cent, positive cultures by lung puncture, 50 per cent within six hours. Fifty-one of these cases were pneumococcal and in forty-four the sputum was available for typing. In nineteen, the type was not determined for want of appropriate typing serums. In the remaining twenty-five sputums, the type ascertained was the same as that of the corresponding lung culture. In other words, when we were able to type both lung culture and sputum there was a 100 per cent agreement. In twenty-four of these, the agreement was determined on the first typing, in one case it was determined on a second attempt. Seventeen blood cultures were done, four were positive and these four agreed in type with those of the lung and sputum. There were three pneumococcal empyemas in the series, here the pleural, lung and sputum types agreed. Our observations, therefore, support the reliability of sputum typing.

DR JESSE G M BULLOWA, New York. Our results at Harlem Hospital are not quite as bad as the difference between 93 and 76 per cent would seem to indicate. My 76 per cent

positive Neufeld results are in cases in which a pneumococcus was later obtained, and (to make the Bellevue statistics comparable) the sixteen cases in which no pneumococcus was obtained by the Neufeld or other method must be subtracted from 93, which would give 77 per cent. The results with type I serum, when considered by the day of illness on which treatment is begun, are almost as good as the results for diptheria. Charts showing this are in my exhibit.

Clinical Notes, Suggestions and New Instruments

TRANSIENT HEART BLOCK IN A DIABETIC PATIENT DURING AN ACUTE CORONARY THROMBOSIS

ELTON R BLAISDELL, M D PORTLAND, MAINE

A woman, aged 56, admitted to my clinic, Dec. 31, 1930, complained chiefly of precordial pain on exertion. The past history was unimportant except for obesity of twenty years' duration. The present illness began in February 1930, at which time she noticed a gradual loss of weight and strength. A few weeks later she was conscious of substernal discomfort when walking up stairs and in May consulted a physician, who made a diagnosis of diabetes mellitus and angina pectoris. A diet was prescribed, and restriction of both physical and mental activities was advised. Although the patient refrained from walking outdoors and reduced her social activities to a minimum, the anginal pain became more troublesome. The urine always contained sugar in spite of strict adherence to the diet. The use of insulin had been discouraged because it was feared that it might aggravate the anginal pain.

On admission to the hospital the patient was healthy looking and of normal weight. The fasting blood sugar was 228 mg and the urine contained 1 per cent sugar. The blood pressure was 130 systolic and 70 diastolic. The circulation in the extremities was good. No heart murmurs were heard and there was no evidence of coronary artery disease in the electrocardiogram. She spent ten days in the hospital and was discharged on a diet of 70 Gm of protein, 100 Gm of carbohydrate and enough fat to make 1,700 calories, with 35 units of insulin daily. This proved to be a maintenance diet, as the weight has not varied more than 8 pounds (3.6 Kg) since that time.

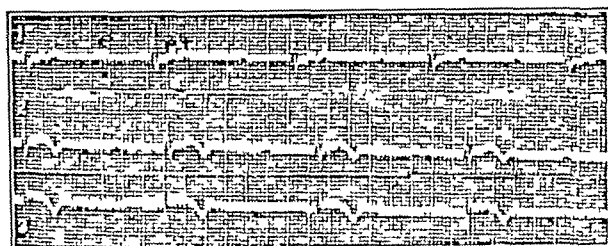
The patient was seen about once a month until March 1932. During this time no change was made in the diet but the insulin was reduced gradually to 4 units twice daily. Hypoglycemia was prevented by a gradual reduction in insulin and blood sugar readings just before lunch, ranged from 110 to 130 mg. She was advised to remain quiet for thirty minutes after each meal. There was almost complete relief from substernal pain during the summer of 1931 although exercise was confined to short walks on level ground. In the late fall the pain returned without any apparent reason. Aminophylline and a preparation of theobromine and phenobarbital given three times a day gave no beneficial effect. The nitrates were equally ineffective in preventing the attacks. Anginal pain would occur on the slightest exertion and it was frequently necessary for the patient to take three tablets of glyceryl trinitrate ($\frac{1}{100}$ grain or 0.6 mg) before the attack would subside. The paravertebral injection of alcohol was suggested but the patient preferred to remain more or less of an invalid, hoping that she would again feel better when summer came.

At 4 p m, March 14 1932 she had a severe substernal pain followed by vomiting and collapse. When I saw her twenty minutes later, the chest pain was evidently excruciating and she was having frequent short attacks of syncope. The skin was cold and moist. The apex rate was 40 and only faintly audible, and the blood pressure readings were not obtainable. The pain was partially controlled with one-half grain (0.03 Gm) of morphine. A rectal suppository containing 3 grains (0.2 Gm) of barium chloride was given and both insulin and nourishment were omitted for the evening.

This case was presented before the clinical session of the Maine Medical Association Portland Oct 5 1934

When she was seen the following morning, the blood pressure was 110 systolic and 70 diastolic. Morphine was given twice during the night for pain. The heart rate was the same and a pericardial friction rub could be heard at the apex. An electrocardiographic tracing showed a 2:1 block and inversion of the T wave in leads 2 and 3. The urine gave a red reduction for sugar with Benedict's test. The usual 4 units of insulin was given and four hours later the blood sugar was 400 mg. Only a small portion of the regular diet was taken during the first week, but the 4 units of insulin was administered night and morning, as the urine continued to show a large amount of sugar. The substernal pain disappeared after the first twenty-four hours and the patient did not complain of it during the remainder of her confinement in bed. During the second day, an unsuccessful attempt was made to restore the normal heart rate with atropine sulphate, $\frac{1}{100}$ grain was given hypodermically every four hours for three doses. She was given 5 grains (0.3 Gm) of barium chloride by rectum on three successive days. The evening of the third day, the heart rate suddenly increased to 80 per minute and the fainting attacks, which had been occurring since the onset of the acute illness, subsided with the increased rate. No electrocardiogram was taken at this time, but clinically the heart block had disappeared.

In the beginning of the second week the diet was increased to 60 Gm of protein, 100 Gm of carbohydrate and enough fat to make 1,500 calories. The insulin was increased to 12 units a day, and four days later the 11 a. m. blood sugar was 170 mg with a decrease in the urinary sugar. The blood sugar



Electrocardiogram taken March 15, 1932. 2:1 block with a PR interval of 0.40 second indicating disturbance of circulation in junctional tissue. Ventricular rate 48, auricular rate 96. Every other P wave in leads 2 and 3 buried in ST interval. Inverted T wave in leads 2 and 3.

gradually fell to 130 mg and was kept at approximately this level with 10 units of insulin daily. An electrocardiogram taken on April 22 showed a normal PR interval but the T wave in leads 2 and 3 was still inverted. After seven weeks of bed rest, the patient was advised to begin getting up, but she was so afraid of a recurrence that it was not until three weeks later that she would get into a chair.

The diet was now increased to 1,700 calories, the carbohydrate was increased to 200 Gm and the fat decreased to 69 Gm, with an insulin requirement of 6 units daily. It was hoped that the increase in carbohydrate would be beneficial to the coronary artery sclerosis. This may or may not have been responsible for the improvement in the patient's condition. However, during the past two years she has been very active socially and has done light work in her flower garden. Her only discomfort is a sense of substernal burning when she walks up an incline. By refraining from this, no medication is necessary, with the exception of insulin. Recently the insulin was discontinued, but this was followed by an elevation of blood sugar, and insulin was again started. The systolic blood pressure has not been less than 130 for the past two years. An electrocardiogram taken, Jan 23, 1935 was essentially normal and closely resembled the one taken before the attack.

COMMENT

Many observers have called attention to diabetes mellitus as being a frequent etiologic factor in producing coronary artery sclerosis. Although the symptoms of coronary artery disease appeared in this patient very shortly after diabetes was discovered and too soon for the disturbance of metabolism to have played a part in the etiology, it is possible that a mild

diabetes may have been present for several years before the onset of acute symptoms.

During the first few days following an acute coronary thrombosis, a previously well regulated diabetic patient may develop a high blood sugar and urinary sugar. If the disturbance of carbohydrate metabolism has been mild before the attack, no attempt should be made during the first week to control the glycosuria with insulin, as it will usually disappear within a few days. In an insulin patient in whom the diet-insulin ratio is known, relatively small doses of insulin may be given. Too much stress cannot be placed on the cautious use of insulin during convalescence from acute occlusion of the coronary artery. An insulin reaction is more than likely to be fatal, and a sudden drop in the blood sugar level, even though it does not go below normal, may produce cardiac embarrassment.

Transient heart block appearing during the course of acute coronary thrombosis decreases the likelihood of recovery from the attack. In Levine's¹ series of 145 cases there were two patients with complete block and eleven with partial block. Both patients with complete block and six of those with partial block failed to survive the initial attack. According to White,² the descending branch of the left coronary artery is the area most commonly affected by sclerotic changes and by thrombosis. As the auriculoventricular node, in the majority of cases, receives its blood supply from the right coronary artery, it is not difficult to explain the relative rarity of transient heart block in acute coronary thrombosis. Parkinson and Bedford³ were the first to demonstrate that it was frequently possible to differentiate between right and left coronary artery occlusion by means of two distinct types of T wave changes in the electrocardiogram. Inversion of the T wave in leads 1 and 2 would indicate occlusion of the left coronary artery, while inversion of the T wave in leads 2 and 3 would indicate involvement of the right coronary artery.

The case presented illustrates the sudden increase of blood sugar that may follow an acute coronary thrombosis and the slight variation in insulin dosage necessary to control the diabetes after the first week. Another interesting feature was the sudden development of a 2:1 heart block that persisted for three days, during which time frequent fainting attacks occurred in spite of a definite decrease in pain and a return of the blood pressure to nearly a normal level after twenty-four hours. It is possible that periods of complete block may have been present during this time. The inversion of T and T_s would suggest an occlusion of the right coronary artery and agrees with the observations of various investigators, namely, that heart block in acute coronary thrombosis is usually caused by interference of circulation in the right coronary artery.

The effect of barium chloride on the heart block in this patient is open to question, as the normal heart rate may have been restored in the same length of time without barium.

Why has there been almost complete freedom from precordial pain since the acute attack? There was no continued drop in blood pressure to account for it. Could it be due to the increase of carbohydrate in the diet or, more likely, to a well established collateral circulation furnishing the heart muscle with a better oxygen supply than it had previously received through a supposedly sclerotic coronary artery?

12 Deering Street

1 Levine S. A. Coronary Thrombosis. Baltimore: Williams and Wilkins Company, 1929.

2 White P. D. Heart Disease. New York: Macmillan Company, 1931, p. 415.

3 Parkinson John and Bedford D. E. Successive Changes in the Electrocardiogram After Cardiac Infarction. Heart 14, 195 (Aug. 1) 1928.

Energy in Certain Foods—The following are the approximate energy values of a few typical foods in calories per pound: bread, 1,200, butter, 3,500, eggs, 600, milk, 300, orange juice, 230, macaroons, 1,900, mince pie, 1,300, potatoes, 380, sugar, 1,800. As foods are "fattening" in almost exact proportion to these energy values it will be seen that where it is desired to keep down the body weight there is much more to be gained by restricting the fats, sweets and pastries rather than milk, fruit and vegetables.—Sherman, H. C. Food and Health, New York, Macmillan Company, 1934.

Special Article**GROWTH, NORMAL AND ABNORMAL**CLINICAL LECTURE AT ATLANTIC CITY
SESSION

WILLIAM BOYD, MD, FRCP (LOND)

Professor of Pathology, University of Manitoba Faculty of Medicine
WINNIPEG, MANIT

Growth is the most fundamental of all biologic processes and one of the most mysterious. Julian Huxley has defined it as "the self multiplication of living substance," and it is fundamentally a matter of multiplication of units rather than of increment of size. An elephant is larger than a mouse because the cells of which it is composed have the power of multiplying more continuously than those of the mouse. The cell units of the large animal are no bigger than those of the small one. When a cell divides into two the daughter cells are at first smaller, soon they attain the original size, but no larger. Lorrain Smith¹ in his delightful book on growth describes the process of growth as "a procession of cell units in which each member in its turn disappears in producing its successors. The units increase in number as the procession moves onward. Generation succeeds generation until the tissue is formed."

Growth is gradual, but cell division is not gradual. It takes place suddenly and is completed in the space of an hour, "one crowded hour of glorious life," as Sir Walter Scott would call it. It is obvious that the cells of an organ do not all divide at the same time, otherwise the liver would double its size in an hour. The cells that are not dividing are functioning, those which are dividing have no time for work. At a certain stage of development some cells, such as those of connective tissue, are capable of unlimited and inexhaustible growth, provided the environment is ideal, the supply of food is abundant, and the cells are not burdened with work. The power of growth varies at different age periods. It is enormously great in the early months of fetal life, for a single ovum has, with the able assistance of a spermatozoon, to develop into an 8 pound (3.6 Kg.) baby in the short space of nine months. That, of course, is nothing to what some animals can do, for R. C. Andrews removed a 25 foot baby weighing 8 tons from a sulphur-bottom whale. This remarkable rate of growth is not necessarily dependent on conditions of intra-uterine life, for, as Wetzel² points out, a premature infant of 1,000 Gm may double its weight in the next forty-four days in order to catch up with a normal baby. At the end of the period of infancy there is a comparative rest in what Wetzel calls the motion of growth, a period of minimum rate of gain, rate of growth, and rate of heat production.

Though growth ceases in adult life, the cells still retain their capacity for growth. Were it not so, repair would be impossible. Perhaps malignant neoplasia would also be impossible.

CONTROL OF GROWTH

The factors that govern and stimulate growth are so numerous and complex that they can be little more than mentioned in this necessarily brief survey. Among these are embryonic tissue extract (so essential in tissue cultures), thyroxine, the anterior pituitary growth stimulating factor, and certain vitamins. In addition there is that obscure and elusive principle which for want of a better name may be called the vital spark, that intangible something which enables living matter to dip down into the dead stuff of the inorganic world and build it up into its own vital protoplasm and, by utilizing the energy so obtained, accomplish the almost incredible act of self reproduction. There is, of course, no inevitable relationship between these two phenomena, and cells are known to vary enormously in their capacity for self multiplication, this depending to some extent on the degree of differentiation. For, generally speaking, growth and specialization are mutually antagonistic. Nerve cells may be regarded as among the most highly specialized in the body, and it is known that when these are destroyed by poliomyelitis or the surgeon's knife they cannot be replaced by cells of their own kind. The same is true of muscle cells. In the bone marrow, multiplication takes place in the megaloblastic and especially the normoblastic stage, the adult erythrocytes have lost this power—naturally so, seeing that they have lost their nucleus. The basal cells of the skin have unlimited power of multiplication, which is no longer shared by the cells of the surface that have become specialized to perform their particular function of protection. It is evident that the great controller of growth is differentiation.

The last two examples raise a question which is seldom asked but is singularly difficult to answer. When an adult cell divides into two, the daughter cells are pictured as being identical in every respect, but in the examples of the skin and the marrow this can hardly be so, for one of the daughter cells must remain in situ while the other becomes cornified and finally changes into a squamous surface cell or loses its nucleus and develops into an erythrocyte. The daughter cells, so apparently alike, are evidently different, for one is taken while the other is left. In a malignant tumor this distinction is lost, and all the daughter cells are alike.

Among the factors necessary for growth, food is the most important. The relation between food and growth is far too complex a subject to be considered here, but reference may at least be made to the growth-stimulating substances known as vitamins. The best example of a vitamin-deficiency disease leading to stunting of growth is rickets, in which the lack of vitamin D interferes to such a degree with the development of cartilage into bone that the child for a time at least may be a rachitic dwarf. Growth is also dependent on an adequate supply of vitamins A and B₂. I shall have to return to the question of vitamins in connection with the growth of tumors.

Reference has been made to dwarfism, and an adequate survey of this subject would display as clearly as anything the extent of our knowledge and ignorance of the subject of growth. It is probable that the most important element in dwarfism is lack of the growth-stimulating hormone of the pituitary either directly from the disease of that organ or indirectly as the result of influences from the other endocrine glands. Every one knows that hypophysectomy in a young ani-

Read before the General Scientific Meeting at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1935.

1. Smith J. L. Growth. Edinburgh: Oliver & Boyd, 1932.

2. Wetzel N. C. On the Motion of Growth. Prolegomena to the Clinical Study of Human Growth and Metabolism. J. Pediat. 3: 252 (July) 1933.

mal inhibits growth, that transplantation of gland tissue or injection of an extract of the anterior lobe will restore the function of growth, that the secretion of the acidophil cells of the anterior pituitary is the most potent regulator of skeletal growth, that hyperplasia of these cells in early life leads to gigantism and in later life to acromegaly, and that the effect of atrophy or destruction of the cells is dwarfism of various types. Hereditary dwarfism has been reported in a strain of mice in which there was entire absence of the acidophil cells.³ In the Lorain type of hypopituitarism the patient remains dwarfed as regards both stature and sex, but in other respects he is perfectly normal. In the Simmonds type there is the addition of the features of pituitary old age. Even in the Frohlich type growth is interfered with, although the adiposity and sexual dystrophy are more striking characteristics. Selye and his associates⁴ in Collip's laboratory believe that the growth of the individual tissues and organs is largely independent of the pituitary. "Apparently the function of the pituitary growth hormone is only to permit enlargement of the size of the body as a whole, with a harmonious and proportional increase in the size of all the organs."

Thyroid deficiency in early life is also associated with dwarfism, for the cretin is a dwarf physically as well as mentally. It is not safe to assume that the lack of growth is necessarily the result of an insufficient supply of thyroxine to the tissues, for it may be due to an indirect action through the pituitary. Indeed, it is not improbable that all forms of true dwarfism are directly due to pituitary insufficiency, no matter what the ulterior cause may be. The cretin can be made to grow by anterior pituitary extract as well as by thyroxine.⁵ Thyroxine hastens the metamorphosis of the tadpole into a frog, but it is a miniature frog which, like Peter Pan, never grows up. The thyroxine, although speeding up a certain phase of development, has restricted the final limit of growth.

A form of lack of growth difficult to explain is that known as renal dwarfism. Here some form of chronic nephritis in childhood is associated with a remarkable lack of skeletal development and in many cases with osteoporosis, deformities at the epiphyses and bowing of the shafts. The essential biochemical feature is an inability of the kidney to excrete phosphorus, but what the relation of the phosphorus retention is to the lack of growth is at present a mystery. The cases described by Byrom Bramwell as pancreatic infantilism show a similar lack of development. Sometimes the cause of the lack of growth is still more obscure, as in a case that I recently saw at the Children's Hospital in Winnipeg, where a normal amount of growth had taken place in utero, but an increase of only 1 inch (2.5 cm.) in length had occurred in the six months following birth, as shown by roentgenograms of the bones, although the viscera had grown to a normal degree. The only abnormality revealed by a most thorough postmortem examination by Dr. Bruce Chown was absence of one half of the posterior lobe of the pituitary, the acidophil cells of the anterior lobe were present in normal amount. Achondroplasia affords another well known example of stunted stature for which at present no explanation can be offered.

I shall now return to some of the more fundamental problems of growth from which I have been diverted by the intriguing subject of dwarfism. The phenomenon of repair is of such universal occurrence that it is taken as a matter of course, and one seldom pauses to inquire why cells that have been sleeping peacefully for years (and surely one might describe the cells of adult connective tissue as sleeping) should suddenly awake to an active life of growth and reproduction merely because some of their neighbors have been destroyed by the surgeon's knife. This problem is more easily studied in tissue culture, where the conditions of the experiment can be simplified to the utmost, rather than in the clinical patient or the experimental animal. By means of this method it has been possible to show that, when fibrous tissue and other cells are destroyed, growth-stimulating substances are liberated, and that it is the action of these which brings about the renewed growth and repair of tissue without which the surgeon's art would be impossible. According to Hammett, the sulphhydryl radical -SH is present in all actively dividing tissue, both animal and vegetable, and practical application of this knowledge has taken the form of the use of thiocresol to stimulate the process of healing in extensive wounds, bed sores and the like.

INFLUENCE OF ENVIRONMENT

The method of tissue culture has thrown a certain amount of light on some of the fundamental problems of growth, particularly the influence of environment. When tissue cells, particularly cells of embryonic tissue, are placed in a suitable culture medium which insures a continuous supply of food and growth-stimulating substances, they will grow and multiply far beyond the life span of the animal from which they were taken. Indeed, in some cases they have continued to grow indefinitely, so that they appear to have put on a kind of immortality. Everything in this world can be bought with a price if one is prepared to pay that price, and it would appear as if immortality were no exception. But the price may be too heavy. In this case it involves the sacrifice of all hope of development and differentiation. When the tissue is removed from its environment, which apparently provides it with the stimulus to differentiate, it has no work to do and does not have to provide itself with food, so that it can devote all its energies to reproduction. The influence of environment on specialization is well exemplified by the work of Drew, who found that the parenchymatous cells of an organ failed to differentiate in pure culture but that this occurred readily when connective tissue cells were added to the culture. When this was done in the case of renal epithelium, well formed tubules were produced, whereas, without the appropriate stroma, growth merely resulted in a confused mass of cells. It would appear as if old age was not a property of the cell itself but of the environment in which it passed its life. It is natural that this cellular immortality should not be attained by adult cells on which the finger prints of age and the sharp tooth of time have already left their mark, but embryonic cells may enjoy the same endless youth (if by that is meant unlimited power of propagation) as is shared by the immortal germ plasma.

The resemblance between a malignant tumor and a tissue culture such as has just been described is so evident that it does not need to be elaborated. The malignant tumor, like the embryonic tissue culture, toils

³ Smith P. E. and MacDowell E. C. Hereditary Anterior Pituitary Deficiency in the Mouse. *Anat. Rec.* 46: 249 (Aug. 25) 1930.
⁴ Selye Hans, Mortimer H. Thomson D. L. and Collip J. B. Effect of Parathyroid Extract on the Bones of the Hypophysectomized Rat. *Arch. Path.* 18: 878 (Dec.) 1934.
⁵ Evans H. M. Clinical Manifestations of Dysfunction of the Anterior Pituitary. *J. A. M. A.* 104: 464 (Feb. 9) 1935.

not, neither does it spin, so that its whole energy can be focused on reproduction. The malignant cells are affected by environment just as are the cells of a tissue culture. A carcinoma of the sigmoid may grow quite slowly, but the cells may grow with extreme rapidity when carried by the portal blood stream to the liver, and at autopsy the growth in the liver may completely overshadow the primary lesion. On the other hand, it may not. When blood-borne metastases occur in one organ, why should they not occur in every organ? In diffuse carcinomatosis the skeletal muscles must be deluged with tumor cells, and yet secondary growths are of the rarest occurrence. In a recent paper Oertel⁶ records a case of carcinoma of the stomach in which no metastases were evident at autopsy and yet all the organs in the body including the bones showed groups of tumor cells in the vessels. These cells had not succeeded in establishing a footing, in becoming colonized, the environment was unfriendly. Many years ago M. B. Schmidt demonstrated that metastatic groups of tumor cells could often be found in the pulmonary vessels surrounded by fibrin and dying for lack of nourishment. So that even the cancer cell has its weaknesses and is vulnerable, if only one knew how to attack it.

GROWTH OF CANCER CELLS

Cancer may be regarded in two ways. It may be the expression of a power for unlimited proliferation which develops in a tissue at a certain age, i. e., after the cells which compose it have gone through a certain number of mitoses. As this power is part and parcel of the very nature of the cell, it would seem that the cell was destined from the beginning to manifest this tendency when it had reached a certain stage of its genetic life history. As Lorrain Smith¹ puts it: "Cancer cells do not fall into the procession. They fall out. They do not keep step, the procession is moving slowly and they move fast." When identical twins develop at the same age in the same organ the same variety of malignant growth, as not infrequently happens, it would appear that the tendency toward malignancy formed part of the warp and woof of these cells.

On the other hand, a malignant condition can be imposed on cells from without by a number of agents known as carcinogenic, of which the most used in experimental work are coal tar and 1-2-5-6 dibenzanthracene. By means of external stimuli one can speed up the growth and division of cells whether in tissue culture or in the animal body. Of the exact mechanism by which this is accomplished, nothing is known, nor may it ever be known. It is extremely likely that the mechanism varies with different stimulating agents. Filtrable viruses, for instance, which have such a remarkable power to make epithelial cells multiply, penetrate directly into the interior of the cell. As a result of stimulation of the cells by such viruses definite benign papillomas may be formed, and the suspicion, long harbored in secret, is now being openly expressed that viruses may be responsible for true malignant tumors. McIntosh⁷ has shown that sarcomas may be produced in birds by tar injections, the same agent, it may be noted, that produces mammalian cancer, and that the majority of these tumors are transmissible by cell-free filtrates, strongly suggesting the presence of a filtrable virus. It is evident that, though

the tar plays the chief part in the induction of these tumors, it cannot be directly responsible for the subsequent malignant growths, as transmission to other animals is by means of a cell-free filtrate. The carcinogenic agent seems to play the role of a trigger mechanism, the subsequent stimulus being perhaps provided by a filtrable virus.

There is no reason why the two views of malignant neoplasia that have just been outlined should be mutually exclusive. It is reasonable to suppose that, if the innate tendency to neoplastic development is inherent in the cell, an extrinsic agency capable of speeding up the rate of cell division will bring the cell to that stage in its life cycle when this tendency is most likely to express itself. Champlin records the case of identical twins, one of whom died of a malignant tumor of the right testicle at the age of 31, the other was struck by a board on the right testicle at the age of 26 and shortly afterward a malignant tumor of that organ developed. In such an instance it would appear that the tempo of the process had been suddenly accelerated by an extrinsic factor.

The question may be asked, To what extent is it possible to modify conditions in the experimental animal so that the action of the carcinogenic agent may be modified? In answer to this question some experiments by Dr. J. R. Davidson⁸ of Winnipeg, although still in a preliminary stage, have yielded some interesting results. Davidson was struck by the fact that mice in which tar cancer develops resemble in many ways mice suffering from vitamin E deficiency. The apparent parallelism suggested that a deficiency of vitamin E and a carcinomatous condition induced by tarring produced general metabolic disturbances of comparable nature and that a diet unusually rich in vitamin E might inhibit the development of cancer. At the commencement of tarring the mice were transferred to a diet containing wheat germ cereal, wheat germ oil, and lettuce. In the last of Davidson's⁸ experiments, of nine mice on an ordinary diet all died of tar cancer, whereas of ten mice on a high vitamin E diet cancer did not develop in any. It would appear that a diet rich in vitamin E renders mice more resistant to the carcinogenic factor in tar than does a normal diet, but Davidson is careful to point out that such a diet is also rich in vitamins B and B₂. Whatever may be the precise factor concerned, this is apparently an example of the constitutional make up of an animal being so altered that it becomes resistant to the extrinsic carcinogenic agent.

CONCLUSION

In this brief review I have wandered far and wide, perhaps too far and too wide, but the peripatetic survey has revealed that growth is not only the most fundamental but also one of the most fascinating of problems, that it is controlled by a number of factors the disturbance of which may result in dwarfism, gigantism or deformity, that growth and differentiation are mutually inhibitory, that this inhibition may be overcome by removing cells from their environment and allowing them to grow in tissue culture, that cancer is the supreme example of freedom from restraint, and that something may be done in the way of imposing some degree of restraint from without.

Bannatyne Avenue

⁶ Oertel, Horst. On a Peculiar Vascular Transportation and Generalization of Carcinoma Without Local Metastasis. *J. Path. & Bact.* **40**: 323 (March) 1935.

⁷ McIntosh, J. On the Nature of Tumours Induced in Fowls by Injections of Tar. *Brit. J. Exper. Path.* **14**: 422 (Dec.) 1933.

⁸ Davidson, J. R. An Attempt to Inhibit the Development of Tar Carcinoma in Mice, *Canad. M. A. J.* **31**: 486 (Nov.) 1934. **32**: 365 (April) 1935.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS
HOWARD A. CARTER Secretary

DAVIS-BOVIE ELECTROSURGICAL UNIT ACCEPTABLE

Manufacturer The Liebel-Flarsheim Company, Cincinnati
This machine is recommended for electrosurgical cutting and coagulation. The firm states that the unit meets all electrosurgical requirements of transurethral prostatic resection, neurologic surgery, intrapleural pneumolysis or neoplastic, rectal, gynecologic and general surgery, and, in addition, special provisions have been made for the new high frequency method of treating detachments of the retina and for prostatic resection.

The electrical and mechanical characteristics of the unit compare favorably with the standards previously established by the Council for the acceptance of such apparatus.

An investigator who has had three years' experience with the unit reports that the device fulfils satisfactorily the purposes for which it is intended. When used for transurethral prostatic resection and electrosection of

bladder neck obstruction, the investigator finds that, while there is some bleeding, the coagulating current controls it, and that the cutting current cuts the tissue very well.

In view of the efficiency of the machine, the Council on Physical Therapy voted to include the Davis-Bovie Electrosurgical Unit in its list of accepted apparatus.

McINTOSH STANDARD DIATHERMY UNIT ACCEPTABLE

Manufacturer McIntosh Electrical Corporation, Chicago

The manufacturer recommends this unit for medical and surgical diathermy. It is a portable diathermy machine, of the usual construction for a small unit, enclosed in a leatherette case. The main line switch is mounted on the panel. The binding posts for the treatment cords are mounted on the front of the panel and a four gap spark gap covered by a metal screen is mounted on top of the panel. It has a four point voltage selector switch (rheostat) and a typical milliamperemeter protected by fuses, with two scales 0 to 1,000 and 0 to 4,000. The unit weighs about 55 pounds. This machine is supplied also in a floor cabinet of modernistic design.

At the request of the Council the manufacturer submitted data containing a report of tests of the unit for power input and output and for its spark gap and transformer temperature rise. The results recorded in the data were in agreement with the observations of the Council's investigator and in conformity with the standards for diathermy machines previously established by the Council.

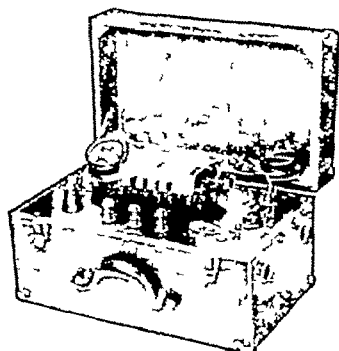


Fig 1—McIntosh Standard Diathermy unit

From a clinical standpoint, the Council's investigator reported that the machine gave satisfactory performance for the purposes for which it is recommended.

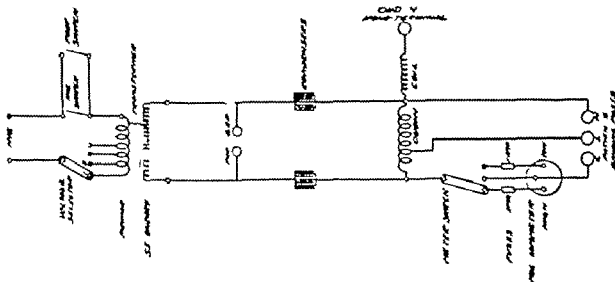


Fig 2—Schematic diagram of circuit

In view of the foregoing report, the Council voted to include the McIntosh Standard Diathermy Unit in its list of accepted apparatus.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG Secretary

OLAV'S A AND D VITAMIN PÂTÉ

Manufacturer—Thor Cannery, Fredrikstad, Norway

Description—Canned cooked mixture of ground cod livers, potatoes, eggs, salt, mace, nutmeg and white pepper.

Manufacture—Fresh cod livers on receipt at the cannery are inspected for soundness, washed, trimmed, mechanically ground and thoroughly mixed with formula proportions of steam cooked potatoes, eggs, salt and spices. The mixture is packed by hand in cans which are sealed and processed under 5 pounds pressure for from one to one and one-quarter hours. The product is packed only during January, February and March.

Analysis (submitted by manufacturer)—

| | per cent |
|--|----------|
| Moisture | 54.2 |
| Ash | 0.8 |
| Fat (ether extract) | 28.1 |
| Protein (N x 6.25) | 4.7 |
| Crude fiber | 0.3 |
| Carbohydrates other than crude fiber (by difference) | 11.9 |

Calories—3.2 per gram 91 per ounce

Vitamins—Vitamin assay shows 5,000 U. S. P. units of vitamin A and 1,000 U. S. P. units of vitamin D per ounce.

Claims of Manufacturer—An appetizing spread for conveniently providing children and adults with vitamins A and D of cod liver oil. One level teaspoonful is equal to one half teaspoonful of U. S. P. standard cod liver oil in vitamin A and three fourths teaspoonful in vitamin D.

(1) VALLEY BREAD

(2) VALLEY ROYAL LOAF

Manufacturer—Valley Baking Company Inc., Shippensburg, Pa.

Description—White breads made by the sponge dough method described in THE JOURNAL, March 5, 1932, page 817. (1) prepared from flour, water, condensed skimmed milk (sweetened), sugar, lard, salt, yeast, butter, malt extract and a yeast food containing calcium sulphate, sodium chloride, ammonium chloride and potassium bromate. (2) prepared from flour, water, condensed skimmed milk (sweetened), lard, sugar, salt, yeast, malt extract, honey and a yeast food containing calcium sulphate, sodium chloride, ammonium chloride and potassium bromate.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET CHICAGO, ILL.

Cable Address

Medic, Chicago

Subscription price

Seven dollars per annum in advance

Please send in promptly notice of change of address giving both old and new always state whether the change is temporary or permanent Such notice should mention all journals received from this office Important information regarding contributions will be found on second advertising page following reading matter

SATURDAY, NOVEMBER 9, 1935

THE POLIOCIDAL SUBSTANCE IN HUMAN SERUM

As man matures he acquires more resistance to some of the infectious diseases. The adult is not often the victim of measles, pertussis and poliomyelitis. Difficulty has been experienced in explaining the fact that the serum of a majority of normal adults will inactivate the virus of poliomyelitis in vitro. Many of these adults are without a history of an attack of infantile paralysis, and even exposure to the antigen apparently can be ruled out in many others, nevertheless the immunologic effects of their serums are indistinguishable from those brought about by the specific antibody. What is the origin of the normal poliocidal substance in these serums? There are several possibilities. It may arise as the consequence of an infection with the etiologic agent of the disease which does not become manifest, some other common infection may cause its production, and, finally, these neutralizing substances may be only the result of normal physiologic changes in the maturing organism.¹ Jungeblut and his associates have reported a variety of interesting experimental observations. They performed virucidal tests with pooled lots of serum from adults of the same blood group who gave a history of an attack of paralysis, and also on another group whose serum was normal. The virucidal titer of adult normal serum from blood group A individuals was found to lie between 1/5 and 1/25, that of serum from the blood group O individuals between 1/25 and 1/40, and that of serum from normal blood B individuals between 1/40 and 1/80. The titer of adult convalescent serum of blood group A was between 1/15 and 1/20, of blood group O serum between 1/10 and 1/20, and of blood group B serum between 1/60 and 1/80. These data suggest that the titer of convalescent serums in blood group O may be considerably below that of normal serums while no fundamental difference exists in blood groups A and B in the neutralizing capacity of the two kinds of serum. In testing the thermostability of the pooled

serum, they found that convalescent serum from blood group O individuals was more thermostable than normal serum from blood group O, a significant difference in this respect was not detected between the normal and convalescent serums from blood groups A and B. The thermostability of the serum depended largely on the amount of antibodies present. It appears, therefore, that the normal poliocidal substances in human serums are in quantity and in resistance to heat equal to and in some cases superior to the poliocidal substances that develop as the result of convalescence from poliomyelitis.

The specificity of the neutralization of poliomyelitis virus by serum was investigated. A number of antitoxic, antiviral and antibacterial serums were tested for their capacity to inactivate poliomyelitis virus. Perhaps the most interesting result of these experiments was the high percentage of positive tests obtained with diphtheria serums. The investigation was carried further by testing for virucidal power the serum of fifteen monkeys that had been immunized with various preparations of diphtheria toxin and toxin antitoxin. Also the resistance of these animals to intracerebral inoculation with small doses of poliomyelitis virus was determined. Two of the monkeys completely resisted the intracerebral infection and five others developed only light symptoms of infection. Eight of the monkeys succumbed to poliomyelitis. The immune serums of three of the protected monkeys had definite virucidal power. Schick tests were then made on fifty normal monkeys and, for comparison, also on fifty different monkeys that were convalescent from poliomyelitis. It was found that a great majority of the monkeys convalescent from poliomyelitis gave a negative Schick test. This peculiar relation between an increase in tolerance for diphtheria toxin and insusceptibility to poliomyelitis virus in monkeys was followed by a study on man to see whether any parallel could be demonstrated between the results of the Schick test and the presence or absence in the serum of virucidal substance against poliomyelitis virus. The result was that the two reactions agreed in the majority of cases. The exceptions, however, were frequent.

While these experiments invite further research, they seem to show that no fundamental differences exist in the quantities of virucidal substance in adult normal or adult convalescent human serum, with the exception of convalescent serums from blood group O, which show consistently low virucidal titers. High titered serums were found to be more thermostable than low titered serums, irrespective of the source of the serum.

The most important observation, however, was not only that poliomyelitis virus can be inactivated by an antibody in the serum formed as the result of contact with the specific antigen but also that, during immunization with certain bacterial and animal toxins, substances may arise in the serum which will inactivate the virus. This substance is not as yet known. The

¹ Jungeblut, C. W. The Immunological Characteristics of the Poliocidal Substance in Human Serum. *J. Immunol.* 27: 17 (July) 1934.

authors believe that it is not the recognized antitoxin but a by-product of the immunization. It is conceivable, they say, that diphtheria toxin, for example, when introduced parenterally in small doses stimulates the endocrine system, releasing certain principles into the circulation and tissues. In fact, in another paper Jungeblut and his associates² report experiments in which poliomyelitis virus was inactivated in vitro by certain biologic products containing the anterior pituitary-like gonadotropic principle of pregnancy urine and by epinephrine. They also showed that diphtheria toxin was inactivated in vitro by pregnancy urine preparation and by adrenal cortex extract. Ultimately, they believe, it may be shown that susceptibility to both diphtheria and poliomyelitis is the result of some endocrine deficiency and that protection against one of these two diseases may be associated with some resistance against the other. At present this hypothesis is difficult to verify.

INDUSTRIAL DERMATOSES

Industrial dermatoses constitute approximately 60 per cent of the industrial diseases not including actual accidents, they are, thus, of considerable medical and legal importance. Eller and Schwartz¹ have recently reported a study of the cause, prevention and treatment of such skin disturbances. While the matter of predisposition is still uncertain, blondes, the relatively young and the aged are perhaps more susceptible than others to skin irritants. Certainly diseased and abnormal skins are more susceptible than thick and oily ones. Poisoning by heavy metals may possibly act as a predisposing agency. The chief causes of industrial dermatitis differ in various localities, according to the prevailing types of industry, but it can be safely stated that in general the majority of industrial skin diseases in the United States are caused by the action of acids, alkalis, caustics, oils, greases, solvents and plants. It is possible, the authors believe, to classify the cases in a simple way into physical agents, general irritants such as acids, strong alkalis and caustics, specific irritants that do not affect every one but do irritate a considerable percentage, many plants such as ivy and oak, and biologic agents such as parasites, bacteria and fungi.

When the average patient is first affected with itching and burning and the visible signs of an occupational dermatitis, his clinical appearance on examination, excepting in a few cases, does not offer a clue to the nature of the irritant. The differential diagnosis from skin diseases due to other causes may, in fact, be most difficult. There is nothing in the appearance of industrial dermatitis to differentiate it from similar contact eczemas caused by noxae in the patient's home or elsewhere. The patch test may be of diagnostic importance in determining the source but is not absolutely depend-

able. False positives may be obtained with benign substances due to accompanying impurities. Contrariwise, the patch test may be negative because it does not represent or simulate actual working conditions. Thus friction may be the missing factor. Sometimes heat or ultraviolet radiation must coexist.

A person who is sensitive to the material with which he works and cannot develop an immunity or "become hardened" to it should seek some other occupation. If uncomplicated, the dermatitis should disappear when a worker is away from the substance that has caused it. Most cases of industrial dermatitis develop in new employees or those exposed to a new irritant and are usually mild in character. Sometimes mild protective ointments will aid in the establishment of "immunity" and allow continued working. In certain cases, desensitization has been successfully employed.

Prevention should be the primary aim. The ideal method is to safeguard the industries which have skin hazards so that the injurious chemicals will not come in contact with the skin of the worker. Protective ointments have also been found useful pending more suitable preventive measures. The laws regarding compensation for industrial skin diseases are not uniform in different states. It would do much to clarify the situation if model laws for compensation could be drafted and enacted in a uniform manner throughout the states. At present it is advisable for the physician handling such cases to become familiar with the compensation law of his own state.

BASAL METABOLISM AND IODINE EXCRETION DURING PREGNANCY

Pregnancy is accompanied by a progressive increase in the basal oxygen consumption. There is, moreover, a considerable amount of evidence tending to support the view that the thyroid is involved in the metabolic reaction of the normal woman to pregnancy. A group of Ohio State investigators¹ have recently reported a study of the factors affecting the increase in metabolism occurring in pregnancy, the urinary iodine excretion and the effects of advancing pregnancy on vital capacity and tidal air.

Eight subjects were used in these studies. Seven were primiparas ranging in age from 15 to 20 years, who were inmates of a home for unmarried mothers and therefore had uniform dietary and sleeping habits. All were normal cases of pregnancy terminating in uncomplicated labor and healthy infants. None of them showed any symptoms of thyroid dysfunction.

All determinations of basal metabolism were made by means of the closed circuit type of apparatus generally known as the Benedict-Roth. With four of the women a study was made of the iodine excreted in the

² Jungeblut, C. W., Meyer, Karl and Engle, E. T. Inactivation of Poliomyelitis Virus and of Diphtheria Toxin by Various Endocrine Principles. *J. Immunol.* 27: 43 (July) 1934.
¹ Eller, J. J. and Schwartz, Louis. Industrial Dermatoses. *New York State J. Med.* 35: 951 (Oct. 1) 1935.

¹ Enright, Lena, Cole, Vera V. and Hitchcock, F. A. Basal Metabolism and Iodine Excretion During Pregnancy. *Am. J. Physiol.* 113: 221 (Sept.) 1935.

urine Twenty-four hour samples of urine were collected by each of the subjects each week The total quantity of iodine contained in the samples was determined by means of the Phillips and Curtis modification of the Fellenberg method

Five of the seven inmates of the institution were given iodized salt Inspection of the metabolism studies showed that in every case there was an increase in the metabolic rate toward the end of pregnancy This increase was, however, of greater magnitude in the younger subjects The two who did not receive iodized salt were under observation only during the last month of pregnancy The rise in metabolism of one of these as well as the drop that occurred at parturition was of greater magnitude than was obtained with any of the women who received iodized salt From an inspection of the curves of body weight and basal oxygen consumption it was apparent that in all but one of the seven there was a close correspondence between changes in body weight and variations in oxygen consumption This fact naturally suggests that the energy required in laying down the new tissue of the fetus and accessory structures is an important factor in producing the increased heat production of pregnancy It was noteworthy also that with adolescent girls there seems to be another stimulating factor at work, which results in a more marked rise in the metabolism of such subjects than that which occurs during the pregnancy of more mature women

The results obtained in the study of urinary iodine excretion carried out on four patients throws further light on the relation of the iodine of the diet to the metabolism of pregnancy Those who were using iodized salt excreted from three to ten times as much iodine as did the one who received no supplementary iodine. This may be taken as probable proof that iodized salt added to an ordinary diet furnishes an adequate supply during pregnancy There is, however, no apparent relationship between iodine excretion and the magnitude of the increase in metabolism as pregnancy advances The principal feature of these results was the marked increase in the urinary iodine excretion that occurred in the third week ante partum in three of the patients who were receiving iodized salt The meaning of this is not clear, but it must indicate a profound modification of iodine metabolism and possibly it accompanies a change in thyroid function

Finally the changes that occur in vital capacity and tidal air during pregnancy were studied on seven patients In all but one there was a definite increase in vital capacity as pregnancy advanced, although in two of the six there was a drop in the last week With four the vital capacity decreased after parturition and with one there was a gradual decrease in vital capacity during the last three months of pregnancy, which was followed by marked improvement after delivery In six of the seven patients, therefore, the increase in

abdominal contents was associated with an increase rather than a decrease in vital capacity Furthermore, it seems that the increased oxygen consumption of pregnancy is accomplished by an increase in the volume of tidal air

Current Comment

MILK FOLLY

The state of New York is taking its milk industry seriously! In fact, it seems to be taking it so seriously that the advertising agencies are making it ridiculous Apparently they have found it necessary to sell milk as a medicine rather than as the wholesome food it really is These remarks are prompted by the appearance in New York newspapers of a new type of advertisement in which the value of milk as a cure for several complaints is emphasized Strangely enough, the emphasis is also untrue The complete text of the advertisement reads

ALKALIZE WITH MILK! At one time or another you certainly have felt the need of alkalizing But chances are that you didn't take milk because you didn't realize that milk is a natural alkaliizer fresh, cold milk

Milk—the alkaliizer—works like a charm Over indulgence, after noon fag any time that acid products accumulate in your blood, simply alkalize with milk. Every glass of milk has a definite alkaline effect And there's real economy in using milk one of today's best food buys

Free Booklet—Milk—the Alkaliizer Write to The Bureau of Milk Publicity Albany

THE STATE OF NEW YORK

The Bureau of Milk Publicity of the New York State Department of Agriculture and Markets also issues a folder in which these facts are reemphasized, reiterated and even more exaggerated It is amusing to realize that directly opposite this advertisement appears one for a "patent medicine" with exactly similar claims It should be unnecessary to point out for a medical audience that milk is the only article of diet whose sole function in nature is to serve as a food Certainly the values of milk in protein, in mineral salts and in vitamins are sufficient on which to base claims as to its usefulness without trying to turn the product into a "patent medicine" Officials in the state of New York will do well to select an advertising agent more conversant with the facts of medical science and nutrition

SELF DETERMINATIONS OF BLOOD PRESSURE

Here and there in amusement parks throughout the country all sorts of peculiar devices are being exploited in relationship to determinations by individuals of their own physiologic functions For years men have been especially interested in having the records of their weights and heights Then came devices of the spirometer type, whereby lung capacity could be determined, and also the ergometer for measuring the strength of the hand or the force of a blow with a fist There are also machines for measuring the pulling power of man as well as of horses and of mules More recently devices have appeared which presume to give information regarding the heart beat The latest wrinkle is the

adaptation of mechanical devices for measuring the blood pressure. The manufacturers of such apparatus, including those of the mercury manometer and of the spring type, protest earnestly and long that they are doing their utmost to stop the sale of such devices to persons outside the profession. Certainly there is great danger to the public inherent in the employment of such apparatus without the necessary medical background for interpreting the results of the investigation. Any single reading of blood pressure, pulse rate or even temperature, without relationship to the general physical condition and mental condition of the person concerned, is bound to lead to false interpretations and the associated hypochondria.

ACTIVE IMMUNIZATION IN POLIOMYELITIS

Investigators have learned during many years of experimentation that the virus of poliomyelitis is strikingly unstable in its disease-producing properties. Specimens of virus of high virulence may suddenly decrease in activity and then after a time regain the lost power while being preserved in glycerin. On the other hand, some strains of poliomyelitis virus show weak activity and frequently fail to induce infection in the monkey. As early as 1910, Flexner and Lewis¹ discovered that in the process of immunizing *Macacus* monkeys with living virus a proportion of monkeys instead of becoming immune always became paralyzed. Numerous attempts have been made to modify poliomyelitis virus so as to preserve its immunizing properties and at the same time to remove its paralyzing action. Flexner² has recently stated that, while both physical and chemical means have been employed for this purpose, the results have not been satisfactory. Whenever the modifying agents inactivated the poliomyelitis virus, immunity failed to follow the inoculations, and when such modifying agents reduced the activity, immunity would result but paralysis would result also. In other words, the effect of the modifying agents seems to be a dilution of the virus and not an attenuation. The virus recovered from paralyzed monkeys that had been infected with the chemically treated virus resembled in virulence the original virus strain before the treatment was begun. When the human virus is injected into the skin of *Macacus* monkeys it produces active immunity in most of them but produces paralysis in some of the inoculated animals just as the passage strains of virus do. In view of experimental studies made during the 1931 epidemic in New York and of various other studies, Flexner believes that there is no evidence showing that the passage of virus through monkeys removes its power to infect and produce paralysis in man. There are, on the contrary, he says, convincing observations which show that an indeterminate number of passages of virus through human beings does not deprive the virus of its potential paralyzing effect when injected into monkeys. The available evidence also indicates that poliomyelitis

virus which has been exposed to injurious physical and chemical agents is either destroyed or merely reduced in concentration. When therefore the virus has been destroyed by the physical or chemical agent it no longer has immunizing power, and when it has only been reduced in concentration by the modifying agent it immunizes certain animals and may paralyze others. The fact that fully active virus has been recovered from the paralyzed animals proves, it is said, that the treated active virus has not been attenuated.

AN UNUSUAL PUBLIC EDUCATION SERIES

The New York Academy of Medicine, realizing the great development of interest on the part of the public in the advances that are taking place in medical science, has outlined an extraordinary group of lectures for the public, which began in the Academy of Medicine on October 3. The series that has been developed is entitled "Art and Romance of Medicine" and the lectures together with the dates on which they are to be given follow:

Wisdom of the Body, by Walter B. Cannon, M.D., professor of physiology, Harvard Medical School, October 3

Medicine in the Days of the Great Monarch, by Howard W. Haggard, M.D., associate professor of applied physiology, Yale University, November 14

The Mystery of Death, by Alexis Carrel, M.D., Rockefeller Institute for Medical Research, December 12

Medicine of the American Indian, by Harlow Brooks, M.D., emeritus professor of clinical medicine, New York University, Jan. 9, 1936

How We Learned About the Human Body, by Benjamin P. Watson, M.D., professor of obstetrics and gynecology, Columbia University, February 13

The Organic Background of Mind, by Foster Kennedy, M.D., professor of neurology, Cornell University Medical College, March 12

The Story of Vitamins, by Elmer V. McCollum, M.D., School of Hygiene and Public Health, Johns Hopkins University, April 9

Man—The Common Denominator of Disease, by George Draper, M.D., associate professor of clinical medicine, Columbia University, May 14

It will be interesting to learn how far public interest will go in attending these lectures and whether or not the attendance gradually increases with each successive engagement. Such interest as is bound to be displayed by this series will be reflected in the sympathetic understanding of medical problems, which is so necessary for developing the future of medicine in this country.

Association News

THE KANSAS CITY SESSION

Application Blanks Now Available for Space in the Scientific Exhibit

Application blanks for space in the Scientific Exhibit at the Kansas City Session are now available. The Committee on Scientific Exhibit requires that all applicants for space fill out the regular form. Applications close Jan. 27, 1936.

Blanks may be obtained from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

¹ Flexner, Simon and Lewis, P. A. Experimental Poliomyelitis in Monkeys. *J. A. M. A.* 54: 1780 (May 28) 1910.

² Flexner, Simon. Concerning Active Immunization in Poliomyelitis. *Science* 82: 420 (Nov. 1) 1935.

RADIO BROADCASTS

The American Medical Association broadcasts over the Blue network and certain additional stations of the National Broadcasting Company at 5 p. m. eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time) each Tuesday, presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers a toast "Ladies and gentlemen, your health!" The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

The next three programs are as follows

November 12 Infection, Morris Fishbein M.D.
November 19 Common Household Emergencies W. W. Bauer M.D.
November 26 Automobile Accidents, Morris Fishbein M.D.

This program is broadcast also on the short waves through KDKA, Pittsburgh, over station W8XK, 11,870 and 12,210 kilocycles.

Debate on State Medicine

November 12, at 2 o'clock eastern time a trial debate is to be held over the network of the National Broadcasting Company on the subject 'Resolved, That the several states should enact the legislation providing for a system of complete medical service available to all citizens at public expense.' The speakers for the affirmative are William T. Foster and Bower A. J. The speakers for the negative are Dr. R. G. Leland, director of the Bureau of Medical Economics of the American Medical Association, and Dr. Morris Fishbein, editor of THE JOURNAL.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

District Meetings—At a meeting of the Second Council District Medical Society in Batesville, October 14, Drs. Joseph F. Shuffield, Little Rock, spoke on 'The Value of Organized Medicine', William R. Blue, Memphis, 'Undulant Fever', Shelby B. Hinkle, Little Rock, 'Obstetrical Emergencies' and William R. Brooksher, Fort Smith, 'Present Status of Radium Therapy'. Dr. Paul H. Jeffery, Bethesda, was chosen president. At the meeting of the Fifth Council District Medical Society in Camden, October 3, Drs. Melvin E. McCaskill, Little Rock, discussed 'County and State Society Relationship', Sidney C. Barrow, Shreveport, 'X-Ray Diagnosis of Chronic Appendicitis', and Darmon A. Rhinehart, Little Rock, 'Skin Cancer'. At a meeting of the First Council District Medical Society in West Memphis, October 24, papers on osteomyelitis were presented by Drs. James S. Speed and Willis C. Campbell, both of Memphis. Drs. Raphael E. Semmes, Memphis, discussed 'Surgical Relief of Pain, Including Tic Douloureux', William T. Pride, Memphis, 'Placenta Praevia', John H. McCurry, Cash, digestive tract disturbances, Henry King Wade, Hot Springs National Park, 'Differential Diagnoses of the Right Side of the Abdomen from a Urologic Standpoint'. Joseph A. LePrince, U. S. Public Health Service, Memphis, discussed 'Mosquitoes and Malaria Prevention'.

COLORADO

Society News—Representatives of the Colorado Tuberculosis Association held a clinic in connection with the Crowley County Medical Society in Ordway recently. The speakers at the evening meeting were Drs. Charles O. Giese and Ardan M. Mullett, Colorado Springs. At a meeting of the Fremont County Medical Society in Canon City recently, Dr. Raynor E. Holmes Jr. read a paper on 'Differential Diagnosis and Treatment of Peptic Ulcer'. A symposium team

representing the committee on tuberculosis education of the state medical society presented the program before the Northeast Colorado Medical Society in Sterling recently, speakers were Drs. William Wiley Jones, Charles J. Kaufman and John S. Bouslog, Denver. The Pueblo County Medical Society was addressed recently by Dr. Dwight B. Shaw, Pueblo, on 'Effects of Disease on History' and, September 17, by Dr. Lawrence E. Berg, Boone, 'Childbirth'. Members of St. Joseph's Hospital staff presented the program before the Medical Society of the City and County of Denver, October 15. Drs. Albert W. Metcalf, 'Peripheral Arterial Diseases, Diagnosis and Treatment', Glen E. Cheley and Leonard Freeman Jr., 'Unusual Case of Ectopic Pregnancy', Duval Prey, 'Imperforate Anus' and Philip Work and Chesmore Eastlake, 'Encephalitis in Chickenpox'. Speakers before the Boulder County Medical Society, October 10, in Boulder, included Drs. Warren M. Gilbert and Walter K. Reed on action and uses of irradiated petrolatum.

Hobby Display at State Meeting—The Colorado State Medical Society, for the first time, featured an exhibit of the hobbies of its members during the recent annual meeting. The hobbies were interspersed with the scientific exhibits, instead of being arranged as a special exhibit. The group included

Photographic compositions, Drs. Cuthbert Powell and William H. Crisp, Denver.
Stamp collections, Drs. Philip Work and Anders J. O. Lof, Denver.
Entomology, Dr. Tracy R. Love, Denver.
Tinted miniature photographs on ivory, Dr. Nolie Mamey, Denver.
Ship model, Dr. Douglas W. Macomber, Denver.
Ink sketches, Dr. Crisp.
Collection of paintings, Dr. Gerrit Heusinkveld, Denver.
Western Americana, Dr. Harry S. Finney, Denver.
Water color sketches, Dr. Chesmore Eastlake, Denver.
Collection of chiropractic advertisements, Dr. Duane Turner, Steamboat Springs.

It is hoped to make the display of hobbies an annual feature of the state meeting.

CONNECTICUT

In Commemoration of Dr. Peter Parker—The one hundredth anniversary of the establishment of the Ophthalmic Hospital in Canton, China, by Dr. Peter Parker, who introduced modern medicine in China, was observed by Yale University, November 5. Mr. Tsune-chi Yu, Chinese consul general at New York, representing Ambassador Sze, was among the speakers. Dr. Samuel C. Harvey, William H. Carmalt, professor of surgery at Yale, spoke on 'Peter Parker, Initiator of Modern Medicine in China', and Rev. Kenneth S. Latourette, D. Willis James, professor of mission and oriental history, Yale Divinity School, gave an address on 'Peter Parker, Missionary and Diplomat'. There was an exhibition of paintings by the Chinese artist Lamqua illustrating the work of Dr. Parker, his portraits and memorabilia which he presented to the Yale University School of Medicine. November 4 a celebration commemorating the same event was held in Canton. Dr. Edward H. Hume, president of Yale-in-China, presented a portrait of Dr. Parker, with greetings to the Canton Hospital. Dr. Parker graduated from the Yale school of medicine and the divinity school in 1834. He was the first Protestant medical missionary to enter China. In 1835 he, with the assistance of British and American merchants, opened the Ophthalmic Hospital. He specialized on diseases of the eye, particularly on the removal of cataracts. In 1838, largely through his influence, the Medical Missionary Society was formed in China. He returned to the United States in 1840 on account of war between Great Britain and China but returned to China in 1842. In 1844 he served as secretary to Caleb Cushing, negotiating the first treaty between the United States and China. In 1845 he was appointed secretary to the American legation, and in intervals between commissions was chargé d'affaires, continuing at the same time his medical practice. In 1855 he became American commissioner and minister to China, remaining in China until 1857. He died in Washington in 1888, at the age of 84.

DISTRICT OF COLUMBIA

Personal—Dr. Daniel L. Seckinger, formerly epidemiologist for the Georgia State Department of Health, has been appointed assistant health officer for the District of Columbia. Major Gen. Charles R. Reynolds, surgeon general of the U. S. Army, was guest of honor at a reception given by the Medical Club of Philadelphia, October 18. Surgeon General and Mrs. Reynolds were guests at a reception recently given by medical department officers of Washington and vicinity.

Monthly Army Meetings—The monthly meetings of the officers of the medical department of the U. S. Army living in Washington and vicinity were resumed, October 21, when Major Gen. Charles R. Reynolds, surgeon general of the army, discussed the activities and policies of the medical department.

These meetings will be held on the third Monday of each month at the Medical Center and will continue until May. Commissioned officers (active, reserve and retired) and physicians of the medical services of the army, navy, public health service and veterans' administration, and members of the medical and dental professions of the District of Columbia are invited.

ILLINOIS

Eighteen Thousand New Cases of Syphilis—The Illinois State Department of Health announces that venereal diseases are now by a wide margin the greatest of all health hazards to young adults. About 18,000 new cases of syphilis are reported annually in the state, already more than 14,000 cases have been reported this year. Nearly two thirds of the 225,000 diagnostic laboratory tests made annually by the state department of public health relate to syphilis. The department spends \$20,000 annually for drugs for the treatment of indigent patients alone. About 1,400 mental patients are always in state hospitals at an annual cost of about \$500,000 because of syphilis. More cases of the disease are reported than of any other disease except measles and scarlet fever, the department reports.

Chicago

Society News—Speakers before the Chicago Gynecological Society, November 15, will include Drs. Fred O. Priest, Chicago, and Gilbert P. Pond, Oak Park, on 'Surgical Complications of Pregnancy' and 'Positive and Permanent Identification of the New-Born' respectively. Dr. Ruth R. Darrow discussed 'Icterus Gravis in the New-Born' before the Chicago Council of Medical Women, November 1. At a meeting of the Chicago Laryngological and Otological Society, November 4, Drs. Alfred Lewy read a paper on 'After Care of the Radical Mastoid Operation', Samuel Salinger, Rhinoplasty, 'Some Practical Considerations,' and Richard L. Webb, Ph.D., 'Lymphatics of the Head and Neck.'

Free Medical Service Analyzed—The council of the Chicago Medical Society unanimously adopted a report of a study of the abuse of free medical service in outpatient practice at a meeting, October 9. In the six teaching outpatient departments studied, which handle about 60 per cent of the free outpatient work in Chicago, the service was found to be abused to the extent of 13 per cent, ranging from 22 per cent in one institution to 6 per cent in another. Of the 5,615 consecutive admissions reviewed, 1,484, or 26.4 per cent were found to be appropriate for home visits for investigation, 300, or 5.3 per cent, were not suitable for home visits because the patients were nonresidents of Chicago and for various other reasons. 478, or 8.6 per cent, were excluded because the question of abuse did not enter into the matter, and 3,353, or 59.7 per cent, were cases receiving relief when admitted. This last group of cases was not included in the study, since it was assumed that sufficient investigation had already been made and these persons were entitled to free care. Complete information was obtained on 1,043, or 70 per cent of the 1,484 cases suitable for home visits. In this group it was found that 66.1 per cent had incomes of less than \$1,000 each year and 90.8 per cent received less than \$1,500. The survey was conducted by Dr. William H. Walsh, hospital consultant, for the committee on medical economics of the Chicago Medical Society to determine the extent of abuse of free medical service by those able to pay private physicians and to ascertain the standards used in establishing the economic eligibility of patients accepted for free care. The institutions studied were Central Free Dispensary, Children's Memorial Hospital Dispensary, Mandel Clinic of Michael Reese Hospital, Mercy Hospital Free Dispensary, Northwestern University Medical Clinics and the Research and Educational Hospital of the University of Illinois. The two institutions with the lowest percentages of abuse are those in which the social service divisions are best administered and staffed. The report recommends (1) that the standards for admission administration and medical service be improved, (2) that the medical profession take steps to apprise the public of the fact that private medical service is available at a price within the reach of the patient of moderate means, and (3) that there be organized a standing committee or council on hospitals and clinics to represent the society in all matters concerned with these institutions.

INDIANA

Society News—The Hamilton County Medical Society was addressed in Arcadia, October 8, by Dr. Matthew Winters, Indianapolis, on 'Scarlet Fever and Nephritis.' At a meeting of the St. Joseph County Medical Society in South Bend, October 1, Dr. Joshua M. Gordon, South Bend, discussed rheumatic heart disease. A symposium on toxemia of late pregnancy was presented before the Indianapolis Medical

Society, October 29, by Drs. Gerald W. Gustafson, Henry F. Beckman and John E. Dalton, all of Indianapolis. Dr. Clifford G. Grulee, Evanston, Ill., will discuss 'Anemias of Infancy' before the Tippecanoe County Medical Society, November 12.

LOUISIANA

Society News—At a meeting of the St. Tammany Parish Medical Society, recently, speakers were Drs. Manuel M. Garcia, New Orleans, on the role of the general practitioner in cancer control, and Daniel N. Silverman, New Orleans, on bacillary and amebic dysentery. A symposium on pain in the lower part of the back was presented before the Orleans Parish Medical Society, October 14, by Drs. John F. Dicks, John G. Pratt and George C. Battalora, New Orleans. Dr. Jacob M. Bodenheimer discussed the incidence and diagnosis of ectopic pregnancy before the Shreveport Medical Society recently. Dr. Oscar W. Betha, New Orleans, conducted a clinic on cardiac diseases before the Fourth District Medical Society, October 1, and Dr. William R. Mathews, Shreveport, discussed a case of lipid pneumonia of the right lung with secondary pneumococcal endocarditis, terminating in a fatal pulmonary infarction of the left lung.

MARYLAND

Society News—At a meeting of the Baltimore City Medical Society, November 1, speakers included Drs. Ernest H. Gaither on 'Therapy of Peptic Ulcer,' Conservative versus Radical, Paul Padgett and Joseph E. Moore, 'Interrelationships of Tuberculosis, Syphilis and Antisyphilitic Treatment,' and Charles M. Byrnes, 'Treatment of the Postherpetic Neuralgias.' At a meeting of the Maryland Academy of Medicine in Baltimore, October 14, Dr. Thomas P. Sprunt, among others, discussed endocrine neoplasms. Dr. Charles Loring Joslin addressed the Baltimore County Medical Association in Baltimore, October 16, on 'Causes of Malnutrition in Infants.'

Malnutrition Decreases—A decrease in the percentage of children showing signs of malnutrition and an increase in the percentage of defects corrected are indicated in the report of the medical examination of children in the public and parochial schools in Baltimore County during the school year ended July 31 according to the state department of health. Children who were 10 per cent or more underweight or who gave other evidence of malnutrition comprised 13.6 per cent of the total number examined, as compared with 16.9 during 1933-1934, 14.6 in 1932-1933 and 16.2 in 1931-1932. The percentage of corrections completed during the year of 1934-1935 was 40.3 as compared with 32.9 in 1933-1934, 22 per cent in 1932-1933 and 12 per cent in 1931-1932.

MASSACHUSETTS

The Gay Lecture on Medical Ethics—Dr. James B. Herrick, professor emeritus of medicine, Rush Medical College, Chicago, delivered the George W. Gay Lecture on 'Medical Ethics' at Harvard Medical School, November 7. His subject was 'The Care of the Patient.' Lectures will be given by Dr. Arthur R. Crandell, Taunton, November 14, and by Dr. David D. Scannell, Boston, November 21.

Society News—Dr. Reginald Fitz, Boston, discussed 'Recent Advances in Medicine' before the Hampden District Medical Society in Springfield, October 29. A symposium on silicosis and asbestosis was presented before the Massachusetts Society of Examining Physicians in Boston, October 30. Speakers before the Norfolk District Medical Society in Sharon, October 29, were Drs. Walter A. Griffin, Sharon, and Edward D. Churchill, Boston, on 'Early Diagnosis of Tuberculosis and Treatment of Bronchiectasis' respectively.

MICHIGAN

New Executive Secretary of State Society—William J. Burns, Detroit, executive secretary of the Wayne County Medical Society since 1930, has been named to a similar position with the Michigan State Medical Society, effective November 1. Mr. Burns may be addressed at suite 2020 Olds Tower, Lansing. Dr. Clifford T. Ekelund, Pontiac, will be secretary of the society succeeding Dr. Burton R. Corbus, Grand Rapids, who has been acting secretary. Mr. Burns, who has a degree of bachelor of laws from St. John's College, Toledo, before becoming associated with the Wayne County Medical Society, was executive secretary of the Academy of Medicine of Toledo and Lucas County, Ohio.

Personal—Dr. Romulus S. Buckland, Baraga, was honored October 19 when a new recreation field in the township was dedicated in his honor. Dr. Buckland is 69 years of age and has been practicing in the community for thirty five years.

MISSOURI

Society News—Dr John C Morfit discussed "The Opportunity and Responsibility of Organized Medicine in Relation to Economic Trends" before the St. Louis Medical Society, October 29, the program was under the auspices of the section on medical economics of the society.—The South Central Counties Medical Society was addressed in Houston, recently, by Drs Adolph H Conrad, on "Common Drug Eruptions", Richard S Weiss, "Precancerous Skin Lesions," and Martin F Engman Jr, St. Louis, "Contact Dermatitis."

Cancer Clinic at State Hospital—A fully equipped cancer clinic will be constructed at the state hospital at Fulton, as a part of a \$1,500,000 building program for state hospitals. The clinic will be located in a penthouse on the new building to be erected and, in the beginning, will accommodate twenty-four patients. Definite plans for the clinic were discussed at a recent meeting in St. Louis, which was attended by representatives of the eleemosynary board, the committee on cancer of the state medical association and members of the staffs of the state hospitals. Through an act of the last legislature, indigent persons suffering from certain conditions other than mental diseases may now be treated in the eleemosynary institutions.

MONTANA

Dr Kilbourne Named State Epidemiologist—Dr Burton K Kilbourne, health officer of Fargo, N. D., since 1923, has been appointed epidemiologist to the Montana State Board of Health at Helena, effective October 1. Dr Kilbourne was a graduate of Kansas Medical College, Topeka, in 1904.

NEBRASKA

Fall Clinic—St. Elizabeth's Hospital, Lincoln, held its annual fall clinic, October 11-12. The following speakers were guests of the hospital: Drs Harold Swanberg, Quincy, Ill., Roland M Klemme, St. Louis, Kellogg Speed, Ralph C. Brown and Wilber E. Post, Chicago, and Mr C. E. Lounsbury, Chicago, former assistant state's attorney of Illinois.

NEW JERSEY

Society News—A symposium on ulcerative colitis was presented before the New Jersey Gastro Enterological Society in Newark, November 4, by Drs Asher Winkelstein, Joseph Felsen and Thomas T. Mackie, all of New York.—The Society of Surgeons of New Jersey will meet at Atlantic City, January 15.

NEW MEXICO

Personal—Dr Sophie B. D. Aberle, recently of New Haven, Conn., has been appointed in charge of the Pueblo Indians in the vicinity of Albuquerque. Dr Aberle was graduated from Yale University School of Medicine in 1930 and has been engaged in research there and in Baltimore.—Dr Frank C. Diver, Springer, has been appointed health officer for the ninth New Mexico health district.

NEW YORK

Medical Society Conducts Immunization Campaign—The Medical Society of the County of Albany recently reported that a diphtheria immunization campaign carried out in 1934 in the manner of the "Detroit plan" resulted in an increase of the proportion of immunized children from 32 to 54 per cent. Features of the plan, which was worked out in cooperation with the city departments of health and education, were that physicians set aside hours during which they would give the treatments at a fee of \$1, that the health and education departments agreed not to hold clinics and that the health department would reimburse the physicians for their immunization of indigent children.

County Society Plan for Medical Care—The Medical Society of the County of Nassau announces the establishment of a Charity Public Health and Medical Hour to provide medical care, both preventive and curative, to persons unable to pay the regular charges for service. To protect the physicians from imposition, it has been decided to restrict the service to patients referred by public health or school nurses. Most of the members of the society have arranged to set aside special office hours each week during which they will render any type of care that can be given in an office at a fee of \$1 per visit. In addition to advice and treatment for those who are sick, they will also offer immunization against diphtheria, vaccination against smallpox, examination of apparently well babies or preschool children, care of women during pregnancy, and eye examinations. If the patient is unable to pay even the reduced fee the nurse who refers him is requested

to notify the physician, and the services will be given without charge. In the case of persons on the relief rolls, the regular medical authorization from the relief bureau must be obtained. Welfare departments do not pay for the preventive services, but if persons on the welfare list desire them and are unable to pay the dollar fee, they will be treated without charge if they bring a note from the nurse explaining the circumstances.

Society News—An institute on conservation of vision arranged by the bureau of prevention of blindness of the state department of social welfare was held in Rochester, October 15-16. Among speakers were Drs Eugene R. Vernou, on "Metabolism and Nutrition in Relation to the Eyes", Harry S. Gradle, Chicago, "Prevention of Blindness," and Louis Resnick, director of industrial relations, National Society for the Prevention of Blindness, "Eye Accident Hazards at Work and at Play"—Dr Josephine B. Neal, New York, addressed the Mount Vernon Medical Society October 10, on "Diagnosis and Treatment of Acute Anterior Poliomyelitis"—Drs Cornelius Mezei, Comstock, and Edwin MacDonald Stanton Schenectady, addressed the Medical Society of Washington County, Glens Falls, October 1, on "Differential Diagnosis of the Painful Abdomen" and "A Study of What Surgery Has Really Done for Cancer of the Breast," respectively.—Dr William T. Getman, Buffalo, addressed the Geneva Academy of Medicine, October 17, on toxemias of pregnancy.—Drs Arthur J. Wallingford and John C. McClintock addressed the Medical Society of the County of Albany, Albany, October 23, on "Auto Blood Transfusion" and "Differential Diagnosis of Hyperthyroidism," respectively.—Dr George H. Whipple, Rochester, addressed a joint meeting of the Rochester and Syracuse academies of medicine, October 17, on "Problems in Anemia."—Dr Edward M. Livingston, New York, addressed the Medical Society of Monroe County, Rochester, October 24, on "Abdominal Surgical Diagnosis."

New York City

New Cancer Unit in Preparation—A building formerly used as the children's section of the Kings County Hospital is being reconditioned by the municipal department of hospitals for use as a special cancer center. The new institution, which will take the place of the Brooklyn Cancer Institute now at Cumberland Hospital, will have an initial capacity of seventy-five or eighty beds with the prospect of 100 or more later. Dr Sigismund S. Goldwater, commissioner of hospitals, has appointed a committee to advise him on the selection of a staff. Dr John E. Jennings, chairman of the Brooklyn Cancer Committee, is chairman and members include Drs George A. Merrill, Mark L. Fleming, Ira I. Kaplan, Edward M. Bernecker, James Ewing and William Harris.

Flower and Fifth Avenue Hospitals Merge—Affiliation of the Fifth Avenue Hospital with Flower Hospital was announced October 17, after a meeting of the trustees of the former. The two institutions will be combined in the building of the Fifth Avenue Hospital, but for the present they will operate independently, though along parallel lines. Dr Claude A. Burrett, dean and professor of surgery, New York Homeopathic Medical College and Flower Hospital, has been named director of the hospitals. Mr David Q. Hammond, superintendent of Flower Hospital, will be superintendent. Flower Hospital, which has a capacity of 197 beds, was founded forty-six years ago, Fifth Avenue, with 300 beds, was organized in 1922 as a consolidation of the Laura Franklin Free Hospital for Children and Hahnemann Hospital. The present buildings of Flower Hospital will be utilized by the medical college.

Society News—Drs Arnold R. Rich, Baltimore, and James Alexander Miller addressed the Medical Society of the County of New York, October 28, on "Immunity in Tuberculosis" and "The Evolution of Pulmonary Tuberculosis," respectively.—Drs Charles C. Higgins, Cleveland, and James Dellinger Barney, Boston, addressed the New York Society of the American Urological Association, October 23, on "Experimental Production and Solution of Urinary Calculi" and "The Relation of the Parathyroid Glands to Urinary Calculi," respectively.—A symposium on the treatment of chronic constipation was presented before the National Society for the Advancement of Gastro-Enterology, October 23, by Drs Albert J. Sullivan, New Haven, Conn., Walter A. Bastedo, Michael G. Mulinos and Richard Kovacs.—Dr. Mark Gerstle Jr, San Francisco, addressed the New York Neurological Society, October 1, on "Congenital Stenosis and Atresia of the Aqueduct of Sylvius." Speakers at a meeting of the society with the section of neurology and psychiatry of the New York Academy of Medicine, November 12, will be Drs Milton M. Ables on "Nervous System Trichiniasis", Ira Cohen, "Posterior Fossa Tumors Without Papilledema," and Charles A. Elsberg, "The Value of Quantitative Olfactory Tests for the Localization of Supratentorial Lesions."

torial Tumors of the Brain"—Dr Thurston Scott Welton addressed the Medical Society of the County of Queens, October 29, on "Common Errors in the Practice of Obstetrics and Gynecology"

OHIO

Institute on Cardiovascular Disease—The Heart Council of Greater Cincinnati and the Cincinnati Academy of Medicine will hold their third annual Institute on Cardiovascular Disease at the Cincinnati General Hospital, November 12. Dr Paul D White, Boston, will give a clinical lecture with patients at the morning session and, after a luncheon at the University of Cincinnati College of Medicine, Dr Hugo Roesler, associate professor of radiology, Temple University School of Medicine, Philadelphia, will give a fluoroscopic demonstration of cardiovascular disorders. In the evening Dr Roesler will address the academy of medicine on "Recent Studies in the Treatment of Cardiovascular Diseases"

OREGON

Annual Registration Due December 1—All practitioners of medicine and surgery holding licenses to practice in Oregon are required by law to register annually on or before December 1, with the secretary of the Board of Medical Examiners, and at that time to pay a fee of \$5. A practitioner failing to register is subject to a penalty of \$1 for each thirty days, or part thereof, of default and his failure to reregister within ninety days after December 1 is a misdemeanor

PENNSYLVANIA

Personal—Dr Samuel J Dickey, who has been on the staff of the state department of health for about ten years, has been appointed medical director of Chester County.—Dr Howard F Straub, Selinsgrove, has been named medical director of Snyder County, succeeding Dr Russell W Johnston

Philadelphia

Society News—The Philadelphia County Medical Society will observe Pennsylvania State Health Day, November 13, by a special program with the following speakers: Drs Clarence A Patten, "The Effect of Noise on the Human Organism and Its Treatment", Joseph A Daly, "Apathy of the Medical Profession Toward Public Health Legislation", and Chauncey L Palmer, Pittsburgh, "Legislative Problems Affecting the Medical Profession and the Public."—Brig Gen Matthew A Delaney, Carlisle Barracks, addressed the section on public health and industrial medicine of the Philadelphia College of Physicians, November 8, on "The Army Officer and the Public Health."—The Philadelphia Allergy Society held its first annual meeting, October 30, with the following speakers, among others: Drs Philip S Stout, "Ionization of Nasal Mucous Membranes for Allergic Manifestations", Abraham Trasoff, "Value of Air-Conditioned Rooms in the Treatment of Seasonal and Perennial Asthma," and Louis Tuft and Isaac George Blumstein, "Incidence and Importance of Tree Pollen Hay Fever with Particular Reference to Philadelphia and Vicinity"

RHODE ISLAND

Society News—Drs Gordon Berry Worcester, Mass, and Adolph W Eckstein, Providence, addressed the Providence Medical Association, October 7, on "Our Deaf Children and How We Are Caring for Them" and "Emergency Treatment and Transportation of Fractures," respectively. A panel session on diabetic surgery was held, November 4. Dr Alexander M Burgess, Providence, was chairman and the speakers were Drs. Leland S McKittrick, Howard F Root and Shields Warren, all of Boston, and Lucius C Kingman, Providence.

VERMONT

State Medical Election—Dr Lester W Burbank, Cabot, was elected president of the Vermont State Medical Society at the annual meeting in October. Other officers are Drs John Trotter Jr, Bennington, vice president and William G Ricker, St Johnsbury, reelected secretary. Next year's meeting will be in Burlington. Dr Burbank was graduated from the University of Vermont School of Medicine in 1896.

WASHINGTON

Health at Spokane—Telegraphic reports to the U S Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended October 26 indicate that the highest mortality rate (177) appears for Spokane and that the rate for the group of cities as a whole was 106

The mortality rate for Spokane for the corresponding week of 1934 was 12 and that for the group of cities, 106. The annual rate for the eighty-six cities was 11.4 for the forty-three weeks of 1935, as against a rate of 11.3 for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

PHILIPPINE ISLANDS

Bill to Release Lepers Vetoed—Governor General Frank Murphy vetoed a bill adopted by both houses of the Philippine legislature, by which lepers would have been released from segregation in colonies. Governor Murphy held that, although the bill had a worthy purpose and certain meritorious features, it would create a situation menacing to the public health. Its first effect would be to return large numbers of lepers to their homes, where it would be difficult to prevent transmission of their infection to children now protected, he pointed out in his veto message. Furthermore, release of many of the lepers now maintained by the government would precipitate a serious social and economic problem. Governor Murphy said that he would appoint a commission to study the entire problem of leprosy control with a view to improving present methods.

PUERTO RICO

Society News—The annual meeting of the Puerto Rico Medical Association for the district of Guayama was held at Central Aguirre recently. Dr Antonio Navas-Torres, president of the district association, presided and papers were presented by the following physicians: Drs Ramon M Suarez, Esteban Garcia Cabrera, Oscar G Costa-Mandry and George C Payne, all of San Juan, Rafael Lopez Nussa, Ponce, and Jose B Gotay, Adjuntas.

GENERAL

Placement Bureau for Physicians—The American Association of School Physicians recently established a placement bureau to aid physicians meeting its qualifications to find desirable positions, and to recommend to educational institutions medical inspectors qualified to organize and administer an efficient program of health service and health education. Information may be obtained from Dr Arville O DeWeese, formerly president of the association and director of health and physical education, Kent State College, Kent, Ohio, who is director of the bureau.

Dr Houssay to Visit the United States—Dr Bernardo Alberto Houssay, professor of physiology at the National University of Buenos Aires, Argentina, will arrive in New York, November 18, for a tour of the United States, during which he will lecture in several cities on endocrinology. He will visit Boston, Cleveland, San Francisco and other California cities: Chicago, Toronto, Montreal, Washington, Baltimore, Philadelphia, New Haven and Rochester, Minn, leaving New York January 25. Dr Houssay left Buenos Aires September 8 and spent a month in Paris before visiting the United States.

Fellowship for Women Physicians—The Women's Medical Association of New York City offers the Mary Putnam Jacoby Fellowship of \$1,000 for one year for graduate work abroad in medical sciences. The fellowship is open to any woman graduate of an approved medical school. Each candidate must be endorsed by the head of the department in which she has done her previous work. The recipient must give full time to the research. Applications for 1936-1937 should be filed with the chairman of the committee by April 1, 1936, and must be accompanied by statements as to health, educational qualifications and proposed problem for investigation. A report for publication will be required at the completion of the fellowship. Dr Annie S Daniel, 105 East Fifteenth Street, New York is chairman of the committee.

New Editor of Journal of Syphilis—With the October issue, the *American Journal of Syphilis and Neurology* passed under new editorial management. With the first issue of the new volume to appear in January 1936 its title will become the *American Journal of Syphilis, Gonorrhea and Venereal Diseases*, and there will be six issues instead of four yearly, published at bimonthly rather than quarterly intervals. The omission of the words "and Neurology" from the title does not mean that the journal ceases to be interested in the neurologic aspects of syphilis, it was stated. The organization of the American Neisserian Medical Society seems to guarantee the widening of the journal's scope to include not only gonorrhea, but also chancroid, granuloma inguinale, lymphogranuloma

inguinale and other similar conditions, it was said Dr Joseph Earle Moore, Baltimore, is the new editor

Bequests and Donations—The following bequests and donations have recently been announced

Fifth Avenue Hospital and Woman's Hospital New York, \$59,000 and \$20,000 respectively Monmouth Hospital, Long Branch, N. J. \$10,000 by the will of the late Mrs. Mary T. Sheldon The residuary estate of undetermined value goes to the Society of the New York Hospital, New York

Mount Sinai Hospital New York named residuary legatee and received remainder and contingent interests in \$830,000 under the will of Edward J. King

Mount Sinai Hospital New York \$1,300,000 by the will of Bertha Weinman St. Vincent's and Presbyterian hospitals, New York, \$2,500 each

ankenau Hospital, Philadelphia \$1,000 by the will of Pauline Berges Episcopal Hospital of Philadelphia \$30,000 by the will of Mrs. Annie B. Moore

New York Eye and Ear Infirmary \$5,000 by the will of Miss Gertrude S. Thomas Morristown, N. J. who bequeathed also half her residuary estate to the New York Post Graduate Medical School and Hospital

Ashland General Hospital, Ashland, Wis. \$40,000 by the will of the late Frank Drummond

Mortality of the Blind—A survey of causes of death among blind persons, recently completed by the Metropolitan Life Insurance Company, reveals that the mortality is distinctly higher among these persons than among normal persons. The study was made over a ten year period and involved 11,716 industrial policyholders who were granted disability allowances because of blindness incurred subsequent to the issue of their policies. Diseases which themselves cause blindness were responsible for this high rate rather than accidents. The causes of death that showed the highest mortalities were syphilis and diabetes. The death rates for these were respectively more than twelve and seven times those of normal persons. Of the entire group, accidents were responsible for the blindness of 6 per cent. In the majority of cases, the blindness was reported as due to specific diseases of the eye, but study of the causes of death showed that the facts were not accurately reported in many cases and that the blindness was due to a general disease. The most frequently reported cause of blindness was cataract, second, glaucoma, and third, atrophy of the optic nerve.

Association of American Medical Colleges—At the annual meeting of the Association of American Medical Colleges in Toronto, October 28-30 a symposium on the basic sciences in relation to the physician's training was presented by Dr. Jacob Parsons Schaeffer, Philadelphia, Brenton R. Lutz, Ph.D., Boston, and Robert K. Cannan, D.Sc., New York. Harry N. Holmes, Ph.D., Oberlin College, Oberlin, Ohio. Edward C. Schneider, Sc.D., Wesleyan University, Middletown, Conn. In another symposium on undergraduate instruction, members of the faculty of the University of Toronto participated as follows: Drs. Duncan A. L. Graham, medicine, Alan G. Brown, pediatrics, William E. Gallie, surgery, John G. Fitzgerald, hygiene and preventive medicine, Clarence B. Farrar and Edward A. Bott, B.A., psychology and psychiatry. The program also included discussions of the teaching of pharmacology and therapeutics and the internship as a problem in medical education. Dr. Stanley Ryerson, Toronto was chosen president-elect of the association and Dr. John H. Wyckoff, New York, was installed as president. Dr. Russell H. Oppenheimer, Atlanta, Ga., was elected vice president, Dr. Arthur C. Bachmeyer, Chicago, treasurer, and Dr. Fred C. Zapffe, Chicago, was reelected secretary. The next meeting will be held in Atlanta, Ga., Oct. 27-29, 1936.

Southern Medical Association—The twenty-ninth annual meeting of the Southern Medical Association will be held in St. Louis, November 19-22, at the Municipal Auditorium. Tuesday will be "St. Louis Day," when all the programs will be presented by St. Louis physicians. Wednesday morning there will be four sessions meeting concurrently representing all specialties. At these sessions speakers will include, among others: Dr. James Tate Mason, Seattle, President-Elect of the American Medical Association, who will discuss "Some Modifications of the Technic in Surgery of the Common Duct," and Dr. James S. McLester, Birmingham, President, American Medical Association, "The Emotional Factor in Clinical Problems." Fifteen sections will hold meetings, and organizations that will hold annual meetings in conjunction with the association include: American Society of Tropical Medicine and the National Malaria Committee, regional sections of the American Public Health Association, the American Academy of Pediatrics, the Society for Experimental Biology and Medicine, Southern Association of Anesthetists, Mid-Western Association of Anesthetists and the International Anesthesia Research Society will also convene during the week. The annual golf tournament will be at Meadow Brook Country Club Tuesday, Wednesday and Thursday, the tenth annual trap shooting tournament Wednesday afternoon. Dr. H. Marshall Taylor, Jacksonville, Fla., is president of the association.

Psychiatrists Warn Statesmen of War Psychosis—An analysis of the war spirit and a warning against the development of a "war psychosis" are set forth in a document recently drawn up by more than 300 psychiatrists from many countries and sent to leading statesmen of the world under the auspices of a "committee for war prophylaxis" of the Netherlands Medical Association. Declaring that the science of psychiatry has advanced to a point at which psychiatrists are able to distinguish between real, pretended and unconscious motives the statement asserts that arguments for war advanced by well known statesmen camouflage a primitive craving for power. In spite of the conscious individual aversion to war, "civilized twentieth century man still possesses strong, fierce and destructive instincts which have not been sublimated or only partly so and which break loose as soon as the community to which he belongs feels itself threatened by danger," it continues. Peoples under the influence of the warlike spirit in their leaders may become neurotic and may be carried away by hallucinations and delusions, thus involving themselves in adventures perilous to their own and other nations' safety, the document explains. It urges the statesmen to arouse the peoples to a realization of the intrigues of the international traffic in arms and to a sense of collective self preservation, the popular ideas of war as they find expression in dress uniforms and military display are no longer in keeping with the realities of war itself. The psychiatrists express the belief that international organization is sufficiently advanced to enable statesmen to prevent war by concerted action, but they urge that if any statesmen think that the apparatus to ensure peace is not strong enough they should devote to this purpose as much energy and as much money as is now being expended on armaments. Among the signers of the document are Drs. Charles Macfie Campbell, Boston, Alfred Gordon, Philadelphia and Aaron J. Rosanoff, Los Angeles.

Government Services

Award of the Wellcome Prize

Major Leon A. Fox, Medical Corps, U. S. Army, stationed at Baltimore has been awarded the Sir Henry S. Wellcome Prize and Medal for 1935 for his work on field chlorination of water, Science reports. The award, a gold medal and a prize of \$500, is made by the Association of Military Surgeons.

Course in Aviation Medicine

A course in aviation medicine for medical reserve officers was started at Cornell University Medical School, New York, September 1, to continue for six months under the direction of Lieut. Comdr. Julius F. Neuberger, medical corps, U. S. Navy. The practical work of the course is being given by Lieutenant Commander Neuberger at the headquarters of the third naval district, where all candidates for aviation in the U. S. Navy are examined. Lectures are being given by officers of the medical reserve corps who are professors or assistant professors connected with various institutions in New York. Recent lecturers are:

Lieut. Comdr. Aaron E. Parsonnet, Newer Methods in Electrocardiography
Lieut. Comdr. Philip R. Lehrman, The Structure of Neurosis
Lieut. Comdr. Page O. Northington, Function of the Internal Ear
Dr. John D. Reichard, surgeon U. S. Public Health Service, Signs and Manifestations of Organic and Functional Diseases of the Nervous System
Lieut. Comdr. Albert S. Hyman, Pathology of the Heart

Examination for Public Health Consultants

The U. S. Civil Service Commission announces competitive examinations for various grades of public health consultants and for public health research assistant to fill vacancies in the Children's Bureau, Department of Labor, and the U. S. Public Health Service both in Washington and in the field. Optional subjects for the public health consultants are maternal and child health, general public health practice and orthopedics. For the research assistant the specialty must be maternal and child health. Entrance salaries for the consultant positions range from \$2,600 to \$4,600 a year and the entrance salary for the research assistant is \$2,000. Certain education and experience are required. Information may be obtained from the civil service board of examiners at the postoffice or customhouse of any city that has a first or second class postoffice or from the commission at Washington. Applications must be on file not later than November 25.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct 12, 1935

Too Much Administrative Work

In his presidential address to the Society of Medical Officers of Health, Dr W G Savage said that when the public health service of today was compared with that before the war, it was found that on the whole the work was less interesting and less stimulating. It was likely to become even less so if developments took place along the lines which experience suggested as possible. The tendency was for the senior men, those who had become heads of their departments, to become more and more purely administrators. It was a commonplace that the function of public health was preventive. While they had their feet planted on the broad road of preventive medicine, they were being induced and officially directed to squander their energies by incursions into side roads which, while occasionally profitable, prevented progress to their real goal being other than deplorably slow. One of the difficulties of putting preventive medicine into practice was its necessary relation to the inflexibility of the law. Enmeshment in mere administration and close relation to rigid legal requirements were definite obstacles.

The special training and wide experience of health officers entitled them, and should compel them, to survey the whole field of preventive medicine and to exert their influence in making the practice of public health more scientific in outlook and more effective in operation. In some way or other they must shed a good deal of the present burden of pure administration to enable them to carry out their life work. This could be done only by the use of a new and different kind of administrator, responsible to but strictly subordinate to the head.

With regard to junior members of the service, he had sympathy with certain grounds of dissatisfaction. In the main their duties were confined to clinical work, chiefly school medical inspection and attendances at maternity and child welfare clinics. In the large clinics and in most counties the work of newly appointed officers was almost entirely dissociated from preventive medicine proper and without any opportunity to take part in its broader activities. This work had to be carried on, but he hoped that he would see extensive modifications. It was one of the valid arguments for the transfer of much of this work to the private physician that it would tend to shorten the long road of the health officer from obtaining his diploma to his appointment as health officer. An alternative possibility was to alter materially the basis of some of the work, especially school medical inspection and maternity and child welfare work. With adequately trained, competent infant visitors, most of the work should be done by them in the homes, and the health officer could restrict his activities to selected cases.

The Smoke Evil

At a meeting of the Edinburgh and East Scotland sections of the Society of Chemical Industry, John du Plessis Langrishe, lecturer in public health at the University of Edinburgh, complained that while meticulous care was bestowed on the control of the purity of food and water, little was exercised over the purity of air. Statistics showed a close relation between death rates and atmospheric conditions. The number of deaths from pulmonary and cardiac diseases increased in direct proportion to an increase in the intensity and duration of smoke fogs. At the extremes of life these effects were most marked. The lungs of city dwellers became blackened like those of a coal miner. Increased tuberculosis of the lungs was produced. There was also good ground for believing that the

tarry matter of smoke was at least partly responsible for the increase of cancer of the lung. Another evil was obstruction of solar radiation. On a still day Manchester received only 55 per cent of the daylight received by Temperley, only six miles south. On a foggy day it received 5 per cent. The ultraviolet rays were affected to an even greater extent. Manchester received only 26.9 per cent of the radiation enjoyed by Hale, nine miles away. City dwellers were stunted because of the reduced ultraviolet radiations being insufficient to produce assimilation of calcium and phosphorus. Rickets and anemia resulted. Psychologic ill effects were interrelated with the physiologic. Smoke gloom lessened the potential reserve, working power and well being of the individual. It had been shown that the pasturage of the industrial towns in Lancashire, which at one time supported two cows to the acre, could now carry only one cow to three acres, while the milk was deficient in calcium. Garden produce also was affected by the smoke. Lettuce grown under such conditions gave only 31 per cent of the natural yield and was deficient in quality.

In the discussion Mr A M Ritchie, chief sanitary inspector of Edinburgh, said that Edward I believed that smoke affected his health. He issued a proclamation forbidding the use of coal while parliament was sitting and it was related that a man was hanged in the fourteenth century for causing a smoke nuisance. But even this penalty was not effective, as shown by the constant reference to the evils of smoke in the following centuries. For years the main efforts in smoke abatement had been directed to reducing factory emissions, with excellent results. But to effect any real improvement in atmospheric conditions, attention must be paid to the pollution caused by the domestic fireplace. The British people had a persistent partiality for the open fireplace. The aim of the future must be to replace the burning of raw coal by smokeless fuel.

Speaking at a York Health Week, Mr Marsh, general secretary of the National Smoke Abatement Society, said that York needed smoke abatement not only for the health of its citizens but also for its minster (the cathedral). Smoke deposits had created cavities in the stone work more than 9 inches deep. York was unfortunate in that it lay on the line of the prevailing wind from the West Riding industrial area, where the atmospheric conditions were appalling. The coal industry was striving to evolve a smokeless fuel that would make it possible to impose really effective penalties on the domestic chimney.

The Public Health

The annual report for 1934 of the chief medical officer to the Ministry of Health has just been published. It shows that even in the most distressed areas the measures taken by public authorities and the generous efforts of individuals have, so far as the usual indexes of health can be trusted, largely held in check the deleterious influences of unemployment and reduced income. But it is added, "At the same time the report gives no ground for complacency. No inquiry can accurately evaluate the grave indirect dangers to health of mind and body which prolonged unemployment involves." Last year's vital statistics are most satisfactory. The death rate was 11.8 per thousand of population against 12.3 in 1931, 12 in 1932 and 12.3 in 1933. The lowest rate yet recorded was 11.4 in 1930, in 1928 the rate was 11.7 in 1926, 11.6. The rates of infant mortality are equally satisfactory. The rate last year was the lowest ever recorded, 59 deaths of children under 1 year of age per thousand births. Previous rates show an almost constant decline: 1926, 70; 1928, 65; 1930, 60; 1931, 66; 1932, 65; 1933, 64. The rate from 1911 to 1915 was 110, from 1916 to 1920, 90; from 1921 to 1925, 76. It is therefore obvious that young children are being better fed and cared for than ever before, in spite of world conditions, of unemployment and of a change in the age constitution of the population, which places on the shoulders of young fathers a heavier burden of care for aged

relatives The birth rate, which has been steadily falling since 1880 (from 35.4 per thousand to 14.4 in 1933) rose slightly, to 14.8

THE CAUSES OF DEATH

Among the causes of death among persons between 15 and 65 years of age the following are the most important

| | Proportion per 1,000 |
|---|-------------------------|
| 1 Diseases of the heart and circulation | 207 |
| 2 Cancer | 168 |
| 3 All forms of tuberculosis | 139 |
| 4 Bronchitis pneumonia and similar conditions | 94 |
| 5 Diseases of the nervous system | 78 |

There was during 1934 a marked fall in the incidence of pneumonic diseases, cerebrospinal fever, typhoid, smallpox and acute poliomyelitis The high incidence of scarlet fever and diphtheria that characterized the autumn of 1933 persisted into 1934 Scarlet fever has for many years been of a mild type, but a grave form of diphtheria is again in evidence Cases of this grave form occur in some districts simultaneously with cases of a mild form in other districts The death rate from tuberculosis was the lowest ever recorded This is regarded as showing that the efforts to secure better houses and better food, especially the supplying of milk to school children, are producing lasting benefit Little progress has been made in dealing with the undiminishing maternity mortality, but study is now proceeding, and it is held that lack of antepartum care and expert help and advice are important contributory causes

A British Ambulance Service for Ethiopia

A British ambulance service is being formed for Ethiopia under the Geneva convention. It is working in consultation with the International Red Cross at Geneva The executive committee has made preliminary arrangements so far as funds privately subscribed have permitted It has secured a tentative panel of physicians, and further applications are invited An officer has been dispatched to recruit native personnel in Kenya and Uganda. The committee is represented at Addis Ababa by a missionary of thirty years' standing, who has the complete confidence of the emperor It is estimated that the complete cost of a properly equipped ambulance, consisting of one clearing station and one field hospital with seven surgeons and the necessary native dressers, including vehicles for transport and maintenance for three months, would be \$175,000 Each additional casualty clearing station would cost a further \$50,000

PARIS

(From Our Regular Correspondent)

Oct. 4, 1935

The Medical Societies of Paris

The list of the meeting places, dates of first meetings and days on which each medical society of Paris holds its regular sessions during the coming winter has just appeared (September 28) There are forty societies in Paris, representing every special field of medicine. Admission to the majority is granted on submission of qualifications, based on hospital and faculty positions, previous publications in a specialty and the reading of an inaugural thesis based on personal clinical experience or research work.

At least half of the forty societies publish their proceedings in a weekly or monthly bulletin Many of the papers read at these meetings appear only in such a bulletin. Often the visitor is astonished to note that fifteen or twenty communications are announced for a given meeting and one wonders how such a large number can be read in a period of one or two hours At one of the most important weekly meetings, that of the Société de biologie, only abstracts of research work are permitted to be read As often occurs in continental medical societies, conversation does not cease in the audience, and the foreign visitor is astonished The publication of the papers in abstract, within

a week after the meeting, allows the audience to postpone reading the papers until they are published This system of issue of complete reports of the society proceedings is more highly developed in Paris than in any other continental medical center

Societies such as the Société nationale de chirurgie, Société de biologie, Société médicale des hôpitaux, Académie de médecine and Académie des sciences have a fixed day every week for meetings The majority of the other societies meet once a month, and a few meet twice a month Members of the societies sit in an enclosure and visitors sit in a separate part of the auditorium

It is unfortunate that the proceedings of many of the societies are published only in the corresponding bulletins, because much of the material is thus rendered inaccessible to those who wish to keep abreast of the splendid work being done in Paris Only longer articles are published in the journals accessible to the medical profession in foreign countries

The Employers' View of Social Insurance

An article in *l'Information*, a financial daily of Paris, September 26, cites a letter written by Henri Garnier, president of the Association of the Chambers of Commerce of France, to Mr Frossard, secretary of labor, whose department administers the social insurance law The essential features of the letter are as follows

"The Chambers of Commerce have frequently protested the surcharge on national economy of the social insurance law and have been pleased to see that some radical reforms are being introduced There is urgent need of a reduction in the premiums paid by the assured and his or her employers Simplification of the application of the law is also urgently needed. Recovery from the present economic crisis affecting France depends more than ever on lightening the burden that is at present checking business and financial circles Some headway in this direction has been made by the government in a cut in salaries of officials, by suppression of certain taxes, and by similar measures A reform of the social insurance law should have the same objective. It would seem wise to suspend or make optional the application of this law until better times come back.

"Extension of the law to those who work at home should by no means be considered at present In the past four years, more than 17 billion francs (nearly 700 million dollars) has been sequestered from the national economy and this must be regarded as playing an important part in the present crisis

"It is futile to give salaried workers the illusion of old-age pensions in the distant future and at the same time take money away from them by ruining the establishments where they are employed, resulting in unemployment and thus making it difficult to earn a living at the present time."

Should a Physician Be Compelled to Retire at a Certain Age?

In the August 25 *Concours médical*, Noir quotes a letter sent out by the executive committee of the "University Statistical Bureau" stating that "a resolution had been voted unanimously to the effect that compulsory retirement from all professional or technical work should be demanded, provided a general pension plan could be elaborated. The attention of the French medical profession should be called to such a movement and their aid in its accomplishment asked for"

Noir states that a demand has been frequently made to have every physician retire at the age of 60 Many practitioners would be happy to comply, having earned a rest after many years of active work The majority, however, still have heavy financial burdens to bear at the age of 60, such as children whose education has not been completed or who cannot earn their own living Even if the two latter conditions have been fulfilled, a retired physician at 60 could not ask his children to support him.

Siredey, president of the French Academy of Medicine, is quoted as saying that, under present conditions, an age limit is not feasible for the liberal professions, especially for medical

men who are obliged to practice during their entire life. From the legal point of view it would be impossible to state in granting a diploma that its possessor might practice only during a certain number of years. Members of the faculties of medical schools in France, military surgeons and those connected with other public medical institutions are provided with a pension at the age of retirement. This is not true of the attending staffs of free hospitals and other charitable organizations. In order to provide a pension equivalent to two thirds of what a physician had earned annually in the six years prior to retirement at sixty, it would be necessary for him to pay premiums during a fixed number of years of active practice. Statistics of such old-age pension associations in France show that comparatively few physicians are able or at least are far sighted enough to avail themselves of such insurance. In the case of government officials, 5 per cent of their salaries is deducted to pay for pensions on retirement. One cannot compare a physician to such a government official. The only solution would be for every medical man to become a salaried officer of the state, and this is a condition hanging over the heads of the profession in France.

BERLIN

(From Our Regular Correspondent)

Sept 9, 1935

Compulsory Attendance on Graduate Medical Courses

The federal fuhrer of physicians has now announced the rules that are to govern compulsory attendance on graduate medical courses. The administration of this obligatory instruction has been entrusted to the provincial leaders of the *Kassenärztliche Vereinigung Deutschlands*, who will designate the physicians who are to be summoned to take the various courses, will distribute the physicians among the various courses, and will supervise the conducting of the courses. The system of graduate instruction at present affects the Aryan general practitioners located in places of less than 100,000 population. The physicians in larger cities, and the specialists, will be brought into the system later, under different regulations. According to the rules, every physician in a place with fewer than 100,000 inhabitants must take a graduate course at a hospital every five years during the period from April to November. Each course will continue for three weeks. As a rule, physicians chosen to take given courses will be notified at least two months in advance. Physicians will be assigned to hospitals or cities with which they ordinarily have no contacts, the idea being that the physician will be freer to act with relation to the hospital director and to the patients. An endeavor will be made to afford the participants an opportunity for training in branches in which they feel themselves deficient. Internal medicine will be given the chief emphasis, but participants will be allowed to look around in other departments.

As a rule, practitioners will substitute for one another during the months in which certain colleagues are participating in these graduate courses, but in some instances "assistant physicians" in hospitals will be permitted to serve as *locum tenentes*. Such an arrangement may be frequently feasible owing to the fact that young physicians must, according to the new requirements, serve for three months in a country practice before they are admitted to panel practice. The expenses connected with the appointment of a *locum tenens* must be borne by the participant in the graduate courses, in addition he must pay 2.50 marks (\$1) a day for his maintenance in the hospital.

The graduate instruction will be organized as follows. Physicians taking the courses will be distributed in small groups among the various hospitals, in which they will obtain board and room. The participants in the graduate courses will each be given a number of patients to care for, with the cooperation of the chief physician. They will not, however, be strictly bound by the service hours, as is the assistant physician," but

will have an opportunity to inspect other departments and to do such work as seems most profitable to them. Importance will be attached to participation in pathologic births. In addition to the graduate training at the sick-bed, there will be clinical lectures and practical drills, together with presentation of patients, to which all the participants in the city will be summoned. Exact records will be kept of the attendance at lectures, and physicians will receive certificates as evidence of their participation in the courses. From 9 to 1 the work in the various hospital services will be accomplished, and afternoons from three to four hours will be devoted to lectures in the different fields of medicine, according to a definite schedule. For the afternoon lectures a long list of subjects that seem important has been chosen.

Diphtheria in Children's Homes

In consequence of continual outbreaks in various regions, diphtheria receives considerable attention, especially where children are found in homes conducted by the welfare societies. The minister of the interior has ordered that in such homes only persons who are healthy and are not carriers of diphtheria bacilli shall be employed or sheltered. Evidence of the health of all occupants of the homes must be furnished through a medical or bacteriologic examination. Every new applicant for employment in such a home must present a medical certificate which guarantees that the examinee is free from diphtheria bacilli. Likewise, children and juveniles who are about to be admitted to such homes must be examined before starting on their journey, to exclude carriers of diphtheria bacilli. Before children may be sent from regions in which there is a high incidence of diphtheria, the consent of the local bureau of health must be secured, to obviate the danger of transmission of the disease to the homes.

Medical Care of Needy Patients

Heretofore the medical care of charity patients in the German reich has been anything but uniform. The diverse local agreements between the physicians and the communes have led frequently to misunderstandings. Uniform regulations have now been adopted. The chief objectives that determined the nature of the regulations were the creation of an adequate and satisfactory system of medical care of needy patients, the introduction of an economical method of furnishing medicines and sanitary supplies that would be in keeping with the general principles of welfare work, and the substitution when feasible of domiciliary care for hospital treatment.

All panel physicians within the limits of the local welfare league will be admitted to welfare practice. The needy persons who come under the jurisdiction of a given welfare league have the right to choose their physician from among the physicians affiliated with that league, provided they have secured a so-called treatment certificate. Physicians admitted to welfare practice are under obligations to treat all needy applicants (provided with a certificate) during their office hours or, if necessary, in their homes. The scope of the treatment comprises most forms of medical aid, including night service. Dental treatment is not included. Permits for admittance to a hospital require special authorization and are issued by the welfare league. Hospital care is to be authorized only when an operation is involved that is not commonly performed outside an institution or when adequate treatment can be given only in a hospital. Strict economy must be exercised in the prescribing of medicines. Proprietary foods and tonics, for example, must not be prescribed, and "patent remedies" may be prescribed only when they are inexpensive. The welfare league may, if it desires, specify in the treatment certificate the nature of the medicines that may be prescribed. A price schedule is set up to govern the cost of medical treatment. In the event that these regulations are violated, the cost of a remedy unlawfully

prescribed can be deducted from the physician's fee. The welfare leagues are urged to establish centers for the validation of prescriptions and also a system of medical supervisors. To supply funds for the payment of physicians' fees, the welfare league transmits monthly to the *Kassenärztliche Vereinigung Deutschlands* a certain sum based on experience tables set up as the result of somewhat complicated computations.

VIENNA

(From Our Regular Correspondent)

Oct. 2, 1935

The Society for the Promotion of an Increase of Population

The low birth rate in Austria, and particularly in Vienna, induced the *Oesterreichische Gesellschaft für Bevölkerungspolitik* to choose as the main topics for discussion at its sixteenth session "The Dearth of Children" and "The Family." Some 400 statisticians, political scientists, pediatricians and juvenile-welfare workers attended the session, to discuss the problems thereby involved. The session was held recently under the chairmanship of Prof. Dr. Reichel of Graz, who gave an address on "Healthy Posterity." He pointed out that the number of children in Austria is much less than are necessary to preserve the status quo of the population. What is needed is not only a reduction of taxes payable by the heads of large families but also the removal of various hindrances to marriage. Women should be given an opportunity to quit industrial life and return to the duties of rearing a family. The persons on whom rests the moral responsibility for childless marriages should be revealed. The government should facilitate the contraction of marriages and the rearing of families by improving the housing situation and prohibiting the use of contraceptives. The funds for such undertakings might be secured by the imposition of heavy taxes on inheritances and on bachelors. Prof. Dr. Winkler, head of the department of statistics, analyzed the results of the census of 1934 in its bearings on the present status of the family. The statistics reveal that in Austria as a whole, for the marriages contracted since 1890 the average number of children is 1.8 children to the family for first marriages (of both spouses), 2.4 children to the family for multiple marriages (two or more), and 1.7 children for broken families (due to death, separation or divorce). For Vienna the figures are: average number of children to the family, 1.3, average number of children to the family for first marriages, 1.2, average number of children to the family for multiple marriages (two or more), 1.6, and average number of children to the family for broken families, 1.3. It is an established fact that four children to the family are necessary to bring about an increase of the population and three children to preserve the status quo. Two children to the family will not suffice for the population to hold its own, for, while in a sense the number of married persons are being replaced, the considerable number of unmarried persons are not being reproduced. In Austria, since 1890, more than 25 per cent of the marriages have been childless, 25 per cent of the remainder have yielded only one child, 20 per cent have produced two children, 12 per cent three children, and 16 per cent four or more children. In Vienna 33 per cent of the marriages have been childless, 33 per cent have yielded only one child, and only 6 per cent have produced four or more children. Similar conditions are found in other large cities of the republic and likewise in the immediate vicinity of the large cities, even though a region is inhabited by an agricultural population. This downward trend, which, it is feared, has not yet touched bottom, constitutes a grave menace for Austria.

The problem of illegitimate children was discussed by Dr. Hecke. The total number of births averaged during the period 1920-1925 more than 150,000, but during the period 1930-1933

it has dropped below 100,000. The illegitimate children have decreased from 31,000 births to 25,000, although their percentage has risen from 21 to 26. Since 1926 the total number of living births in Austria has dropped to 76 per cent of the former status, while the total number of illegitimate births has dropped to 83 per cent of the former total. In Vienna the total number of living births has dropped to 53 per cent of the status of 1926, while the total number of illegitimate births has declined to 56 per cent of the former total. In the mountainous agricultural portions of the country the percentage of illegitimate births is much higher than in the cities. In Carinthia, for example, 42 per cent of the children are born out of wedlock. Likewise, the age at marriage in the rural sections is usually higher than in the cities. Thirty per cent of all the brides in 1900 were more than 30 years old, in Vienna only 22 per cent. That is the consequence of the peculiar mentality of the Alpine peasants and the unusual property rights obtaining in that region, whereby early marriage is rendered extremely difficult. The comparatively favorable position of illegitimate children among the peasants tends also to slow up the marriage zeal. Nevertheless it should be noted that the infant mortality among the illegitimate children is a third higher than among the legitimate children. The care that the latter receive is, after all, better and in the interest of public welfare an earnest endeavor should be made to facilitate marriage in rural circles.

Vital Statistics for Vienna

An interesting sidelight on the foregoing report is furnished by the following statistics, issued by the Vienna board of health as of June 1935. In that month 931 living births were recorded in Vienna, 751 of which were legitimate and 180 illegitimate (barely 20 per cent). Only 102 births took place at the home of the mother, the remaining 829 births occurred in hospitals or other maternity institutions. For that month eighteen stillbirths were reported. The deaths for that month numbered 45, 34 infants having died in the first month of life and 11 in the second month. The total mortality for the month was 1,900, in 377 cases organic heart disease was the cause of death, 315 persons died from cancer, 169 from respiratory tuberculosis, 126 from pneumonia and pleuritis, 99 from arteriosclerosis, 98 from hemorrhagia cerebri, 35 from senile weakness, and 27 from epidemic disease. One thousand and ninety-three of the deceased were more than 60 years old, 75 persons committed suicide. There were 1,739 marriages.

Treatment of Uncontrollable Hiccup

Uncontrollable singultus, the extremely tormenting and also dangerous disorder, which occurs occasionally as a postoperative complication, was discussed by Dr. H. Körbl at one of the recent sessions of the Vienna Surgical Society. He presented a patient who, on the third day after a cholecystectomy, developed an uncontrollable singultus. It was assumed that pressure of the retractor on the diaphragm during the operation had precipitated the disorder. An endeavor was made to control the singultus by the induction of vomiting, by sneezing, by stomach lavage, by the induction with drugs of sleep, by pressure on the diaphragm, and by bilateral blocking of the phrenic nerve but without result. As the condition had lasted ten days and the ingestion of food was prevented by uninterrupted hiccup, infusions of a mixture of sugar and sodium chloride were given. On the basis of the observation that carbon dioxide has a stimulating effect on the respiratory center during inspiration and produces normal rhythmic contractions of the diaphragm, an attempt was made to overcome the impulse toward abnormal contractions of the diaphragm by allowing the patient to breathe carbon dioxide. The effect was good. The singultus ceased with the first inspirations—at first for a short time, and then, on repeated application of the carbon dioxide, for increasingly long periods, so that the patient could eat and sleep. After four days the singultus had completely disappeared.

During the discussion that followed the demonstration, the good effects of this treatment were confirmed by Lotheissen and by Starlinger. It is true that good results may be secured by medicinal treatment, for example, the administration of from ten to fifteen drops of a 10 per cent alcoholic solution of menthol in water, several times a day. It appears, however, that the carbon dioxide procedure, which was proposed by Sheldon in America in 1928, has never gained wide publicity in this country, otherwise well known surgeons would not have seen fit to divide the phrenic nerve or to remove the fourth to the sixth cervical roots. Carbon dioxide had been administered to this patient after the operation, but that did not prevent the appearance of the singultus after several days.

CAPE TOWN

(From Our Regular Correspondent)

Aug 30, 1935

The Annual Medical Congress

The twenty-ninth South African Medical Congress, the eighth to be held under the auspices of the South African Medical Association, established in 1926, opens at Graham's Town, in the Cape Province, September 30. The president is Dr J M Beyers of Somerset East, a general practitioner, South African born and educated at Edinburgh. The chief discussion will center round the interesting question whether or not white civilization is progressing or deteriorating in South Africa. Various replies, mostly pessimistic, have been given to this question, but heretofore there has been no opportunity to discuss the available data frankly and to consider their implications apart from political and sentimental considerations. Another subject for debate will be the social and forensic aspects of dagga (*Leonotis*) smoking. At present dagga is classed in the same category as Indian hemp, as a habit forming drug, and its use by natives is severely punished. There is a difference of opinion about its toxicity, some observers claiming that it has no stupefying properties. A more serious allegation is that many specimens of dagga impounded by the police are not specimens of dagga at all but of quite different plants. A third subject for discussion will be the methods of fighting cancer. Much publicity has of late been given to the alleged increase of cancer in this country, but recent statistics do not show that this increase is out of proportion to the average increase of age. A paper by Dr Berman on the incidence of cancer among the Bantu tribes shows that the commonly accepted view that malignant disease is rare among non-Europeans in this country is erroneous. Dr Berman found that sarcomas were rare among natives on the Rand but that carcinomas were not uncommon. A justifiable criticism of his paper is that his statistics deal with a selected group of natives and do not apply to the native within tribal limits.

Senecio Poisoning

In 1920 Robertson and Willmot published a paper in the London *Lancet* describing what they assumed to be cases of poisoning by senecio seed. Previously several veterinarians had described symptoms similar to those mentioned in Robertson and Willmot's paper occurring in animals, mainly horses, that had fed on senecio plants. The cases in human beings came from a district where senecio was a frequent weed of the wheatlands, and the writers assumed that the seed contaminated the wheat flour. The patients, children or adolescents, suffered from abdominal distention, ascites, enlarged liver and diarrhea. The liver changes post mortem were similar to those found by Theiler in horses that had died of senecio poisoning. This year three patients, a father and two children, were admitted to the New Somerset Hospital from a 'senecio district' with a tentative diagnosis of senecio poisoning. Their symptoms resembled those of acute yellow atrophy of the liver. At the postmortem examination hemorrhagic atrophy of the

liver, portal venous obstruction, ascites with effusion into all serous sacs, peritonitis and collapse of the lung were found. The necropsy showed the liver when cut to have an appearance like that in chronic passive congestion, with the liver substance gone and the spaces filled up with blood. Frozen sections showed that the liver cells had disappeared in the center of the lobules and round the sublobular hepatic veins, these areas being completely hemorrhagic, while in some areas this destruction of liver cells had been followed by fibrosis, so that there was a developing cirrhosis, irregular in distribution and not definitely portal. The description reminds one of the subacute hepatic cirrhosis in young adolescents reported by French writers and said to be familial. While the senecio etiology is generally accepted here, there are several arguments against it. One is that the seed of senecio is a feathery pappus, not at all likely to contaminate wheat, as the slightest breath of wind wafts it away, another is that the specific poison of senecio—senecifoline—is not found in the seeds but in the vascular bundles of the young plant before flowering. It is easy to understand how grazing animals, eating young senecio plants, may be poisoned, but it is difficult to postulate senecio poisoning on the assumption that it is caused by the eating of bread baked from flour containing only a small proportion of senecio seed. It is to be hoped that the condition will be made the subject of special investigation.

Vital Statistics

The vital statistics published by the census office range over a period of twenty-three years, from union in 1910 to 1933. They concern the European population almost exclusively and are based on the census returns. As such they must be accepted with caution but nevertheless are interesting. They show, for instance, that in South Africa, as elsewhere, the average expectancy of life has steadily increased, that on the whole the mortality and birth rates are satisfactory, while the illegitimate birth rate is lower than in most civilized countries, with the exception of Holland and the United States, that the suicide rate is increasing and that juvenile marriages among the Europeans are still common. The disease with the highest number of fatalities is heart disease, even when rheumatic heart disorders are excluded, the second is pneumonia, the third cancer and the fourth tuberculosis. Cancer kills only ninety-three South Africans (Europeans) out of every 100,000, and these are all over 45 years of age. As an economic disease it is therefore not comparable to malaria, which, although it kills a far smaller proportion, incapacitates an immeasurably greater number and is of far greater economic and communal importance than malignant disease.

Kala-Azar

No case of kala-azar has as yet been reported from South Africa. A recent editorial in the *South African Medical Journal* suggests that the cases of enlarged spleen found in children in the coastal areas in which no definite cause can be ascertained may be cases of leishmaniasis, similar in type to those reported from the Mediterranean littoral and from Brazil. So far, however, no confirmation of this suggestion has been obtained, although spleen and liver puncture and examination of the bone marrow are now routine procedures in hospital cases in which kala-azar is suspected. From Bechuanaland has been reported the presence of trypanosomiasis among natives in the Ngami area to the north. Prompt steps have been taken by the protectorate authorities to deal with the disease and to limit its incidence to a small strip of marshy land. The importance to the union of trypanosomiasis in the Bechuanaland area is the fact that the mines draw some of their natives from this part and that if trypanosomiasis is once established in our native territories it would be almost impossible to eradicate it.

Marriages

THEODORE LAWRENCE GREENWALD, Orange, N J, to Miss Beulah Adele Durham of Maplewood, August 3

MARY C FOCHTMAN, Cozad, Neb, to Mr Laurence McNerthney of Tacoma, Wash, August 24

VICTOR A SIMIELE, Logan, Ohio, to Miss Mary M Foley of Columbus at Rochester, Minn, August 10

LAWRENCE PAUL JONES, North Emporia, Va, to Miss Emily Layfield Kitchin of Courtland, August 19

ALBERT D ROBERTS to Miss Lucille Gordon, both of Fort Worth, Texas, at Stephenville, August 8

THOMAS NORRIS GRAHAM, New York, to Miss Anne Tusten at Beverly Hills, Calif, August 21

JEFFERSON NEAFIE RICHARDSON to Miss Margaret Allen Pole, both of Philadelphia, July 24

WILLIAM K STROTHER JR., Dallas, Texas, to Miss Drusilla McCullough, August 22

VICTOR HILL, to Miss Gladys Miliken, both of Knoxville, Tenn, August 29

CHARLES B ODOM to Miss Anna May Manthey, both of New Orleans, in July

Deaths

Adolph Barkan, Zurich, Switzerland, Medizinische Fakultät der Universität Wien, Austria, 1866, member of the California Medical Association, the American Academy of Ophthalmology and Oto-Laryngology and the Pacific Coast Ophthalmological Society, professor of structure and diseases of the eye, ear and larynx, emeritus, Stanford University School of Medicine, San Francisco, formerly professor of ophthalmology and otology, Medical College of the Pacific and the Cooper Medical College, San Francisco, for many years eye and ear surgeon to the Lane Hospital, San Francisco, aged 90, died, August 28, of pneumonia

Rae Elsworth Houke ♂ Major, U S Army, retired, Glendale, Calif, Starling Medical College, Columbus, 1913, served during the World War, entered the medical corps of the U S Army as a first lieutenant in 1919, in 1929 was made a major, and retired in 1932 for disability in line of duty, aged 44, died, August 22, in the National Military Home, of coronary occlusion and cerebral arteriosclerosis

Alois Jokl, Lackawanna, N Y, Niagara University Medical Department, Buffalo, 1892, member of the Medical Society of the State of New York, aged 75, past president of the city board of health, formerly health commissioner in Lackawanna, on the staff of Our Lady of Victory Hospital, where he died, September 24, of carcinoma of the gallbladder

George Everett Clark, Stillwater, Minn, Hahnemann Medical College and Hospital, Chicago, 1880, professor of theory and practice of medicine, University of Minnesota Medical School, Minneapolis, 1893-1905, formerly member of the state board of medical examiners, aged 83, died, August 26, of acute nephritis

William Edwin Leonard, Hadley, Mass, Hahnemann Medical College of Philadelphia, 1879, aged 80, for many years a member of the health department in Minneapolis, formerly on the staff of the Minneapolis General Hospital, died, August 28, in Minneapolis, of arteriosclerosis and coronary thrombosis

Kirby Gladstone Averitt ♂ Fayetteville, N C, Baltimore Medical College, 1893, member and past president of the state board of medical examiners, member of the county board of health, aged 65, on the staff of the Highsmith Hospital, where he died, September 18, of cerebral hemorrhage

Ollie H Parker, Custer, Okla, Fort Worth (Texas) School of Medicine, Medical Department of Fort Worth University, 1906, member of the Oklahoma State Medical Association, for six years health superintendent of Custer County, aged 62, died, July 12, of angina pectoris

Cornelius Joseph Buckley, Bedford, Mass, Albany (N Y) Medical College 1910, member of the New England Society of Psychiatry, for many years a member of the staff of the Veterans' Administration Facility, aged 59, died, August 31, of cerebral embolism

Jeanette Bacon Stubbs, Wilmington, Del, Howard University College of Medicine, Washington, D C, 1894, member of the board of health for ten years, formerly superintendent of the Babies Hospital, aged 66, died, September 30, of lobar pneumonia

Paul Raymond Williams ♂ Cape Girardeau, Mo, St. Louis University School of Medicine, 1912, served during the World War, aged 47, died, August 7, in St. Mary's Hospital, St. Louis, of peritonitis, following an operation on the colon

James William Cunningham ♂ Detroit, Detroit College of Medicine, 1901, aged 55, chief of the department of obstetrics, and secretary of the executive committee, St. Mary's Hospital, where he died, September 1, of myocarditis and uremia

Earnest Newton Scott, Hinsdale, Ill, Rush Medical College, Chicago, 1900, member of the Illinois State Medical Society, on the staff of the Hinsdale Sanitarium and Hospital, aged 59, died, August 31, of heart disease

Melton A McKenzie, Lake City, S C, Medical College of the State of South Carolina, Charleston, 1924, aged 38, died, September 30, in the Veterans' Administration Facility, Oteen, N C, of chronic pulmonary tuberculosis

Charles William Jackson, Monson, Mass, University of Vermont College of Medicine, Burlington, 1884, an Affiliate Fellow of the American Medical Association, aged 83, died, August 21, of senile gangrene

Thomas Coe Little, San Diego, Calif, John A. Creighton Medical College, Omaha 1896, member of the California Medical Association, aged 61, died, August 20, of coronary occlusion and arteriosclerosis

Churchill Allan Pritchard, Tivoli, N Y, Bellevue Hospital Medical College, New York, 1890, member of the Medical Society of the State of New York, aged 73, died, August 6, of cerebral hemorrhage

William Phillippe Bernard, Central Falls, R. I, Baltimore University School of Medicine, 1901, served during the World War, school physician in Central Falls, aged 62, died, September 2, of angina pectoris

William Newell Bailey ♂ East Liverpool, Ohio Miami Medical College, Cincinnati, 1878, on the staff of the East Liverpool City Hospital, aged 85, died, October 10, of pneumonia

George Howell Coffin, Longview, Wash, Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1904, aged 55, died in September of heart disease

Don Alvarado Bisbee, Bristol, Vt, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1876, also a druggist, aged 84, died, October 5, of acute myocarditis

Leo Rothenberg, San Francisco, University of California Medical School, San Francisco, 1933, aged 37, died August 30, in the Mount Zion Hospital, of stab wounds, self-inflicted

Gustave Christoph Hoefling, New York, Long Island College Hospital, Brooklyn, 1907, aged 48, died, September 11, in the Doctors Hospital, of carcinoma of the left tonsil

John Sears McCormack, Boston, Albany (N Y) Medical College, 1907, aged 52, died, August 23, in the Peter Bent Brigham Hospital, of bilateral bronchopneumonia

Harry Harold Thompson, Oxford, Neb, John A. Creighton Medical College, Omaha, 1909, aged 51, died, August 4, in a hospital at Holdrege, of cerebral hemorrhage

John L. Benepe, Anderson, Ind, Missouri Medical College, St. Louis, 1887, aged 70, died, September 28, in St. John's Hospital, of a streptococcal infection of the lung

Benjamin Franklin Rogers, Eastport, N Y, University of the City of New York Medical Department, 1886, aged 74, died, September 4, of carcinoma of the bladder

Jesse Strauss Heiman, New York, Syracuse University College of Medicine, 1904, aged 54, died, September 8, in the Park West Hospital, of coronary occlusion

Arthur Louis Cludas, Topeka, Kan, Keokuk (Iowa) Medical College, 1895, member of the Kansas Medical Society, aged 62, died, August 13, of arteriosclerosis

Charles Crittenden Brown, Tampa, Fla., Vanderbilt University School of Medicine, Nashville, Tenn, 1886, aged 78, died, August 20, of cardiorenal disease

Belle Scott Carmody, Boston, College of Physicians and Surgeons, Boston, 1923, aged 47, died, September 23, in the Boston City Hospital, of pneumonia

William Francis Ryan ♂ Utica, N Y, Syracuse University College of Medicine, 1932, aged 29, died, August 26, of acute pancreatitis and myocarditis

Newton Eno Richardson, Yuba City, Calif., College of Physicians and Surgeons of San Francisco, 1902, aged 57, died, August 10, of coronary occlusion

Raymond Kelly Baker, Eads, Tenn., Memphis Hospital Medical College, 1909, served during the World War, aged 49, died, August 19, of tuberculosis

William Douglas, Fairfax, Wash., University of Toronto Faculty of Medicine, 1895, aged 65, died, September 24, of angina pectoris and myocarditis

James Edmund Moses, Kansas City, Mo., University Medical College of Kansas City, 1885, aged 83, died, September 9, of bronchopneumonia

Thomas Jefferson Hackney, Lake City, Fla., College of Physicians and Surgeons, Baltimore, 1881, aged 77, died, suddenly, July 24, of heart disease

William McLure Reedy, Chio, S. C., Louisville (Ky.) Medical College, 1878, Confederate veteran, aged 89, died, August 21, of arteriosclerosis

Theodore H. Sedgwick, Pittsburgh, Jefferson Medical College of Philadelphia, 1877, aged 83, died, October 7, of acute pulmonary edema

Manasseh John Malament, Brooklyn, Long Island College Hospital, Brooklyn, 1898, aged 58, died, September 22, of coronary thrombosis

William H. Reynolds, Lexington, Ga., Atlanta Medical College, 1883, aged 74, died, July 31, of coronary disease with auricular fibrillation

John P. Sherrod, Port Gibson, Miss., Meharry Medical College, Nashville, Tenn., 1897, aged 69, died, August 13, of chronic myocarditis

Clarence Arthur Baldwin, Peru Ind., Homeopathic Medical College of Missouri, St. Louis, 1899, aged 64, died, October 9, of heart disease

Gustave Theodore Wieland, St. Louis, St. Louis College of Physicians and Surgeons, 1891, aged 67, died, September 9, of heart disease

Guy B. Dickson, Chicago, Hahnemann Medical College and Hospital, Chicago, 1886, aged 73, died, October 21, of heart disease

James C. Belsan, Chicago, Northwestern University Medical School, Chicago, 1905, aged 56, died, September 24, of myocarditis

Aghasie Oshana, Mason City, Iowa, Rush Medical College, Chicago, 1897, aged 67, died, August 23, of prostatic obstruction

George B. Hensley, Long Bottom, Ohio (licensed in Ohio in 1896), aged 80, died, August 19, of paralysis agitans and influenza

Alvin H. Bridgefarmer, Melissa, Texas (licensed in Texas under the Act of 1907), aged 62, died, August 25, of angina pectoris

John Long Basinger, Riceville, Tenn., Vanderbilt University School of Medicine, Nashville, 1890, aged 71, died, August 22

Edward Thomas Hoidge, Toronto, Ont., Canada, University of Toronto Faculty of Medicine, 1902, aged 68, died, September 24

I. L. Anderson, Fort Smith, Ark., Gate City Medical College, Dallas, Texas, 1905, aged 78, died, July 30, of heart disease

Charles L. L. Cooper, Okolona, Ky., Louisville Medical College, 1887, aged 71, died, August 16, of coronary occlusion

Thomas Edgar Rogers, Waco, Ga., Atlanta Medical College, 1891, aged 75, died suddenly, July 25, of heart disease

Franklin H. Lyle, Boone, Iowa (licensed in Iowa in 1886), aged 86, died, August 9, in Des Moines of cerebral hemorrhage

Samuel M. Townsend, Madison Ind., Medical College of Ohio, Cincinnati, 1882, aged 88, died, August 27, of senility

Joseph Moorhead, New York, M. R. C. S. England, 1863, aged 93, died, September 19, of coronary thrombosis

James St. Clair Cussins, Decatur Ill., Rush Medical College, Chicago, 1877, aged 84, died, September 5

Theophilus Brenizer, Lamoni, Iowa (licensed in Iowa in 1886), aged 89, died, August 21, of general debility

Vance A. Vermillion, White Gate, Va., Maryland Medical College, Baltimore, 1900, aged 57, died, August 31

James H. Stroud, Cartersville, Ga., Atlanta Medical College, 1888, aged 69, died, August 19

Charles D. Jones, Moline, Ill., Chicago Medical College, 1877, aged 85, died, September 9

Correspondence

CONTRACEPTION

To the Editor—THE JOURNAL is to be congratulated as well as Dr. Latz for his statement "Economic conditions or other weighty reasons may put couples in a position in which they need to limit their offspring" (THE JOURNAL, October 19, p. 1241). Many of us who are engaged in active contraceptive practice have been preaching this for years. We dared not express ourselves so openly on the question of economic needs because of legal restrictions but rather stressed frank medical indications. The depression did for us what we dared not suggest ourselves.

I am not going to take issue with the "safety" of the safe period or discuss its shortcomings in this communication. Others as well as I are collecting records pointing out the large percentage of failures, and time plus pregnant women will determine its fate as a practical birth control measure. The study of the so-called safe period is intriguing, but its clinical application is far too premature and questionable to advocate it to anxious, worried, often sick women.

THE JOURNAL recently published an article with photographs showing the dangers of gold stem pessaries (Sussex, L. T. Penetration of the Uterus by Gold Stem Pessary, THE JOURNAL, May 13, 1933, p. 1490). In my opinion a great opportunity was missed at that time in not advising physicians in the use of safe, scientific and effective contraception. Whether the condom, vaginal rubber occlusive diaphragm, douche, suppository, jelly or cream is used as a contraceptive measure, the physician should learn of the relative efficiency and shortcomings of these methods through his accredited journal rather than rely for his information on the advice of commercial advertisers and detail men. Despite the fact that many studies on the relative values of contraceptive devices have been made, THE JOURNAL has not deemed it advisable to publish any of them.

MARIE PICHEL WARNER, M.D.,
Bronx, New York City

COMMENT—At the request of the House of Delegates, the Board of Trustees has appointed a committee to investigate scientifically the various methods of contraception. The report of this committee will be made to the House of Delegates at the next annual session.—ED

MALARIA IN A VILLAGE

To the Editor—The editorial comment on malaria in a village (THE JOURNAL, August 17, p. 517) is of more than passing interest to me, not so much that such outbreaks as reported may be so rare, but on account of the character of the epidemiologic warning offered.

I assume that the purpose of Current Comment is to inform the scientific readers of THE JOURNAL (local health authorities or physicians) of the dangers from malaria transmission through the medium of the traveling public. Please permit a quotation from the article. There are many other communities in the United States which are similarly in danger of an outbreak of malaria. When a malaria infected person visits these communities the stage will be set for an outbreak of malaria. Perhaps a stop in town just long enough to have lunch or to take on motor supplies would be sufficient for the mosquitoes to find the malaria-infected visitor. For such of your readers as do not know that *Anopheles quadrimaculatus* (our principal malaria vector) practically never bites in the daytime and that the other proved vectors of this genus are essentially night biters, would it not have been more valuable for you to tell your readers of the real dangers of introduction of malaria by overnight stops by "carriers" in

Anopheles-infested camps, hotels, tourist homes and the like? Why not allow the tourist to eat his "lunch" in peace and secure his "motor supplies" without fear and trembling lest he endanger the villagers?

T H D GRIFFITTS, M D, Jacksonville, Fla

METHYLENE BLUE IN CYANIDE INTOXICATION

To the Editor—An editorial published in THE JOURNAL, August 31, page 721, comments on Wendel's paper regarding the much discussed question of the mechanism of methylene blue antidotic action in cyanide intoxication, in which the author proves that it is due to the formation of methemoglobin.

The results of experiments published in 1933 (*Rev Soc argentina de biologia* 9 461, 1933, *Compt rend Soc de biol* 114 947, 1933) had already permitted me to arrive at the same conclusion. Methylene blue was injected into dogs and methemoglobin was determined at different intervals following the injection by means of van Slyke's gasometric method. Not more than 17 per cent of the total hemoglobin was transformed into methemoglobin. On the other hand, sodium nitrite in adequate doses transforms into methemoglobin more than 60 per cent of the hemoglobin in the circulating blood. This explains the higher antidotic power of sodium nitrite in cyanide intoxication, which I had already demonstrated, and has been successfully applied in combination with sodium thiosulphate in several cases of cyanide intoxication in man.

ENRIQUE HUG, Rosario, Argentina

OWNERSHIP OF X-RAY FILMS

To the Editor—Your editorials on the ownership of roentgenographic negatives and particularly the last (October 12) are very encouraging to those who perform roentgen examinations. Each new decision confirming the fact that the films belong to the physician who produces them aids the cause of science and the actual practice of medicine for, other things being equal, the physician who keeps his films and reviews them from time to time is presumably better equipped professionally than the one who does not retain them for further study.

Until proper decisions have been handed down by the courts in every state and the matter is no longer a subject for debate it might be helpful for all physicians who practice diagnostic roentgenology to adopt some specific form of statement on their appointment slips such as that which has been used in my office for the past twelve years and which reads as follows:

NOTE—It is understood that the original films resulting from x-ray examination are to be retained and permanently filed for study by Dr. Kantor. Patients are entitled to detailed reports or to prints of original negatives at nominal cost if they so desire.

This effectively settles the ownership question in advance of the examination and thus prevents any misunderstanding.

JOHN L. KANTOR, M D New York

RESUSCITATION

To the Editor—I have recently received several letters from men and organizations interested in resuscitation from drowning, electric shock, and carbon monoxide asphyxia. These letters ask whether any of the modifications of the Schafer prone pressure method recently proposed afford any real advantage over the procedure now in use by the American Red Cross, Boy Scouts and rescue crews of city police and fire departments.

In my opinion, the answer is positively No!

The Schafer method has been standardized by an immense experience. It has been taught, it is estimated, to more than

thirteen million men and boys, as well as many women and girls. It is saving many lives each year, particularly from drowning. It would be unfortunate if uncertainty and dispute over details were introduced for no real advantage.

All forms of manual artificial respiration are essentially expiratory in effect. The inspirations are wholly due to the tonus and elasticity of the respiratory muscles of the victim. The operator cannot increase the volume of the inspirations by any manual method.

These statements, however, do not justify the use of artificial respiration apparatus of the pulmotor type, for when manual artificial respiration ceases to be effective, the body has entirely lost its tonus, and the victim is irrecoverably dead.

YANDELL HENDERSON, PH D, New Haven, Conn.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

VACCINES AGAINST POLIOMYELITIS—KRUEGER VACCINE FOR PERTUSSIS

To the Editor—May I have information on the following: 1 The Brodie-Park vaccine for vaccination against acute anterior poliomyelitis, with references to the literature its comparison with Dr J. A. Kolmer's vaccine against this disease where the vaccine can be obtained dosage and duration of immunity. 2 Krueger's vaccine for the treatment of acute cases of whooping cough its composition dosage, where obtained and value. M D New Jersey

ANSWER—1 Brodie's vaccine consists of a 10 per cent suspension of formaldehyde treated virus. The vaccine is administered intradermally and subcutaneously in one or two 5 cc. doses. A recent communication from Brodie states that more than 6,000 children have been vaccinated without untoward effects. The disease did not appear in any vaccinated child, although complete data for the controlled experiments are not yet available.

Kolmer's vaccine differs from Brodie's in that it is an attenuated virus, consisting of a 4 per cent suspension of monkey spinal cord in a 1 per cent sterile sodium ricinoleate solution. Kolmer administers his vaccine subcutaneously in three divided doses, which vary with the age of the child. More than 6,000 children have been vaccinated, but a finished analysis has not yet been made.

The vaccine may be obtained directly from both Brodie and Kolmer. The Merrell Company of Cincinnati is also supplying the latter vaccine.

The work has not been followed for a sufficient length of time to ascertain the duration of immunity, although monkeys vaccinated by Kolmer have now retained their immunity for three years. Following are references:

- Brodie Maurice *J Exper Med* 56 493 (Oct) 1932
- Brodie Maurice *Science* 70: 594 (June 29) 1934
- Brodie Maurice *Proc Soc Exper Biol & Med* 32: 300 (Nov) 1934
- Park W H *Pediatric Magazine* May 1935
- Kolmer J A and Rule, Anna M *J Immunol* 26 505 (June) 1934
- Kolmer J A and Rule Anna M *Am J M Sc* 188 510 (Oct) 1934
- Kolmer J A Klugh G F Jr and Rule Anna M *A Successful Method for Vaccination Against Acute Anterior Poliomyelitis* THE JOURNAL Feb 9 1935 p 456

2 Krueger's vaccine for pertussis is an undenatured antigen prepared by mechanical disruption of the washed *Haemophilus pertussis* by grinding in a special mill with stainless steel balls and then filtering. The therapeutic dose recommended has been from 0.5 to 2 cc, depending on the severity of the illness. This dose is repeated daily if necessary. It may be obtained from Eli Lilly & Co.

Reports by Stallings and Nichols indicate a beneficial effect from such therapy in about 90 per cent of patients. Physicians using this antigen have been favorably impressed with the clinical results. However, there has not been any general acceptance of this therapy, because of the lack of sufficiently controlled studies. None of these preparations stand accepted by the Council on Pharmacy and Chemistry.

SYPHILIS AND PREGNANCY

To the Editor—A woman, aged 25 married seven years has been in perfect health all her life and physical examination at the present time including a neurologic examination is negative. In January 1930 she was delivered of a baby girl who died three months later in Baby's Hospital New York. The Wassermann reaction of the baby and of the mother was 4 plus. The father's was negative. The patient has four sisters and two brothers living and well. One sister died at the age of 1 year of inflammation of the bowels (?) and one brother died at the age of 4 years of acute indigestion (?) according to the patient's story. The patient's mother has had several stillbirths. One sister has a positive Wassermann reaction and another has a negative one. The rest of the brothers and sisters and parents are indifferent and will not submit to a blood test. The patient's mother and father are about 60 years of age and in apparently good health. My patient has had four courses of neosarsphenamine of 3 Gm each twenty four injections altogether. Her blood Wassermann reaction was 4 plus-4 plus and is now 2 plus-4 plus and the local physician in charge of the venereal disease clinic believes that there is no use in giving her any more. She had her first course in 1930 and the last in 1932. She has not had a spinal puncture. The questions I should like answered are 1 Will more treatments be of benefit to her? 2 Would you consider this a case of congenital syphilis? 3 Would you advise her to have another child which she wants? 4 Could the positive Wassermann reaction be caused by anything else occurring in two members of the same family? 5 What are the dangers to the husband? 6 What future health can you guarantee such a patient? If this is published please omit name

MD New York.

ANSWER.—No mention is made of the administration of preparations of the heavy metals, such as mercury and bismuth, hence it is assumed that none of these were given. The persistence of the positive Wassermann reaction may be due to the omission of mercury and bismuth compounds in the treatment. A spinal puncture should certainly be made and, if the spinal fluid Wassermann test is positive, intensive treatment is surely indicated.

1 Even if the spinal fluid Wassermann test should prove negative, the patient should receive several courses of treatment with compounds of mercury and bismuth.

2 No proof is given in the history that this is a case of congenital syphilis. Neither the sister's positive Wassermann reaction nor the mother's stillbirths necessarily point to the fact that the patient has congenital syphilis. It is almost certain that this is a case of an acquired infection.

3 The patient should not become pregnant until repeated Wassermann tests have been negative for at least one year, preferably longer. Should the patient become pregnant after the Wassermann test has remained negative for a time, more treatment should be carried out during the pregnancy.

4 Aside from such conditions as yaws, which is rare in this country, repeated positive Wassermann reactions definitely indicate the presence of syphilis. There is no reason why two sisters should not have acquired syphilis.

5 Since the patient has had syphilis for at least five and a half years, the chances of infecting the husband at this time are slight. The older the syphilitic infection, the less likelihood there is of infecting the mate. However, repeated Wassermann tests should be made of the husband's blood and also at least one serologic test of his spinal fluid.

6 With intensive and if necessary repeated courses of therapy, the outlook for this patient's health is good but it is hazardous to "guarantee" anything in medicine.

ARGYRIA

To the Editor—I would appreciate your writing me the minimum amount of silver nitrate used as a douche solution and as bladder irrigation that has produced argyria also the length of time that it takes for the blueness of the skin to develop to the maximum. A woman whom I have been treating for gonorrhea has begun to develop a sort of faint slate color of the skin of the face. She frequently has a slight fever. She may have Addison's disease but the classic symptoms are all present. In my irrigating solutions of the bladder and vagina cervix I have estimated that 42 grains (2.7 Gm.) of silver has been used in the treatments. Of course this silver has not all been retained as only the wet condition of the tissues have been retained after she left the office each time.

F C NEBBIT MD Atlanta Ga

ANSWER.—It is generally known that argyria follows the prolonged administration of silver nitrate or the use of silver salts.

Davidson (*J Cutan Dis* 34 605 [Aug] 1916) reported a case of generalized argyria in a patient who had acute gonorrhea. Discoloration of the hands commenced in three weeks and attained the bluish color in six weeks. He used urethral injection, three times a day, retaining the solution for five minutes. Prior to coming under observation, as far as could be determined, the following amounts were used: mild silver protein 4 ounces (120 cc.) at 10 per cent 2 ounces (60 cc.) 25 per cent, 2 ounces at 30 per cent strong silver protein 4 ounces

at 10 per cent, albargin 4 ounces at 5 per cent. The author further states that, up to the time of the first appearance of discoloration 800 grains (52 Gm.) of mild silver protein and 200 grains (13 Gm.) of strong silver protein were used.

Sollmann (*Manual of Pharmacology*, 1932, p 1048) states that argyria develops gradually after prolonged internal or external use of silver nitrate or salts when the total dose has reached from 15 to 30 Gm.

Sutton (*Diseases of the Skin*, 1931, pp 612-613) states that Stillman and Lawless have successfully employed a local intradermal injection of a mixture of 1 per cent potassium ferri-cyanide with 6 per cent sodium thiosulphate.

ULCERATED AREA ON WRIST

To the Editor—A white woman aged 25 single had a ganglion removed from the tendons on the extensor aspect of the left wrist in July 1932. A severe and extensive infection followed. Slowly the acute inflammation subsided and a small chronic ulcer remained. The wrist and to a lesser extent the fingers became immobile in extension. A biopsy of the edge of the ulcer was made and although I do not know the report I believe it was negative. The Wassermann reaction is negative. The skin tuberculin is positive but complement fixation for tuberculosis and roentgen examination of the chest are negative. The patient is restless and worries and has lost some weight. She is not well nourished but I can find no evidence of disease except for the ulcer. She has had radium which she says made it larger, and ultraviolet rays which did not improve it. She still has a very slight and low grade infection in and around the tendon sheaths and the granulations look very unhealthy. I believe that proper orthopedic and plastic surgery could restore normal use to the wrist and heal the ulcer. If you can guide me in the treatment or recommend some men who you think might be able to take care of it you will be helping me and the patient. I might say that she has seen many physicians and surgeons nearby and she is no better. The urine is normal. The fasting blood sugar was 71 mg per hundred cubic centimeters. Please omit name

MD New York.

ANSWER.—This case suggests several possibilities one, that the original condition was not a simple ganglion but a tuberculous process. Tuberculous tenosynovitis is not infrequently diagnosed as ganglion, and because the process is not completely eradicated recurrences following an operation are rather frequent. Another possibility is that the patient received excessive radiation treatment at the site of the ulcer and that as a result the blood supply to the tissues has been so greatly diminished that spontaneous healing is impossible.

The plan of treatment most likely to be successful is, first, cleaning up of the ulcerated area by careful aseptic treatment for from seven to ten days, second, after the infection has been cleared up as well as possible, complete excision of the infected area and covering of the raw surface with a pedunculated flap from the abdomen or thigh, third, if complete excision of the involved area requires excision of essential tendons, or if such tendons have already been destroyed tendon repair, which should be carried out at a later time. This last step, of course, would have to be postponed until the transplanted flap of skin and subcutaneous tissue has been soundly healed for several months.

DERMATITIS FROM SKIN FOOD

To the Editor—A woman came to my office with a swelling puffiness and redness on both cheeks especially under the eyes. She stated that she bought a skin food which she applied to her face. The next morning the swelling appeared. I eliminated all local and constitutional diseases for the possible causes of the swelling and prescribed a soothing lotion (calamine lotion). The swelling disappeared in three days with scaling of the skin. I therefore attributed this condition to the skin food. The ointment that she applied trades under the name Duharry Special Skin Food manufactured by the Hudnut Sales Company. The formula which was sent to me contains the following ingredients

| | per cent |
|-----------------------------|----------|
| Lanolin anhydrous U S P | 36 4 |
| Spermaceti U S P | 6 4 |
| Snow white petrolatum U S P | 48 2 |
| Distilled water | 7 875 |
| Perfume oils | 1 125 |

The company claims that it would be impossible for any of the ingredients to produce the irritation. I attribute the condition to the patient's idiosyncrasy to perfumed oil. Will you kindly advise me whether the other ingredients might have produced the irritation?

ISRAEL BRIDDER MD Philadelphia

ANSWER.—It is entirely possible that any one or more of the ingredients of this "skin food" except of course distilled water, might have been responsible for the dermatitis. Patch tests should be made by applying a small amount of each ingredient under oiled paper, oiled silk or gutta percha and fastened to the skin with adhesive plaster. These tests should be made on apparently normal skin and should be examined after forty-eight hours unless itching occurs earlier. A control with the covering substance should be made, though irri-

tation due to it or to the adhesive plaster can usually be easily distinguished from that due to the material tested

The inquirer is correct in suspecting the perfumes. Hypersensitivity to perfumes is not uncommon, much less so than hypersensitivity to the other ingredients

SYPHILITIC PHLEBITIS

To the Editor—A Negro, aged 18 awoke with an aching pain in the right thigh in the region of the femoral triangle April 12 this was associated with tenderness in the same region, and with a low backache. No other symptoms have been present. The past history is negative except for a penile sore clinically strongly resembling a chancre just one year ago at which time the blood Wassermann reaction was 3 plus Eagle positive. No treatment was given. He has never had a penile discharge. In October 1934 the Wassermann and Eagle tests were negative. The social and family histories are without significance. Physical examination on the third day of the illness showed him moderately ill. The temperature was 101.4 F. There were scattered acneiform lesions on the shoulders and back. There were several large thin, atrophic scars on the legs. There was a dirotic pulse which usually is proportional in rate to the temperature. An old scar was present on the shaft of the penis. There was palpable thickening of the superficial veins of both thighs and, to a less extent of both forearms and cubital regions. Tenderness was shown in the right femoral triangle. Palpable but not tender inguinal lymph nodes were present on both sides. Pulsations in the dorsalis pedis and posterior tibial arteries were felt with difficulty on the right, and not at all on the left. There has been no edema. During observation, the temperature was remittent with daily peaks of 101 to 103.8 F for thirteen days and then a gradual fall followed by another elevation of temperature which was associated with a shift of the tenderness and pain to the left femoral region and notable extension of the palpable process in the veins down the legs to the feet. After the twenty fourth day the temperature sought normal levels and remained so. The laboratory work showed a normal urine unaltered red blood cell count and hemoglobin moderate leukocytosis (15 350 with 80 per cent polymorphonuclears) negative Widal and negative Wassermann and Eagle tests on two specimens. A biopsy of a superficial vein of the right thigh showed great thickening and fibrosis of the wall the lumen being very small and with widespread vacuolization apparently lipid in nature in the wall of the vein. What are the diagnostic possibilities and probabilities and the treatment in this case of diffuse and multiple involvement of the veins? Kindly omit name

M D, Texas

ANSWER—Acute syphilitic phlebitis is a relatively infrequent complication of early secondary syphilis. It manifests itself as an inflammatory process involving the whole or several segments of the superficial veins of the lower extremities, most frequently the internal saphenous vein. The veins may be palpated as indurated cords or there may be nodules attached to the superficial veins of the hypoderm, and there may be moderate edema and redness of the skin overlying the vein. The process tends to be multiple, progressing from one vein to another and tending to recur in the same vein or in another limb. The symptoms may be slight or severe, causing nocturnal pains, moderate leukocytosis and a slight rise of temperature. Involution with antisyphilitic therapy takes place in from two to four weeks, leaving indurated cords after the acute reaction has subsided. In some cases the lesions simulate erythema nodosum. Pathologically the main change is a proliferation of the connective tissue in the subendothelial layer, causing the endothelium to protrude into the lumen of the vein in the form of buds. The main points of distinction from the phlebitis of other infectious processes are the lack of constitutional and local symptoms, the multiplicity of the veins involved, the marked tendency to recurrence, the lack of formation of an embolus, and the prompt response to antisyphilitic therapy. In the correspondent's case the negative Wassermann reaction, the rather indefinite history of syphilis and the high temperature speak against the diagnosis of an acute syphilitic phlebitis and rather in favor of an infectious phlebitis. Nevertheless the patient should be given the benefit of antisyphilitic therapy and serologic tests should be made at intervals.

EPINEPHRINE AND MYOCARDIAL DISEASE

To the Editor—In an article by Dr. Paul A. Davis in THE JOURNAL, Sept. 29 1934 page 965 the statement is made that epinephrine should not be used in cases of carbon tetrachloride poisoning if there is a possibility of any myocardial involvement. Will you please be good enough to comment on this statement, indicating in what lies the rationale of it?

N I ARDAN M D Niagara Falls, N Y

ANSWER—When considering the use of epinephrine in myocardial disease, there are a number of factors to be considered. Its action from moderate doses may be summarized as follows.

Action on the heart 1 An increased heart rate is a characteristic feature, but it may cause a slow, full beat characteristic of inhibitory activity.

2 It causes a more complete contraction of the heart, but, if there is great acceleration of the heart, relaxation may not be complete and the output of the heart may be decreased.

3 There is an increased irritability of the heart and thus a predisposition to ectopic beats and auricular or ventricular fibrillation.

4 The reports on the effect on the coronary vessels are conflicting but apparently dependent on the dose, certain doses producing dilatation and other doses producing constriction.

Action on the peripheral vessels It produces a vasoconstriction of the peripheral vessels. The splanchnic vessels are constricted most, the limb vessels less and the pulmonary and cranial vessels least, leading to an increased peripheral resistance and increased burden to the heart.

Epinephrine increases the irritability of the heart muscle. In myocardial disease, epinephrine would be contraindicated because of its tendency to induce ectopic beats in either the auricle or the ventricle and to induce auricular or ventricular fibrillation.

In myocardial disease with failure or a very low cardiac reserve associated with shock, epinephrine is contraindicated because it produces an increased peripheral resistance with increased work for the heart.

In direct answer to the question, one must consider the cause, type and severity of the myocardial disease before giving epinephrine. In the mild degrees of myocardial disease with little or no increased irritability of the heart, epinephrine can probably be used with safety. On the other hand, one wonders why it should be used at all in shock. Its action on the cardiac vascular system is of very short duration, and the possibilities of doing more harm than good with this drug must be considered.

GONORRHEAL INVOLVEMENT OF JOINTS

To the Editor—What is the accepted treatment of an acute gonorrheal involvement of the elbow joint? In case one immobilizes the parts, what are the criteria as to the proper duration of immobilization? What is the status of protein therapy in acute gonorrheal arthritis?

J PHILLIPS EDMUNDSON M D Kansas City Mo.

ANSWER—There are two schools of opinion in regard to the treatment of infection of the elbow joint (1) short period of immobilization, and (2) no immobilization.

Some authorities feel that immobilization predisposes to ankylosis. There are, however, just as many and as good authorities who believe that the surest way to prevent ankylosis is to immobilize for a very short period until the active hypersensitive stage is passed.

The position of immobilization should be midflexion of the elbow and midsupination of the forearm with slight dorsiflexion of the wrist.

Following this short immobilization period, physical therapy should be instituted, especially mild active movements followed by very gentle passive movements. Diathermy may be of value but, although short wave diathermy has been used, no statistics are available as yet.

The treatment of the primary lesion is important.

The inquirer should note the most recent work on hyperpyrexia, which in a small number of carefully checked cases has resulted in complete cure, in as few as a number as four treatments. This includes raising the temperature to 106, 107 or 108 F over a period of hours.

USE OF WHEY IN HYPERTENSION

To the Editor—What is the usefulness of evaporated whey taken in tablespoonful doses two or three times daily as a treatment of arterial hypertension? Will you please discuss this and give name of source of supply of this product? EDWARD S PARKER M.D., Ida Grove, Iowa.

ANSWER—Whey powder, containing the solutes of milk, has been used recently in the therapy of hypertensive arterial disease. The number of remedies, diets and other measures suggested for the treatment of hypertension is legion. This is a priori evidence that none of these innumerable methods of management are wholly satisfactory. The evaluation of any therapeutic measure in hypertensive disease is extremely difficult, transient reduction of the arterial tension alone is not a criterion of satisfactory result. Thus far the clinical trial of evaporated whey is entirely inadequate for drawing any conclusions as to the value of the measure. A great many patients must be observed over a long period, at least one year, before conclusions are warranted.

The chief constituents of evaporated whey are lactose (about 70 per cent) and the electrolytic salts of milk, including considerable calcium. Calcium salts in large doses have been extensively used in the management of hypertensive disease and the past, the therapeutic results have proved disappointing and even the more enthusiastic advocates of such calcium therapy have come to admit its futility. It is suggested that 2 ounces (60 Gm) of whey powder a day changes the intestinal flora

and has a mild laxative effect by inducing lactic acid fermentation in the bowel. However, there is no convincing evidence that so-called intestinal toxemia has any etiologic significance whatever in hypertensive disease. Alvarez has shown that constipation is more frequently associated with hypotension than with hypertension.

It is highly questionable whether such therapy will fulfil the expectations of its sponsors, one must keep an open mind and refuse to judge until much more evidence has been accumulated and analyzed.

DIABETES INSIPIDUS

To the Editor—A woman about 25 years of age developed symptoms of extreme thirst and polyuria during her second pregnancy. The urine output averaged 4 and 5 quarts (liters) a day. She was obliged to drink the required amount of water both night and day. The specific gravity averaged 1.010. After delivery the symptoms persisted for two or three months as at first but after this period though still troubled with the frequent urination, she was able to get sleep during the night. The same amount of urine is still eliminated during the twenty-four hours as formerly. Would this be considered diabetes insipidus or is it some upset of the pituitary due to pregnancy? What if any treatment is indicated?

LOUIS L. SHERMAN, M.D., Oakland Calif

ANSWER—In the absence of hyperglycemia and glycosuria, the diagnosis of diabetes insipidus seems most probable. Administration of various preparations of the posterior pituitary gland have been successfully used in controlling this condition. Probably the simplest and least expensive method of administration is to apply desiccated powdered posterior pituitary gland to the nasal mucosa with the finger tip. The amount used depends on the severity of the case but may be little e.g., 5 mg. two or three times daily (Vidgoff, Ben Posterior Pituitary Therapy in Diabetes Insipidus, *Endocrinology* 16:289 [May-June] 1932).

HEMOSTASIS IN LACERATION

To the Editor—Can you advise me as to the best and quickest hemostatic agent to be used in fresh lacerations? I frequently have occasion to take care of boxers who have received facial lacerations. The preparations used by their managers between rounds to stop the bleeding render the wounds unfit for primary closure. Monsel's powder is the most commonly used chemical, and I have been unable to clean the wound following its use without an extensive débridement. Please omit name.

M.D., California

ANSWER—Application of solution of epinephrine with compression, or the flooding of the wound with solution of hydrogen dioxide followed by compression stops hemorrhages without damaging the tissue. Following either of these, or, if the bleeding is not profuse, even without the preliminary use of these agents, finely powdered sugar applied with pressure is probably as good and harmless as any hemostatic that can be found.

LIME JUICE NOT A RELIABLE PROPHYLACTIC FOR OPHTHALMIA NEONATORUM

To the Editor—Kindly answer the following question. In a book on "mothercraft" written by a French physician in one of the languages of the African Congo the use of fresh lime juice is recommended in the prophylaxis of ophthalmia neonatorum when a solution of silver nitrate for the Crédé method is not available. Is there scientific justification for this treatment?

ELLEANOR TAYLOR CALVERLEY M.D. Hartford Conn

ANSWER—There is no mention in the literature of the use of lime juice as a substitute for silver nitrate as a prophylactic agent against ophthalmia neonatorum. It is conceivable that the instillation of lime juice into the conjunctival sac is so irritating that an excessive flow of tears results thereby washing infectious material away and thus preventing the development of the disease in a small percentage of cases.

BOWLEGS

To the Editor—What treatment if any is there for bowlegs in a healthy child of 6 months?

R. F. SHEETS M.D. Carthage Ill

ANSWER—1. The correspondent should have submitted (1) a photograph of the child's legs, (2) a statement of whether the deformity is increasing, decreasing or stationary, (3) a statement of whether there is any hereditary or familial history, (4) the place of birth, (5) roentgenograms to determine whether thickening of the cortex is on the concave or convex side of the bone.

There are no guideposts to tell the physician which legs will or will not correct themselves. Nature is kind to most children but a goodly number of deformities do not take care of themselves.

The proper treatment is a plaster-of-paris cast or a series of casts which may be "wedged." After the correction is obtained, braces may be applied. Massage and binding of the legs together will hasten correction in mild cases. Cod liver oil, ultraviolet rays, viosterol and other preparations including proper food aid in the correction of this type of deformity.

STROPHANTHUS IN CORONARY DISEASE

To the Editor—I recently read an article in some journal quoting the statement of some authority regarding the use of strophanthus in the treatment of angina and coronary disease. Having been diagnosed as having a coronary sclerosis I was rather interested in this treatment but am unable to locate its source. I will appreciate it if you can advise me where I can get full details of this treatment and its results. Please omit name and address.

M.D. South Dakota

ANSWER—Neither digitalis nor strophanthus should be used as a routine procedure in the treatment of coronary disease per se. If auricular fibrillation is present, digitalis should be used in its control, if necessary. This is the only real indication for its use in such cases. All the drugs of the digitalis series, of which strophanthus is one, show evidence of a vasoconstrictor action and are contraindicated in coronary disease. They also increase irritability of the heart muscle, another contraindication.

COMPOSITION OF CERUMEN

To the Editor—I would appreciate an analysis of the constituents of cerumen from the human ear. Please omit name.

M.D., Lebanon Pa.

ANSWER—Following is the composition of dried cerumen as quoted by Creed and Negus in the *Journal of Laryngology and Otology* (April 1926) from the work of Lannois and Martz.

| Principal Constituents | Moist | Dried in Vacuo |
|-----------------------------------|-------|----------------|
| Water | 56.53 | |
| Free fatty acids | 1.30 | 2.99 |
| Fats | 3.55 | 8.16 |
| Cholesterolin | 3.07 | 7.06 |
| Soluble in alcohol | 7.0 | 16.10 |
| Urea | 0.20 | 0.46 |
| Soluble in cold and boiling water | 11.29 | 25.96 |
| Insoluble | 14.40 | 33.12 |
| Various substances | 2.66 | 6.15 |
| | 100.0 | 100.0 |
| Total nitrogen | 2.7 | 6.21 |
| Ash | 3.08 | 7.08 |
| Total insoluble fatty acids | 8.63 | 19.84 |
| Lecithin | 1.63 | 3.74 |

VISION IN INFANT'S EYE

To the Editor—A statement was made that an infant perceives objects as inverted images. Does an infant or a newly born lower animal acquire the ability to project an inverted image into an erect image?

MARTIN J. TREICHLER M.D., Bartlett, Ill

ANSWER—It is true that any image on the retina, whether in the eye of a new-born or of an adult, is inverted. This is discussed at length in Helmholtz's *Physiological Optics*, volume 1, page 91. But in the projection of that image on the cerebral cortex through the optic pathways it is probable that an inversion occurs. If this is the case, the image in the new-born eye is projected cortically in just as upright a position as in the adult eye. The character of vision that results after the removal of a complete congenital bilateral cataract justifies that assumption.

DANGERS OF TETRAETHYL LEAD

To the Editor—I have a patient working in tetra-ethyl lead at a gasoline refinery who has been suffering with painless hematuria for two weeks. Preliminary cystoscopy reveals a marked engorgement of the bladder trigon. Pending further cystoscopic study could you inform me whether tetra-ethyl lead may be a causative factor? Please omit name.

M.D. Pennsylvania

ANSWER—So protean are the manifestations of the action of lead on the human body that it is conceivable that a trigonitis might be attributed to this cause. Practically, however, this concept is not tenable, particularly in the absence of other and more characteristic features of plumbism. On the other hand, gasoline into which tetra-ethyl lead apparently was introduced is a more likely source of bladder irritation. On the assumption that the disorder described is to be associated with work as a cause and not to work-extrinsic causes, it is believable that the gasoline (benzine, naphtha) is a more probable cause than tetra-ethyl lead. Frequent urination and bladder discomfort are clearly associated with the action of hydrocarbon solvents. Occasionally when large wounds are freely cleansed with such solvents as benzene or solvent naphtha a mild hematuria appears within the next twenty-four hours.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country, March 14. Oral examination for Group A and B applicants will be held in Kansas City Mo. May 11-12. Applications for written examination should be filed with the secretary before Jan 15. Sec. Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada Dec. 7. Sec. Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY St. Louis Nov. 18. Asst. Sec. Dr. Thomas D. Allen, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St. Louis, Jan. Sec. Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY Kansas City, Mo. May 9. Sec. Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS St. Louis Nov. 20. Sec. Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY New York Dec. 30. Sec. Dr. Walter Freeman, 1726 Eye St. N. W., Washington D. C.

AMERICAN BOARD OF RADIOLOGY Detroit Dec. 12. Sec. Dr. Byrl R. Kirklm, Mayo Clinic, Rochester, Minn.

ARIZONA Basic Science Tucson, Dec. 17. Sec. Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

ARKANSAS Medical (Regular) Little Rock, Nov. 12. Sec. State Medical Board of the Arkansas Medical Society, Dr. A. S. Buchanan, Prescott, Medical (Eclectic), Little Rock, Nov. 12. Sec. Dr. Clarence H. Young, 207½ Main Street, Little Rock.

CALIFORNIA Reciprocity Los Angeles Dec. 4. Sec. Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT Medical (Regular) Hartford Nov. 12-13. Endorsement Hartford Nov. 26. Sec. Dr. Thomas P. Murdock, 147 W. Main St., Meriden, Medical (Homeopathic), Derby Nov. 12. Sec. Dr. Joseph H. Evans, 1488 Chapel Street, New Haven.

FLORIDA Tampa Nov. 11-12. Sec. Dr. William M. Rowlett, Box 786, Tampa.

KANSAS Topeka Dec. 10-11. Sec. Board of Medical Registration and Examination, Dr. C. H. Ewing, 609 Broadway, Larned.

KENTUCKY Louisville, Dec. 3. Sec. Department of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

MAINE Portland Nov. 12-13. Sec. Board of Registration of Medicine, Dr. Adam P. Leighton Jr., 192 State St., Portland.

MARYLAND Medical (Regular) Baltimore Dec. 10-13. Sec. Dr. John T. O'Mara, 1211 Cathedral St., Baltimore. Medical (Homeopathic), Baltimore, Dec. 10-11. Sec. Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS Boston Nov. 12-14. Sec. Board of Registration in Medicine, Dr. Stephen Rushmore, 413 State House, Boston.

NEBRASKA Lincoln Nov. 19-20. Dir. Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NORTH CAROLINA Endorsement Raleigh Dec. 9. Sec. Dr. Ben J. Lawrence, 503 Professional Bldg., Raleigh.

OHIO Columbus Dec. 3-5. Sec. State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA Oklahoma City Dec. 11. Sec. Dr. James D. Osborn Jr., Frederick.

OREGON Basic Science Portland Nov. 16. Sec. Mr. Charles D. Byrne, University of Oregon, Eugene.

SOUTH CAROLINA Columbia Nov. 12. Sec. Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

TEXAS Houston, Nov. 18-20. Sec. Dr. T. J. Crowe, 918 Mercantile Building, Dallas.

VIRGINIA Richmond Dec. 11-13. Sec. Dr. J. W. Preston, 28½ Franklin Rd., Roanoke.

WISCONSIN Basic Science Milwaukee Dec. 21. Sec. Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

Washington July Examination

Mr. Harry C. Huse, director, Department of Licenses, reports the written examination held at Seattle, July 15-17, 1935. The examination covered 7 subjects and included 70 questions. Twenty-six candidates were examined, all of whom passed. Twenty-one physicians were licensed by reciprocity and 9 physicians were licensed by endorsement. The following schools were represented:

| School | PASSED | Year Grad | Number Passed |
|---|----------------------|-----------|---------------|
| University of Colorado School of Medicine | (1934)* | | 1 |
| Northwestern University Medical School | (1930) | (1932)* | 5 |
| 1935 2)* (1935) | | | |
| Rush Medical College | (1928), (1935) | | 2 |
| Indiana University School of Medicine | (1934)* | | 1 |
| University of Kansas School of Medicine | (1934)* | | 1 |
| Creighton University School of Medicine | (1934)* | | 1 |
| University of Nebraska College of Medicine | (1934)* | | 1 |
| Cornell University Medical College | (1929) | | 1 |
| University of Oregon Medical School | (1934) 2)* (1934) 4) | | 6 |
| University of Pennsylvania School of Medicine | (1931) | | 1 |
| University of Alberta Faculty of Medicine | (1932) | | 1 |
| McGill University Faculty of Medicine | (1928) | | 1 |
| University of Glasgow Medical Faculty | (1934) | | 1 |

| School | LICENSED BY RECIPROCITY | Year Grad | Reciprocity with |
|---|-------------------------|-----------|------------------|
| University of Colorado School of Medicine | (1933) | (1934) | Colorado |
| Rush Medical College | (1928) | | Minnesota |
| Johns Hopkins University School of Medicine | (1934) | | Maryland |
| University of Michigan Medical School | (1930) | | Oregon |
| Univ. of Minnesota Med. School (1929, 3), (1930) | (1935) | | Minnesota |
| Washington University School of Medicine | (1932) | | Missouri |
| University of Nebraska College of Medicine | (1933) | | Nebraska |
| Columbia Univ. College of Physicians and Surgeons | (1920) | | Idaho |

University of Oklahoma School of Medicine (1934) Oklahoma
University of Oregon Medical School (1932) Oregon (1934, 2) Oregon (1930) California
University of Tennessee College of Medicine (1934) Tennessee
University of Texas School of Medicine (1934) Texas
University of Virginia Department of Medicine (1934) Virginia

| School | LICENSED BY ENDORSEMENT | Year Endorsement Grad. |
|--|-------------------------------|------------------------|
| College of Medical Evangelists | (1935) 3) N. B. M. Ex. | |
| University of Colorado School of Medicine | (1933) N. B. M. Ex. | |
| Rush Medical College | (1934) (1935) 2) N. B. M. Ex. | |
| Washington University School of Medicine | (1926) N. B. M. Ex. | |
| University of Rochester School of Medicine | (1933) N. B. M. Ex. | |

* Licenses have not been issued

Nevada Reciprocity Report

Dr. Edward E. Hamer, secretary, Nevada State Board of Medical Examiners, reports eight physicians licensed by reciprocity at the meeting held at Reno, Aug. 5, 1935. The following schools were represented:

| School | LICENSED BY RECIPROCITY | Year Grad | Reciprocity with |
|--|-------------------------|-----------|------------------|
| University of California Medical School | (1932) 2) | | California |
| Harvard University Medical School | (1931) | | New York |
| Creighton University School of Medicine | (1934) | | Utah |
| New York Homeopathic Medical College and Flower Hospital | (1932) | | New York |
| University of Oregon Medical School | (1934) | | California |
| Willamette University Medical Department, Oregon | (1906) | | Oregon |
| University of Tennessee College of Medicine | (1915) | | Mississippi |

Tennessee June Examination

Dr. H. W. Qualls, secretary, Tennessee State Board of Medical Examiners, reports the written examination held at Knoxville, Memphis and Nashville, June 13-14, 1935. The examination covered 8 subjects and included 80 questions. An average of 75 per cent was required to pass. One hundred and fourteen candidates were examined, all of whom passed. The following schools were represented:

| School | PASSED | Year Grad | Per Cent |
|---|--|-----------|----------|
| Howard University College of Medicine | (1934) 82 83 6 84 4 86 4 86 8 87 8 | (1930) | 85.9 |
| Harvard University Medical School | 85 8 (1935) 88 3 | (1933) | 85.1 |
| Jefferson Medical College of Philadelphia | (1934) 81 5 82 9 83 1 83 3 83 5 83 6 84 4 84 3 84 4 | (1934) | 86.3 |
| Temple University School of Medicine | (1934) 84 4 84 4 84 5 84 6 84 6 84 9 84 9 85 85 85 3 | (1934) | 85.5 |
| Meahery Medical College | (1927) 85 3 86 4 86 4 86 5 86 6 86 8 87 8 87 3 | (1927) | 82.9 |
| University of Tennessee College of Medicine | (1935) 87 9 88 3 88 4 | (1935) | 81 |
| Vanderbilt University School of Medicine | (1935) 81 9 82 4 82 9 83 83 3 83 4 83 8 83 9 83 9 | (1935) | 78.6 |
| Medical College of Virginia | (1934) 85 4 85 4 85 4 85 4 85 4 85 4 85 4 85 4 85 4 | (1934) | 86.6 |
| University of Virginia Department of Medicine | (1935) 87 8 87 8 88 8 88 3 88 4 88 9 89 1 89 1 89 9 | (1935) | 79.8 |

Fourteen physicians were licensed by endorsement from Jan. 2 to Aug. 22, 1935. The following schools were represented:

| School | LICENSED BY ENDORSEMENT | Year Endorsement Grad. |
|---|-------------------------|------------------------|
| College of Medical Evangelists | (1935) N. B. M. Ex. | |
| George Washington University School of Medicine | (1931) | Maryland |
| Atlanta Medical College | (1914) | Georgia |
| Emory University School of Medicine | (1929) | Georgia |
| University of Georgia School of Medicine | (1932) | Georgia |
| Hospital College of Medicine, Kentucky | (1905) | Kentucky |
| University of Louisville School of Medicine | (1932) | Kentucky |
| Boston University School of Medicine | (1933) N. B. M. Ex. | |
| University of Michigan Medical School | (1931) | Michigan |
| University of Oklahoma School of Medicine | (1933) | Oklahoma |
| Jefferson Medical College of Philadelphia | (1930) | Penn. |
| University of Pennsylvania School of Medicine | (1931) N. B. M. Ex. | |
| Vanderbilt University School of Medicine | (1904) | Alabama |
| University of Manitoba Faculty of Medicine | (1924) | N. Dakota |

Wyoming Reciprocity Report

Dr. G. M. Anderson, secretary, Wyoming State Board of Medical Examiners, reports four applicants licensed by reciprocity at the meeting held in Cheyenne, May 20, 1935. The following schools were represented:

| School | LICENSED BY RECIPROCITY | Year Grad | Reciprocity with |
|--|-------------------------|-----------|------------------|
| University of Kansas School of Medicine | (1923) | | Penn. |
| University of Minnesota Medical School | (1933) | | S. Dakota |
| University of Nebraska College of Medicine | (1934) | | Nebraska |
| Osteopath* | | | Oklahoma |

* Licensed to practice osteopathy and surgery

Book Notices

Child Psychiatry By Leo Kanner M.D. Associate Professor of Psychiatry the Johns Hopkins University Baltimore With prefaces by Adolf Meyer M.D. LL.D. Henry Phipps Professor of Psychiatry the Johns Hopkins University Baltimore and Edwards A. Park M.D. Professor of Pediatrics the Johns Hopkins University Baltimore Cloth Price \$6 Pp 527 Springfield Illinois & Baltimore Charles C Thomas 1935

Dr Kanner attempts to write "the first text book of child psychiatry in the English language." The author states that he attempts to cover the entire field of children's personality disorders on a broad objective, unbiased and practical basis. Although no previous formal textbook has been written concerning the psychiatric disorders in childhood, there have been previous monographs dealing with certain broad aspects in its field. The author attempts to systematize existing knowledge and to some extent succeeds in outlining what is known in the field. The point of view is, however, by no means catholic but is essentially the psychobiologic point of view reached by the school of Adolf Meyer. Dynamic psychology is depreciated throughout. The neurologic principles included for completeness are not well outlined and are inadequately linked with the psychologic correlates. The practical basis is in name only since the actual procedures of treatment are barely indicated. On the whole the author has done a good piece of work in bringing together what data he has selected for the physician's consumption. It offers the pediatrician an interesting introduction to psychiatry.

Individual Health A Technique for the Study of Individual Constitution and Its Application to Health By E. Obermer Volume I Biochemical Technique By E. Obermer and R. Milton Cloth Price 15s. Pp 244 with 61 illustrations London Chapman & Hall Ltd 1935

This is the first of two volumes that will present a technic to be used by the physician of the future, whose principal concern will be the prevention of disease instead of its diagnosis and treatment, as is the case at the present time. In order to prevent disease, the maximum functional efficiency must be attained. To this end it will be necessary to make an exhaustive study of each individual to determine the part played by every factor—physical, psychologic or environmental—that may hinder or promote his efficiency, affect his resistance to infection or add to his longevity without senile loss of elasticity.

The authors propose a technic of "complete adaptation survey," which includes

- 1 Hereditary constitutional factors by
 - (a) detailed family history
 - (b) anthropometric measurements
- 2 External environmental factors by
 - (a) detailed past history
 - (b) physical examination
 - (c) bone radiology
 - (d) dental examination
- 3 Reaction of internal environment to present external environmental factor
 - (a) direct—by physical or mechanical means
 - (b) indirect—by biochemical means

This book deals with the second part of section three—the biochemical part of the technic. The entire remainder is to be presented in volume II.

The adaptational survey sets out to measure the functional efficiency of the individual the success with which he adapts himself to his particular environment. The authors propose a graph form to permit the linear expression in terms of physiologic equilibrium of the individual as he progresses through life. This necessitates repeating the third part of the survey at intervals of from one to five years up to death. The authors do not intend to deal with the interpretation or application of the observations in either of the two proposed volumes. This is to be reserved for a later consideration of these methods as applied to practical problems of individual health.

The elaborate investigation described requires a well organized laboratory unit for mass examinations. A personnel of eight can do four investigations in one day. The authors describe in great detail the organization and equipment necessary for the numerous examinations. The purpose of the biochemical section is to arrive at a quantitative picture of the

subject's dietetic and excretory habits. The ingesta of twenty-four hours are weighed and samples of each foodstuff analyzed. The blood, twenty-four hour urine specimens and twenty-four hour feces are then analyzed quantitatively and qualitatively. Eighty-seven different tests with more than a hundred examinations are necessary for each complete twenty-four hour survey of the subject's ingesta, excreta and blood examinations. About 175 determinations are necessary in addition to curves for the "metabolic equilibrium" report forms.

Part two of the book is of especial value to those interested in analytic chemistry. It presents in excellent form details of analytic technic. One method of analysis is selected for each constituent and many of the methods are photomicrometric or densitometric methods. These are especially valuable when one deals with large numbers of specimens. An excellent bibliography is included.

Personal and Community Health By Clair Elsmere Turner M.A. Dr P.H. Professor of Biology and Public Health in the Massachusetts Institute of Technology Fourth edition Cloth Price \$3 Pp 680 with 135 illustrations St. Louis C.V. Mosby Company 1935

A book for lay students by a layman, when it deals with basic sciences and their application for individual and collective health measures, concerns the medical profession. Professor Turner's contributions to the teaching of health from the nursery school level to that of the university student are well known and widely respected. The first 326 pages present the elements of anatomy and physiology and some of their applications to personal habits, particularly those of the young healthy adult of both sexes, together with a brief consideration of heredity, mental health, narcotics and stimulants. The next 200 pages give space to the larger problems of communal responsibilities, and organization for health protection. Environment, immunity, health administration, the hygiene of maternity, childhood, and industrial workers are simply presented in summary statements of long accepted facts. In a hundred pages of appendix are offered a reprint of the recent report of Control of Communicable Diseases, published in the August 9 *Public Health Reports*, and a review of disinfection and disinfectants. Except for the appendix report on communicable diseases, which is a document addressed to health officers and medical practitioners and is hardly understandable or usable in this concentrated form by college students, the book contains nothing novel or controversial. It is a straightforward, systematic exposition of matters of rather elementary character, the proper substance of teaching in a cultural arts course. It is a volume not likely to add materially to the useful knowledge of the graduate in medicine. The glossary and index are appropriate for the use of the type of expected readers addressed, but some of the definitions lack adequacy. "Pellagra, an endemic disease of the skin and spinal cord" "Labia, lips" "Virus, a living virulent cause of disease" "Yaws, a form of oriental sore in which the lesions consist of crust capped nodules."

Die rheumatische Infektion im Kindesalter mit besonderer Berücksichtigung der Grenzgebiete Von Dr. E. Glanzmann Professor der Kinderheilkunde an der Universität Bern Boards Price 5.40 marks Pp 83 with 36 illustrations Leipzig Georg Thieme 1935

The purpose of this monograph is twofold. It describes the clinical picture of rheumatic fever as seen in childhood and it describes those chronic diseases of the joints from which the articular manifestations of rheumatic fever must be differentiated. The author makes no attempt to describe acute inflammations of the joints and he excludes from consideration tuberculous and syphilitic involvement. In the section describing rheumatic infection, emphasis is properly laid on the fact that rheumatic fever is in reality a chronic and a systemic disease and that the articular manifestations constitute only one of a number of clinical varieties of rheumatic fever. The various clinical forms seen in childhood are described in turn. The present situation in regard to the etiology of rheumatic fever is discussed. The author points out the confused state of this phase of rheumatic fever and he emphasizes that the hemolytic streptococcus theory is far from demonstrated. The author discusses the medicinal treatment of rheumatic fever briefly and the use of phenylethylhydantoin in the treatment of chorea at some length. He cautions against the routine use of tonsillectomy. The presentation might have been improved

if the author had considered the differential diagnosis of the various forms of rheumatic fever in more detail and had discussed the long term management of this infection. In dealing with the other chronic involvements of joints, the author places particular emphasis on chronic systemic progressive polyarthritis and on Still's disease, which he considers separate entities. Still's disease is distinguished from the other form of chronic polyarthritis by the presence of intermittent fever, diarrhea, extreme cachexia, anemia, enlargement of the lymph nodes, splenomegaly, and cardiac involvement. The other types of joint involvement in childhood are briefly discussed. This monograph is to be recommended not only to pediatricians but also to physicians dealing with adults, because of the clear presentation of the picture of rheumatic fever and because of the fairly comprehensive review of the forms of joint involvement that may be encountered in young adults as well as in children.

The Physiology of Physical Education for Physical Educators and Their Pupils. By Percy M. Dawson, M.D. Cloth. Price \$8. Pp. 938. With 135 illustrations. Baltimore: Williams & Wilkins Company, 1935.

Here is an unusual textbook both in manner of presentation and in subject matter. The usual conventional limitations that beset the writer of most textbooks have not interfered with the irrepressible individuality of this author. The reader can not help but be impressed by the unusual yet scholarly manner in which the author presents his subject. He is a pioneer in textbook writing on subjects of biologic interest. There will be those readers who will immediately be out of sympathy with him for his lack of convention, but any one who will give this book a fair trial will be well rewarded for the effort. At first he will approach it cautiously, wondering what justification there is for the simplified spelling (even at times unorthodox). Later, after he has made an attempt to translate it, he will wonder again. He may finally have to accept it and admire both the author and the publisher for their courage. Perhaps he has undertaken too many ideals in textbook reform at one time. The material and mode of presentation are excellently chosen. Few books on this subject are as comprehensive and well correlated. The discussions on the physiology of muscle, nervous arcs, nutrition, growth and metabolism are particularly well done and contain almost all the recent data in the respective subjects. The chapters on sleep, fatigue, proposed aids to recuperation, exercise and human power and efficiency are only a few of the excellent evaluations of applied physiology. Any one interested in physical education will benefit greatly from this book. Physicians will also find this an excellent source of information not ordinarily available in the average textbook on the subject.

Über Erkrankungen des arteriellen Systems. Von F. Curtius R. Engel, H. Marx und R. Siebeck. Heft 1. Schriftenreihe zur Deutschen medizinischen Wochenschrift. Herausgegeben von L. v. Krehl, R. Siebeck und V. v. Weizsäcker. Boards. Price 3.60 marks. Pp. 102. With illustrations. Leipzig: Georg Thieme, 1935.

This monograph contains a series of five articles dealing with hypertension presented before the Medical Society of Berlin. Siebeck presents a somewhat theoretical discussion of the mechanisms of hypertension. Curtius emphasizes the need of considering in each individual the detailed family and personal history. Engel gives an excellent statistical summary of the relationship of the height of blood pressure to the prognosis of the patient with hypertension. This is based on 1,922 patients from the Heidelberg clinic and includes 884 who died. His careful analysis of statistical methods, with due regard to limitations, has led him to the conclusion that elevation of blood pressure foreshortens life, the prognosis being worse when the blood pressure is fixed at a constant high level. He recognizes that hypertension is not to be considered a systemic disease but rather as a symptom of a disturbance in function which has a definite prognostic significance. Even in patients with "chronic nephritis" the prognosis, he finds, depends on the elevation of blood pressure. Marx presents some experiments on the production of hypertension. He found that the injection of small quantities of streptococcus toxin into the ventricles of the brain of the dog produces hematuria, elevation of the blood pressure and an antidiuretic action. A similar effect is produced in the dog by the injection of spinal fluid from patients suffering with acute nephritis, but not by the cerebrospinal

fluid of normal individuals. Marx concludes from these experiments that one of the causes of hypertension is a disturbance in the function of the pituitary gland, but an examination of the evidence for this deduction will leave the reader far from convinced. Siebeck concludes the series of articles with a summary of some practical considerations of hypertension. He discusses the proper manner of taking blood pressure, the normal limits of blood pressure, the importance of the family history and the significance of cerebral symptoms. In discussing the therapy of hypertension he emphasizes the futility of lowering blood pressure, once hypertension is long established, because of the dangers of producing malnourishment in vital organs. The lowering of blood pressure he properly points out should be limited to the relief of disturbing symptoms. He emphasizes the need of rest, diet and certain general restrictions in the treatment of hypertension. He rightfully points out the lack of proved value of the various depressor substances obtained from organ extracts that have been advocated in the past. Physical therapy, graded exercise and psychotherapy, he believes, play a more important part in controlling the blood pressure level than medicinal treatment. This booklet should prove stimulating to the medical reader.

A Textbook of Anatomy and Physiology. By Jesse Felsing Williams, M.D. Professor of Physical Education, Teachers College, Columbia University, New York City. Fifth edition. Cloth. Price \$2.75. Pp. 646. With 416 illustrations. Philadelphia & London: W. B. Saunders Company, 1935.

This book, according to the author, "is arranged to serve the needs of the student of anatomy and physiology outside the medical school," including students of nursing, physical education or one of the allied fields whose problems are fundamentally alike. The arrangement is excellent. Each chapter is headed with a convenient outline and closes with practical lesson helps. The book is written from the broad point of view of the author, which reflected through all his writings, has placed him in the forefront among health educators as well as in the field of physical education. Of the authenticity of the material presented there can be no question, the form of its presentation makes this a workable textbook which should be a great aid to the student of anatomy and physiology, which the author admits are difficult subjects. For the students for whom he writes, the author says, "no shallow descriptive anatomy and physiology will suffice." Instead, he insists that they shall be "acquiring fundamental concepts of human structure and function." The occasional evidences of gullibility exhibited even by well educated persons, including teachers, in the presence of plausible medical fakes, lends point to the insistence that workers with human material, such as teachers and nurses, shall be soundly grounded in the "fundamental concepts of human structure and function." For such a grounding Dr. Williams presents the materials in a form as readily assimilable as the inherent difficulties of the subject permit. A good glossary and index and numerous illustrations of excellent quality should be helpful to the student. The book can be recommended without reservation.

Röntgenbefund und pathologisch-anatomischer Befund bei Lungenkrankheiten. Versuch einer kritischen Vergleichung. Von Dr. med. Max Versé, o. ö. Professor der allgemeinen Pathologie und pathologischen Anatomie, Marburg. Teil 1. Text. Teil 2. Atlas. Cloth. Price 18 marks. Pp. 93, 144 illustrations. Berlin: Otto Elsner Verlagsgesellschaft m. b. H., 1935.

This book consists of two volumes. Volume I consists of ninety-three pages giving brief clinical histories of fifty-four cases of lung disease, representing the various types, chosen from a large collection of pathologic material. In addition to the clinical history there is a description of the pathologic changes shown by fluoroscopic and roentgenographic studies in comparison with the gross and, at times, the microscopic studies of the pathologic changes.

Volume II is an atlas with 144 full page illustrations showing the conditions described in volume I. Primarily, this work represents the pathologist's work, and most of the illustrations represent the lungs as shown in roentgenograms, with the lungs after the removal from the body deflated, partially inflated, and completely inflated, with associated light photographs of the pathologic specimen in cross section. In a few cases there are shown roentgenograms made during life, but most of these

were made a considerable time before death. The author has shown especially the difficulties of demonstrating small atelectatic areas and has especially emphasized the fact that the roentgenographic appearance often represents atelectasis added to the primary pathologic condition.

The work illustrates how important it is for pathologists to combine roentgenographic and fluoroscopic studies with the macroscopic investigations. It also conveys to the clinical radiologist and to the general clinician a rather definite idea of the pathologic processes that take place in the various diseases. From the standpoint of the clinical radiologist and the general clinician, it is to be regretted that there could not have been shown more of the roentgenograms taken during life, for it is such roentgenograms on which the clinician must depend for the proper treatment of the patient.

This work is of special interest and should be in the library of every pathologist and physician who is giving special attention to diseases of the lungs, also it should be a part of the roentgenologist's library.

A Course of Study in Dentistry. Report of the Curriculum Survey Committee. American Association of Dental Schools. Paper. Price \$1. Pp 413. Chicago. The Committee. 1935.

The survey represents an effort on the part of dental educators to apply to their problems the same scientific methods that are now employed in other fields of education. It is not an evaluation of present practices, rather it attempts to determine, in the light of human needs, what constitutes an adequate undergraduate dental curriculum. The authors recognize that no course of study, however well it may be designed or however solid its foundations, can ever be final; that provision must be made for constant readjustment in the light of newer knowledge and clearer understanding of the public need. In its final recommendations the committee unhesitatingly declares itself in favor of the four year dental curriculum based on admission requirements of two years in college. This declaration will doubtless settle the long standing controversy regarding the length of the dental course. The committee also endorses the policy of maintaining dental education as an independent and autonomous field of professional education. Doubtless this handbook will serve a useful purpose, especially in assisting the weaker schools to improve their curriculums, but the adoption of a detailed syllabus of instruction seems to be a procedure better adapted to secondary education than to instruction at the university level.

The Theory and Practice of Anæsthesia. By M. D. Nosworthy. M.A. M.D. B.Ch. Anæsthetist to Westminster Hospital, London. With a foreword by I. W. Magill. M.B. B.Ch. Senior Anæsthetist to Westminster Hospital, London. Cloth. Price 12/6. Pp 223 with 35 illustrations. London. Hutchinson (Scientific). 1935.

The author has written a short book in which he has not attempted to cover the whole subject of anesthesia but in which he has gone into detail concerning methods of anesthesia that can be applied in every type of case. He says that many of the points in the book may appear trivial to experts but that they have helped many resident anesthetists. It can be said that the book will be of such satisfaction to experts that their work in teaching will be made much easier and many of their ideas will be reflected independently in the book. One chapter deals with the mode of action of inhalation anesthesia and it is well done. Another chapter is on postanesthetic acidosis, which reviews the existing opinions well. In a chapter on the influence of certain factors during anesthesia the author stresses the use of carbon dioxide and oxygen and points out the many valuable uses. A chapter on shock covers the practical points well. The stages and signs of general anesthesia are discussed.

The chapter on ether and the difficulties in general anesthesia, which includes a discussion of respiratory obstruction and respiratory abnormalities, is without doubt the best of its kind in print on the subject. The use of ethyl ether is thoroughly covered, and reference is made to vinylene. The chapter on chloroform is excellent and is valuable to anesthetists in the United States because they seldom use it and yet should know about it. The next chapter, on ethyl chloride, is short but good. The following chapter, on nitrous oxide, is almost as short but equally good, and the one on nitrous oxide and oxygen is excellent and covers that subject especially well.

The author speaks briefly of other anesthetic gases. There is a chapter on endotracheal anesthesia, which is good. The chapter on preliminary medication is particularly good and includes a discussion of the rectal and intravenous use of certain drugs. The chapter on regional anesthesia deals with spinal anesthesia, with the use of only nupercaine and stovaine, and reflects the author's experience with it and the results reported by others. The choice of an anesthetic is dealt with briefly, as are the after-effects of anesthesia. The English speaking anesthetist would do well to read this book.

Review of Legal Education in the United States and Canada for the Year 1934. By Alfred Z. Reed. Staff Member in Charge of the Study of Legal Education. Paper. Gratis. Pp 75. New York. Carnegie Foundation for the Advancement of Teaching. 1935.

As customary, Mr. Reed devotes a large portion of his report to the discussion of a single theme, in this case, "The Salaried Professor in the Learned Professions." He finds the origins of the teaching professions in the apprenticeship customs and the craft-guild organizations of the Middle Ages and recounts the influences, economic and social, which have modified the status of the teacher from that day to this. The varying structure of European and American universities is portrayed and special emphasis laid on the significance of state and municipal universities. A chapter devoted to the "Institutional Development of Medicine, Law, Engineering, and Architecture" presents interesting comparisons of the educational policies of these professions. With respect to the activities of the American Medical Association there is on page 24 an unfortunate misstatement. The Council on Medical Education and Hospitals by no means "recognizes the Association of American Medical Colleges as the standardizing agency for all educational matters."

Tumeurs de l'encéphale. Contributions à l'étude anatomo-clinique des tumeurs intracrâniennes et du repérage ventriculaire. Par D. Paulian. Préface du Docteur Clovis Vincent. Paper. Price 30 francs. Pp 215 with 189 illustrations. Paris. Masson & Cie. 1935.

This monograph consists of three parts: the first dealing with the pathologic anatomy of intracranial tumors, the second with ventriculography and the third with a series of forty-six cases of neoplastic disease affecting the brain. The French of the author is none too good, and typographic errors are innumerable. He follows the classification of Hortega in the first seven pages and then suddenly shifts to that of Bailey and Cushing, making it difficult to correlate the two discussions. There are numerous incorrect statements in this part, such as that the oligodendrogliomas are encapsulated and that microscopically the medulloblastomas are easily confused with the spongioblastomas. He details at great length the outworn conception of a neurospongium. In the second part great emphasis is placed on Laruelle's method of ventricular visualization. Any one with any experience with this method knows how readily one may misinterpret the roentgenograms obtained in this way. The third part details a series of forty-six neoplasms of all kinds and locations, many metastatic. Many American clinics could fill libraries with such case reports. The American student will learn nothing from this disjointed discussion.

Meharry Medical College. A History. By Charles Victor Roman. Professor of Philosophy and Social Ethics. Tennessee A. and I. State College. Cloth. Pp 224 with 43 illustrations. Nashville. Sunday School Publishing Board of the National Baptist Convention, Inc. 1934.

The author states in the introduction that, like the writer of the Epistle to the Hebrews, he is appealing to his own. His audience he describes as alumni of Meharry Medical College, alumni of Howard and Shaw, those of Negro blood wherever they were graduated and wherever they reside, all who love or practice the principles of the healing art of whatever language, race or country, and finally the friends of human progress, whatever their specific interests or occupations. The story of Meharry Medical College is told in brief sketches of the men who have been prominently connected with it, the founders, successive presidents, and members of the faculty. Personal impressions predominate and there is little attempt to appraise the educational significance of the institution. It will serve as a eulogy of the courage, perseverance and utterly unselfish devotion of George Whipple Hubbard, dean and president from 1876 until his death in 1924.

Medicolegal

Workmen's Compensation Acts Compensability of "Chemical Conjunctivitis"—The claimant, in the course of her employment, handled dresses made of goods containing certain dyes. She had an attack of conjunctivitis in 1926 and another in 1927, which her physician diagnosed as "chemical conjunctivitis" and attributed to the dyes in the dresses she handled. She applied to the industrial commission of Ohio for compensation under the workmen's compensation act. The commission denied her claim but on appeal the court of common pleas allowed it and the order of that court was affirmed by the court of appeals. The industrial commission then appealed to the Supreme Court of Ohio. The claimant alleged that particles of the dyes in the goods she handled became detached, some of them sticking to her hands and others floating in the air, and that these detached particles thus came in contact with the mucous membrane of her eyes and caused the conjunctivitis that was the basis of her claim.

"Chemical conjunctivitis," said the Supreme Court, is not an occupational disease within the category of occupational diseases defined by the legislature in the workmen's compensation act of Ohio. If it is compensable at all, the claimant must prove that it is the proximate result of traumatic injury received in the course of her employment. There was no testimony to show that particles of dye did adhere to the claimant's hands and by rubbing were transferred to her eyes or that such particles floated in the air. She herself testified that she never rubbed her eyes. Her physician's diagnosis of chemical conjunctivitis was based on the history given by the claimant and on the fact that the condition did not yield readily to treatment. No microscopic examination was made to prove or disprove the presence of particles of dye on the claimant's hands or in the air. Her physician's testimony was to the effect that the actual cause of the claimant's condition was unknown to him but that particles of dye could have caused it.

The condition of the claimant's eyes may have been due to some external irritant sufficient to constitute "medical trauma," but, asked the court, was it "legal trauma," or the kind of trauma that the legislature had in mind when it enacted the workmen's compensation act? If the court should hold that, when microscopic particles of dye come in contact with the uninjured mucous membrane of the eye they cause trauma within the meaning of the law, it would be obliged to hold that trauma resulted whenever any microbe entered the body from the outside and lodged on an uninjured mucous membrane. Such a holding would upset all legislation relative to occupational diseases. Even if it should be admitted, continued the court, that the dress goods handled by the claimant gave off particles of dye, which were communicated to her eyes in the course of her employment, the claimant still would not be within the purview of the workmen's compensation act, for the claimant herself testified that nothing unusual had happened to her. Therefore there was no accidental injury within the meaning of the law.

The judgment of the court of appeals was reversed and the order of the industrial commission of Ohio denying compensation was affirmed—*Industrial Commission of Ohio v. Armacost (Ohio)*, 194 N. E. 23.

Chiropractic Jurisdiction of Kentucky Chiropractic Board Over License Issued by State Board of Health.—The state board of health of Kentucky in 1924 licensed J. E. Triplett to practice chiropractic and physical therapy, pursuant to a Kentucky statute authorizing the board to issue licenses to practitioners of any drugless or limited school of treating human ailments. In 1928 the legislature passed an act creating a board of chiropractic examiners and conferred on that board the right to issue and revoke licenses to practice chiropractic. Subsequently, proceedings were instituted before the state board of health to revoke Triplett's license. He petitioned the circuit court for an injunction to restrain that board from action against him, contending that the chiropractic practice act of 1928 divested the state board of health of jurisdiction

to revoke chiropractic licenses. The court sustained a demurrer by the state board of health. From a judgment dismissing his petition for an injunction, Triplett appealed to the Court of Appeals of Kentucky.

In the opinion of the Court of Appeals, it was clearly the purpose of the legislature, in enacting the chiropractic act of 1928 creating the state board of chiropractic examiners and defining its powers and duties, to give that board jurisdiction over all licensed chiropractors, including those to whom licenses had been issued by the state board of health prior to passage of the act. It necessarily followed that after the effective date of the act the state board of health was without authority to revoke a license to practice chiropractic even though the license had been granted by it.

Triplett's license, however, authorized him not only to practice chiropractic but also to practice physical therapy. The court was unable to determine from the record whether or not physical therapy was a drugless or limited school of healing. Assuming that it was, the court concluded that the authority of the state board of health to revoke a license to practice physical therapy for causes specified by statute was not affected by the act of 1928 creating the board of chiropractic examiners.

The judgment of the circuit court was reversed. The case was returned to the trial court for proceedings consistent with the decision of the Court of Appeals that the state board of health had no authority to revoke Triplett's license so far as it related to the practice of chiropractic but that it had authority to revoke it so far as it related to the practice of physical therapy—*Triplett v. State Board of Health (Ky)*, 79 S. W. (2d) 226.

Privileged Communications Privilege Not Waived by Cross-Examination of Lay Witness Present at Examination of Patient.—On June 9, 1930, the defendant insurance company delivered a policy on the life of the deceased. On April 23, 1931, she died. The certificate of death issued by the attending physician gave tuberculous laryngitis as the immediate cause of death. The insurance company refused to pay the benefits named in the policy, claiming that when the policy was issued the deceased had been treated for pulmonary tuberculosis and that her statements to the contrary in her application were false and fraudulent. The plaintiff, individually and as administratrix of the deceased's estate, sued the insurance company. From a judgment in her favor the company appealed to the Supreme Court of Nebraska.

Sometime preceding her application for life insurance, the deceased was taken sick. Her roommate accompanied her to the office of a Dr. Betz and was present when he made his examination and gave advice. The roommate made a deposition in the present case in the course of which she was cross-examined by counsel for the plaintiff and which was admitted in evidence. Later when the defendant offered in evidence the deposition of a Dr. Fiske, who had treated the deceased subsequent to her visit to Dr. Betz, the plaintiff objected, on the ground that Dr. Fiske's deposition contained a privileged communication between physician and patient and was therefore inadmissible, since the deceased had not waived her privilege. The defendant insurance company contended, however, that the plaintiff had waived the privilege of her intestate by reading to the jury the cross examination of the roommate of the deceased, who had been present when she was examined and advised by Dr. Betz. The reading of that cross examination, the defendant contended, waived the privilege as to any and all doctors who had treated the deceased.

In the cross-examination of the deceased's roommate, said the Supreme Court, the counsel for the plaintiff did not seek to introduce evidence on his own case. His cross examination may be considered as a limitation or modification of the answers made by the witness on direct examination. Nothing indicates that he sought independent evidence, and such a cross-examination cannot be considered as the evidence of the party who calls the witness, unless that party goes too far afield in his examination. The argument that the deceased, by taking a third person with her into the examining room of her physician, waived her privilege of professional secrecy did not appeal to

the court. It did not seem to the court to constitute a waiver of confidential relations. The cross-examination of such a third person when she has been called by the other side to answer questions that are unobjectionable is not a waiver of privilege. The privilege of secrecy should be jealously guarded to protect the rights of one whose lips are closed in death.

The weight of the evidence did not, in the judgment of the Supreme Court, show that the insured had made any untrue answers in her application for insurance. The judgment of the court below was affirmed.—*Leeds v Prudential Ins Co of America (Neb)*, 258 N W 672

Workmen's Compensation Acts Compensability of Injury Impairing Physical Function but not Earning Capacity—An employee developed a perforation of his nasal septum because of the inhalation of chrome in the course of his employment. The perforation was permanent but it in no way disabled the employee in the discharge of his duties or diminished his earning capacity. He claimed and was awarded compensation, however, under the workmen's compensation act. The court of common pleas affirmed the award and thereupon the employer appealed to the supreme court of New Jersey. The employer contended that his employee's injury was not compensable, because it was neither incapacitating nor disabling. Medical witnesses testified that branches of the olfactory nerve distributed through the septum had been destroyed or permanently impaired, resulting in a diminution of the employee's sense of smell. This, said the supreme court, is a compensable injury even though the employee's capacity to perform his work is not impaired or his earning capacity diminished. The test of compensability under the workmen's compensation act of New Jersey, said the supreme court, is not impairment of earning capacity but rather the "loss of physical function which detracts from the former efficiency of the body or its members in the ordinary pursuits of life." The supreme court refused to review the decision of the court below.—*Sutkowski v Mutual Chemical Co of America (N J)*, 178 A 71

Workmen's Compensation Acts Insurer Liable for Payment for Medical Services Rendered Injured Employee—The hair of an employee, in the course of her employment, caught in a revolving shaft and "her scalp and back of neck were torn off." The hospital to which she was taken called the physician-claimant, a member of its staff, who was not "on service" at the time but was subject to call for emergency cases, to render emergency treatment. On the day of the accident, but after the admission of the employee to the hospital, her father selected as her physician the physician who had already rendered emergency treatment. This physician treated her for several months in the hospital, performing several skin graftings and looking after manipulations of the neck muscles at intervals. No express contract was made between the employer's insurer and the physician-claimant as to compensation, but the insurer knew that the physician-claimant was treating the case. The insurer paid the compensation due the injured employee and paid the hospital bill but refused to pay the physician for his services. The physician then instituted proceedings under the workmen's compensation act, before the industrial accident board against the employer and the employer's insurer. From a decree of the superior court, after certification from the industrial accident board, in favor of the physician the insurer appealed to the Supreme Judicial Court of Massachusetts.

The workmen's compensation act of Massachusetts requires the insurer to pay the reasonable charges for services rendered by a physician when the employee selects a physician other than the one provided by the insurer and in case of emergency or other justifiable cause. The industrial board held that the employee, through her father, had selected the physician-claimant as her physician and that the insurer should pay a reasonable fee for his services, because there was justifiable cause within the meaning of the act for his continuing treatment of the injured employee as his private patient. The insurer contended that there was no evidence to support the board's finding.

While there is no evidence said the Supreme Judicial Court that the employee herself expressly selected the physician

claimant as her physician, her acceptance of his services for many continuous months clearly warranted the inference that she ratified and adopted his selection by her father. The insurer further contended that a physician on the staff of a general hospital is not entitled to compensation from an insurer for his services to a patient in that hospital, in the absence of any contract with the insurer, especially when the treatment was not begun as that of a private patient and was continued in the same hospital by the same staff physician and when the hospital had been paid for its services by the insurer. Apparently the insurer's contention was that the case originally was a staff case of the hospital and not a "private" or personal case, that it continued as a staff case, and that therefore a staff physician of the hospital, the hospital itself having been paid, was not entitled to compensation for his services. This argument did not appeal to the court. Although, said the court, the treatment did not begin as that of a "private patient," it was considered as such following the employment of the physician by the employee's father. In this case there was both an emergency and a selection of a physician after the employee had recovered consciousness. The exact moment of such selection was immaterial.

The court affirmed the decree awarding payment to the physician for his services.—*Zombrie's Case (Mass)*, 195 N E 312

Evidence Admissibility of Complaints Made to Physician Examining Only to Qualify as Witness, Medical Examination of Plaintiff in Presence of Jury—In the course of the trial of this personal injury case, the plaintiffs called as a witness a physician who had examined one of them for the sole purpose of enabling him to testify as to her physical condition. In the course of this physician's testimony the trial court permitted him to relate statements made to him by the plaintiff whom he had examined. These statements embraced (1) complaints of present pain and suffering, (2) complaints showing present subjective symptoms and (3) the history of her injuries, including some history of past suffering. Counsel for the defendants repeatedly objected to the admission of such statements on the ground that they were hearsay. The witness however, declared that a narration of what the plaintiff told him was important in the light of his physical findings and opinion. Judgment was rendered for the plaintiffs and the defendants appealed. On appeal, the district court of appeal, second district, division 2, California, found no error in the admission of this testimony holding that—

On the trial of cases for damages for personal injuries complaints by the injured party of present pain and suffering are admissible on proper foundation as evidence through the medium of either medical or lay witnesses. *Bloomberg v Laventhal* 179 Cal 616 178 P 496. *Kimball v Northern Electric Co* 159 Cal 225 231 113 P 156. Declarations and statements made to an examining expert by an injured party of previous condition and past suffering when declared by the expert to be necessary to enable him to form an opinion as to the nature and extent of the disease or injury and when such statements constitute in part the basis upon which the opinion of the expert is based are admissible not for the purpose of establishing the truth of the statements but to serve as a basis for the medical opinion the expert is about to give. *People v Shattuck* 109 Cal 673 42 P 315. *Davis v Renton* 113 Cal App 561 298 P 834. *Rohner v Cross* 121 Cal App 667 9 P (2d) 509.

In the course of the trial a medical witness was permitted to manipulate the plaintiff's neck with his fingers and to "pinch" her cervical vertebra, in the presence of the jury, causing the plaintiff to cringe and to twist her body, with accompanying registration of pain by her facial expression and contortion. This was in the nature of a medical examination of the injured parts and amounted to what might be termed a demonstration. The district court of appeal refused to consider such a demonstration as error. Reception of such evidence, it said, lay primarily and largely in the discretion of the trial court, and it would be only in case of a plain abuse of such discretion that an appellate court would interfere. Such a demonstration may open the door to deception or encourage malingering, or unduly arouse the sympathy of the jury, and it may therefore require a greater degree of care on the part of the trial judge in exercising the discretion vested in him. The existence of such contingencies however, are not recognized as sufficient to forbid the reception of such evidence in cases such as this.

The trial court heard and saw the whole demonstration and was in a situation peculiarly favorable to determine whether it was prejudicial to the defendants. There was no basis, therefore, for substituting the discretion of the appellate court for that of the trial court.

The judgment in favor of the plaintiffs was affirmed—*Willingby v Zylstra (Calif.)*, 42 P (2d) 685

Workmen's Compensation Acts Heat Stroke an Accidental Injury, Autopsy Not Necessary to Prove Cause of Death—The appellee filed a claim for compensation under the workmen's compensation act of Montana, asserting that her husband died as the result of heat stroke. His employer, the appellant, introduced evidence to show that he died of myocarditis. The appellee, the widow, had thought an autopsy unnecessary, and the coroner rejected the suggestion made by a physician employed by the appellant that he order one. The facts and circumstances of this case, said the Supreme Court of Montana, on appeal, bear out the claim that the deceased died from exposure to heat. With the contention of the appellant that it was necessary for the widow to prove the cause of death by the best possible evidence, which must be based on autopsy, the court could not agree. It would be entirely violative of the principles of the workmen's compensation act to hold that the widow, because she had not had an autopsy made on the body of her husband, forfeited her rights under the act. The obligation to take every necessary step to preserve evidence to establish the cause of death rested on the employer, its superintendent, and its medical adviser, at least as heavily as it did on the widow of the dead workman. The judgment of the district court awarding compensation to the appellee was affirmed—*Birdwell v Three Forks Portland Cement Co (Mont.)*, 40 P (2d) 43

Medical Practice Acts License Obtained by Fraud Revocable—The board of medical examiners of California, in 1922, issued to Eugene J. Rinaldo a license to practice medicine, on the basis of a license issued to him by the Missouri state board of health. Complaint was filed against Rinaldo before the California board of medical examiners, April 28, 1924, charging him with having procured his California license by fraud and misrepresentation, in that he falsely stated in his application that he had a medical diploma from the St. Louis College of Physicians and Surgeons, issued in 1908, and that prior to his matriculation at that college he had all the preliminary education required by the medical practice act of California, whereas he did not have such a diploma and never had a bona fide certificate of preliminary education. After litigation extending over eight years, Rinaldo's license was finally revoked, Oct. 18, 1932. The superior court, in certiorari proceedings, annulled the order of revocation, and the board appealed to the district court of appeal, second district, division 2, California, thus bringing the case before that court for the fifth time.

The fact that Rinaldo did not appear at the hearing at which his license was revoked, said the district court of appeal, was immaterial. He was cited to appear and had reasonable notice and opportunity to be heard. That was all that was necessary to give the board jurisdiction. The evidence before the board showed that in 1918, through a solicitor for the St. Louis College of Physicians and Surgeons, Rinaldo purchased from the assistant superintendent of public instruction of Missouri a certificate of high school credits, and from a physician in Los Angeles a certificate of four years' medical education in the Pacific Medical College. That in October 1918 he enrolled in the College of Physicians and Surgeons of St. Louis, and that he studied there until April 1919 and was graduated by that school in June 1919. The trial court, in certiorari proceedings, held that the evidence adduced was insufficient to warrant the revocation of the license, but on appeal the district court of appeal took a different view.

The writ of certiorari said the court, can be used only to ascertain whether the board exceeded its jurisdiction. The action of the board is final and conclusive on every question other than that of its own jurisdiction. When the state board of medical examiners is vested with authority to determine the guilt or innocence of a person charged with an offense under

the medical practice act, as the board was in this case, its determination of the question of guilt or innocence, however erroneous it may be, is not void for want of authority in the board to render it. Only where it appears that there is a total lack of competent evidence on which the board's adjudication could be based can a review of the evidence by the court be had to determine whether facts adequate to give the board jurisdiction were or were not proved. The board in this case, on competent evidence, made its determination, and neither the superior court nor the district court of appeal may substitute its determination for the determination of the board.

While the right of a person to practice a profession for which he has prepared himself is property of the very highest character and entitled to protection, the legislature may authorize the board of medical examiners to revoke the licenses of persons whose principles, practices and characters make them unfit to remain in the medical profession. Any fraud or misrepresentation in the application on which a license to practice medicine is based, resulting in giving the appearance of qualification to a person who does not in fact possess it, is sufficient under the law to warrant revocation of that license. The judgment of the superior court, annulling the board's revocation order, was reversed.—*Rinaldo v Board of Medical Examiners of State of California (Calif.)* 42 P (2d) 724

Hospitals Liability for Care of "Non Compos Mentis" Patients—According to the court of appeals of Georgia, division 2, "A private hospital [for the treatment of patients suffering from nervous and mental diseases] in which a patient is placed for treatment owes the duty of safeguarding and protecting the patient from any known or reasonably apprehended danger from himself which may be due to his mental incapacity, and to use ordinary and reasonable care to prevent such danger, and where the patient, while in the care of the hospital, is, with the knowledge of the authorities in charge of the hospital having him in care and charge, temporarily insane and in a mental condition where he may possibly do injury and harm to himself or others, and the authorities negligently fail to so care for and keep the patient, and by reason thereof he has access to a knife or other sharp instrument, which he uses in killing himself by cutting his throat, the authorities of the hospital are guilty of negligence as respects their duty to keep and care for the patient which is the proximate cause of the homicide, and are liable in damages therefor to the person legally entitled to recover"—*Browner v Bussell (Ga.)*, 179 S E 228

Society Proceedings

COMING MEETINGS

- American Academy of Tropical Medicine, St. Louis Nov 20-21 Dr. Earl B. McKinley 1335 H Street NW Washington D. C. Secretary
- American Association for the Study of Neoplastic Diseases Baltimore, Dec 19-21 Dr. Eugene R. Whitmore 2139 Wyoming Avenue NW, Washington D. C. Secretary
- American Association of Railway Surgeons Chicago November 13-15 Dr. Louis J. Mitchell, 86 E. Randolph St. Chicago Secretary
- American Society of Tropical Medicine St. Louis November 19-22 Dr. Alfred C. Reed 350 Post Street San Francisco Secretary
- American Student Health Association New York Dec 27-28 Dr. Harold S. Diehl University of Minnesota Medical School Minneapolis, Secretary
- Clinical Orthopedic Society Indianapolis and Louisville Nov 13-16 Dr. J. E. M. Thomson 1307 N. Street Lincoln Neb. Secretary
- Eastern Section American Laryngological, Rhinological and Otolaryngological Society, Newark, N. J., Jan 3 Dr. Henry B. Orton 24 Commerce St. Newark N. J., Chairman
- Medical and Surgical Association of the Southwest El Paso Texas Nov 21-23 Dr. W. Warner Watkins 15 East Monroe Street, Phoenix, Ariz. Secretary
- National Society for the Prevention of Blindness, New York, Dec 5-7 Dr. Lewis H. Carris 50 West 50th Street New York, Managing Director
- Radiological Society of North America Detroit Dec 2-6 Dr. Donald S. Childs 607 Medical Arts Building Syracuse N. Y. Secretary
- Society of American Bacteriologists, New York Dec. 26-28 Dr. I. L. Baldwin College of Agriculture, University of Wisconsin Madison, Wis. Secretary
- Southern Medical Association, St. Louis, November 19-22 Mr. C. P. Loranz, Empire Building Birmingham Ala. Secretary
- Southern Surgical Association Hot Springs Va. Dec. 10-12 Dr. E. W. Alton Ochsmier 1430 Tulane Ave New Orleans Secretary
- Western Surgical Association, Rochester Minn Dec. 6-8 Dr. Albert H. Montgomery 122 South Michigan Boulevard Chicago, Secretary

Current Medical Literature

AMERICAN

The Association Library lends periodicals to Fellows of the Association and to individual subscribers to *THE JOURNAL* in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J Obstetrics and Gynecology, St. Louis

30 309-458 (Sept.) 1935

Physiology of Corpus Luteum Comparative Actions of Crystalline Progesterin and Crude Progesterin on Uterine Motility in Unanesthetized Rabbits W M Allen Rochester, N Y and S R M Reynolds, Brooklyn—p 309

Cancer of Female Urethra E S Auer St. Louis—p 318

*Blood Lipids in Eclampsia E M Boyd Rochester N Y—p 323

Tribrom Ethanol Premedication in Operative Gynecology J L Reycraft, Cleveland—p 332

Experimental Study of Effects of Intravenous Injections of Hypertonic Glucose Solution (Fifty per Cent) on Circulation of the Cat II Effects of Injection of Fifty per Cent Glucose Solution Before and After Artificial Reduction of Blood Pressure by Trauma V P Mazzola and M A Torrey Brooklyn—p 339

*Blastomycosis of Female Reproductive Tract Report of Case E C Hamblen R D Baker and D S Martin Durham N C—p 345

Analysis of Labor in Young Girls A C Posner and M Pulver New York—p 357

Treatment of Persistent Occipitoposterior Position by One Hundred and Eighty Degree Manual Rotation of Occiput S S Rosenfeld New York—p 364

Results of Treatment of Benign Lesions of Cervix Uteri P Tompkins Philadelphia—p 369

*Complications Following Cauterization of Cervix Uteri D Cannell and M Douglass Cleveland—p 376

Sex Prediction Test of Dorn and Sugarman W T Pommerenke and W C Rogers Rochester N Y—p 380

Pregnancy Complicating Cardiac Disease I Daichman and G Kornfeld Brooklyn—p 386

Injection of Varicose Veins During Pregnancy Preliminary Report. G R Cheatham and A E Peck Endicott N Y—p 392

Motility in Transplanted Denervated Uterus S Kaminester and S R M Reynolds Brooklyn—p 395

Electro-Uterography H C Falk and R Nahon New York—p 403

Historical Review of Syndrome Embracing Utero-Ovarian Atrophy with Persistent Lactation (Frommel's Disease) E A Sharp Detroit—p 411

Pregnancy Complicated by Carcinoma of the Cervix. W Neill Jr Baltimore—p 414

Tuberculous Endometritis M W Diethelm and T L Ramsey Toledo Ohio—p 420

Massive Collapse of Lung Following Cesarean Section G W Gustafson Indianapolis—p 425

Instance of Like Monsters in Successive Pregnancies M G DerBrucke Brooklyn—p 429

Chondrodystrophic Nanism with Delivery by Cesarean Section Case L A Balasquide Ponce Puerto Rico—p 430

Tube for Collection of Urine Under Aseptic Conditions S Litt Chicago—p 433

Diffuse Sarcoma of Endometrium G H Moench and Louise H Meeker New York—p 435

Blood Lipids in Eclampsia—Boyd found that the concentration of lipids varied greatly in eclamptic patients, but no significant variation occurred in the value of any single lipid. The ratio of phospholipid to cholesterol in plasma was found, however, to be without exception higher in eclampsia than in other toxemias or in normal gestation. The mean minus the standard deviation for the ratio in eclampsia was higher than the mean plus the standard deviation in normal gravidas and other toxemias. Variations in the value of the ratio from one eclamptic patient to another were only one fourth to one third as great as the variation in single lipids indicating that the ratio was also less variable than the component lipids. When the patients recovered from eclampsia the ratio phospholipid/total cholesterol of plasma returned quickly to normal, owing chiefly to a fall in the value of phospholipid. Cessation of convulsions without termination of pregnancy left the ratio still high, indicating that a high ratio did not result from convulsions but was associated with and possibly accounted for the eclamptic state. Only a small proportion of cases diagnosed as preeclampsia were found to show an elevated plasma phos-

pholipid/total cholesterol ratio and, hence, were literally preeclamptic. The test is at present being used as a means of separating the preeclamptic group into true preeclampsia and nonconvulsive cases. The relation of water retention to convulsions becomes more apparent if attention is confined to the tissues of the brain. Increased water retention by the brain, due to an increased plasma phospholipid/total cholesterol ratio favoring increased phospholipid values in the brain will result in increased pressure within the bony skull. When this surpasses a certain maximum, the irritability of the nerves may reach a point at which convulsions ensue. The explanation, deduced from the present data, is offered as a working hypothesis not as a proved theory.

Blastomycosis of Female Reproductive Tract—Hamblen and his associates recount their study of a case of infection of the fallopian tube and uterus with *Blastomyces dermatitidis* in a patient with arrested pulmonary blastomycosis (American type, Gilchrist's disease). A preoperative diagnosis of uterine involvement was made from a section of endometrial curettings and confirmed by culturing the organism. Mycologic and anatomic studies of the removed tissues are recorded. This apparently constitutes the first report of extensive blastomycosis of the female reproductive tract. The tissue reaction in the affected organs was remarkably like that in tuberculosis but was to be differentiated from the latter by the presence of the double-contoured blastomycetes. The removal of the uterus was necessary to prevent further excessive blood loss, and the extirpation of the tubo-ovarian masses was indicated to eliminate the large blastomycotic focus. Surgery was justified in this case by the uncomplicated postoperative course.

Complications Following Cauterization of Cervix Uteri—Cannell and Douglass have observed a number of complications following cauterization, three of which are reported. The complications have followed cauterizations after the heavy duty or Paquelin cautery, or the postcautery in office practice. Very light surface cauterization with the finer types of cautery is definitely advisable but is less effective. The occurrence of widespread pelvic infections following cauterization is evidently much more frequent than is commonly supposed. The presence of a latent gonorrheal infection of the cervix should be carefully eliminated whenever possible. Patients with a history of infected abortion, especially of recent occurrence, should be dealt with most cautiously as subjects for cervical cauterization, especially with the heavy duty cautery. The authors also have had an instance of pelvic inflammatory disease, apparently immediately initiated by office cauterization for erosion of the cervix in a patient with adherent retroversion of the uterus and one-child sterility of a duration of seven years. This patient had had a number of negative smears and had no local stigmas of gonorrhea. The cautery should be employed with extreme care and circumspection and with the knowledge that severe cellulitis may result occasionally as a complication.

American Journal of Ophthalmology, St. Louis

18 801-902 (Sept.) 1935

Teaching of Ophthalmology in an Undergraduate Medical School E Hill Richmond Va—p 801

Streptococci in Inflammations of Eye Report of Eighteen Cases H C Kluever Iowa City—p 805

Etiologic Significance of Elementary Body in Trachoma P Thygeson Iowa City F I Proctor Santa Fe N M and P Richards Albuquerque N M—p 811

*Tendon Transplantation in Ocular Muscle Paralysis R O Connor San Francisco—p 813

Changes of Refraction in Children with Convergent Strabismus E A Vonsek Chicago—p 820

Parinaud's Syndrome L F Barker Baltimore—p 827

Blepharochalasis Report of Case with Pathologic Histology R W Gunther Cleveland—p 832

Comparison of Intracapsular Methods of Cataract Extractions I Hartshorne New York—p 835

Sight Saving Classes C Berens and Winifred Hathaway New York—p 845

Tendon Transplantation in Ocular Muscle Paralysis—O'Connor emphasizes the need to have cases of ocular muscle paralysis under the observation, from their onset of an ophthalmologist who is able to handle them surgically, in order that operation may be done as soon as it becomes certain that the paralysis is permanent and before contractures have developed.

in the opponents. He disproves the contention of some authorities (Bielschowsky) that transplantations are not worth while because of a mistaken idea that binocular action is never secured. Binocular vision is secured, at least in positions near the primary, in all cases that have come to operation before contractures have occurred. He believes that the operation of choice is his new one by which the tendon halves farther from the palsied muscle are used. In case of an abducens palsy the nasal halves of the vertical recti are transplanted. The cinch loop, of course, must be used for secure anchorage in the transplants. General results in a series of operations by different methods are given.

American Journal of Public Health, New York

25: 989 1080 (Sept.) 1935

- Sanitation in Holy Land I W Mendelsohn, New York—p 989
School Health Problems Through the Years Boston Public Schools 1635 1935 J P Sullivan Boston—p 1001
Sanitary Survey of Beverage Establishments with Reference to Sanitary Condition of Glassware W L Mallmann and E. D. Devereux East Lansing Mich—p 1007
Rocky Mountain Spotted Fever in New York State Outside of New York City E R Maillard and E L Hazen New York—p 1015
Relative Value of Heated Toxin and Toxoid as Controls in Schick Test, Ellen Loeffel and E Massie St. Louis—p 1018
Survival and Rate of Death of Intestinal Bacteria in Sea Water P J Beard and N F Meadowcroft, Stanford University Calif—p 1023
Control Agglutination Studies Against Bacillus Dysenteriae on Serums of Three Hundred Individuals in New York City J Felsen and A G Ososky New York—p 1027
Modified Technic for Detection of Escherichia Aerobacter Group in Milk A Moldavan Montreal—p 1032
Simultaneous Immunization Against Smallpox and Diphtheria C S Stern, West Allis Wis—p 1034

American Journal of Surgery, New York

29 337 506 (Sept.) 1935

- Cysts of the Omentum Review and Report of Case J Horgan Washington D C—p 343
Recent Developments in Combating Infections of Urinary Tract A L Clark Oklahoma City—p 354
Critical Analysis of Thirty Five Deaths Following Appendicitis When Should Delayed Operation of Ruptured Appendicitis and Peritonitis Be Used? C R Davis Detroit—p 368
Acute Appendicitis Complicated by Peritonitis Immediate and Late Results in One Hundred and Twenty Six Consecutive Cases G W Kehl and C B Rentschler Reading Pa—p 373
Duodenal Ulcer in Infancy and Childhood Case of Perforated Duodenal Ulcer in Child of Seven k Tashiro and N Kobayashi Los Angeles—p 379
Pezzer Catheter Gastrostomy A. Brunswick Chicago—p 384
Reaction of Peritoneum as It Affects Surgical Pathology of Peritonitis J W Kennedy Philadelphia—p 387
*Interrelation of Gynecologic and Gastro-Intestinal Symptoms G L Moench New York—p 399
Full Term Intra Abdominal Pregnancy A M Hellman and H J Simon, New York—p 403
Clinical Evaluation of Pathogenicity of Trichomonas Vaginalis A Jacoby and M G DerBrucke New York—p 414
Correction of Paralytic Instability of Pelvis C L. Lowman Los Angeles—p 420
Lipoma of Rectum Report of Case S D Weinstein and W Lieberman Brooklyn—p 424
Artificial Fever Therapy of Gonorrheal Arthritis Report of Thirty One Cases H W Kendell W W Webb and W M Simpson Dayton Ohio—p 428
*Bacteriophage Therapy Clinical Study with Especial Reference to Technic of Application R Lampert F F Boyce and Elizabeth M McFetridge New Orleans—p 436
Plantar Warts Callosities and Corns J J Eller New York—p 444

Interrelation of Gynecologic and Gastro-Intestinal Symptoms—Moench points out that, considering the close proximity of the genital organs to all others in the abdominal cavity and the interrelation of the blood supply and the general and autonomic nervous innervation, it would be strange if disturbances in the genital system did not affect the gastro-intestinal system, and vice versa. That markedly relaxed abdominal walls and relaxation of the pelvic floor may cause gastro-intestinal symptoms goes without saying, and he has cured many such cases by perineal repair and a proper belt. In every female patient with gynecologic or gastro-intestinal symptoms or both, one must first determine whether an organic lesion is present, and, secondly, where it is situated. After an organic lesion has been found, one must carefully evaluate whether it can explain all the symptoms the patient complains of and whether the symptoms referred to one organic system can be explained by the organic change present in the other

It must not be forgotten that the gynecologic lesion may obscure or hide gastro-intestinal symptoms or contrarily cause only gastro-intestinal disturbances, or that the gastro-intestinal lesion may produce only gynecologic symptoms. If organic changes are found in both the gynecologic and gastro intestinal systems, it must be determined whether or not the two lesions are separate entities or whether they are interrelated and, if the latter, in what way. At times, however, no organic lesions are discovered or the lesions actually present cannot possibly explain the patient's gastro-intestinal or gynecologic complaints. It is here that a painstaking and tactful anamnesis is of inestimable value. But further than this, one must know of the patient's habits. Nostalgia or grief may cause gastro-intestinal upsets as well as gynecologic symptoms. Nausea and vomiting may appear only near the menstrual period, perhaps owing to pelvic congestion. In other cases the reaction is a psychic revolt against menstruation because of a desire for offspring. After coitus gastro-intestinal symptoms may come on. Roentgen treatment for uterine fibromyomas may cause diarrhea. Asthenic conditions and even gonadal insufficiency, coupled with other hormone defects, may cause symptoms simulating gastro-intestinal disease. It is evident that routine treatment is impossible. Sometimes a mild sedative will alleviate gynecologic and gastro-intestinal symptoms quicker than any complicated specialized treatment. Again, a sympathetic attitude and reassurance of the patient in regard to her gynecologic troubles will cure gastro-intestinal distress.

Bacteriophage Therapy—The experience of Lampert and his associates with bacteriophage in the treatment of certain types of infections, chiefly carbuncles, furunculosis and hand infections, is based on approximately 1,000 cases and has resulted in more than 90 per cent of successes. They consider their successful results to be due in large measure to the technic of application, which is based on direct contact of the bacteriophage with the infected tissues by means of generous daily applications. The prompt relief of pain and the brief duration of treatment by bacteriophage therapy, as compared with the duration of treatment by other measures, are noteworthy clinical facts. The method does no harm in cases in which it does not succeed.

American Review of Tuberculosis, New York

32: 229 342 (Sept.) 1935

- Epidemiologic Aspects of Silicosis and Tuberculosis A. S. Pope, Boston, and D. Zacks Brookline Mass—p 229
Tissue Reactions of Lung to Intratracheal Injection of Particulate Sericite Experimental Study W S Lemon and G M Higgins, Rochester Minn—p 243
*Involvement of Spinal Meninges and of Bone in Undulant Fever Simulating Tuberculosis S U Marietta Washington D C—p 257
Tuberculosis of Shafts of Long Bones Clinical and Roentgenologic Study with Report of Eight Cases C K. Petter and J P Medelman, Minneapolis—p 285
Controlling Factors in Production of Cavities and Pseudocavities of the Lung E Mayer, New York—p 294
Permeability of Paper Sputum Napkins F L Jennings Oak Terrace Minn—p 304
*Raw Spleen Extract in Tuberculosis G F Watson Kitchener Ont—p 312
New Technic for Oleothorax T C Liu, Shanghai, China—p 320
Allergy as Guide in Terminating Artificial Pneumothorax. J R Neal, Los Angeles—p 326
Intracutaneous Tuberculin Test and Use of Fluoroscope in a County Survey G W Weber K M Murphy and F W Holcomb Kingstree N Y

Involvement of Spinal Meninges and of Bone in Undulant Fever—Marietta reports a case with involvement of the spinal meninges and of the lumbosacral joint, which is considered the result of infection by *Brucella melitensis*, bovine type, and has been observed over a period of two years. The patient finally returned to his usual occupation. The question in his case is the accuracy of the diagnosis, that is, whether, with no positive cultures obtained from any source, a definite diagnosis of brucella infection is justified on the basis of the history, clinical course, positive agglutinations and the apparent elimination by laboratory study of other possible factors. While it cannot be said that there is any specific agglutination titer that is diagnostic, a titer of 1:80 is generally so accepted, the titers are generally not so high as in the present case, except in the presence of an active infection, those due only to antibodies from the use of infected milk being in the low range,

at least below 1 100 Negative cultures of the blood, pus, urine, and the like may be explained as being due to the age or chronicity of the condition, positive cultures being obtained usually in the early stages Tuberculosis may be eliminated as a causative factor in the case by the negative history, the absence of tuberculous lesions elsewhere in the body, the numerous negative smears and cultures, the roentgenographic appearance of the bone lesion, which is entirely different from that seen in tuberculosis of the bone, that is, too little of a destructive and too much of a regenerative process, and more specifically by the numerous negative animal inoculations Typhoid is eliminated by the numerous negative cultures of the urine, blood, pus and stools, by the clinical course and, inferentially at least, because of the fact that the patient had previously had several courses of typhoid vaccine Actinomycosis was ruled out Syphilis was not a factor, as evidenced by the repeated negative serologic observations In favor of brucella as the etiologic factor are the undulant and irregular type of fever, mild secondary anemia, general low white blood count with low polymorphonuclears, marked sweating, loss of weight, orchitis, cough with abundant mucopurulent expectoration, long duration of the disease, positive agglutinations and elimination of other infectious agents The late development of bone involvement as a complication of brucella infection, mentioned by Roger, was exemplified by being demonstrated twelve months after the beginning of the patient's illness, abscess formation did not take place until three months after the first bone changes were noted The author states that his treatment probably left something to be desired as a formulated plan carried out to its completion Pyronin dye seemed to have a definitely beneficial effect when injected into the abscess tracts, and goat's serum and antiabortus vaccine were also markedly effective in the relief of subjective and objective symptoms The patient himself noted and remarked on the relief that he experienced from these remedies Intravenous injections of mercurochrome, arsphenamine and antimony and potassium tartrate have been previously tried by the author in cases of brucella infection with no obvious benefit

Raw Spleen Extract in Tuberculosis—Watson discusses the results obtained in experiments with injections of raw-spleen extract carried out during the last four years on guinea-pigs The general procedure has been to inoculate the animals with an emulsion of tubercle bacilli subcutaneously in the right groin and to treat them with subcutaneous injections of spleen extract in the left groin Forty eight guinea-pigs were divided into two groups of equal weight One group was given two preliminary doses of spleen extract and nine days later was inoculated with tubercle bacilli The treated series were given 0.375 cc of spleen extract every second day Sixty-five days after inoculation, four treated and twenty one untreated animals were dead Each guinea-pig in both series was examined post mortem and showed generalized tuberculosis Other experiments gave similar results

Anatomical Record, Philadelphia

63: 101 212 (Sept 25) 1935

- The Process of Sex Transformation in Parabiote Amblystoma III Conversion of Testis to Ovary in Heteroplastic Pairs of Amblystoma Tigrinum and Amblystoma Punctatum R K Burns Jr Rochester N Y—p 101
- Proliferative Activity of Thyroid Gland of Female Guinea Pig During Sexual Cycle K S Chouke Denver Hilda Friedman and L Loeb St. Louis—p 131
- Follicular Apparatus of Ovary of Hypophysectomized Immature Rat and Effects of Hypophyseal Gonadotropic Hormones on It C E Lane and R O Greep Madison Wis.—p 139
- Gonad Stimulating Activity of Pituitary Glands from Horses of Different Ages and Sex Types A A Hellbaum Madison Wis.—p 147
- Relations of Hair Cycles in Ferrets to Changes in Anterior Hypophysis and to Light Cycles T H Bissonnette Hartford Conn.—p 159
- Window Technic for Fetal Observation C S Gersoni Charlottesville Va.—p 169
- Effect of Inanition on Growth of the Brain of Albino Rat D Rudin Minneapolis—p 175
- Volume of Fetal Fluids in Sow and Cat G B Wislocki Boston—p 183
- Observations in Vivo on Capillaries in Greater Omentum of Cat J B Rogers Louisville Ky.—p 193
- Conclusive Evidence for Sino-Atrial Dominance in Isolated Forty Eight Hour Embryonic Chick Hearts Cultivated in Vitro G H Paff Notre Dame Ind.—p 203

Arkansas Medical Society Journal, Fort Smith

32 61 78 (Sept) 1935

- Some Experiences with Malaria M S Dibrell Van Buren—p 61
Goster J M Smith Russellville—p 63

California and Western Medicine, San Francisco

43: 177 248 (Sept.) 1935

- Medicinal Treatment of Hepatic and Biliary Disorders. T P Sprunt Baltimore—p 183
- Aniseikonia K C Brandenburg Long Beach—p 188
- Modern Trends in Anesthesia R M Tovell Rochester Minn.—p 192
- Experimental Syphilis Research Review of Some of the Recent Findings E K Stratton San Francisco—p 197
- Relation Between Anterior Pituitary Hormones Acting on Thyroid Gland and on Ovary L Loeb W C Anderson J Saxton S J Hayward and A A Kippen St Louis—p 199
- Intracapsular Extraction of Senile Cataract J L McCool and C A Dickey San Francisco—p 200
- Body Measurements of Japanese Children Born in America P M Suski Los Angeles—p 208
- Ship Surgeons Log R W Hooker New York—p 209
- Treatment of Lacerated Soft Parts E Butler San Francisco—p 212
- Pohomyelitis—the Los Angeles Epidemic of 1934 Part II R W Meals V F Hauser and A G Bower Los Angeles—p 215

Canadian Medical Association Journal, Montreal

33: 243 352 (Sept) 1935

- Site of Formation of Phosphatase of Serum A R Armstrong and F G Banting Toronto—p 243
- Diagnosis of Hepatic Disorders D Graham Toronto—p 247
- *Urea Clearance Test Compared with Other Renal Function Tests in Urology R W I Urquhart and J L McCollum Toronto—p 251
- *Frequency and Age Incidence of Duodenal Diverticula J C B Grant Toronto—p 258
- Treatment of Prostatic Obstruction G G Smith, Boston—p 262
- Icterus Neonatorum N Book Winnipeg Manit.—p 269
- Perineum at Childbirth Reinforcement of Tissues and Fulcrum Principle F N K Falls Montreal—p 272
- Lymphogranuloma Inguinale Report of Three Cases J A Bourguoin Winnipeg Manit.—p 276
- The Management of the Cardiac Case D M Baltzan Saskatoon, Sask.—p 281
- Rectal Hemorrhage E A Daniels Montreal—p 287
- Clinical Use of Staphylococci Toxoid J A Gilchrist and Mary J Wilson Toronto—p 292
- Seven Years of Spinal Anesthesia in Private Practice E H Wood Ottawa—p 298
- The Pharmacopeia for the Indigent the Insured and the Ordinary Patient V E Henderson Toronto—p 303
- Sensitization to Novocain L M Mullen Calgary Alta—p 306

Renal Function Tests—Urquhart and McCollum performed a series of 113 clearance tests on seventy eight patients In addition, concurrent blood urea and nonprotein nitrogen determinations have been obtained in the whole series In a small group divided phenolsulphonphthalein tests have been carried out in conjunction with the other determinations The usual technic was followed throughout No practical advantage was found in the use of the micromethod of Conway and Byrne for blood and urine urea Repeated blood urea nitrogen determinations were found to be as efficient from the standpoint of prognosis as repeated urea clearance determinations The degree of kidney damage demonstrated by moderately subnormal clearances did not prove to be an appreciable factor in the operative risk In the group with very low clearances and consequently poor kidney function the repeated blood urea nitrogen determinations and the clinical state of the patient gave ample warning of impending danger The deaths in the series were almost evenly divided between renal and extrarenal causes The renal deaths were for the most part preoperative, and surgery was not attempted because of the condition of the patients The divided phenolsulphonphthalein test is of value in the estimation of the kidney function It gives results comparable to the urea clearance and is perhaps more adaptable in a general hospital In common with the other tests, it is the direction of change in successive tests that is of significance from the standpoint of prognosis rather than the individual test itself

Incidence of Duodenal Diverticula—Of the 133 cadavers examined for duodenal diverticula Grant found fifteen that had single or multiple diverticula None of the ten subjects between 17 and 32 years of age had diverticula, one of the twenty between 33 and 42 years and one of the twenty-one between 43 and 52 years had diverticula Four of the twenty-six subjects between 53 and 62 years, five of the thirty between

63 and 72 years, fourteen of the nineteen between 73 and 82 years and none of the seven more than 82 years had diverticula. Of these subjects thirteen were male and two were female. For each decade after the fifty-second year the proportion of duodenums with diverticula remains almost constant, at about 15 or 6, whereas before this period the proportion is about 1255. Of the fifteen specimens with diverticula, eleven had one, three had two and one had three, making twenty diverticula in all. All save one sprang from the concave, pancreatic border of the duodenum, and all save this one were buried in the substance of the pancreas, and, had the duodenum not been filled with wax, a number of them would certainly have escaped detection. From the junction of the first and second parts of the duodenum there was one diverticulum. From the second part there were fourteen, of these, eight arose around the entrance of the common bile and pancreatic ducts (perivaterine). From the junction of the second and third parts there were two diverticula, and from the third and fourth parts there were three. Though the diverticula were not sectioned and examined microscopically, it was in most instances apparent with the aid of a lens and probe that these diverticula were of mucous membrane herniated between the fibers of the circular and longitudinal muscle coats, which sometimes were carried on to the neck of the sac for a few millimeters. The specimen springing from the convex border of the second part was also of this nature.

Colorado Medicine, Denver

32: 689 760 (Sept.) 1935

- Preventive Aspects of Mental Hygiene P A Draper, Colorado Springs —p 700
Recent Advances in Treatment of Spontaneous Retinal Detachment with Improved Surgical Prognosis G H Stine, Colorado Springs —p 708
Report of Blood Transfusion Service at University of Colorado School of Medicine and Hospitals R H Jones Denver —p 714
Cause of Postoperative Rupture of Abdominal Incisions H J Sims, Denver —p 717

Delaware State Medical Journal, Wilmington

7: 183 202 (Sept.) 1935

- Urogenital Tuberculosis Short Review B S Vallett Wilmington —p 183
Tuberculosis Prevention in Delaware, J P Wales Wilmington —p 188

Florida Medical Association Journal, Jacksonville

22: 95 140 (Sept.) 1935

- Maternal Mortality in Florida and Suggestions for Correction H Hanson Jacksonville —p 109
Treatment of Injuries with Reference to Fractures General Principles. T H Bates Lake City —p 112
Simple Method of Control of Diabetics T F Hahn, DeLand —p 117
Backache The Gynecologic Point of View C J Collins Orlando —p 119

Georgia Medical Association Journal, Atlanta

24: 317 352 (Sept.) 1935

- Ox Fascia Repair in Cure of Hernia M J Egan Savannah —p 317
Poor Appetite in Children W Kiser Jr Atlanta —p 322
*Treatment of Empyema in Children by Aspiration C M Burpee, Augusta —p 326
Multiple Myeloma Case Report W R Minnich Atlanta —p 332
Operation on Phrenic Nerve in Treatment of Pulmonary Disease K N Joseph Alto —p 335
Is Human Immunity Declining? L A Smith Quitman —p 339
Syphilitic Aortic Insufficiency Cases of Unusual Duration L M Blackford Atlanta —p 341

Treatment of Empyema in Children by Aspiration—Burpee discusses the twenty-six cases of empyema in infants treated by aspiration. Twenty of the patients were cured by aspiration without an operation. Four of the patients were later operated on with no deaths. The mortality in the group was 76 per cent. The patients ranged in age from 5 months to 12 years. The pneumococcus was the organism present in 60 per cent of the cases and in all the cases that later required open drainage. The staphylococcus was the organism present in 11 per cent and the streptococcus in 55 per cent. In 55 per cent the pus was sterile. The average number of aspirations was ten and the average stay in the hospital was sixty-one days. In a few cases small subcutaneous abscesses developed that were drained, otherwise no complications developed. Permanent deformity was not observed.

Illinois Medical Journal, Chicago

68: 197 292 (Sept.) 1935

- Principles of Intestinal Surgery G de Tarnowsky Chicago —p 219
Cataract Symposium Introductory Remarks O B Nugent Chicago —p 230
What the Slip Lamp Shows R Von der Heydt, Chicago —p 231
Preoperative Preparation and Anesthesia for Cataract Extraction W Stevenson Quincy —p 233
Cataract Incision Iridectomy and Iridotomy F W Brodrick, Sterling —p 235
Senile Cataract. W A Fisher, Chicago —p 238
The Elschmig Technic for Lens Extraction H Gradle Chicago —p 240
Extracapsular Extraction of Lens H Woodruff Joliet —p 242
Prevention of Complications in Cataract Operation S R Gifford, Chicago —p 243
Endophthalmitis Phacogenetica Beulah Cushman Chicago —p 245
Scarlet Fever Susceptibility and Active Immunization S C Peacock, Chicago —p 249
*Roentgen Differentiation of Osteomyelitis and Metastatic Bone Tumors. E L Jenkinson Chicago —p 255
Surgery of Bone Tumors D B Phemister Chicago —p 258
Bone Tumor H W Grote Bloomington —p 260
Hepatodiaphragmatic Interposition of Colon Report of Case J C T Rogers Urbana —p 264
Paroxysmal Dyspnea Diagnosis and Treatment L Unger Chicago —p 268
Orthoptic Treatment of Strabismus J L Bressler Chicago —p 273
Hepatic Lesion in Thyrotoxicosis J M Mora Chicago —p 282
Significance of Electrocardiography in Children M M Lewison, Chicago —p 286

Roentgen Differentiation of Osteomyelitis and Bone Tumors—Jenkinson believes that, in the differentiation of neoplastic from inflammatory lesions, it is imperative that the roentgenologist obtain all the information that can be elicited through a complete history including laboratory observations. The salient points in the roentgen diagnosis of inflammatory lesions are 1 Infections usually occur in young people, probably more frequently in men than in women 2 The infection occurs more frequently during the active period of a person's life when he is exposed to injury. The infection does not always start from an external wound, but the injury often causes a lowered resistance of the part, and the infection localizes at this point 3 The first roentgen examination may reveal no evidence of pathologic changes in the bone. It is inadvisable to take a negative report from the roentgenogram as final, especially if the examination has been made within the week. Usually, roentgen changes in bone infections are slow in presenting themselves, and they do not become manifest until a week or ten days after the infection. The first change usually reported is bone rarefaction due usually to destruction, but, if the roentgenogram is examined closely with a magnifying glass, the earliest observation is an area of increased density probably due to edema and infiltration of leukocytes. An inflammatory process may attack large portions of the bone, but usually the lesion is not as extensive as neoplastic lesions. It is much more difficult to differentiate primary bone tumors from inflammatory lesions than it is to differentiate metastatic tumors from bone infection. Whether a lesion is malignant or benign is often judged on the roentgenographic appearance by the nature of the bony changes—osteoporoses, osteosclerosis, erosion, new bone formation. Lesions that show a mass extending from the bone into the soft tissues are neoplastic and not inflammatory. In the early acute stage of osteomyelitis, there are usually no visible roentgen changes, and the diagnosis or the operation should not be defined on roentgenographic evidence. As the lesion becomes chronic, proliferation of new bone appears and areas of new bone can be seen in the area of destruction. In chronic osteomyelitis, localized abscesses often develop. These abscesses usually occur in the ends of long bones and occasionally they develop in the body of a vertebra. The complete removal of a large piece of cortex may simulate bone invasion, which is an important diagnostic point between osteomyelitis and neoplasia.

Indiana State Medical Assn. Journal, Indianapolis

28: 417-474 (Sept.) 1935

- Surgical Management of Peptic Ulcer E H Weber Evansville —p 417
Incidence of Cardiac Diseases in Two Hundred and Ninety-Seven Cases. A G Moore Deer Creek —p 419
Obstetrics in General Practice E O Asher New Augusta —p 422
Transproctoscopic Resection of Rectal Carcinoma Case Report. N Zehr Fort Wayne —p 424
Myths in Medicine H S Leonard Indianapolis —p 425
General Consideration of Sciatica F S Downey Dillsboro —p 429

Johns Hopkins Hospital Bulletin, Baltimore

57 111 182 (Sept.) 1935

- Syphilis of Mitral Valve and Membranous Interventricular Septum of Heart S S Blackman Jr, Baltimore—p 111
Hypophysis Cerebri of Finback (Balaenoptera Physalus) and Sperm (Physeter Megaloccephalus) Whale E M K Geising with assistance of L N Tarr and A D Tarr Baltimore—p 123
The Brain of Whalebone Whale Balaenoptera Physalus O R Langworthy, Baltimore—p 143
*Value of Intracutaneous Tuberculin Test in Diagnosis of Ocular Tuberculosis J S Friedenwald and J Dessoiff Baltimore—p 148
Renal Rickets Report of Case Showing Four Enlarged Parathyroids and Evidence of Parathyroid Hypersecretion D H Shelling and D Remsen Baltimore—p 158

Tuberculin Test in Diagnosis of Ocular Tuberculosis

—Friedenwald and Dessoiff observed that of ten cases of proved ocular tuberculosis six reacted to 0.001 mg of tuberculin, while only one failed to react to all dilutions below 1 mg. The proportion of strongly positive reactions in this group is much higher than in the general population. Extreme hypersensitivity to tuberculin is therefore of definite diagnostic significance in these cases. Moderate hypersensitivity to tuberculin producing reactions to 0.1 or 0.01 mg is no more common in cases of proved ocular tuberculosis than in cases of nontuberculous uveitis. No diagnostic significance can therefore be given to this degree of reactivity in relation to the ocular inflammatory condition. Finally, an essentially negative reaction to tuberculin can occur even in patients with active ocular tuberculosis. Such a negative reaction cannot therefore be taken as conclusive evidence that the ocular lesion is not tuberculous. Hence the significance of the intracutaneous tuberculin test can be evaluated only when weighed in relation to all other clinical data.

Journal of Biological Chemistry, Baltimore

111 1284 (Sept.) 1935 Partial Index

- Alteration of Protein Distribution in Vitro Between Corpuscles and Plasma Caused by Isosmotic and Hyperosmotic Solutions. C J Bellis and F H Scott Minneapolis—p 17
Total Protein Content of Plasma and Serum Note W Lehman and F H Scott Minneapolis—p 43
Leaf Carotenes G Mackinney Stanford University Calif—p 75
Carotene IX. Carotenes from Different Sources and Some Properties of α -Carotene and β -Carotene H H Strain Stanford University Calif—p 85
Influence of Proteins on Activity of Yeast Invertase E L Saul and J M Nelson New York—p 95
Normal Distribution of Calcium Between Skeleton and Soft Tissues O A Bessey C G King E J Quinn and H C Sherman New York—p 115
Constituents of Waxlike Coating of Pear *Pyrus Communis* L. K S Markley S B Hendricks and C E Sando Washington D C—p 133
Effect of Desiccated Thyroid α -Dinitrophenol and Cortical Hormone Extract on Vitamin C Content of Some Organs of Guinea Pig Fed Graded Doses of Ascorbic Acid J L Svirbely Pittsburgh—p 147
*Further Observations on Possible Interrelationship Between Physiologic Actions of Parathyroid Glands and Vitamin D J H Jones Philadelphia—p 155
Deuterium as an Indicator in Study of Intermediary Metabolism I R Schoenheimer and D Rittenberg New York—p 163
Id II Methods. D Rittenberg and R Schoenheimer New York—p 169
Id III. Role of Fat Tissues R Schoenheimer and D Rittenberg New York—p 175
Trichogenic Action of Sulphydryl Group in Hereditary Hypotrichosis of Rat G J Martin and R E Gardner Baltimore—p 193
Oxidation of *L*-Tyrosine and *D*-Tyrosine by Livers and Kidneys of Various Animals F Bernheim Durham, N C—p 217
Proteolytic Enzymes VII Synthesis of Peptides of *L*-Lysine and Their Behavior with Papain M Bergmann L Zervas and W F Ross New York—p 245
Metabolism of Phospholipids VII Further Evidence of Selection and Retention of Unsaturated Fatty Acids by Phospholipids of Animal Tissues. R G Sinclair Rochester N Y—p 275

The Parathyroids and Vitamin D.—Jones states that young growing pups fed a modification of the Karr Cowgill diet for dogs, to which had been added 0.75 per cent beryllium carbonate, developed a severe rachitic condition in a few weeks. Neither direct ultraviolet irradiation of the animals nor the administration of cod liver oil prevented the onset of the disturbance. Large doses of parathyroid extract failed to produce any marked rise in the level of calcium in the serum of the beryllium fed animals, even though vitamin D was administered. Viosterol, given in daily amounts of 150,000 international units per kilogram of weight readily produced a marked hypercalcemia with toxic symptoms in the animals which failed to

respond to parathyroid extract. From the data presented it appears that the failure of rachitic animals to respond to parathyroid extract is not directly due to a lack of vitamin D. Furthermore the toxicity of viosterol is not due to a stimulation of the parathyroids.

Journal of General Physiology, New York

19:1 198 (Sept 20) 1935 Partial Index

- Studies on Osmotic Equilibrium and on Kinetics of Osmosis in Living Cells by Diffraction Method B Lucke M G Larrabee and H K Hartline Philadelphia—p 1
Thickness of Wall of Red Blood Corpuscle J F Danielli Princeton N J—p 19
Escape of Hemoglobin from Red Cell During Hemolysis E Ponder and D Marsland New York—p 35
Studies in Respirometry IV Use of Comparator System in Refractovolumetric Respirometry W R Thompson and D M Grayzel New Haven Conn—p 61
Accelerating Effect of Manganous Ions on Phage Action A P Krueger and N S West Berkeley Calif—p 75
Molecular Weight and Iso-Electric Point of Thyroglobulin M Heidelberger New York and K O Pedersen—p 95
Combination of Divalent Manganese with Certain Proteins Amino Acids and Related Compounds R K Main and C L A Schmidt, Berkeley Calif—p 127
Effect of γ Rays on Chromosomes in Different Stages of Mitosis. A Marshak Cambridge Mass—p 179

Journal of Immunology, Baltimore

29 175 266 (Sept.) 1935

- Tests for Immunity to Acute Anterior Poliomyelitis I Technic and Status of Monkey Serum Neutralization or Antiviral Test J A Kolmer and Anna M Rule Philadelphia—p 175
Id II Skin Reactions to Virus J A Kolmer G Klugh Jr and Anna M Rule Philadelphia—p 191
*Id III Colloidal Gold Complement Fixation and Precipitation Tests J A Kolmer and Anna M Rule Philadelphia—p 199
Method for Production of Staphylococcus Toxin and Toxoid G F Leonard and A Holm New Brunswick N J—p 209
Genetic Studies of Agglutinogens M and N Harriet S Hyman, Columbus Ohio—p 223
Complement Fixation with Type-Specific Carbohydrate of Haemophilus Influenzae Type b Margaret Pittman and K Goodner New York—p 239
*Gonococcus Complement Fixation Test Causes and Solution of Irregularities A E Thomson Agnes C Hamann and W H Park New York—p 249
Study of Generalized Shwartzman Phenomenon K Aptiz Boston—p 255

Tests for Immunity to Acute Anterior Poliomyelitis

—Since they found that monkey serum neutralization tests are of limited application, Kolmer and Rule have inquired into the possibility of employing serum colloidal gold, complement fixation and precipitation tests for the detection of immunity to poliomyelitis and they briefly summarize the results. The serum colloidal gold test is not acceptable as a substitute for the monkey serum neutralization test for poliomyelitis antibody. The complement fixation test employing antigens of monkey poliomyelitic spinal cord gave completely negative reactions with the serums of human beings containing antiviral antibody. The serums of normal and poliomyelitic immune monkeys gave completely negative Wassermann reactions. The serums of normal monkeys gave completely negative complement fixation reactions with antigens of monkey poliomyelitic spinal cord. Some of the serums of monkeys with poliomyelitis, as well as some immunized with poliomyelitis vaccine or previously inoculated intracerebrally with neutralized serum-virus mixtures, gave positive complement fixation reactions. All the human and monkey serums employed in the complement fixation tests gave completely negative precipitation reactions with an antigen of monkey poliomyelitic spinal cord.

Gonococcus Complement Fixation Test.—Thomson and his associates point out that the value of the gonococcus complement fixation test as an aid in the diagnosis of gonococcal infection is lessened because of the irregularity of reports on the same serums from different laboratories. This irregularity has been overcome by considering the hemolytic and binding power of the complement in one test. The Hamann combined system largely removes the irregularities previously noted in the diagnosis of serums sent to different laboratories. It consists in recognizing and titrating the fixing and hemolytic power of the complement. Previously the complement was tested solely for its hemolytic power.

Journal of Lab and Clinical Medicine, St Louis

20: 1219 1326 (Sept) 1935

- *Surgical Maggots Study of Their Functions in Wound Healing F C Messer and R H McClellan Pittsburgh—p 1219
- The Primary Carcinoma of the Lung Review of One Hundred Autopsies R H Jaffé Chicago—p 1227
- III Local Cerebral Anaphylaxis in the Dog L M Davidoff N Kopeloff and Lenore M Kopeloff, New York—p 1238
- Monophyletic Scheme of Blood Cell Formation for Clinical and Laboratory Reference K Kato, Chicago—p 1243
- Some Observations on Comparative Effectiveness of Mercurial Diuretics With and Without Theophylline (Mercupurin Salyrgan, etc) M N Fulton Boston and A H Bryan Chicago—p 1252
- Experiments with Evipal in Prolonged Anesthesia A H Maloney and R Hertz Washington D C—p 1260
- *Studies on Effect of Administration of Carotene and Vitamin A in Patients with Diabetes Mellitus I Effect of Oral Administration of Carotene on Blood Carotene and Cholesterol of Diabetic and Normal Individuals Elaine P Ralli H Brandaleone and T Mandelbaum New York—p 1266
- Technic and Application of Supravital Staining E A Gall Boston—p 1276
- Colorimetric Microdetermination of Chlorides in Blood and Urine T V Letonoff, Philadelphia—p 1293
- Rose Bengal Test of Liver Function Photometric Method W P Stowe and G D Delprat San Francisco—p 1297
- Simple Basket Carrier for Use in Tissue Dehydration A J Cox Jr San Francisco—p 1298

Surgical Maggots—Messer and McClellan state that chronic osteomyelitis wounds healing in the presence of blowfly larvae develop reactions more alkaline than pH 7.4 in contrast to wounds dressed only with physiologic solution of sodium chloride. Sterile larvae of *Lucilia sericata* produce sufficient ammonia to account for this excess alkalinity. The excess alkalinity is probably a factor in bacteriostasis and wound healing. Blowfly larvae excrete a relatively weak proteolytic enzyme, while they contain in their digestive tract a more powerful one. The relative strength and location of these enzymes permit the removal of necrotic tissue from a wound with a minimum of irritation. The assimilation by the larvae of the protein split products of necrotic tissue removes the latter from the wound, in which they would otherwise putrefy or be absorbed to the detriment of the patient. Maggot therapy depends for its beneficial action on the presence of living larvae, which cannot be successfully replaced by pastes or extracts of maggots.

Carotene, Vitamin A and Diabetes Mellitus—Ralli and her associates found the fasting blood carotene to be higher in eight of nine patients with diabetes mellitus than in a group of nine nondiabetic subjects. Following the administration of carotene in oil and of carrots, the blood carotene rose sooner in the diabetic patients and the increase was greater and was maintained for a longer period of time. A second administration of carotene to nondiabetic persons did not result in any greater increase in the blood carotene than did the first dose. In the diabetic patients a second dose of carotene caused a greater increase in blood carotene in all but one case. To obtain a curve in a normal person simulating that in the diabetic patients, it was necessary to administer large amounts of carotene. The prolonged administration of 1 cc of carotene in oil to three normal and three diabetic patients resulted in a greater increase in the blood carotene in the diabetic patients and a more gradual fall. The fasting blood cholesterol was higher in the diabetic patients but bore no absolute relationship to the height of the blood carotene. The blood sugar bore no relationship to the blood carotene. To explain these results the authors advance the hypothesis that there is an increased concentration of carotene present in the liver of patients who have diabetes, owing to a diminished ability on the part of this organ to convert carotene to vitamin A, and that this increased concentration of carotene interferes with the absorption of carotene from the blood.

Kansas Medical Society Journal, Topeka

36 353 396 (Sept) 1935

- Relationships Between Endocrine System and Personality W C Menninger Topeka—p 353
- Hyperinsulinism Due to Adenoma of Islets of Langerhans L B Smith E H Hashinger and L P Engel Kansas City—p 363
- Malignant Epithelial Tumors of Ovaries L R Pyle and O R Clark Topeka—p 367

Kentucky Medical Journal, Bowling Green

33 343 394 (Aug) 1935

- President's Address Cephalalgia and Some of Its Causes A L Bass, Louisville—p 348
- The Pros and Cons of Jugular Ligation in Lateral Sinus Thrombosis L Richards Boston—p 351
- An Unusual Case Case Report J D Williams Ashland—p 355
- Traumatic Osteomyelitis of Frontal Bone Complicating Pannosus Case Report A L Bass Louisville—p 356
- The Healing of the Tonsillectomy Wound W Dean, Louisville—p 357
- Lateral Sinus Thrombosis W S Snyder Jr, Frankfort—p 360
- Major Trigeminal Neuralgia R G Spurling Louisville—p 372
- Pulsating Exophthalmos M C Baker Louisville—p 377
- Incipient Senile Cataract C K Beck Louisville—p 380
- Nasopharyngeal Fibroma Report of Two Cases W R Pryor, Louisville—p 387
- The Community's Obligation to the Child J C Morrison Hickman—p 390
- The Cure of Crossed Eyes C L Woodbridge Winchester—p 392

Minnesota Medicine, St. Paul

18: 561-630 (Sept) 1935

- The Community versus Tuberculosis Some Phases of the Campaign D A Stewart Ninette, Manitowish—p 561
- Side View Sketches of Physicians Archa E. Wilcox, Minneapolis—p 567
- Oleothorax Report of Its Use in Twenty Cases E K Geer, St. Paul—p 576
- Safeness of Artificial Pneumothorax as Therapeutic Treatment in Pulmonary Tuberculosis D R Hastings Minneapolis—p 580
- Chronic Ulcerative Colitis Among Elderly Persons, J C M Brust and J A Bergen Rochester—p 583
- Mode of Onset of Symptoms of Carcinoma of Stomach D L Wilber Rochester—p 586
- Study of Mortality of Premature Infants Delivered by Cesarean Section E F Robb Minneapolis—p 590
- Ambulant Treatment of Varicose Veins by Ligation Division and Injection of Distal Segment M G Gillespie Duluth—p 592
- *Sodium Ricinoleate as a Sclerosing Agent H W Froehlich and E C Henrikson Minneapolis—p 594
- Supracondylar Fractures of Elbow and Their Complications M O Henry Minneapolis—p 597
- Angioid Streaks of Retina Associated with Pseudoxanthoma Elasticum A Hilding Duluth—p 599

Sodium Ricinoleate in Treatment of Varicose Veins.—Froehlich and Henrikson used sodium ricinoleate, prepared in accordance with the directions of Rider, as a sclerosing agent in the treatment of varicose veins. A history is obtained, drawings of the veins are made on charts and a urinalysis is done. If there are no contraindications, 1 cc of sodium ricinoleate is injected in a small loop of vein in the lower leg, as a test to see whether the patient has any idiosyncrasy to the solution. With sodium ricinoleate the only reactions in a series of 300 cases have been those in which irregular purplish red blotches varying in size from 2 to 20 mm appeared on the skin drained by the offending vein. In two patients these patches took the form of a localized urticaria. However, there were no subjective symptoms. A cramping pain in the lower leg and foot is sometimes experienced when 5 cc. doses are used. The patient returns for a second injection in two or three days when from 3 to 5 cc is injected at the highest point possible. The needle on an empty 2 cc syringe is inserted into the vein while the patient sits on the edge of a table. Then the patient lies down and the leg is elevated to drain as much of the blood from the vein as possible. The small empty syringe is replaced by one containing the solution, without moving the needle. The injection is made, the operator watching for evidences of perivascular injection. A tourniquet is applied near the groin. The syringe is removed, with the needle left in place. The patient is asked to sit up with the leg hanging down. This change in position gives the solution a chance to gravitate downward. The tourniquet is removed in from three to five minutes. The needle is then withdrawn and a small compress is taped over the site of injection. By this method the authors have often been able to sclerose the veins of an entire leg by two or three injections. It is their opinion that ligation of the saphenous vein in the groin greatly decreases the possibility of recurrence in those patients having large varicosities extending into the thigh. Under local infiltration of 2 per cent solution of procaine hydrochloride, the vein is exposed through a 5 to 10 cm incision. A small section is excised and the cut ends doubly ligated, chronic catgut

number 1 being used. Then from 3 to 5 cc of the sclerosing solution is injected into the exposed distal stump and the skin is closed, with dermal or skin clips. The patient is allowed to go home at once, and may be up and about as desired. Should the leg become painful, hot applications are advised. All patients treated should be checked for recurrences at intervals of from two weeks to two months for a year.

New England Journal of Medicine, Boston

213:447-504 (Sept 5) 1935

- Two Hundred Acute Perforated Ulcers of Stomach and Duodenum from the Boston City Hospital W R Morrison Boston—p 447
Treatment of Recurrent Varicose Ulcer E A Edwards Brookline Mass—p 450
X Ray and Autopsy Study of Anatomic Changes of the Upper Urinary Tract in Patients with Obstructing Prostates G C Prather and M L Brodny Boston—p 457
Some Aspects of Treatment of Carcinoma of Bladder W C Quinby Boston—p 460
Methods and Results in Surgical Treatment of Diseases of Biliary Passages D Cheever Boston—p 463
Surgery of Subtotal Parathyroidectomy O Cope Boston—p 470
Reduction of Mortality in Hyperthyroidism F H Lahey Boston—p 475
The Progress of Nutrition F L Burnett Boston—p 480

New Jersey Medical Society Journal, Trenton

32:507-564 (Sept) 1935

- Abnormalities of Alimentary Tract Among Fifteen Thousand Nine Hundred and Sixty Eight New Born Infants with Roentgenologic Evidence B M Joseph Jersey City—p 513
Influence of Bone Structure on Purulent Lesions of Temporal Bone S J Kopetzky New York—p 518
Chronic Appendicitis versus Mucous Colitis C D Smith Paterson—p 522
Common Disorders of Digestive Tract Clinical and Roentgenologic Study of Five Hundred Private Cases S W Johnson Passaic—p 527
Why Is Health Insurance Not Health Insurance? F F Borzell Philadelphia—p 532
Treatment of Burns S T Snedecor Hackensack—p 535
Traumatic Intracranial Hemorrhage T S P Fitch Plainfield—p 538
External Fronto Ethmoid Operation O R Kline Camden—p 545

New York State Journal of Medicine, New York

35:851-900 (Sept 1) 1935

- Primary Carcinoma of Lung L F Frisell New York—p 851
Thymus Gland Its Relation to Surgical Risk C W Henson New York—p 860
Symphysis Pubis and Its Relation to Backache M G Potter Buffalo—p 867
Verruca Plantaris Method of Removal by Electrosurgery G M Lewis New York—p 869
Erythroblastosis Fetalis Report of a Case H A Peck Albany—p 871
Measles Prophylaxis S Karelitz New York—p 876
Burning Tongue Glossodynia H Fox New York—p 881

Relation of Thymus Gland to Surgical Risk.—According to Henson, children who have had thymic symptoms or who show definite or indefinite evidence of thymic enlargement are better not operated on but, if operation is essential, should have a course of roentgen therapy previous to that procedure. Adults who exhibit the characteristic signs and symptoms of the lymphatic condition should never be operated on unless it is necessary for the maintenance of life. Nesbit has presented evidence which seems to indicate that in the lymphatic condition there is a reduction in the function of the parathyroids, and consequently low serum and spinal fluid calcium. Roentgen therapy raises the calcium content of these fluids and probably exerts its beneficial effects in this manner. The same result may be obtained by the intramuscular injection of parathyroid extract combined with the oral administration of calcium gluconate.

Prophylaxis of Measles.—Karelitz points out that in the evaluation of passive immunity to measles by the use of convalescent serum, immune adult blood or serum and more recently, globulin, extracted either from human placentas or from immune adult blood serum the dosage depends on the consideration of age size and physical state of the exposed individual, the duration and intimacy of the exposure and the period that has elapsed since the first moment of the exposure. The age and period of exposure have been considered in most studies, but it has only recently, been demonstrated that other

conditions, the epidemiologic factors, were vital in evaluating a measles prophylactic measure. Thus the author believes that hospitals, nurseries, schools and so on are not suitable for measles prophylaxis studies, since under such conditions the degree of exposure of the children must vary, and the certainty of exposure of all susceptibles can never be established. In studies conducted in homes, in which the contact between the sick and susceptible children was intimate and long, the percentage of complete protections was smaller, unless the serum dosage was increased. In homes in which better hygienic conditions prevailed the serum used seemed to be more effective than in homes of poor hygiene but less effective than in hospitals, nurseries and other such institutions. It is evident that, unless all these factors are considered by all workers, no uniform results will be obtained. The literature demonstrates just that. Except in the use of convalescent serum, the results are difficult to interpret in most reports.

Northwest Medicine, Seattle

34:325-368 (Sept) 1935

- Hypotension Growing Appreciation of Its Importance O H P Pepper Philadelphia—p 325
Significance of Mental Disorders R H Rea Fort Steilacoom Wash—p 329
Malarial Therapy Analysis of Two Hundred and Nine Cases at Western State Hospital C C Carlson Fort Steilacoom Wash—p 332
Diverticula of Urinary Bladder A H Peacock Seattle—p 335
Management of Acute Peritonitis L P Gambee Portland Ore—p 339
Prevention of Postoperative Complications L L Nunn Vancouver Wash—p 343
Anesthesia for Childbirth J S Lundy and R M Tovell Rochester Minn—p 346
Brain Complications Following Mastoiditis with Especial Reference to Petrous Apex Report of Four Cases C W Pond Pocatello Idaho—p 351

Ohio State Medical Journal, Columbus

31:641-728 (Sept 1) 1935

- Clinical Picture of Bright's Disease S D Simon Cincinnati—p 657
Traumatic Subdural Hematoma Report of Twenty Two Cases W J Gardner Cleveland—p 660
Dermatoses Involving the Eyelids H J Parkhurst Toledo—p 666
Advantages and Uses of Elastic Bag in Management of Labor H L Woodward Cincinnati—p 670
Ulcerative Colitis Etiology and Management H F Howe Toledo—p 672
Hypertension with Relation to Capacity for Work A G Cranch Cleveland—p 676

Traumatic Subdural Hematoma.—Gardner discusses twenty-two typical cases of subdural hematoma. Only two patients were women. Two thirds of the patients were more than 40 years of age. The preponderance of these lesions in older patients must be explained by the lessened elasticity and greater fragility of the cerebral veins, which develop with advancing age. Chronic alcoholism was not a predisposing factor. In only six cases was the blow to the head of sufficient force to cause unconsciousness. In no case was there roentgenographic evidence of a fracture of the skull. It is inconceivable that a tear of the cerebral veins is more common after a mild trauma than after a severe one. In two thirds of the cases the patients either maintained or assumed the erect posture immediately after the accident and in only two cases were they definitely known to lie down. The author can advance no reason why the erect posture following cranial trauma should favor venous bleeding unless it could be because of a lowering of the arterial and a rise in the venous pressures secondary to partial syncope. On the other hand, in cases of severe cranial trauma the maintenance of the horizontal position the occurrence of cerebral edema, the laceration of the membranes and the presence of a fracture seem to militate against the formation of a large subdural clot, or, if one has formed one or more of these conditions may predispose to its absorption. The force of the blow was exerted in an anteroposterior direction, that is it was received on the frontal or occipital regions in fifteen cases on the side of the head in three cases, on the vertex in two cases and in two cases the site was not known. The average time interval between the trauma and the operation (or necropsy) was twelve and a half weeks. The shortest interval was five weeks and the longest was thirty three weeks.

When the interval is much longer than this, it would appear likely that the implicated trauma is not the responsible one. Headache was the chief complaint in nineteen cases, and alterations in the intellectual sphere as shown by confusion, somnolence and personality changes were frequent observations. Somnolence, when present, was out of all proportion to the degree of intracranial pressure. The most stuporous patients frequently had a normal or subnormal spinal fluid pressure. Vomiting occurred in seven cases, vertigo and visual complaints each in three instances. The neurologic observations indicated the side of the lesion in eight cases. In five there were no localizing signs. In five the neurologic signs pointed to the wrong side of the head and in four patients with unilateral lesions the neurologic signs indicated bilateral damage. Two patients exhibited a homolateral homonymous field defect. This rare observation must be associated in some way with the marked dislocation of the brain occasioned by these large lesions. It could be explained by pressure on the optic radiations in the region of the lateral geniculate by the margin of the incisura of the tentorium. In the four cases in which there were hematomas on both sides, no localizing signs were present. A definite choking of the optic disks was present in three cases, a mild edema in three cases, a haziness of the disk margins in four cases, and in twelve instances the disks were normal. Spinal puncture in twenty cases revealed a normal or subnormal pressure in twelve instances and an increased pressure in eight. In thirteen cases the spinal fluid was xanthochromic and in seven it was colorless. Twelve patients treated by formal craniotomy recovered. In eight patients the operation consisted of a simple drainage of the lesion through a cranial perforation, two died, but the type of operation was not responsible for the deaths. In both instances there were bilateral lesions. The other six patients treated by simple drainage recovered as quickly and completely as those treated by craniotomy and complete evacuation. In none of these cases was an attempt made to remove any part of the wall except that immediately beneath the craniotomy opening. Since drainage through a single opening has proved satisfactory, through and through drainage by means of two openings as advocated by Fleming and Jones was not employed. Of the eighteen patients who recovered, fourteen were restored practically or entirely to their former state of health.

Oklahoma State Medical Assn Journal, McAlester

28: 321-356 (Sept.) 1935

- Modern Trends in Surgery M Thorek Chicago—p 321
Cranial Nerve Signs of Intracranial Pathology H Wilkins Oklahoma City—p 327
Oral Administration of Typhoid Vaccine H D Moor and Ida Lucille Brown Oklahoma City—p 330
Colles Fractures A R Wiley Tulsa—p 335
Tuberculosis Complicated by Pregnancy J T Woodburn Muskogee—p 339

Philippine Islands Med Association Journal, Manila

15 407-458 (Aug.) 1935

- *Periodic Human Microfilaria in the Philippines C M Africa E Y Garcia and J Layco Manila—p 407
Paraldehyde as an Amnesic Agent in Obstetrics H S Waters Iloilo Iloilo—p 413
Report on Fatal Limit of Blood Creatinine and Its Relation to Uric Acid Among Filipinos W de Leon and J F Leyva Manila—p 417
Comparative Study of Weight Height Height Weight Ratio and Vital Capacity in Certain Athletes M Ocampo W Pascual P Sapinoso J Z S Cruz and J Salcedo Jr Manila—p 420
Tribrom Ethanol Anesthesia in Surgery Report of Fifty Four Cases R. L. Blanco and L. A. Tojong, Cebu, Cebu—p 427

Periodic Human Microfilaria in the Philippines—The results of Africa and his co-workers tend to indicate the existence of the periodic type of microfilaria (microfilaria of *Wuchereria Bancrofti*) in the Philippines, contrary to allegations in textbooks in the general literature. They do not discount the presence of the nonperiodic type, as suggested by the results of the investigations of Ashburn and Craig (1907), although, judging from the observations of more recent workers, the former is the more prevalent type in this country. The duality of the microfilarial type in the Philippines seems to be supported by the ethnic origin of the Filipino race and by the

immigration of people into that country from the Asiatic mainland, which has been going on for centuries. The authors' results would also indicate that the best time for obtaining blood for diagnostic purposes is between 10 p. m. and 2 a. m. However, a negative count in the presence of clinical manifestations is without value, since it has been demonstrated repeatedly in numerous surveys that in a large number of cases of actual filarial infection, in some of which living adult females were demonstrated, no microfilariae could be demonstrated in the blood.

West Virginia Medical Journal, Charleston

31 389-436 (Sept.) 1935

- Jaundice Consideration of Phenomenon from Clinical and Biochemical Points of View V E Simpson Louisville Ky—p 389
Stereocentrometric Method of Fetometry and Pelvimetry with Its Obstetric Application Appraisal Based on Seven Hundred and Forty Determinations S H Clifford, Boston—p 401
*The Allergic Child M F Petersen Charleston—p 414
Some High Points in Surgical Progress Oration on Surgery B. O. Robinson Parkersburg—p 417
Occurrence of Epidemic Pleurodynia in West Virginia H A. Carney, Van—p 419
Medical Participation in the School Health Program of Cabell County G M Lyon, Huntington—p 421

The Allergic Child.—Regarding the treatment of asthma in children, Petersen states that it is in a large majority of cases dependent on a sensitiveness to the bacterial proteins of the child's chronic and recurrent respiratory infection and can be stopped if the child can be made relatively immune to his own respiratory flora. The most successful means for accomplishing this is by the use of an autogenous vaccine in graduated doses over a period of months of intensive treatment and years for occasional inoculation with the same vaccine.

Wisconsin Medical Journal, Madison

34: 601-700 (Sept.) 1935

- *New Procedure for Lumbar Puncture H H Reese and I B Shulak Madison—p 613
Hyperleukocytosis in Pneumonia Review of Literature and Case Report B J Birk and N DeNosaguo Milwaukee—p 615
Tuberculosis of the Spine C C Schneider and L Van Hecke Milwaukee—p 618
Cancer of the Breast A W Erskane, Cedar Rapids Iowa—p 623
Tumors of the Mammary Gland T J Snodgrass Janesville—p 624
Thyroid Diseases in Children K H Doerge Marshfield—p 627
Malignant Neutropenia Case Report M Hardgrove Milwaukee—p 630
Radiation Therapy in Medical Practice IV Leukemia Hodgkins Granuloma and Allied Diseases E. A. Pohle, Madison—p 632
Are We Satisfied with Our Wisconsin Infant and Maternal Mortality Rates? Amy Louise Hunter Madison—p 636

New Procedure for Lumbar Puncture—Reese and Shulak recommend giving the patient 50 cc. of a 0.225 hypotonic solution of sodium chloride from five to ten minutes before the spinal puncture is performed. After the spinal puncture is performed, the patient is kept quiet for one hour and then allowed to get up. The postpunctural headaches in their group of twenty-five patients were completely eliminated by this new method. Only one patient complained of a slight frontal headache lasting for approximately eight hours. It is difficult to say in this instance whether the headache was the result of the spinal puncture or whether it was merely a manifestation of excessive indulgence in alcoholic beverages. In order to demonstrate whether hypotonic solution of sodium chloride is of therapeutic value after postpunctural headaches have occurred the authors performed lumbar punctures without giving the preliminary injection and then allowed the patients to get up and walk about one hour thereafter. As soon as postpunctural headaches occurred, 50 cc. of the solution was given intravenously. With this procedure the responsive improvement was variable. Some patients were definitely benefited, the headaches disappearing approximately one-half hour after the injection of the hypotonic solution. Another group of patients showed response to this procedure in that the headaches were not as intense as before the injection and the duration of the headaches was definitely shortened. A few, however, showed no appreciable response to this treatment, the headaches continuing even after the injection. The best results were obtained when the hypotonic solution was given from five to ten minutes before the spinal puncture.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Physical Medicine, London

10 73-86 (Sept.) 1935

- Superficial X-Ray Therapy: Results Obtainable in Pathologic Conditions of Skin. E. Dore—p. 74
- Ultraviolet Irradiation in Internal Medicine. A. P. Cawadiaz—p. 75
- The Physics of Ultraviolet Radiation. B. D. H. Watters—p. 78

British Journal of Radiology, London

8: 531-600 (Sept.) 1935

- Dystrophies of the Skeleton. J. F. Brailsford—p. 533
- Study of Behavior of Cultures of *Bodo Caudatus* on Release from Irradiation with Gamma Rays and of Effect on Growth of Interrupted or Repeated Irradiations. M. Robertson—p. 570
- *Cleidocranial Dysostosis in the New-Born. J. B. Higgins—p. 588

Cleidocranial Dysostosis in the New-Born.—Higgins states that cleidocranial dysostosis manifests itself in delayed development of the membranous bones of the skull and clavicles. It may or may not be hereditary, while deformities of the spine, scapulas, thorax, pelvis and limbs may also occur. In his case, a new-born child, the last of a family of five, showed an absence of the right clavicle and of a portion of the left clavicle and a marked bone deficiency of the skull. The cause of the condition is not known. Amniotic bands, injury, hereditary tendencies, germinal abnormalities and arrested development have all been advanced as possible causes. It would seem, however, that the true cause may be found in the theories of Fitzwilliam and Couvelaire, who suggest that the condition is probably due to the absence of certain chemical constituents that are normally present and are necessary for the calcification of membranous bones. Differential diagnosis should present no great difficulties as a rule, though special attention may be required when anencephaly, intra-uterine fractures and fractures at birth are dealt with. There is also a medicolegal aspect of some importance.

Edinburgh Medical Journal

42: 445-504 (Sept.) 1935

- The Teaching of Neuroses to Medical Students. T. A. Ross—p. 445
- Specific Effect of Ascorbic Acid on Anemia of Scurvy. D. M. Dunlop and H. Scarborough—p. 476

Journal of Hygiene, London

35 303-448 (Aug.) 1935

- Effective Radiating Surface of Human Body. T. Bedford—p. 303
- Skin Temperature in Relation to Warmth of Environment. T. Bedford—p. 307
- *Prevention of Compressed Air Illness. Obsolete Statutory Regulations as an Obstacle to Progress. G. W. M. Boycott—p. 318
- Effect of Oxygen and Carbon Dioxide Baths on Subcutaneous Tissue Gas Tensions. P. Elman and H. J. Taylor—p. 322
- Is Cancer Mortality Increasing or Decreasing? G. Wolff—p. 327
- Louping Ill in Monkeys. Infection by Nose. I. A. Galloway and J. R. Perdrau—p. 339
- Serologic Grouping of Rough Vibrios. P. B. White—p. 347
- Study of So-Called *Bacterium Typhi Flavum*. J. C. Cruickshank—p. 354
- Some Immunity Experiments on Hypophysectomized Animals. J. Gordon and J. M. Robson—p. 372
- Decrease in Mortality During Early Adult Male Life in England and Wales. W. J. Martin—p. 375
- Relationship of Cotton Crop to Plague and Its Role as a Vehicle for Rats and Fleas in East Africa. J. I. Roberts—p. 388
- Violence of Reaction of Animal in Relation to Etiology of Cancer and Inflammation. C. C. Twort and R. Lyth—p. 404
- Enzootic Psittacosis Among Wild Australian Parrots. F. M. Burnet—p. 412
- Occurrence of Typhoid Bacilli Containing Vi Antigen in Cases of Typhoid Fever and of Vi Antibody in Their Serums. A. Felix, K. S. Krikorian and R. Reitter—p. 421
- *Virulence and Immunogenic Activities of *Bacillus Typhosus* in Relation to Its Antigenic Constituents. A. Felix and R. M. Pitt—p. 428
- Viability of *Bacteria Coli* and *Bacteria Aerogenes* in Water. Method for Rapid Enumeration of These Organisms. A. E. Platt—p. 437

Prevention of Compressed Air Illness.—Boycott states that the fact that strict stage decompression has been adopted for divers in the navies of the United States and of France, examples of whose rules for decompression for caisson and tunnel workers have been given, seems sufficient proof that the stage method is the method most approved by physiologists in

these two countries. There remains, therefore, only the existence of obsolete state regulations to account for the fact that stage decompression has not been adopted for caisson and tunnel workers in France, and in only a modified form in the state of New York. With small airlocks compromise methods may be necessary or even desirable. But it seems clear that, in the sphere of compressed air work, state regulations have proved to be more of a hindrance to health than a help to those for whose benefit they were intended.

Virulence and Immunogenic Activities of *Bacillus Typhosus*.—Felix and Pitt observed that rough variants, derived from strains of *Bacillus typhosus* which possess the Vi antigen may still contain this antigen though the smooth O antigen has been lost. Such variants, which are nonvirulent, are yet capable of inducing active and passive immunity. The virulence of *Bacillus typhosus* depends on the combined activity of the smooth O and the Vi antigen. Nevertheless the Vi antibody alone is sufficient to protect against infection with strains of the highly virulent type. The use of avirulent, rough, but Vi-containing variants as vaccines and in the preparation of therapeutic serums is discussed. Large doses of a live vaccine of this avirulent culture could be inoculated into horses without those harmful effects that follow the injection of the smooth virulent bacilli in the living state. The Vi antibody in the serum of rabbits and horses immunized with this rough variant was found to be as potent in protective action and in its phagocytosis promoting activity as was the Vi antibody derived from immunization with the smooth and highly virulent bacilli. The efficacy of a therapeutic antityphoid serum also depends on the presence in it of an adequate amount of the O antibody, which is responsible for effecting the neutralization of the endotoxin of *Bacillus typhosus*. This antibody can be produced by injecting a dead vaccine containing the smooth O antigen, whereas the live rough variant serves as the source of the "natural" Vi antigen required for the elaboration of the Vi antibody.

Medical Journal of Australia, Sydney

2 199-230 (Aug. 17) 1935

- Urinary Tuberculosis. H. Lett—p. 199
- Diagnosis and Treatment of Urinary Tract Infections. R. J. Silvertown—p. 204
- Anemia in Childhood. I. Wood—p. 211

2 231-274 (Aug. 24) 1935

- *Observations on Certain Aspects of Cyclic Vomiting Syndrome. L. Dods—p. 231
- Vitamin C in the Australian Fauna. G. Bourne—p. 260

Cyclic Vomiting.—Dods states that an investigation of ketonuria among 685 admissions revealed a general incidence of 46 per cent, an incidence of 57 per cent in the febrile and of 30 per cent in the afebrile children, and a lower incidence in the group of children less than 3 years of age. Attempts to assess the part played by either emotional disturbances or marked physical exertion in the production of ketonuria proved inconclusive but suggested that these stresses, unless unduly severe or prolonged, would be unlikely to produce ketonuria in the normal child. As the result of a clinical study of eighteen children subject to attacks of cyclic vomiting, the majority of which were observed over a period of about two years, it was observed that cyclic vomiting was more common among the outpatient class, there was frequently a family history of similar attacks, the majority of the children were alert and easily excitable, defects of stance and signs of vasomotor instability were frequently noted, the first attack usually occurred between the ages of 3 and 8, the majority of the attacks commenced during the night or the latter part of the day, the dramatic and sudden recovery from even prolonged vomiting was a striking feature of many attacks, the degree of ketonuria encountered during an attack frequently failed to bear any direct relation to the gravity of the attack, in a small group of these susceptible children mild acute infections and short anesthetics did not precipitate attacks and the possibility was suggested that undue emotional disturbance or undue emotional and physical stress may aggravate or precipitate the underlying metabolic disturbance in the susceptible child. This disturbance might be defined as the clinical picture of the overtired child. This syndrome of overtiredness has many features in common with the early stages of cyclic vomit-

ing and usually occurs in the same highly sensitive type of child. Ketosis alone apparently is not the cause of cyclic vomiting but is probably a concomitant of the unknown underlying disturbance. Attacks of spontaneous hypoglycemia in childhood may closely simulate cyclic vomiting. In a small series of normal and cyclic vomiting children, blood sugar levels were found to be slightly lower in both groups of children during ketosis, and the blood sugar showed a normal response to the subcutaneous injection of a small dose of epinephrine. Prophylactic dietaries (prolonged) given to two groups of cyclic vomiting children supported the fact that the group whose fats were carefully restricted and whose diet consisted mainly of carbohydrates did not show any better response than those children who were given adequate fat and an ordinary amount of carbohydrate. If the susceptible children were protected as much as possible from emotional stresses there was a definite diminution in the number of their attacks. A short but complete rest, and possibly some nerve sedatives before and/or after any unavoidable stresses of this nature seemed to be helpful in aborting possible attacks.

Practitioner, London

135 249 376 (Sept.) 1935

- Sexual Problems of Adolescence W Brown—p 249
 Problems of Menstruation Gwendoline Brown—p 257
 Exercise and Heart Strain G E Friend—p 265
 *Albuminuria in Adolescence H H Bashford—p 272
 Routine Medical Care in Public Schools G O Barber—p 277
 *Acute Infectious Diseases at School R E Smith—p 283
 Some Common Skin Affections of Adolescence J L Franklin—p 298
 Pulmonary Tuberculosis in Young Adults F J Bentley—p 308
 Postural Deformities in Adolescence P Wiles—p 318
 Treatment of Acute Cerebral Inflammation in Children C P Lapage—p 330
 Three Way Syringes and a Few of Their Uses H Dodd—p 339
 Adequate Feeding in Acute Infections and Similar Conditions H S Pemberton—p 348
 Favorite Prescriptions IN Pharmacopoeia of St John's Hospital for Diseases of Skin J E M Wigley—p 352

Albuminuria in Adolescence—Bashford points out that evidence from the records of the medical branch of the post office appears to support the view that adolescent albuminuria, alone, and in the absence of any other signs or symptoms, is a nonpathologic, idiosyncratic condition of neither immediate nor potential significance. In the great majority of cases the after-returned specimens are free from albumin, though not in all nor at all times. It is probably wise, in the present state of our knowledge, to regard the small minority, in which the presence of albumin is constant in all specimens, with rather more care from an insurance point of view. But there seems little doubt that a certain number of these also belong to a nonpathologic and idiosyncratic type, and if, in these cases, there is satisfactory evidence of general renal efficiency, there would seem to be no reason to think otherwise. About one in every twenty young male adolescents and at least the same proportion and perhaps more of young female adolescents will be found to show this condition. In a considerable number of instances it may persist for many years, if not throughout life. The condition is not associated with any particular physical type or build of young man or young woman, or with lordosis, ovaluria, a history of scarlet fever or a history of general nervous instability. It is without significance in respect of either current or future ill health.

Acute Infectious Diseases at School—Smith warns that schools are not immune from any infections. Recently epidemics of rheumatic fever, catarrhal jaundice and bacillary dysentery have been reported. Influenza is of paramount importance, over which there seems to be little control. The following policy should be considered by those who are responsible for the care of children. 1 Whooping cough vaccine in sufficiently large doses should be given at an early age together with a suitable diphtheria prophylactic, preferably toxoid-antitoxin floccules. There seems no contraindication to mixing the vaccine with the toxoid-antitoxin floccules. Benson advises mixing the prophylactics in active immunization against scarlet fever and diphtheria. 2 Measles and whooping cough should be vigorously prevented or arrested until after the age of 5. If contact with measles has occurred and an attack is almost

inevitable, serum should be given and attenuation achieved if possible. The provision of measles serum on a wide scale and facilities for bacteriologic diagnosis of whooping cough are matters of great importance and some urgency. 3 Unnecessary waste of time and inconvenience should be avoided by allowing contacts with measles, mumps, chickenpox and rubella to return to school provided they have been kept away from the source of infection as soon as it was recognized.

South African Medical Journal, Cape Town

517 548 (Aug 10) 1935

- Control of Bilharzia Infection in the Union F G Cawston—p 519
 Lymphogranuloma Inguinale Presenting Some Unusual Features. F W F Purcell and M H Finlayson—p 521
 Treatment of Staphylococcal Osteomyelitis N Petersen—p 523
 The Housing Problem with Especial Reference to the Slums Act T S Higgins—p 527
 Atypical or Benign Uterine Bleeding I P Schabort—p 530

Chinese Medical Journal, Peiping

40: 609 722 (July) 1935

- Missed Abortion A Wong—p 609
 Fetuses with Cephalic Malformations Delivered in the Peiping Union Medical College Hospital from July 1 1922 to Jan 1 1934 K T Lim—p 624
 Atelectasis in Pulmonary Tuberculosis M H Chien and T P Wu—p 636
 Indigenous Cases of Leprosy in Manchuria Report of Four Cases K Y Yu—p 644

40: 723 826 (Aug) 1935

- Detachment of Retina Report of Eight Cases Treated with Diathermy Microcoagulations P C Kronfeld and T H Luo—p 723
 Notes on Certain Larval Stages of Lungfluke Paragonimus in China K. Wu—p 741
 Double Spontaneous Rupture of Uterus During Labor Case. Hsieh Love Rankin—p 747
 *Presence of Carotene in Ovarian Tumors Report of Case. C. Y. Ch. P L Li and C. S. Yang—p 751

Presence of Carotene in Ovarian Tumors—Chi and his associates discuss a case of dermoid cyst of the ovary combined with pseudomucinous cystadenoma, which resulted in peritoneal implantations. This condition is generally known as pseudomyxoma peritonei. In the combined cystomas the mucinous material is usually mixed with fatty materials. The fluid contents of such tumors may be colorless or brownish; the latter color is probably due to the presence of altered blood pigment. Discoloration of the fluid by carotene is almost unknown in the literature. According to Anzei its absorption in the intestinal tract takes place by virtue of its solution in fat. Lipoid substances in general have a great affinity for carotene. High blood carotene content is frequently observed in cases of diabetes mellitus with increased blood cholesterol. Carotene excretion is effected through the sebaceous and sweat glands of the skin and through the epithelial cells of the kidney tubules. Opinions differ in regard to its excretion through the skin. Hashimoto holds that its excretion is carried out mainly by the sebaceous glands of the skin, while Anzei insists that it is excreted only through the sweat glands. In two cases Anzei found at necropsy marked yellow pigmentation in the subcutaneous omental and mesenteric fat tissues. Other organs, such as the kidneys and the adrenals, were also intensely pigmented. It is evident therefore that carotene may be retained by any fatty tissues of the body. Since the fluid content of this tumor is rich in fatty material from the sebaceous glands and degenerative products of the squamous epithelium, carotene is present in greater concentration in the cystic fluid than in the blood.

Journal of Oriental Medicine, Dairen, South Manchuria

23: 1 8 (July) 1935

- Effect of Local Obstruction of Blood Flow on Sweat Secretion in Man. T Ichihashi and K Ogata—p 1
 Observations on Daily Amount of Human Perspiration in Winter and Summer and Its Relationship with Intake of Food and Drink and with Amount of Urine T Ichihashi and K Ogata—p 3
 Polyvalent Cutaneous Hypersensitivity in Patient with Skin Tuberculosis K Tasaki—p 4
 Therapeutic Value of Large Doses of Atropine for Sequels of Encephalitis Epidemica K Maeda—p 5
 Intracellular Oxidation Reductions of Plant Cells by Vital Staining with Methylene Blue and Rongalit White. S Hatano and H Ryo—p 6
 Effect of Intake of Water and Salt Solution on Sweat Secretion and on Regulation of Body Temperature S Ito and T Kosuge—p 8

Archives des Maladies du Cœur, Paris

28: 549 628 (Sept.) 1935

- *Blood of Hypertensive Patients Carrière C Huriez Leperre and Sence.—p 549
- Phonocardiographic Study of Diastolic Rumble with Presystolic Reinforcement. D Routier and G Tavecchi.—p 576
- Reflexogenic Physical Therapy in Cardiac Patients L. Alquier.—p 597
- Acute Pulmonary Edema in Experimental Lesions of Right Ventricle. G M. Cataldi.—p 604
- Latent Form of Secondary Sclerosis of Pulmonary Artery V. Nichita and V. Balaceanu.—p 609

Blood of Hypertensive Patients—Carrière and his collaborators made studies of the blood of 105 hypertensive patients with a view to determining the principal physicochemical properties of the blood and their possible relations to one another. From the physical point of view the blood of all permanent hypertensive patients is characterized by increased weight by hyperviscosity of the blood and to a lesser degree of the serum and by considerable increase in the osmotic pressure of the serum. The uremia of hypertensive patients is moderate except in cases of gross renal lesions. The plasma chlorides are generally low. The sugar metabolism appears little disturbed as a rule. A slight but constant disturbance of protein metabolism is present. This is shown by a moderate hyperproteinemia and especially by an elevation of the albumin-globulin quotient. It is certainly the fat metabolism that is modified most by the hypertensive process. The hypercholesterolemia is considerable and constant. These observations are presented in the words of the authors "independently of all premature pathogenic interpretation."

Paris Médical

2 141 152 (Aug 31) 1935

- *Investigations of the Pyrogenic Principle Contained in Human Urine C. Urechia I. Manta and M. Bumbacescu.—p 141
- Results of Treatment of Twenty Nine Cases of Dementia Paralytica R. Largeau and M. Conte.—p 145
- Solitary Abscess of Each Lung H. Eschbach.—p 148
- Growing Importance of Lambliasis in Etiology of Colitis H. Gaehlinger.—p 149
- Biplotic Rubella Developing on Ninth Day of Treatment with Methenamine Derivative of Meta Amino-Para Oxyphenyl Arsenic Acid (Treparsol) of Mother and True Rubella in Child Transmitted by Mother Mme M. Spitzer.—p 151

Pyrogenic Principle in Human Urine—Urechia and his collaborators investigated the fever-producing properties of urinary residues obtained from various sources. The residue was prepared by evaporation of the urine to dryness in a vacuum. The residue thus obtained was kept in a dryer with calcium chloride. Finally it was dissolved in distilled water at the ratio of 0.1 Gm to 1 cc. of water. The quantity injected in rabbits varied from 0.1 to 0.6 cc. Later similar preparations obtained from the urine of patients with dementia praecox were used in dementia praecox and in dementia paralytica by the intravenous route. In practically all instances a considerable febrile reaction occurred. This was frequently associated with marked clinical improvement. Intradermal tests with the urinary residue, practiced on patients with dementia praecox, dementia paralytica, parkinsonism and manic-depressive insanity as well as on normal persons, produced no reactions. The urine of normal persons contains a chondromucoid substance that is found in greater quantities in certain conditions, such as dementia praecox, dementia paralytica and pregnancy. The urinary residue obtained from these sources possesses a strong fever producing action, while that from normal persons or persons having tuberculosis, myopathy or cancer is much less active.

Policlinico, Rome

42 1899 1942 (Sept 30) 1935 Practical Section

- *Dimethyl Carbamic Ester of Hydroxy Phenyl Tri Methyl Ammonium Methyl Sulphate the Physostigmine Derivative in Treatment of Postoperative Intestinal Obstruction E. Pescarmona.—p 1899
- Acute Febrile Syphilis Case V. de Antoni.—p 1906
- Orchitis and Orchiepididymitis in Brucellosis and Other Infections D. A. Mazzolani.—p 1912

Treatment of Postoperative Intestinal Obstruction—Pescarmona advises the use of dimethyl carbamic ester of hydroxy phenyl-tri-methyl ammonium methyl sulphate the physostigmine derivative, injections in the amount of 1 cc. of a 0.5 per thousand isotonic stable solution at each injection

that is, 0.0005 Gm of the active substance in 1 cc. of the solution, in the treatment of postoperative dynamic intestinal obstruction. This treatment gives satisfactory results even in cases in which the ordinary methods of treatment, such as enemas the use of a rectal sound, intravenous injections of hypertonic salt solution and hot cataplasms, have failed. It does not produce harmful effects on the heart or on the arterial pressure, or clinical complications of any sort. The abdominal pain with which some patients react is transient and tolerable. As a rule one injection of the mentioned dose is sufficient to obtain satisfactory results. Nevertheless, in severe cases one may give two or more injections (up to five or six) at intervals of a few hours during the same day without any danger to the patient and usually with good results. Although the injections may be given either intravenously or intramuscularly, the latter technic is preferable because of its simplicity.

Semana Medica, Buenos Aires

42: 745-820 (Sept 12) 1935 Partial Index

- Biliary Peritonitis in Puerperium Case T. A. Chamorro M. Coquet and E. Dacharry.—p 745
- Diverticula of First Segment of Duodenum Cases M. Royer E. Cornejo Saravia and R. Lottero Lanari.—p 748
- Anatomy of Arterial System as Seen by Modern Methods of Visualization P. Belou.—p 764
- Thoracoplasty Technic of Local Anesthesia R. Finochietto.—p 771
- *Extraperitoneal Cervicosegmental Cesarean Section Modified Technic. J. León.—p 773
- Treatment of Suppurative Arthritis of Knee A. E. Despontin.—p 780
- *Intradermal Infiltration in Treatment of Leprosy S. Schujman and J. M. M. Fernández.—p 790

Extraperitoneal Cervicosegmental Cesarean Section—Leon states that extraperitoneal cervicosegmental cesarean section according to Michon's technic gives better results than transperitoneal segmental cesarean section in labor complicated by amniotic infection, either proved or suspected. The refinement of Michon's technic consists in the utilization of portions of the peritoneum for exclusion of the operative field through coaptation of the visceral and parietal edges of the peritoneum at the line of transversal peritoneal incision by means of sutures or forceps. This is followed by the cervicosegmental longitudinal incision, extraction of the child, administration of an intramural injection of a pituitary preparation in order to promote spontaneous expulsion of the placenta, suture of the muscular wall of the uterus, removal of the forceps or sutures and in infected cases, insertion of a Mikulicz drain. The author's modification consists in covering the peritoneal flaps with impermeable compresses, which are fastened on one side to the peritoneal edges and on the other to the border of the cutaneous laparotomic incision, thereby excluding the hysterotomy field from the peritoneal cavity and protecting the latter, as well as the hypodermic cellular tissues, against contamination with the amniotic fluid. The author performed cesarean section according to Michon's technic in five cases. Impermeable compresses were used in three cases of the group. The peritoneal flaps were lacerated in two cases, with and without impermeable compresses, respectively. Neither amniotic fluid nor blood was found in the peritoneal cavity or in the cellular hypodermic tissues in the case in which the structures had been protected by an impermeable compress. A drain was left in these two patients and also in a patient with amniotic infection. The incision of the inferior segment of the uterus was peritonized in four cases. As a whole, the postoperative period was uneventful, peritoneal reactions did not develop, and in time both mothers and children left the hospital in satisfactory condition.

Intradermal Infiltration Method in Treatment of Leprosy—Schujman and Fernandez state that intradermal infiltration of chaulmoogra derivatives is the most active method for the treatment of leprosy. Not all chaulmoogra derivatives can be given by the intradermal route because of the severe local reaction they cause. Tattooing and the intense local reaction that follows the infiltration are the most serious results of the treatment. A chaulmoogra derivative that would cause neither tattooing nor intense local reactions when intradermally injected would be the ideal preparation for the method of intradermal infiltration.

Klinische Wochenschrift, Berlin

14 1305 1344 (Sept 14) 1935 Partial Index

Relations Between Epilepsy and Angina Pectoris W Hadorn and A Tillmann—p 1308

Behavior of Vitamin C in Addison's Disease S Siwe—p 1311

*Action of Intravenous Administration of Large Doses of Digitalis in Paroxysmal Tachycardia R Aschenbrenner—p 1313

Acute Azotemia in Severe Gastrointestinal Hemorrhages K Sucić—p 1316

*Value of Kline's Microscopic Slide Precipitation Test for Serodiagnosis of Syphilis J Schmitz—p 1320

Action of Digitalis in Paroxysmal Tachycardia—Aschenbrenner agrees with Bohnenkamp that the customary treatments of tachycardia are comparatively unreliable, pointing out that even the most commonly employed intravenous injections of quinidine fail in severe cases. Moreover, quinidine is not entirely harmless in patients with heart disease, for the author detected considerable changes in the electrocardiogram following its administration. Bohnenkamp obtained favorable results in severe attacks of tachycardia by the intravenous injection of large doses of digitalis. Because patients with mitral stenosis are ordinarily susceptible to digitalis, the author reports a case with paroxysmal tachycardia and mitral stenosis. In a severe attack of tachycardia, when, in view of the mitral stenosis, the life of the woman seemed in danger, the author decided to follow Bohnenkamp's suggestion to administer a large dose of digitalis. The results were satisfactory. When three weeks later the patient had another attack of tachycardia, she again was given an intravenous injection of a large dose of digitalis. She developed anginal pain and vomiting, but these symptoms disappeared after the tachycardia had been brought under control. The author thinks that it is especially important to produce a prompt interruption of the tachycardia in mitral stenosis. He says that the intravenous administration of doses corresponding to from 0.45 to 0.5 Gm of digitalis leaves caused, in addition to severe vomiting, only slight signs of intoxication, which subsided again in from one to three days.

Kline's Precipitation Test for Syphilis—Schmitz describes his experiences with this test employed on 2,100 specimens of serum and on 187 specimens of cerebrospinal fluid. He compared its reliability with that of the Wassermann, the Kahn, the Meimcke turbidity and the Meimcke clarification tests. He reaches the conclusion that the Kline test is a valuable method in the serologic demonstration of syphilis. As regards its sensitivity and specificity, he found that it takes an intermediate position between the turbidity and the clarification tests of Meimcke. He thinks that few syphilitic serums will escape detection even if the Kline test is the only serologic method employed. The advantages of the Kline method that make it particularly valuable for serial examinations are its rapidity and the economic use of materials, for the test can be made with 0.05 cc of serum and 0.008 cc of dilute antigen. The author thinks that, if it is used for routine examinations on large numbers, the positively reacting serums may then be subjected to other serologic tests.

Medizinische Klinik, Berlin

31 1225 1256 (Sept 20) 1935 Partial Index

Internal Secretion and Water Economy W Nonnenbruch—p 1225

*Surgical Therapy of Adherent Pericarditis A Winkelbauer and M Schur—p 1231

*Symptomatology of Panmyelophthisis R Weindel and C G Engel—p 1235

Solitary Tubercle in Cervical Spinal Cord E. Hoeschel—p 1238

Action of Short Electric Waves E Hasche and T Triantaphyllides—p 1239

31 1257 1288 (Sept 27) 1935 Partial Index

Mixed Forms of Functional Disturbances of Thyroid W Redisch—p 1268

*Surgical Therapy of Adherent Pericarditis A Winkelbauer and M Schur—p 1269

Measuring of Isthmus of Aorta by Means of Transparent Spheres S Kreuzfuchs—p 1274

Differences in Rapidity of Development of Various Organs in Their Significance for Problem of Relation Between Constitution and Tuberculosis W Brandt—p 1276

Surgical Therapy of Adherent Pericarditis—Winkelbauer and Schur describe eight cases of adherent pericarditis and recommend the following principles for the surgical treatment. If the stasis in the inferior cava predominates, the site of anastomosis of the inferior cava should be liberated, but, if hydrothorax is the most prominent symptom, it is important

to free the left ventricle. It should be taken into consideration that some of the anatomic changes are compensated by an improvement of the cardiac function. The improved function is facilitated particularly by freeing the heart from the diaphragm and from the adhesions on the posterior wall. The decortication of the right ventricle (anterior surface) is much less important. It is inadvisable to complete the operation in one stage. Since the condition of the myocardium is the decisive factor for the extent of the operation, the electrocardiogram and the peripheral edemas have to be given careful attention. If the myocardium has already become considerably impaired by a growing in of the adhesions, completion of the operation in one stage is impossible. In severe cases of this nature the first stage of the operation consists only in Brauer's cardiolysis. In cases of myocardial lesion in which the condition of the patient permits it the curass may be broken at the same time by an incision above the left ventricle, and further decortication can then be done by a second or third intervention. During the operation the blood pressure and the pulse should be constantly watched, and it is advisable to interrupt the operation as soon as there are signs of diminution of the heart action. If the indurated tissue contains calcareous plates, especial precaution is necessary, if there is complete adherence between the pericardium and the epicardium or if the calcareous plates are in the epicardium, it is better to refrain from removing the plates, for it may prove impossible to close a perforation of the ventricle. In these cases the decortication should be limited to the uncalcified regions. In view of the fact that considerable functional improvement is often obtained merely by removing the bones of the thoracic wall (cardiolysis), it is advisable not to resort immediately to a transpleural intervention. If the flaps are made of adequate size, the opening of the left pleural cavity will provide a sufficiently large approach for the required decortication of the inferior and posterior surfaces of the heart.

Symptomatology of Panmyelophthisis—Weindel and Engel say that Frank's description of the symptomatology of panmyelophthisis stressed three essential symptoms: (1) grave anemia, (2) inflammations with the anatomic aspects of diphtheria, which are followed by sepsis, and (3) morbus maculosus haemorrhagicus. The authors describe the histories of several patients observed in their clinic. On the whole the cases correspond in their symptomatology with that given by Frank. The first and third points stressed by Frank were always demonstrable but the diphtheric inflammations were not quite as regular. The blood pictures always showed a reduction of the morphologic constituents of the blood. Erythrocytes, leukocytes and thrombocytes were always equally involved. However, in the beginning stage of the disease one of the morphologic constituents may be destroyed more rapidly than the others, so that another form of blood disease may be thought of. In the differential blood picture there are great differences. As a rule, however, the cell forms are normal and only their reduced number indicates the nature of the disorder. In some instances the young forms are relatively increased, while in other cases the cells with vital granulations are increased as indication of a reduced regenerative capacity. The exact status of the bone marrow can be detected only in the course of the necropsy. In addition to the true form of panmyelophthisis there are a number of other blood diseases in which only a part of the bone marrow is destroyed. Among these there are two definite forms: the agranulocytosis of Schultz and the morbus maculosus of Werlhof. The first of these cannot always be differentiated from panmyelophthisis, but the course of the second is nearly always differentiable. Occasionally some forms of blood diseases apparently develop into a panmyelophthisis. In all lesions of the bone marrow, toxins seem to be the eliciting cause. The authors believe that different chemical and bacterial toxins, if they are present in sufficient quantities and for a sufficient time, produce one of the blood diseases and impairment of the bone marrow. Attempts have been made to bring the various lesions of the bone marrow into a nosologic system. The authors consider the best one that suggested by Naegeli, who differentiated (1) aplastic anemia, (2) agranulocytosis, (3) thrombopenia, (4) aleukia (the combined symptomatology of 2 and 3) and (5) panmyelophthisis (a combination of the symptoms of the first three). The treatment is chiefly symptomatic and consists primarily in blood transfusions.

Münchener medizinische Wochenschrift, Munich

82:1515 1556 (Sept 20) 1935 Partial Index

- Guiding Principles for Treatment of Myocardial Infarct M Hochrein—p 1515
Bacterial Etiology of Catarrhal Icterus K Hassmann—p 1520
When and How to Operate on Varicose Veins (New Method) S Romich—p 1522
Growing Pains O Meyer—p 1523
Rupture of Uterus Following Cesarean Section Case G Steigelmann—p 1524
Fluorine as Specific for Parathyroids M Callam—p 1534

Operative Treatment of Varicose Veins—Romich thinks that the failures in the treatment of varicose veins are partly due to the fact that the difference between varices and strong veins is frequently not given sufficient consideration and that occasionally strong, healthy veins are ligated. After discussing the pathogenesis of varices, he shows which parts should be ligated and which should not. He demonstrates that the intervention is considerably simplified by making percutaneous ligatures and by subcutaneous severing of the veins. The advantage of this procedure is that no cutaneous scar is produced and no ligatures remain in the skin. Moreover, it makes possible the ambulatory use of the operative treatment. The author deplors that the percutaneous ligature, which Kocher used in operations on veins, has been given up, for it is suitable also in connection with the injection treatment.

Fluorine for Parathyroid Insufficiency—Callam points out that fluorine can be used with good results in disorders in which there is insufficiency of the parathyroids. He prescribes a 1 per cent solution of chemically pure sodium fluoride in distilled water, of which the patient takes from five to eight drops in a teaspoonful of water four times daily. He asserts that, if the sodium fluoride is given in these quantities, there are no toxic effects. An indication of the efficacy of sodium fluoride is the disappearance of the cicatricial keloids after from two to three months of medication. Callous scars decrease in size and become so soft that they hardly differ from the surrounding skin. This applies to external scars and is true also of urethral, vaginal, esophageal or other scars. The author thinks that, aside from surgical stimulation of the parathyroids, the medication with sodium fluoride is the best treatment for scars. That sodium fluoride has connections with the parathyroids is indicated by the author's observation that, in the dosage mentioned, sodium fluoride is a good antispasmodic in infantile eclampsia and in epilepsy of children. Moreover, sodium fluoride is helpful in suppurations and inflammations of the bones, in exostoses and in fractures that fail to heal. The author thinks that it might likewise be tried in bone sarcoma. He suggests investigations on the effect of fluorine on the calcium content of the blood, osteomalacia, osteitis fibrosa and experimental tetany following removal of the parathyroids.

Wiener klinische Wochenschrift, Vienna

48:1151 1174 (Sept 20) 1935 Partial Index

- Calcium Metabolism and Surgery of Parathyroids F Mandl—p 1151
Antigonadotropic Action of Epiphysean P Engel—p 1160
Clinical Significance of Determination of Concentration of Organic Substances in Cavity Fluids. I Schulutko—p 1161
Peritonitis in Scarlet Fever N Vučetić—p 1163

Determination of Organic Substances in Cavity Fluids—Schulutko points out that the determination of the concentration of organic substances in fluids makes it possible to differentiate exudates from transudates. The Rivalta reaction is often used for this purpose. Another method is that suggested by Castellino, but this test does not indicate the concentration of a fluid and, according to Kartaschowa it has only slight clinical value. The author employed the method of Model, which is based on the observation that organic substances become oxidized by a chromium mixture. To 0.5 cc. of the fluid to be examined is added 15 cc. of a decinormal solution of potassium bichromate and 30 cc. of concentrated sulphuric acid. This mixture is left to cool, is diluted with distilled water to make 100 cc. and is again left to cool. Then 5 cc. of a 10 per cent solution of potassium iodide is added and the precipitated iodine is titrated in the presence of starch by means of a decinormal sodium thiosulphate solution. The quantity of sodium thiosulphate required for the titration is subtracted from the quantity of the decinormal solution of potassium bichromate that was added in the beginning and is multiplied

by two (for computation for 1 cc. of the fluid to be examined). The number thus obtained is called the reduction index and indicates the sum of the organic substances, that is, the higher the reduction index, the greater the concentration of organic substances. The author used this method for the examination of transudates and exudates, but particularly for the determination of the concentration of organic substances in the bile. He points out that under normal conditions the concentration of the B bile is greater than that of the A and C biles. Further he shows that under pathologic conditions (hepatitis, angiocholitis, cholecystitis, cholelithiasis and so on) the concentration of the bile increases. He gives tabular reports of the concentration of organic substances in the bile (A, B, C), which he determined by means of Model's method in the various disturbances, those without and those with involvement of the biliary system. In patients with symptoms of cholecystitis, he found that the reduction index was from two to three times as high as in persons without these disturbances.

Zeitschrift für Krebsforschung, Berlin

42:251 346 (Aug 22) 1935 Partial Index

- Estimation of Relations Between Cancer and Accidents or Occupational Diseases A Dietrich—p 251
Copper Content of Jensen Sarcoma and Its Relation to Copper in Organs S Edlbacher and W Gerlach—p 272
Copper Content of Human Tumors in Relation to Copper Content of Liver W Gerlach—p 290
Carcinoma Reaction with And of Bacterium Coli J Čizek—p 311
Regulation of Growth Equilibrium of Epithelium and Connective Tissue by Factors That Increase Cell Permeability and Their Significance for Cancer Problem Traube and Else Knake—p 324

Copper Content of Jensen Sarcoma—Edlbacher and Gerlach explain the connection of their studies with former investigations. In this report they consider the problem of whether the copper and iron content of experimental tumors shows peculiarities. On the one hand, they studied the various parts of tumors for their copper and iron content and, on the other hand, they investigated whether there are relations to the copper metabolism in other portions of the animal organism, particularly the liver. The experiments were made on white rats. These animals had been subcutaneously inoculated with Jensen's rat sarcoma. In the first series of animals the authors determined the copper-iron content of the tumor and of its necrotic part and the copper content of the liver, spleen and kidney. In the second series, neoplasms of various ages were examined for the copper and iron content of the tumor and of its necrotic part. In the third series the problem was whether the copper metabolism could be influenced by intensive copper storage of the organism. The authors found that the average normal copper content of the liver per gram of moist substance is 3.2 microgram but that it fluctuates between 1 and 6 micrograms. The spleen has a considerably lower copper content, namely, 0.3 micrograms, while the kidney has a relatively high one of 3.4 micrograms. The copper content of the liver is apparently subject to fluctuations, tumor animals showing low as well as high values. It was found also that within the tumors the copper content varies greatly, there being considerable differences between the necrotic center and the rapidly growing periphery of the tumor. The necrotic portion always contains considerably larger quantities of copper than the growing tumor tissues. This difference is always present and is apparently independent of the absolute copper content, the quotient of the copper content between the necrotic portion and the tumor being always the same. The authors point out that in this respect their observations corroborate those of another investigator, who also observed a higher copper content in the necrotic portions than in the surrounding tumor in the Ehrlich-Putnoky rat tumor. They think that in view of the rapid growth of the tumors it is reasonable to assume that the copper in these inoculation tumors comes from the organism of the host. They found that while the quotient between the necrosis and tumor remains the same, the absolute copper content of tumors decreases with the course of time. In this respect the authors' observations differ from those of another investigator, who observed a continuous increase. In their studies on the effects of copper storage, the authors observed an inhibition of the tumor growth following the introduction of copper. They think that the question of whether the copper content of malignant tissues and their necroses exerts an influence on the

increased enzymatic action of these tissues must be answered in the negative. However, they consider it possible that the increased copper content of the necrotic tissues might be related to the enzymatic changes that take place during necrotization.

Carcinoma Reaction with Aid of Bacterium Coli—Cizek states that in an endeavor to simplify the Fuchs cancer reaction he utilized for the demonstration of proteolysis of the fibrin substrates the capacity of *Bacterium coli* to form indole from the cleavage products of protein, which contain the tryptophan group. In this case indole can readily be demonstrated by the Ehrlich test. This cancer reaction is simple and, on the basis of the author's observations, comparatively reliable and specific. Of thirty untreated cancer patients, twenty-seven (90 per cent) had a correct reaction, two (67 per cent) an incorrect reaction and one an indefinite reaction. In seventy-nine control cases the results were correct in seventy-four cases, incorrect in two cases and indefinite in three cases.

Zentralblatt für Chirurgie, Leipzig

62 2225 2288 (Sept. 21) 1935 Partial Index

- Corrosion of Stomach by Hydrochloric Acid F. Breuer—p. 2226
- *Hypertension and Denervation of Kidneys R. Uebelhor—p. 2230
- Hydrocolpos and Hydrometra in Vaginal Atresia During Senility H. Markus—p. 2233
- *Dupuytren's Finger Contraction W. Niederland—p. 2238
- Experiences with Evipan Anesthesia H. Geiger—p. 2243

Hypertension and Denervation of Kidneys—Uebelhor points out that the suggestion for the separation of the kidney from its sympathetic nervous system for the purpose of reducing the blood pressure came from animal experiments in which it was observed that the denervated kidney is protected against various injuries, owing to the elimination of vascular spasms and the better blood perfusion. Since complete denervation seemed to accomplish more than simple decapsulation, it was suggested that denervation be resorted to in certain cases of glomerular nephritis and particularly in not fully developed nephrosclerosis. The problem of blood pressure was studied by several investigators, who reasoned that denervation counteracts an injurious spasm of the renal arterioles. The author cites several surgeons who resorted to renal denervation and reported some favorable results, but in some cases the reduction in blood pressure disappeared again after a few weeks and after that the disorder took its usual course. The author observed two cases in which the treatment was a complete failure. He stresses that the object of this report is to call attention to the fact that renal denervation and operations on other organs produce similar results as far as the blood pressure is concerned. The considerable decrease in a fixed hypertension and the improvement in some subjective symptoms persists not only for a few days but for months. The author has no explanation for this observation, the less so since the hypertension did not have the same cause in the patients in whom these improvements were noted. The postoperative reduction in blood pressure was observed in the majority of patients with hypertension, but in some it lasted only for a short and in others for a long period. The reduction lasting for only a short time may be explained by the operative shock and by the effect of the anesthesia, however, a reduction of several months' duration cannot be explained in this manner. To be sure, operations are often followed by an improvement in the general condition that cannot be wholly explained by the removal of a diseased organ. The author emphasizes that he does not wish to discourage further attempts to improve hypertension or preuremic conditions, but he points out that renal denervation can be justified only if it accomplishes more than some other operation or the internal treatment.

Dupuytren's Contraction.—Niederland points out that although the anatomic aspects of Dupuytren's contraction are well known its etiology is still disputed. He is of the opinion that (1) in rare cases a single trauma may produce a Dupuytren's contraction, (2) in some cases hereditary factors without a demonstrable trauma may be the cause, (3) in the majority of cases it is the result of chronically recurring traumas of the inner surface of the hand, such as repeated mechanical injuries from tearing, pressure or jerk, and (4) careful attention to all factors, particularly to the occupational aspects, will reveal that it is an occupational disorder in the majority

of cases. He reviews and attempts to disprove the objections that have been made against points 3 and 4 and concedes that as yet it is an open question whether traumatic influences are as such capable of producing Dupuytren's contraction or whether they can do this only on the basis of a hereditary predisposition. He points out that whether this question will be answered in the affirmative or the negative will have no essential effect on the estimation of the disorder as an occupational disease.

Zentralblatt für Gynäkologie, Leipzig

59: 2161 2224 (Sept. 14) 1935

- Management of Delivery in Pelvic Presentation H. Nevenny—p. 2162
- *Danger of Intra Uterine Pessaries H. Gesenius—p. 2168
- Intrathoracic Endoderm Cyst in Posterior Mediastinum in a New Born Infant K. H. Stoeckel—p. 2178
- Röntgen Diagnosis of Foreign Bodies in Female Genitalia H. Helldall—p. 2183
- Marking of the New Born E. Winter—p. 2187
- Röntgenologic Control of Madlener's Method of Sterilization J. Russa—p. 2188

Danger of Intra-Uterine Pessaries—Gesenius gives a history of the use of intra-uterine pessaries. He cites some of the bold claims that have been made for the use of some intra-uterine pessaries. A review of the literature reveals several hundred cases of severe complications and forty-one fatalities caused by the most common forms of pessaries. These figures do not include the uncomplicated abortions, and the incidence of severe complications and fatalities is doubtless much higher, since only a small portion of such cases are reported in the literature. If conception takes place while the woman wears a pessary, septic abortion may result. Sterility or tubal pregnancies have been known to result after the use of pessaries. Moreover, stem pessaries have been known to perforate into the abdominal cavity, the rectum or the bladder. Some authors believe that certain types of pessaries may cause deformities of the fetus. He describes a case in which the forensic aspects of the introduction of pessaries came up. He thinks that the time has come when the medical profession should assume the stand that the introduction of foreign bodies into the uterus is an "act of negligence." This attitude has been adopted by the Berlin medical society.

59: 2225 2288 (Sept. 21) 1935

- *Appendectomy as Etiologic Factor of Biliary Disease? G. Schubert—p. 2226
- Diagnostic Exploratory Incision into Uterus in Situ in Case of Open Abdomen B. Ottow—p. 2230
- Sterilization for Eugenic Reasons F. Engelmann—p. 2233
- Tuberculosis of Vagina V. Deppisch—p. 2240
- Treatment of Leukorrhea by Practitioner E. Nitzsche—p. 2241
- Intra Inguinal Varicocele of Round Ligament D. Maluschew—p. 2244

Appendectomy as Etiologic Factor in Biliary Disease?—Schubert directs attention to a report by Scharf in which that author states that he observed a high incidence of biliary diseases following appendectomy and that two other authors had made similar observations. In accordance with this, Scharf has recommended (1) inspection of the gallbladder during every appendectomy and (2) removal of the appendix only when absolutely necessary, never for prophylactic reasons. Schubert, however, objects to Scharf's stand. He analyzes his own material of several hundred gynecologic laparotomies in the course of which he removed the appendix, whether it was diseased or normal, not only because he himself had frequently observed the development of appendicitis shortly after a gynecologic laparotomy but also because other leading surgeons had advised prophylactic appendectomies in connection with every laparotomy. In studying the postoperative records of his patients he finds 117 per cent of postoperative biliary disorders. He thinks that, in view of the rather high incidence of biliary disease, the same number might be expected had the appendix not been removed. In this connection he cites Truesdell, who in the course of several hundred laparotomies in women observed that almost 10 per cent had gallstones. Moreover, in gynecologic operations in which the appendix was not removed the postoperative incidence of biliary disease was 145 per cent, that is, it was higher than in the operations in which the appendix had been removed (117 per cent). On the basis of these observations he rejects the assumption of connections between a prophylactic removal of the appendix and postoperative biliary disease, because it lacks corroborative evidence.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 105, No 20

CHICAGO, ILLINOIS

NOVEMBER 16, 1935

HYSTERICAL PARALYSIS AND ITS TREATMENT

ABRAHAM MYERSON, M.D.
BOSTON

Hysteria, like many another concept of medicine, is a fusion of conditions that resemble but are not identical with one another. From the hysterical state that is a total alteration of personality to the case in which hysterical manifestations appear as a sort of foreign body in the personality is a wide gap, which extends from an innate or constitutional disorder to an easily curable condition.

The group of cases here presented have a physiology or, at any rate, a physiologic psychology which, once understood, opens the doors to a rapid cure. But unless their mechanism of disability is understood the patients may be markedly incapacitated and wander from physician to physician vainly seeking help. In other words, a superficial pathologic condition blocks the normal conduct reactions of the individual as thoroughly as the deeper lying disorder in those cases in which hysteria is really a psychosis demoralizes the individual.

The first cases of this group make up a sample wherein there is disturbance in the flow of muscular power which constitutes the so-called hysterical paralysis. Something occurs, either accident, injury or disturbing emotional state, by which a part becomes immobilized for a time. In its genesis the paralysis represents what I here call the hysterical amnesia for the proper interaction of muscles to produce motion. More simply, there is a sort of forgetting of the mechanism of successful motion and a substituted disorder, which produces paralysis.

REPORT OF CASES

CASE 1—K. W., a man, aged 22, single, a salesman, whose early history was entirely negative for neurotic or hysterical manifestations, was playing football eight weeks before being seen and was knocked unconscious for one and one-half hours and was hazy the next day. In the hospital to which he was taken, it was stated that there was a fracture of the first lumbar vertebra. He stated that both legs felt paralyzed and anesthetic at first. The anesthesia of both legs remained for some time, then that of the left entirely disappeared and the right improved but had remained more or less anesthetic ever since. He was unable to use the right leg although the left leg had entirely recovered. The right leg was "numb" as well.

Physical examination was entirely negative except for the right leg. The knee jerks on both sides were lively and equal. Ankle jerks were lively and equal. There was no Babinski reflex. There was almost complete anesthesia below the right knee. The anesthesia ran circularwise around the leg in typical hysterical fashion. As he attempted to lift the leg, the muscles on both sides of the thigh contracted violently, that is the quadriceps contracted vigorously as did the flexors. The toes were moved but slightly. The wrong flow of power was distinctly evident, that is to say when the attempt was made to

raise the leg from the table, the agonist and antagonist were contracted. This set up a deadlock between the two groups of muscles and, naturally, motion became impossible.

The immediate psychogenesis of the situation seems simple enough. There was undoubtedly some cord injury at first, which set up a numbness of the legs and weakness. This disappeared but left behind it a state of fear and one of amnesia for the proper use of the muscles of the legs. This condition was explained to the patient. He was told that he would be able to walk when he left the office. A powerful electric current was given to the muscles of the front of the leg. They contracted vigorously. This continued for a few minutes. The patient was told to watch the muscles contract, and it was stated to him that he must try to help the electric current and contract the muscles with each stimulation. In a short time the current was discontinued surreptitiously, and the patient continued to move his leg with no electrical stimulation. Shortly thereafter he was able to move his leg perfectly well and walked out of the office with no drag whatever to his leg.

CASE 2—K. B., a housewife, aged 44, was one of a group of patients in whom "medicolegal trauma" operated as the initiation of a hysteria. The usual claim that in a case in which litigation is proceeding a cure cannot be effected while the litigation is going on is upset by this case. Three years before, the patient was in an accident and suffered severe injury to the leg, especially around the patella. The leg was painful and stiff, there was an injury to the cartilage. A year afterward a cartilage was removed from the left knee. Since that time the leg had been held rigid and there had been no power of extension or flexion at the knee. She had walked about, dragging this leg. The question of operation had now come up, since the situation had not improved, despite physical therapy of an extensive and persistent type. At the time of the accident the patient injured the left arm, but this member had almost completely recovered, although there was some numbness and tingling. The patient struck her head at the time of the accident and had headaches and dizziness even at the time of examination. However, the main complaint concerned the left leg.

The patient walked without extending or flexing the left knee, and there was little motion at the left hip. However, there was very little atrophy of the left thigh. Both knee jerks were equal, although the left required reinforcement for its appearance. When reinforcement was used, it was equal to that of the right side. When the leg was held up and the thigh supported, the knee dropped. However it was noticed that when this happened the hamstrings contracted and assisted gravity in pulling the leg down. There was absolutely no power to extend the leg voluntarily at the knee. There was some power to extend the leg at the hip, that is when the entire leg was supported and the patient was urged to do so, she could flex the thigh on the abdomen. There was no general loss of sensation, although there was an absence of tickle reaction on the sole of the left foot. Further examination showed that, when the effort was made to extend the leg, the hamstrings contracted while the quadriceps did not. On this basis, namely, that the antagonists were called into play rather than the agonists a diagnosis of hysteria was made and the patient was advised as to the situation, reassured that the condition was entirely curable, and the rather bold statement was made that she would not be allowed to go home until she used the left leg as well as the right.

The electric current was tried but had no value in this case. Although the muscles contracted vigorously with the galvanic

current and she experienced definite pain, she was still unable to use the leg voluntarily. Another technic, therefore, was used, based on the following observation. Ordinarily, when the leg is flexed at the hip on the abdomen, the quadriceps is thrown into associated activity in an involuntary but synergic fashion. Therefore, the patient was instructed to flex the hip vigorously. After a while she did this, and it was then noted that the quadriceps contracted and the leg, when the support of the physician's hand was removed, did not drop immediately or rapidly to the table. The patient's attention was called to this, and she saw for the first time that there was power in the quadriceps of the leg. The flexion of the hip was repeated fifteen or twenty times, after which the quadriceps was contracting vigorously. She was then able to hold the leg off the table. With the continuance of this exercise, the patient's will obtained control of the quadriceps muscle and in half an hour after the treatment was commenced she was using the leg as well as ever and performed all the motions without the flow of the effort into the hamstrings but properly into the muscles normally utilized for the motion.

It is noteworthy that when the power first returned to the quadriceps there was a marked coarse tremor of that muscle. This disappeared, and the patient has remained well since.

CASE 3—A youth, aged 16 years, a strong and powerfully built boy, twisted his back, Sept 19 1934, while playing football. He had pain at this time but felt well continuing to play football until September 25, when he had severe pain in the front of the body near the pelvis and running up the abdomen. He quit playing football. The pain was so severe that he took to bed and had remained there ever since. At first he had a temperature of 101 F, with rigidity of the abdominal muscles. The bowels were constipated. The temperature dropped in a day or two, and a roentgenogram at the hospital showed a separation of the symphysis. Since that time he had been in bed except to go to the bathroom, and this he did with much assistance and much dragging and scuffling of the feet.

He was examined by a surgeon, who found no orthopedic abnormality and who referred him for neurologic study. He was a large boy and was supported by others when he walked. He dragged both legs. There was very slight flexion of the thigh on the hip, slight extension of the leg on the thigh, and foot drop on both sides. The cranial nerves and the arms were entirely intact. Thorough examination of the legs revealed no organic neurologic signs. When he attempted to move the legs, the muscles were thrown into a coarse tremor. The muscular exertion seemed powerful, but it was obvious that the agonist and the antagonist were being contracted at the same time. There were no sensory disturbances of any type.

It was explained to him that his entire condition was due to fear that he would be able to walk if he put himself into a calm frame of mind regarding his condition, and that the separation of the symphysis, of which he had been informed was of no practical consequence. Rapid passive motions were made, and he was asked to cooperate as best he could. After a dozen or more such passive motions had been made the leg was suddenly released, and it was found that he was using his leg with force and precision. From motions while on his back, instruction was continued while the patient was on his feet. There was a remarkably quick transition from helplessness to perfect control of motions of the legs, so that he walked out of the office without any difficulty whatever.

In this particular case the mechanism seems to have been first pain, then fear, and as a resultant of the psychologic situation a physiologically wrong innervation of the muscles of the legs. The correction was a simple matter of encouragement, instruction and some trickery (I have labeled this trickery "legitimate hocus-pocus").

CASE 4—A housewife, aged 35, also demonstrates that traumatic hysteria may be genuine and that the patient suffering from such a condition may make an honest effort to get well. The patient was seen Dec. 5, 1934. A year before she was in an automobile accident. The car in which she was riding tipped over and all the passengers fell out in a heap. She was not rendered unconscious but was shaken, bruised and cut. She was out of bed in two days but noticed that the right arm commenced to shake. This continued, grew worse, and reached the stage at which she could not use the hand for writing or

for any of the ordinary purposes, so that she has been compelled to do most of her work with the left hand. Shortly afterward it was noticed that there was side-to-side, rotatory shaking of the head. There was no pain. Her sleep was poor, she tired easily. At times she became generally shaky.

She was sturdy and well developed. There was at times a rotatory lateral tremor of the neck and head. This often disappeared but generally was quite conspicuous. The right arm, when extended, showed marked tremor, and this was quite extreme in the finger-to-nose test. The left arm showed a very slight tremor. Reflexes of the arms were equal and active. There was no apparent tremor of the right leg. Motions of the legs were intact. Reflexes of the legs were somewhat hyperactive and equal. There were no pathologic toe signs. There was a very marked midline right-sided diminution of sensation throughout, including the face, palate, right eye, right nostril, mucous membrane of the mouth and the right side of the chest and abdomen, including one half of the vagina and the entire right leg. The abdominal reflexes were normal. The visual field that concerned the right eye was diminished throughout, that which concerned the left eye was normal. It was also noted that the tremor of the arm depended on the overuse of the muscles concerned with motion. Any one can create a tremor of his arm who will overcontract the muscles of action, especially if he contracts the antagonists at the same time. There was some doubt as to whether this was not a case of multiple sclerosis, but the general alignment of symptoms and signs finally indicated that it was hysteria.

The treatment here was first to change the anesthesia of the right side into normality by the use of the strong galvanic current, after the use of this current on a few occasions, the anesthesia disappeared. With relaxation exercises, together with the judicious use of stramonium, the tremor disappeared, and six months later there was only a slight amount present.

There is no satisfactory explanation of the fact that half of the body disappears from consciousness so far as skin sensation is concerned. There is, of course, a numbness of the hands or any part of the body experienced under violent emotion and it may safely be said that in the mechanism of emotional injury is the superficial explanation of hysterical anesthesia. The electric current was used merely to "recall" the part into consciousness. This it succeeded in doing. The tremor was obviously due to the wrong use of muscles. When this was corrected, the tremor disappeared.

The next two cases concern situations that were so deeply rooted in the entire attitude of the patients that any ordinary approach, as involved in suggestion, explanation or the use of electric currents, was unavailing. Consequently, a more radical attack was instituted.

CASE 5—G K, a young man working as a laborer, felt a sharp pain in his back while doing some heavy work lifting. It happened that he was working for himself and, consequently, there was no medicolegal situation involved and therefore no "compensation neurosis." However, the pain increased to the point at which he became entirely incapacitated, and his back assumed a marked flexed position and the body was rotated somewhat to the left. He was in one of the important hospitals of Boston for about six weeks. Roentgenologic studies were instituted with the result that nothing organic was found, after which interest in him lapsed. A few efforts were made psychotherapeutically to encourage him to get up, with no results of importance. He was taken home and had been in bed some three months entirely helpless when he was seen.

He was a stalwart young man and lay in bed, more or less curled up, the legs flexed on the abdomen, the back held rigid by contracture of the long muscles, which stood out like whipcords and which could not be relaxed by persuasion, pleading or suggestion. It was then explained to him that he was holding his back rigid more through pain and fear than through any organic situation. It was suggested that he take some ether, he was told that the muscles would be relaxed under ether, that when he 'came to' he would be walking without trouble and without pain. His wife was instructed to assure

him that this would be the result until the therapeutic anesthesia was to be given the next day. At the time appointed he was anesthetized to the state just beyond primary ether. The muscles were entirely relaxed, the back became entirely straight. An assistant put him on his feet and held him in an erect position. He was then marched to and fro by the assistant and the patient's wife. At the same time I spoke to him encouragingly, telling him that the pain was gone and that he was able to walk. As the ether wore off and consciousness returned, he found himself walking to and fro in an erect posture. As consciousness became clear, he discovered to his surprise that his back was free and flexible and that he was able to bend and to walk in a normal fashion.

The patient was seen three years later. At this time he had pain in his back as a result of his work. This pain was declared by a competent orthopedic surgeon to be due to a sacro iliac condition, for which he continued to have treatment for a long time. There was, however, no distortion of the back and no hysteria at this time.

CASE 6—W H, a man, aged 43, single, of high scholastic attainments and a professor in a great university presented perhaps the most interesting case of this series. The personality of this man is one that markedly deviates from the ordinary. He had a boyhood and youth of extreme struggle and great devotion to learning, a devotion that led through the garret type of existence to a chair in a university. He is a solitary man, entirely celibate, but undoubtedly his inner life is not so placid as his actions would lead one to believe.

About fifteen years ago he had a neurosis which was associated with difficulty in swallowing. This difficulty never reached an extreme grade and after an extended rest he recovered, at least outwardly. His career continued and from time to time he had slight recurrences, which ran the following general course. There was first a loss of appetite with general anxiety, sleeplessness and fatigue. There developed fear of choking which, to some extent, was traceable to his excursions into psychiatric literature, then there appeared an inability to pass the food beyond the mouth and finally the disappearance of the ability to swallow solid food and a marked difficulty in the swallowing of liquids.

When he was seen, July 10, 1931 he had already been sick some six weeks. The attack was the worst he ever had. He had lost weight although the anxiety had disappeared and he was sleeping fairly well, but the difficulty in swallowing had become quite central in the symptomatology and had reached the point at which a crisis had developed. "In swallowing he puts the food in his mouth, the tongue then gets in the way, he puts his head forward gulps strains, chokes and in a considerable period of time manages to swallow part of a mouthful. By dint of considerable application and concentration he manages to do away with two or three glasses of milk a day at the expense of a large part of his time."

He was unable to receive treatment from the neurologist who cured him in his first major neurosis. He visited a psychoanalyst, who told him that it would take a long time to be psychoanalyzed and consequently he had better seek some other type of treatment because of the nutritional emergency. He was sent to a hospital. An effort was made to increase his appetite by bitter tonics and by exercise, but no real or substantial change took place. It was then decided that if the fear of swallowing could be displaced for a short time so that automatic swallowing could take place he would recover.

The only approach to this end seemed to be through anesthesia. There were two treatments given. Prior to the first he was informed that on the following day he would be given anesthesia in a mild form, that when he recovered consciousness, he would be able to swallow liquids without any trouble whatever. The next day he was given nitrous oxide. As he became unconscious, a glass of milk was put to his mouth. As he started to recover consciousness he was instructed in peremptory fashion to drink. He did this, drinking quite freely and by the time he recovered complete consciousness he found himself drinking with freedom and without any difficulty whatever. He continued to drink without any trouble thereafter. Three days later the experiment was repeated except that he was assured that he would find himself eating solid food. By this time he was quite prepared to believe that this

would be the case. When the mask was removed, a sandwich was handed to him. He was enjoined to eat it and the meal was finished by the adjournment of the physician, the assistant and the patient to a restaurant where all three had a hearty meal, the patient eating with as much dexterity as the others.

In the four years that has elapsed the man has continued to be well. There has been no recurrence of the difficulty. Whatever deep and dynamic complexes are at work in his subconsciousness, they have not interfered with his success, and whatever role they may have played in the difficulty of eating and drinking has also disappeared back into the unconscious.

Superficial as the treatment may have been, results were excellent. Moreover, this man is not the type who would yield himself to a psychoanalysis or any other intimate form of self revelation. His whole instinct is to hide his intimate feelings from the scrutiny of others. His solitariness is, in large measure, conditioned by this phase of his psychologic make-up. He continues to be a valuable member of society despite his shut-in personality. Probably it is better for scholarship and culture that he continues to manifest this peculiarity, since his singular excellence is probably dependent on his escape from the distractions of society.

COMMENT

These cases are undoubtedly of the kind that make up the roster of miracles, by which healers, saints and shrines build up their reputation. They are here recorded to show that the pathologic condition disappears when the symptoms are explained physiologically and the therapeutics is rationally directed.

Boston State Hospital, Dorchester

THE HEMOLYTOPOIETIC EQUILIBRIUM AND EMERGENCY SPLENECTOMY

CHARLES A. DOAN, M.D.

GEORGE M. CURTIS, M.D.

AND

B. K. WISEMAN, M.D.

COLUMBUS, OHIO

Despite the mystery that has surrounded the spleen in the past, and the ignorance that still persists with reference to the exact nature and variety of its physiologic functions, two important activities are now definitely established as centering in this organ: one, the reservoir capacity for red and white blood cells,¹ the other, the phagocytic, destructive activity of the reticulo-endothelial elements, the clasmotocytes of the splenic pulp, for old or injured erythrocytes,² granulocytes,³ and blood platelets.⁴ Under physiologic conditions

From the Research Service, University Hospital and the Department of Medical and Surgical Research, Ohio State University.

Read before the Section on Surgery, General and Abdominal at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.

Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the authors' reprints. A copy of the latter will be sent by the authors on receipt of a stamped addressed envelope.

1 (a) Barcroft, Joseph and Barcroft, H. Observations on the Taking up of Carbon Monoxide by the Hemoglobin in the Spleen. *J. Physiol.* 58: 138 (Dec.) 1923. (b) Barcroft, Joseph, Murry, C. D., Orshovatz, D., Sands, J., and Weiss, R. J. The Influence of the Spleen in Carbon Monoxide Poisoning. *J. Physiol.* 60: 79 (May) 1925. (c) Barcroft, Joseph. Recent Knowledge of the Spleen. *Lancet* 1: 319 (Feb. 14) 1925. (d) Barcroft, Joseph and Stephens, J. G. Observations upon the Size of the Spleen. *J. Physiol.* 64: 1 (Oct.) 1927. (e) Barcroft, Joseph and Nisimaru, Y. Cause of Rhythmic Contraction of the Spleen. *J. Physiol.* 74: 299 (March) 1932. (f) Doan, C. A., Zerfas, L. G., Warren, Sylvia and Ames, Olivia. A Study of the Mechanism of Nucleinate Induced Leukopenia and Leukocytic States with Special Reference to the Relative Roles of Liver, Spleen and Bone Marrow. *J. Exper. Med.* 47: 403 (March) 1928.

2 Doan, C. A. The Type of Phagocytic Cell and Its Relative Proportions in Human Bone Marrow and Spleen. *J. Exper. Med.* 43: 289 (March) 1926.

3 Bedson, S. P. and Johnston, M. E. Further Observations on Platelet Genesis. *J. Path. & Bact.* 28: 101 (Jan.) 1925. Bedson, S. P. The Role of the Reticulo-Endothelial System in Regulation of the Number of Platelets in the Circulation. *Brit. J. Exper. Path.* 7: 317 (Oct.) 1926. Altrutz, L. F., Nortell, J. L. and Piette, L. C. Thrombopenic Purpura. *Arch. Path. & Lab. Med.* 1: 356 (March) 1926.

there is maintained in health a nice balance between bone marrow hematopoiesis and these splenic functions of cell storage and cell death. To express succinctly this reciprocal relationship between the organs subserving these antithetical functions, Krumbhaar⁴ proposed in 1923 the term "hemolytopoietic equilibrium."

It has been the experience in medicine that, whenever any physiologic function is recognized for any organ, a disease entity due to a corresponding pathologic dys-

of spontaneous or of precipitated origin, and irrespective of the severity of the anemia that may develop.

During the past five years our clinical investigation of diseases involving the spleen has resulted in advising and in consummating splenectomy in thirty-one cases. In each instance careful and thorough laboratory studies were made the basis for differential diagnosis and for an attempted appraisal of the hemolytopoietic equilibrium, preliminary to, during, and subsequent to removal of the spleen. Seventeen of the cases represented a variety of syndromes—thrombopenic purpura, Banti's disease, hypoplastic anemia, leukanemia (persistent extreme splenomegaly after two and one half years of medical treatment), chronic myeloid and lymphoid leukemia (with intestinal obstruction from splenic tumor), and polycythemia vera (with cirrhosis and repeated hemorrhages from esophageal varices). The details of these cases will be presented elsewhere. The indications for removal of the spleen in each individual in this group we believe to have been valid, but in some instances, as parenthetically suggested, the cure of the principal underlying disease was not the basis for operating. The operative mortality in this group was five, three of the fatalities being far advanced cases of Banti's syndrome, two patients with early Banti's disease survived splenectomy and have been greatly benefited by the procedure up to the present writing. The technical difficulties of splenectomy in advanced Banti's disease suggest reliance on ligation of the splenic artery as the procedure of choice if operative intervention is necessary.

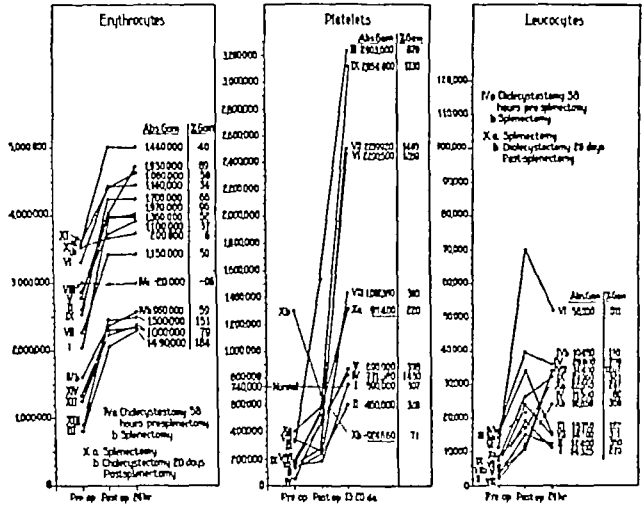


Chart 1—Postsplenectomy cellular reactions in fourteen cases of congenital hemolytic jaundice.

function may be anticipated and sooner or later will be encountered. Specific clinical entities each involving a disturbance in one or more of the functions just mentioned for the spleen are known. In congenital hemolytic jaundice we recognize a simple dominant familial tendency for the erythroclastic functions of the spleen to become overemphasized to the point of clinical signs and symptoms. In certain types of purpura the thrombopenia may be of splenic origin. The leukopenia of Banti's and of Felty's syndromes is associated with splenomegaly. In each of these several pathologic states the surgical removal of the spleen in the more chronic stages of activity has resulted in clinical improvement coincident with the correction of the specific cytologic deficiencies involved.

Experience with splenectomy in the past, however, has led to the almost universal dictum that operative intervention is distinctly contraindicated in the presence of an acute splenic crisis⁵. It is our belief, on the contrary, that if the pathologic physiology of the spleen is adequately understood, and its relationship to the hemolytopoietic equilibrium recognized, splenectomy—emergency splenectomy if you please—is not only indicated in the more acute exacerbations but demanded as a life saving measure, whether the hemoclastic crisis is

Fourteen splenectomies were performed with no operative deaths in patients with a readily established diagnosis of congenital hemolytic jaundice. In this second group, removal of the spleen was accomplished in four patients during a quiescent interlude of the disease as a prophylactic procedure, in five patients, operative intervention was decided on during a subacute

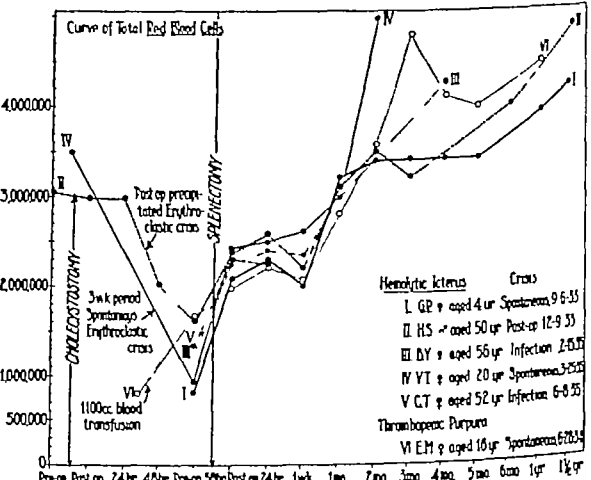


Chart 2—Acute splenoclastic crises showing dramatic recovery following emergency splenectomy

4 Krumbhaar E B The Hemolytopoietic System in the Primary Anemias with a Further Note on the Value of Splenectomy Am J M Sc 166 329 (Sept) 1923
5 Mayo W J Splenectomy in Splenic Anemia and Banti's Disease J A M A 77:34 (July 2) 1921 Whipple A O Splenectomy as a Therapeutic Measure in Thrombopenic Purpura Haemorrhagica Surg Gynec & Obst 42:329 (March) 1926 Spence A W The Results of Splenectomy for Purpura Haemorrhagica Brit J Surg 15:466 (Jan) 1928 Giffin H Z Splenectomy Surg Gynec & Obst 45:577 (Nov) 1927 Walton A J The Indications for and Results of Removal of the Spleen Ann Surg 98:379 (Sept) 1933 Homans John Textbook of Surgery Springfield Ill Charles C Thomas 1931 p 905 Stevens A A Practice of Medicine ed 3 Philadelphia W B Saunders Company 1933 p 871 Krumbhaar E B in Cecil's Practice of Medicine ed 3 W B Saunders Company 1934 p 1287 Lucas W P and Fleischer E C in Abt's Pediatrics W B Saunders Company 4 525 1924 Pool E N and Stillman R C Nelson Loose Leaf Surgery New York 5:378 1928

exacerbation of the hemolytic process, and in five critically ill patients the spleen was removed as an emergency procedure with the total red count rapidly approaching or actually under 1,000,000 cells per cubic millimeter in a fulminant, acute, hemoclastic crisis. While the evidence on which our decision to advise operation during the acute stage of an erythroclastic crisis was obtained from a careful study of the changes induced immediately following splenectomy in the more

chronic phases of the disease⁶ (chart 1), we shall limit this discussion to the results of emergency splenectomy the more sharply to emphasize the spectacular hematologic and clinical recoveries (chart 2) that at times follow speedily on the removal of this organ, and at the same time to point out the grave dangers to life which exist when the spleen begins to exert an excessive destructive action on any of the circulating elements of the blood and/or an undue inhibitory effect on bone marrow hematopoiesis.

Much discussion continues to center about the relative roles of spleen and bone marrow in certain hemato-cytopenic states. In those deficiency states of the blood entirely unrelated to the spleen, the removal of this organ is not only useless but definitely contraindicated. The most meticulous differentiation of underlying mechanism in each case must therefore precede the outlining of any rationale of therapy. Our emergency splenectomies, i. e., those performed with the total red count near the 1,000,000 level, have been limited to patients with congenital hemolytic jaundice, to selected instances of thrombopenic purpura, and to certain cases of hypoplastic anemia. In the first condition we believe that the spleen is the primary seat of the pathologic condition, in the latter two, the splenic influence may represent an important factor in the existing cellular disequilibrium.

HEMOLYTIC JAUNDICE

The sensitiveness and lability of the "zonal" cellular variations from moment to moment, as revealed in carefully controlled, frequently repeated, counts of the peripheral blood elements, were established some years ago⁸ and have been repeatedly confirmed. As a consequence, in our first studies of clinical cases of chronic congenital hemolytic jaundice⁶ daily estimations of the various cell levels were made for periods of three months or longer to establish thoroughly the range of fluctuation existing before operative intervention was undertaken. Then on the day of operation blood studies were made at fifteen minute to half hourly intervals throughout the day, with the astonishing discovery that instead of the erythrocyte increase, as described in the literature, coming in from one to three months following the removal of the spleen, a major increase, frequently of 1,000,000 or more red blood cells per cubic millimeter, occurred immediately—before the patient left the operating table, irrespective of the preoperative level of the total red cells. This phenomenon was observed not occasionally or sporadically but regularly, whenever sufficient hematologic studies were made (chart 1). Hemoglobin, hematocrit, leukocytes and thrombocytes likewise rose promptly in sufficient magnitude, coincident with a dramatic clinical improvement, to suggest strongly an absolute increase in available circulating elements rather than a concentration phenomenon of the plasma only. A progressive decrease in icterus index and reticulocytes, which always follows removal of the spleen in hemolytic jaundice, reflected the elimination or subsidence of the hemolytic process. Moreover, the gradual return of the red cells to a more nearly normal diameter and volume and the increase

to a more nearly normal range of their resistance to hypotonic saline solution seemed to be evidence of the increased efficiency of the bone marrow in the absence of splenic influence. In short, the data obtained suggested that the epinephrine stimulated and manipulatively induced disgorgement of the sequestered blood cells from the splenic reservoir incident to operation, and the sudden elimination of the destructive activity of the splenic phagocytes renders more effective the unusually active erythrocyte delivery and erythropoiesis that characterize the bone marrow in hemolytic anemia. Subsequent blood volume studies have established beyond question the validity of these first assumptions.

The gradual accumulation of such facts as have been cited formed the background for a growing conviction that, given proper medical judgment and adequate surgical management, the patient in acute erythroclastic crisis should respond even more dramatically and promptly to the surgical removal of the spleen than those patients seen in the subacute and chronic phases. The first test of this hypothesis came in a little girl.

CASE 1 (chart 2)—G. P., a girl, aged 4 years, during the month of August 1933 became gradually less active, fatigued easily, grew pale, then slightly icteric, and when finally seen by her physician had only 869,000 red blood cells per cubic millimeter. Despite intensive liver therapy, at the end of ten days the red count was only 600,000, the jaundice had increased, the spleen had become palpable, the peripheral lymph nodes were shotlike, and, a high leukocyte count being recorded, the diagnosis of acute lymphatic leukemia was made. In consultation, however, on careful laboratory study, we found the apparent elevation of the leukocyte count to represent for the most part nucleated red blood cells with little qualitative or quantitative deviation of the leukocytic formula from the normal. Approximately 100 per cent of the red blood cells were found to be reticulated, and a macrocytosis rather than the usual microcytosis existed in this child. The mother and the maternal grandfather, who were examined at once, both showed the laboratory stigmas of congenital hemolytic jaundice. The child was moribund. It was decided to give a small transfusion, since the jaundice was slight, indicative of liver efficiency in handling satisfactorily the increased pigment, and the renal function was apparently good. Following 200 cc of the father's matched blood a temporary rise in the total red count to 900,000 occurred, however, within twelve hours the count again totaled only 660,000 and the hemoglobin 2 Gm per hundred cubic centimeters. A second transfusion of 200 cc. from the original donor raised the count to 1,190,000, but twelve hours later the erythrocyte count was 810,000, the jaundice had perceptibly deepened, the spleen had definitely increased in size, the temperature was 101.8 F, pulse 120, respirations 30, systolic blood pressure 75, diastolic unobtainable. It was perfectly obvious that more transfusions were contraindicated, liver therapy had already been given a ten day trial by the first attending physician. The only possible hope lay in splenectomy, if the child could survive the ordeal. The courageous parents accepted this decision after a full explanation of the facts, and an emergency operation was performed at midnight by Dr. Verne Dodd, surgeon-in-chief, at the University Hospital, under nitrous oxide-oxygen ether anesthesia. The spleen as removed weighed 212 Gm. Immediately prior to operation, at 11 p. m., the patient had a temperature of 101 F, pulse 112, blood pressure 98 systolic and 0 diastolic, total red cells 1,020,000, hemoglobin 37 Gm, reticulocytes 99 per cent, leukocytes 15,000. Immediately at the conclusion of the operation, at 1 a. m. the temperature was 101.6 F, pulse 132, blood pressure 106 systolic and 40 diastolic, total red cells 2,070,000, hemoglobin 60 Gm, leukocytes 34,000 with no immature myelocytes present, reticulocytes 89 per cent, erythrocyte fragility 0.707-0.412. Nine hours after the operation the reticulocytes had fallen to 68 per cent, at nineteen hours to 55 per cent and by the fourth day to 23 per cent thereafter showing a gradual but steady decrease to within the limits for normal by the thirty-eighth postoperative day. The blood platelets rose from a preoperative level of

6 Doan C. A. Wiseman B. K. and Erf L. A. Studies in Hemolytic Jaundice. *Ohio State M. J.* 30:493 (Aug.) 1934.
8 Sabin F. R., Cunningham R. S., Doan C. A. and Kindwall J. A. The Normal Rhythm of the White Blood Cells. *Bull. Johns Hopkins Hosp.* 37:14 (July) 1925. Doan C. A. and Zerfas L. G. The Rhythmic Range of the White Blood Cells in Human Pathological Leukopenic and Leukocytic States with a Study of Thirty-Two Bone Marrows. *J. Exper. Med.* 46:511 (Sept.) 1927. Doan C. A. The Neutropenic State. *J. A. M. A.* 99:194 (July 16) 1932. Short J. J. Diurnal Variations in the Concentration of Red Blood Cells and Hemoglobin. *J. Lab. & Clin. Med.* 20:708 (April) 1935.

the red blood cells, 688 microns, mean cell volume, 100 cubic microns, mean corpuscular hemoglobin, 32 micromicrograms, mean corpuscular hemoglobin concentration, 32 per cent, erythrocyte fragility, 0.582 to 0.300, corrected erythrocyte sedimentation, 0.6 mm per minute, icterus index, 882, white blood cells, 12,000, with 92 per cent neutrophilic leukocytes, 1 per cent basophils, 1 per cent small lymphocytes, 6 per cent monocytes, no immature forms, the blood was type AB. The urine was normal save for the high concentration of bile. The stools were of normal color and consistency and there was no occult blood. The direct van den Bergh test was immediately positive and the quantitative indirect test was 21 mg. The blood cholesterol was 197 mg, further confirming the relative quiescence of the hemolytic process. Wassermann and Kahn reactions were negative and remained consistently so. The electrocardiographic studies revealed no significant cardiac abnormality. On roentgen examination a small annular shadow about 1 cm in diameter, was discernible just to the right of the upper part of the third lumbar vertebra, the gallbladder was nonfilling.

During the next forty-eight hours the red count fell to 3,000,000, the hemoglobin to 11 Gm, the reticulocytes rose gradually to 14.2 per cent, and the icterus index decreased appreciably to 652, 555 and 428 and then started to rise again to 440.

The observations thus indicated an icterus of double origin, first an older fairly quiescent congenital hemolytic form, with splenomegaly, and, secondly, a recent acute, obstructive form, due to common duct stone. Since some 70 per cent of patients with hemolytic icterus are known to develop pigment calculi in the gallbladder, such an incident as described is easily explained and may be anticipated in these patients. The hemolytic factor in the beginning was negligible, but, as frequently happens, the trauma incident to the obstructive symptoms began to activate the hemolytic process. Two courses of management had therefore to be considered: (1) immediate splenectomy, to stop an impending erythroclastic crisis, or (2) a prior cholecystostomy, in the attempt to relieve the acute cholemia and prepare the way for a safer hemostasis in whatever major operative procedures might be required subsequently. The relatively good level of red cells and hemoglobin, with as yet little evidence of severe hemolysis determined our decision to follow the second course, hoping that the anticipated precipitation of an acute hemoclastic crisis might be delayed long enough to permit of a subsidence of the major part of the obstructive element in the jaundice.

On the night before, and again on the morning of operation the patient was prepared for laparotomy by the intravenous administration of 5 Gm of calcium chloride in 200 cc. of physiologic solution of sodium chloride and by a hypodermoclysis of 1500 cc of Ringer's solution containing 5 per cent dextrose.

Cholecystostomy was accomplished uneventfully under local anesthesia supplemented by nitrous oxide oxygen between 10 a m and noon December 7.

Prompt and rapid relief from the cholemia ensued. By the afternoon of the day of operation the icterus index had dropped to 250 the next morning it was 164, and forty eight hours after the operation it was 94. However, during the first thirty-six hours the erythrocytes decreased a million cells and the hemoglobin 3.7 Gm, while the reticulocytes rose coincidentally to 20 per cent. Frequently repeated observations confirmed the acuteness and the severity of the erythroclastic crisis, which had been threatened by the original spontaneous obstruction and which, by the manipulation and trauma incident to the operation, had become fully precipitated. The red cells continued to fall rapidly to reach a low of 1,610,000 by 9 p m. December 9, the hemoglobin fell to 3.9 Gm and the cholesterol to 130 mg, at which time the icterus index had ceased to fall and had begun to rise again from 94 to 125 within seven hours. A sharp change in the clinical picture occurred and it was apparent that a fatal outcome threatened unless adequate measures were promptly instituted. Transfusion was definitely contraindicated. From the experiences already cited it seemed evident that splenectomy was the only rational measure to employ to arrest this unusually severe though anticipated

hemolytic complication, and it was felt that we could reasonably count on the customary postsplenectomy autotransfusion in the convalescence, if the operative procedure itself was safely accomplished.

The patient was prepared immediately, therefore, for his second major operation within sixty hours with calcium, dextrose and fluids, as before. At 10 p m, December 9 just fifty-eight hours after the cholecystostomy, an emergency splenectomy was successfully performed under local and nitrous oxide-oxygen anesthesia. Epinephrine, 1 cc., was administered twenty minutes before the splenic pedicle was clamped to ensure maximum contraction of the organ. The spleen was removed through a left subcostal Kocher incision without undue difficulty or untoward incident. The blood pressure remained around 140 systolic, 50 diastolic, throughout the procedure and prompt postanesthetic recovery followed.

The spleen weighed 1,740 Gm and measured 22 by 15 by 9 cm. It was firm and contracted. The white opaque capsule was in some places as thick as 4 mm. The splenic parenchyma was dark red, cellular, somewhat friable and more fibrous than normal. Microscopically the pathognomonic picture of hemolytic icterus, including infrequent atrophic follicles, erythrocytic engorgement, prominent endothelial nuclei and clasmatoocytes, and empty sinuses, was confirmed.

Immediately on the removal of the spleen the unfavorable course of events of the preceding forty-eight hours was strikingly changed. The red cells immediately after operation jumped to 2,380,000 (a gain of approximately 800,000), with the hemoglobin 6.6 Gm (a gain of 2.7 Gm). The icterus index again showed a downward trend with a reading of 100. These results and the other clinical and laboratory data were doubly significant in that they not only reflected an actual, almost instantaneous, increased availability of important cellular elements essential to the vital functions of the body but at the same time revealed as a part of the mechanism of accomplishment of that end the abrupt termination of the fulminating hemolytic process which had so rapidly plunged the patient into extreme danger. The steady upward trend of the red cells and hemoglobin from this point, the prompt return of the reticulocyte percentage and icterus index to normal, and the leukocytic reaction may be followed in chart 4. At no time in the subsequent stormy convalescence (cholecystoduodenostomy and lung abscess) was the hemolytotoxic equilibrium again seriously disturbed, the bone marrow meeting all demands promptly and efficiently as they arose, without any evidence of decompensation or incapacity.

THROMBOPENIC PURPURA

The similarity and dramatic suddenness with which certain types of acute, fulminant thrombopenic purpura can be arrested by emergency splenectomy have led us to incorporate one such instance, which has come under our immediate care, in this communication. Our chief interest throughout these studies of the past decade, whether they have been animal experiments or human clinical problems, has been the further understanding of the pathologic physiology of the spleen. This organ has been amply demonstrated to contain within itself the potential sources for inhibition of marrow hematopoiesis or/and the sequestration and destruction of the circulating elements of the blood emanating from the marrow. The same fundamental considerations apply, therefore, whether the chief pathologic manifestation of such activities is reflected primarily in red cells, in the platelets or in the granulocytes.

While accepted as a procedure of some promise in the more chronic thrombopenic states, the question of the safety and rationale of splenectomy under the critical circumstances attending an acute thromboclastic crisis continues to be debated, even as in hemolytic jaundice. The consensus of the best surgical opinion at the moment seems to be against operation

except in those instances in which some degree of chronicity exists, or may, by medical means, be induced⁹

CASE 4 (charts 2 and 5)—E. M., a Negro girl, aged 17 years, was admitted to University Hospital as a transfer from another hospital, June 23, 1934, with the diagnosis of aplastic anemia with symptomatic purpura

The laboratory studies showed an anemia of 1,770,000 red blood cells, hemoglobin 4.9 Gm (Newcomer), color index 0.9, reticulocytes 57 per cent, erythroblasts 1,200, normoblasts 2,400 per cubic millimeter, mean erythrocyte diameter 8.6 microns with both anisocytosis and poikilocytosis extreme on direct examination but with no "sickling," immediate or delayed, erythrocyte fragility was markedly decreased, hemolysis starting at 0.319 and not complete until something less than 0.210 salt equivalent, icterus index 6, leukocytes 30,000, with 67 per cent actively motile, mature, neutrophilic granulocytes, 5 per cent myelocytes C and metamyelocytes, 1 per cent eosinophils, 18 per cent lymphocytes, 9 per cent monocytes, blood platelets 3,500, bleeding time twenty-three minutes, coagulation time (Howell) eleven minutes, calcium time twelve minutes, prothrombin time twelve minutes, no clot retraction in twenty-four hours, tourniquet test (50 mm of mercury) showed innumerable petechiae after ten minutes. The Wassermann and Kahn tests were negative, carbon dioxide combining power 36 blood group O. Blood cultures were negative. The daily temperature fluctuation ranged from 99 F to 104 F.

In spite of intensive medical treatment—intramuscular whole blood 50 cc. within the first twenty-four hours and 500 cc intravenously during the second day, electrical cauterization of the cervical canal with firm packing, oral hygiene, orange juice 1 pint three times a day, viosterol 10 minims (0.6 cc.) three times a day¹⁰ and a high fat-protein diet¹¹—the total red blood cell count fell rapidly until on the morning of the fourth day it was found to be only 725,000, hemoglobin 2.4 Gm, nucleated red cells 6,000, reticulocytes 30 per cent and leukocytes 25,000, with absolutely no blood platelets to be found (chart 5). The patient was comatose and moribund. An emergency transfusion of 700 cc of blood at 11 a. m. raised the red count to 1,230,000, another of 400 cc was given at 7 p. m. the same day. The blood count at 7.45 the next morning, June 28, showed erythrocytes 1,660,000, hemoglobin 4.9 Gm, leukocytes 10,800, blood platelets, 0. The clinical condition of the patient was the best it had been since admission, temperature 99.6 F, pulse 88, respiration rate 24, blood pressure 100 systolic, 58 diastolic. The mentality was clear, the patient was bright and responsive. It was decided thereupon to resort to surgery without further delay, a ligation of the splenic artery¹² to be attempted if splenectomy for any reason seemed inadvisable.

Under local procaine hydrochloride and nitrous oxide oxygen anesthesia a spleen weighing 225 Gm was removed without difficulty and with a minimum loss of blood. At the conclusion of the operation the pulse was 96, respiration rate 24, blood pressure 140 systolic, 90 diastolic, red blood cells 1,990,000, reticulocytes 15 per cent, hemoglobin 5.9 Gm, leukocytes 14,800, blood platelets 21,900. The maximum leukocyte count of 52,000 with 85 per cent active mature neutrophils was reached twenty-four hours after operation, the red cells at that time being 2,230,000, hemoglobin 6.2 Gm and blood platelets 89,000, with all bleeding stopped.

The blood platelets, showing a marked variation qualitatively in individual size, increased steadily in number on every count after operation until a total of 395,000 was reached on the fourth postoperative day, following which there was a gradual fall during the next eight days without symptoms or signs. A spontaneous recovery carried the total to 748,000 by the twenty-second postoperative day. The condition of the mouth cleared

promptly with the cessation of the hemorrhages, the offending molar was extracted on the fifteenth postoperative day, and the teeth and gingivae were given much needed attention. The red cells never again fell below 2,000,000, the reticulocytes promptly decreased, and both hemoglobin and cell count rose gradually until on the twentieth day 3,400,000 erythrocytes were recorded. The bleeding time became normal, clot retraction occurred promptly and the tourniquet test was negative for petechiae after ten minutes at 50 mm pressure of mercury. The temperature and pulse returned to within normal limits by the ninth day and the patient was discharged from the hospital on the twenty-second postoperative day.

The patient has maintained an entirely normal existence for the past year, with the platelet count maintained at or above a million units per cubic millimeter consistently (chart 5).

CONTROL OBSERVATIONS

The influence of any major surgical procedure and of anesthesia on the cellular equilibrium of the blood and on the blood producing and blood regulating mechanisms of the body must be known before any specificity may be attributed to the changes noted following splenectomy. In chart 1 it will be noted that in two of the patients with hemolytic jaundice other major operative procedures were carried out.

In chart 4 the influence of cholecystostomy before and of cholecystoduodenostomy after splenectomy may be compared in the same individual. Only following splenectomy were the spectacular recovery changes in the hemolytopoietic equilibrium apparent, a precipitous hemoclastic crisis being stopped instantly with removal of the spleen, just fifty-eight hours after a major operative procedure in the opposite abdominal quadrant.

Chart 6 carries the cytologic changes in fourteen cases in which operation was done for a variety of conditions, and illustrates the lack of uniformity in the degree and the direction of the reactions.

It would seem fair to conclude that the removal of the spleen removes certain inhibitory and destructive influences which ordinarily affect all the circulating units, including the lymphocytes, which, after a latent period of some two weeks, definitely seek a new and higher level in the circulation. The surgical removal of other body structures does not seem to influence the cellular equilibriums of the blood to the same extent.

A million gain the first twenty-four hours, with the consolidation of the gain during the first week, the second million gain by the end of the first month, and, following that, a more or less rapid ascent to an absolutely normal erythrocyte level is the story depicted in chart 2 for the six individuals who have undergone emergency splenectomy as described.

ETIOLOGIC CONSIDERATIONS

Our studies of the past five years have led us to incriminate the spleen as the major pathologic agent in hemolytic jaundice for the following reasons: 1 Qualitative changes in the erythrocytes—microcytosis, increased reticulocytosis and increased fragility—are not necessarily present in every clinical case, even with acute symptoms. 2 Anemia, when present, is always accompanied by acholuric jaundice or other evidence of excessive hemolysis. 3 The more severe the anemia the greater the bone marrow activity, as measured either by reticulocytosis (usually the higher the reticulocytes the more severe the hemolysis) or by direct observations of erythroblastic hyperplasia of the bone marrow. 4 Splenomegaly, and the number and activity of the splenic phagocytes, fluctuates directly with the severity of the anemia and the icterus. 5 The splenic artery, in several instances of sampling just prior to

9 Whipple & Spence.

10 Phillips R. A. Robertson D. F. Corson W. C. and Irwin G. F. Effect of Irradiated Ergosterol on Thrombocytes and Coagulation of Blood. *Ann. Int. Med.* 4: 1134 (March) 1931.

11 Kugelmass I. N. Clinical Control of Chronic Hemorrhagic States in Childhood. *J. A. M. A.* 102: 204 (Jan. 20) 287 (Jan. 27) 1934.

12 von Stubenrauch L. Die Ligation der Arteria lienalis. *Deutsche Ztschr. f. Chir.* 172: 374 1922. Rossi C. Effetti della legatura dei vasi splenici sulla struttura e funzione della milza. *Ann. ital. di chir.* 6: 127 (Feb. 28) 1927. Payr E. Ueber die Drosselung der Milzarterie mit Fäscie. *Arch. f. klin. Chir.* 167: 512 1931.

ligation, contained more cellular elements than the splenic vein. 6 The epinephrine test reveals an excessive cellular sequestration capacity of the spleen in congenital jaundice. The data accumulated following splenectomy further support this thesis in that 7 Hemoclastic crises, spontaneous or precipitated, may be terminated instantly by successful removal of the spleen and do not recur. 8 The total volume of circulating red blood cells becomes immediately increased, as much as 77 per cent of the original volume. 9 A normal erythrocyte equilibrium is reestablished and indefinitely maintained, with 10 Restoration of a relatively normal bone marrow—functionally and topographically—as reflected by the reduction to normal of the erythroblastic hyperplasia, the disappearance of the high peripheral reticulocytosis, the recovery from the myeloid hypoplasia with correction of the peripheral neutropenia, the elimination of the megacaryocytic hypoplasia or hypofunction with reversal of the peripheral thrombopenia and the maintenance of an elevated thrombocytosis, the return of the erythrocyte diameters (Price-Jones curves) more nearly to the established limits for normal, a decrease in the erythrocyte volume-thickness index (Haden), and the increase in erythrocyte resistance sometimes to an entirely normal range, and finally, 11 The clinical recovery is complete and permanent so far as the hemolytic tendency is concerned.

The facts that relate to the pathologic physiology of the spleen as inferred from this study may be applied in other instances to appraise the significance of the spleen in less clearly defined syndromes. The objective in all analyses of biologic problems should be an understanding of the underlying mechanisms involved, and all therapy should be directed toward a correction of, or, as in this instance, to the elimination of the dysfunctioning unit. Once the physiologic mechanism is understood and the technical facilities for testing its efficiency and adequacy are available, the physician may hope to place his therapy on a rational basis.

CONCLUSIONS

1 The pathologic physiology of the spleen may be manifest through either or both of two mechanisms (a) inhibitory, (b) destructive—and may affect any or all of the circulating blood elements.

2 The spleen is the major pathologic agent in congenital hemolytic jaundice.

3 Splenectomy is indicated as a prophylactic measure against clinical exacerbations of excessive hemolytic activity in the chronic and subacute manifestations of the disease.

4 Splenectomy is also the therapeutic procedure of choice in acute hemoclastic crises, whether the crisis is of spontaneous or of precipitated origin, and regardless of the severity of the anemia.

5 The immediacy of the erythrocyte response following splenectomy in hemolytic jaundice is dramatic occurring on the operating table. It is usually a million or more cells per cubic millimeter in quantity and represents a true increase in total available circulating units. This autotransfusion removes the necessity for preoperative and/or postoperative transfusions.

6 Splenectomy is not contraindicated in properly selected cases of thrombopenic purpura in acute crisis provided adequate preoperative blood transfusions are given. The immediacy of the beginning recovery and reappearance of blood platelets in the circulation fol-

lowing splenectomy in thrombopenic purpura may be quite as dramatic as the changes noted in hemolytic jaundice.

7 The responses recorded following splenectomy in this series are not the result of the operative or anesthetic influences per se, since the same studies in a series of miscellaneous operations performed under identical conditions did not yield similar results. More impressive still, three major operative procedures other than splenectomy were performed either before or after splenectomy in two patients with hemolytic jaundice, and the cellular responses were quite unlike.

We are indebted to Drs. Verne Dodd and Luke Zartman for the splenectomies in cases 1 and 2 and to Dr. Carl Moore, National Research Council Fellow in this department, for the blood volume studies, also to Drs. Lowell Erf and M. M. Hargraves, medical residents, and to Dr. Louis Barron, surgical resident in the Research Service, University Hospital, for assistance and cooperation in the care of certain of the patients in this series.

ABSTRACT OF DISCUSSION

DR IRVIN ABELL, Louisville, Ky. I was particularly impressed by the advocacy by the authors of immediate splenectomy in hemolytic and purpuric crises, a course diametrically opposite to that which heretofore has been thought the wisest to follow. In the light of their results the proposal merits one's earnest consideration. Advantage has been taken of the reservoir function of the spleen and the fact that it can be made to empty itself by the injection of epinephrine, to prevent the loss of its stored blood during splenectomy. After the incision has been made and the spleen exposed, an injection of epinephrine is given causing the organ to contract, forcing its contained blood into the general circulation and at the same time effecting a decrease in size and an increase in consistency that may facilitate its removal. Complete and repeated blood studies constitute the essential factor in deciding for or against operation and, in the event of the former, in determining the time of its performance.

DR G. M. CURTIS, Columbus, Ohio. During the last thirty-two months I have performed twenty-seven splenectomies for various blood diseases. The blood picture has been followed thoroughly previous to, immediately after and subsequent to removal of the spleen. The outstanding success has been in congenital hemolytic icterus. These patients have all survived. My outstanding failure has been in attempting splenectomy for late Banti's disease. Owing to extensive adhesions and unusual vascularity, this is a technically difficult and hazardous procedure. Occasionally in hemolytic icterus the enlarged spleen is adherent to the diaphragm. However, a useful cleavage plane may be found between the thickened capsule and the pulp. This is not possible in Banti's disease, since the sclerosis involves the connecting capsular trabeculae. It is the usual teaching that the acute hemoclastic crisis of congenital hemolytic icterus and the acute thromboclastic crisis of thrombocytopenic purpura contraindicate splenectomy. This is not my experience. I have made three splenectomies for the acute crisis occurring in congenital hemolytic icterus. My colleagues have made two more. I have made one splenectomy for the acute crisis of thrombocytopenic purpura. These six patients recovered, are all living and are well. The rationale of this departure from the common teaching followed a cooperative study with my colleagues Doan and Wiseman. Following our first splenectomies there ensued a definite and immediate postoperative rise of the red cells and of the hemoglobin. Dr. Doan has presented those data. This amounted essentially to an autotransfusion. The evidence became convincing that the spleen is primarily responsible for the increased blood destruction. Therefore when an acute crisis came it seemed logical to remove the spleen. From our previous studies we depended on a postoperative autotransfusion. In certain cases of failure after splenectomy for congenital hemolytic icterus or for thrombocytopenic purpura, we would advise searching for an accessory spleen. We find them in making these splenectomies. Therefore it is reasonable to assume that

when the symptoms recur they may be due to an accessory spleen. These results consider a further indication for splenectomy. They afford added hope in the control of severe hemoclastic crises and throw more light on the pathologic physiology of the spleen. This newer information should prove of value in evaluating the fundamental rule of the spleen in blood dyscrasias.

DR. B. K. WISEMAN, Columbus, Ohio. My feeling with regard to hemolytic icterus is that all these patients should be operated on as soon as the diagnosis is made. Many, probably most, of these patients show little of the external manifestations and not very much of the hematologic characteristics of their disease. Under such circumstances it is often the practice to defer splenectomy with the hope that possibly the operation will not be necessary. Because of the tendency of this disease to change from one of perhaps extreme chronicity to the acute phase with alarming and dangerous features on the advent of a primary infection, it often follows that operation must be then performed under most unfavorable conditions. In some circumstances this occurs in a remote region in which the underlying condition will not be recognized readily. Dr. Doan has shown that there is no doubt that emergency splenectomy can be done and is a life-saving measure (contrary to common belief) during an acute hemolytic crisis. Nevertheless the added factor of extensive hemolysis, together with in some cases the presence of the affliction that precipitated the crisis, adds a definite hazard to the chances of survival. Early operation in Banti's disease is also, I feel, very important. Of all the blood dyscrasias, Banti's disease is perhaps the most difficult to diagnose especially in the early phases. It therefore seems advisable at times to operate before a positive diagnosis can be made. Operated early, before cirrhosis of the liver is advanced, portal obstruction is evident or dense perisplenic adhesions are formed, it is attended by the usual low surgical mortality, and the maximal benefit accrues to the patient. Therefore it will often be necessary to operate on a well founded suspicion and not a clear cut diagnosis. With the possible exception of myeloid leukemia, there is no blood dyscrasia that we have found to be unfavorably affected by splenectomy.

DR. WILLIAM DAMESHEK, Boston. I was particularly interested in the marked almost immediate increase in red cell count following splenectomy mentioned by the authors. I wonder whether this might not be due to unavoidable handling of the spleen which takes place at time of operation. The normal spleen contains about 250 cc of blood. In congenital hemolytic jaundice the spleen becomes very much enlarged and the splenic sinusoids are dilated, therefore it must contain a much larger quantity of blood. The sudden increase in red cell count might conceivably be due to squeezing out into the general circulation of a fairly large volume of blood from the spleen. The list of reasons given in the article for implicating the spleen as the fundamental cause for congenital hemolytic jaundice is an imposing one, but several of them may be secondary to the fundamental bone marrow dysfunction stressed by several authors, particularly Naegeli and Haden. These investigators have shown that the bone marrow in this disease produces abnormally small thick (and thus more fragile) red cells susceptible of ready disruption and fragmentation. The spleen, together with the remainder of the reticulo endothelial system, becomes hyperplastic, probably as the result of the increased amount of activity demanded of that organ in breaking down an increased number of red cells. Some of the phenomena listed by the authors may thus be secondary to this hyperplasia of the reticulo endothelial system (and spleen) rather than primary manifestations. In purpura one should be very conservative regarding splenectomy, even though it cannot be denied that this procedure will result in great improvement. A number of our patients with splenectomy are beginning to bleed years later. Before finally deciding on this major operative procedure, one should always attempt to do everything possible in the way of conservative medical treatment, such as high vitamin, high protein diet, and roentgen therapy over the spleen.

DR. E. B. KRUMBHAR, Philadelphia. The spleen is undoubtedly the major offender in hemolytic jaundice, and this constitutes an excellent reason for taking it out. On the other hand, I think perhaps Drs. Doan, Curtis and Wiseman would

agree that the primary defect is in the red cells for the reasons that Dr. Dameshek gave. It may be that there is also a primary defect in the spleen, or it may be that the spleen acquires the role of chief offender from long practice in destroying these futile, congenitally poor red cells of hemolytic jaundice. Undoubtedly, when the spleen of hemolytic jaundice is taken out there is a substantial rise, often very quick, in the erythrocyte level, but I would call attention to the possibility at least (I think it is more than a possibility) that the spleen normally aids in red blood cell formation. Because a diseased spleen has been taken out, it must not be inferred that the role of the normal spleen is one of inhibition of red cell formation. I have been studying this for several years and still stand by the conclusion that the normal human spleen has a stimulating effect on the bone marrow in ways that are not yet apparent, perhaps associated with the metabolism of broken-down red cells and some of their products. At any rate, if a normal spleen is taken out, there will be a period of temporary depression of bone marrow activity with temporary anemia, which eventually will be compensated for just as most of the functions of the absent spleen will be compensated for by other parts of the reticulo-endothelial system.

DR. C. A. DOAN, Columbus, Ohio. I realize the departure from accepted facts that my observations imply, and the rightful skepticism aroused by certain of my conclusions, and were it not that I have observed multiple repetitions of the same phenomena over a period of five years, I should not feel justified in reopening some of the questions that have been raised. Banti's disease is admittedly difficult to influence favorably in its later stages, and in three instances in this series splenectomy was unsuccessful. In two early cases, however, the immediate and remote results have more than justified the operative intervention. I may not have made it sufficiently clear that in the patients with acute hemoclastic crises splenectomy was advised, at the beginning of this study, only in the face of failure of other less radical measures. Intensive liver therapy, adequate iron and repeated blood transfusions preceded operation in practically every instance without beneficial effect. More recently I have not risked delay in the face of a crisis. The idea is prevalent that removal of the spleen is incompatible with longevity. I well remember seeing the first patient ever operated on in this country for hemolytic jaundice, for twenty five years shown annually by Dr. Thayer before the senior clinics at the Johns Hopkins Hospital. The patient, an invalid during the first twenty-five years of his life, was completely rehabilitated after splenectomy and remained in excellent health for the succeeding quarter of a century. Four years ago Lord Dawson reported that a number of patients with congenital hemolytic jaundice, splenectomized prior to 1914, went through the war without physical limitations or handicap. The spleen is not essential to life, conversely, it may at times be exceedingly dangerous to existence. The mechanism of the prompt increase in the cellular level following splenectomy has been demonstrated adequately in the blood volume studies. Both an absolute increase in circulating units and some decrease in plasma volume contribute to the immediate phenomenon. An unusually active bone marrow thereafter maintains and supplements this initial gain and rapidly and effectively reestablishes the normal cellular balance in the absence of the pathogenic spleen. This interpretation, of course, introduces the controversial point as to the relative roles of bone marrow and spleen in hemolytic icterus. I have already presented my reasons for believing the spleen to be the chief offender in this disease. I would reemphasize the necessity for the closest possible cooperation between the hematologist and the surgeon in the diagnosis and therapeutic management of these cases. Only by the intelligent analysis of each patient as an individual and a full understanding of the mechanism of the disease process, as it is reflected in certain constantly changing signs and symptoms, may optimal clinical results be expected.

Blood Pressure—If a patient has diseased arteries a small rise of blood pressure may be very important from the point of view of possible cerebral hemorrhage.—Dr. Maurice Campbell, F.R.C.P., quoted by Fisher, *Aphorisms in Clinical Medicine* *Canad J Med & Surg* 77 166 (June) 1935.

THE CHOICE AND INTERPRETATION OF
TESTS OF RENAL EFFICIENCY

R H FREYBERG, MD

ANN ARBOR, MICH

The importance of measuring the functional ability of the kidneys in renal disease need not be emphasized. The value of a knowledge of renal efficiency as an aid in the diagnosis, prognosis and treatment of Bright's disease has been pointed out by Christian,¹ Van Slyke² and others. The existence of renal disease, which may be suggested by proteinuria or other changes, may often be proved only by demonstrating impairment of kidney function. Van Slyke and his collaborators² call attention to the fact that the degree of proteinuria, hematuria and hypertension is no indication of the severity of the renal lesion and is of little or no prognostic importance, but that the functional capacity of the kidneys is an accurate index of the gravity, course and prognosis of Bright's disease. Lashmet and Newburgh³ have pointed out that the degree of functional impairment governs the fluid needs of the nephritic patient, one of the most important therapeutic considerations.

It becomes of great concern, therefore, to know how best to measure renal efficiency. All the numerous methods proposed are based on one of three principles: (1) the ability of the kidneys to concentrate and dilute urine, (2) the effectiveness of the kidneys in eliminating introduced substances, such as phenol-sulphonphthalein, and (3) the success of the kidneys in excreting normal metabolic waste products, which can be studied by comparison of the urinary and blood values of the various waste products (so-called clearance tests) or by determining the concentration of these wastes in the blood.

During the past few years I have been occupied in determining the relative worth of various kidney function tests, based on these different principles.

METHODS

Whenever it was desired to determine renal efficiency, three procedures were employed, each based on a different one of the three principles. The concentrating ability of the kidneys was measured by the method described by Lashmet and Newburgh.⁴ The urea excreting ability was measured by the urea clearance test of Van Slyke because of the widespread usage of this test and its already demonstrated worth. The fifteen-minute phenolsulphonphthalein excretion test was used to measure the efficiency of dye elimination for the following reasons. It has been shown by Van Slyke⁵ and others that the total two-hour phenolsulphonphthalein excretion test measures impairment of kidney function only when extensive renal damage exists. Recently, Chapman and Halstead⁶ have pointed

out that the excretion of this dye during the first fifteen minutes after its injection is a much more sensitive test and, in their experience, comparable to the urea clearance as a measure of renal efficiency.

Because it has been clearly shown by a number of investigators that retention of catabolic waste products does not occur as a result of kidney damage, except when the renal injury is severe, blood nonprotein nitrogen and blood urea determinations were not made as a routine.

With these three procedures in each case, then, the Lashmet-Newburgh concentration test, the Van Slyke urea clearance, and the fifteen-minute phenolsulphonphthalein excretion, renal efficiency was measured 412 times in 254 different patients whose clinical diagnoses included hemorrhagic nephritis (with and without the "nephrotic syndrome"), arteriosclerotic Bright's disease, pyelitis, pyelonephritis, tuberculous kidney disease, polycystic kidney disease, renal amyloidosis, pregnancy, and other clinical conditions in which impairment of kidney function was suspected.

Technical Considerations—Specific gravity of the urine was determined by a carefully calibrated urin-

TABLE 1—Kidney Function During the Initial Stage of and Recovery from Hemorrhagic Nephritis

| Pa- tient | Date | Urine | | Concen- trating Ability Specific Gravity | Urea Clear- ance Per Cent | 15-Minute Phenol sulphon- phthalein per Cent | Comment |
|--------------|----------|---------|-------------|--|---------------------------------------|---|---------------|
| | | Protein | Blood | | | | |
| B B | 2/15/34 | + | Gross | 1.027 | 77 | 28 | Initial stage |
| B L | 8/20/34 | Trace | 0 | 1.026 | 109 | 31 | Initial stage |
| | 1/24/35 | 0 | 0 | 1.035 | 130 | 35 | Well |
| D S | 3/22/34 | ++++ | Gross | 1.013 | 13 | 3 | Initial stage |
| | 6/22/34 | + | Microscopic | 1.023 | 51 | 26 | Recovering |
| | 8/1/34 | 0 | Microscopic | 1.024 | 61 | 27 | Recovering |
| | 11/13/34 | 0 | Microscopic | 1.026 | 98 | 31 | Recovering |
| L S | 2/20/35 | + | Gross | 1.025 | 83 | 29 | Initial stage |
| | 7/7/35 | + | Microscopic | 1.025 | 93 | 30 | Recovering |
| E M | 6/26/34 | Trace | Microscopic | 1.023 | 93 | 18 | Latent stage |
| | 8/10/34 | 0 | Microscopic | 1.023 | 90 | 22 | Recovering |
| | 11/23/34 | 0 | 0 | 1.029 | 81 | 18 | Well |
| J J | 3/4/33 | +++ | 0 | 1.028 | 88 | | Recovering |
| G H | 7/20/34 | | | | 50 | 31 | Initial stage |
| | 8/4/34 | + | Microscopic | 1.025 | 71 | 30 | Recovering |
| | 11/10/34 | 0 | Microscopic | 1.028 | 79 | 24 | Recovering |
| | 4/14/35 | 0 | Microscopic | 1.031 | 94 | | Recovering |

out that the excretion of this dye during the first fifteen minutes after its injection is a much more sensitive test and, in their experience, comparable to the urea clearance as a measure of renal efficiency.

ometer during the early part of this study and later by a special Westphal balance. Since only the non-protein specific gravity indicates the concentrating power of the kidneys, proteinuria was quantitatively determined and the nonprotein specific gravity obtained from the observed specific gravity according to the method described by Lashmet and Newburgh.⁷ Whenever concentrating ability of the kidneys is referred to hereafter, nonprotein specific gravity of the urine is implied.

The urea clearance was determined by the simplified technic described by Van Slyke and Cope.⁸

To test dye excretion, 6 mg of the sodium salt of phenolsulphonphthalein was injected intravenously and the amount in the urine determined by color comparison (in a colorimeter) with a standard freshly prepared from the same lot of dye injected into the patient.

All technical procedures were performed by only two individuals, so that personal variations might be lessened.

7 Lashmet, F H and Newburgh, I H. An Improved Concentration Test of Renal Function. II Simple Method for Measuring Proteinuria. J A M A 100 1328 (April 29) 1933.

8 Van Slyke, D D and Cope, C L. Simplified Colorimetric Determination of Blood Urea Clearance. Proc Soc Exper Biol & Med 29 1169 1174 (June) 1932.

From the Department of Internal Medicine University of Michigan Medical School.

Read before the Section on Pathology and Physiology at the Eighty Sixth Annual Session of the American Medical Association Atlantic City N J June 14 1935.

1 Christian H A. The Use of Tests of Renal Function in Cases of Nephritis, J Urol 1: 319 349 (June) 1917.

2 Van Slyke D D, and others. Observations on the Courses of Different Types of Bright's Disease and on the Resultant Changes in Renal Anatomy. Medicine 9 257 386 (Sept.) 1930.

3 Newburgh L H and MacKinnon Francis. The Practice of Dietetics New York Macmillan Company, 1934 p 233.

4 Lashmet F H and Newburgh L H. An Improved Concentration Test of Renal Function. J A M A 99 1396 1398 (Oct 22) 1932.

5 Van Slyke, D D McIntosh J F Moller Eggert Hannon R R and Johnston, Christopher. Studies of Urea Excretion. VI Comparison of the Blood Urea Clearance with Certain Other Measures of Renal Function. J Clin Investigation 8: 357 374 (April) 1930.

6 Chapman E M and Halstead J A. The Fractional Phenol sulphophthalein Test in Bright's Disease. Am. J. M. Sc. 180: 223 232 (Aug.) 1933.

Normal Values—Under the conditions of the concentration test, the specific gravity of the urine should reach 1 029, or higher. When the maximum specific gravity is less than 1 029, impairment of function is indicated. Blood urea clearance is reported in per cent of mean normal. The interpretations of the originators of this test have been adopted to consider values between 75 and 125 per cent as normal, values greater than 125 per cent as indicating hyperfunction, and

to concentrate normally. Is this the result of technical errors in performing the concentration test, or is this an indication that the ability of the kidneys to excrete a concentrated urine is impaired before the urea excreting power is recognizably diminished? The answer to this is quite evident after studying the data presented in table 1. During the initial stage of hemorrhagic nephritis it has been repeatedly observed that the concentrating ability is impaired before the urea clearance is measured below normal (cases B B and B L) and likewise, during recovery from hemorrhagic nephritis, the urea clearance becomes normal while the concentrating ability is still impaired (cases D S, L S, E M, J J and G H). I have observed, as have Alving and Van Slyke,⁹ that the maximal specific gravity of the urine may remain below normal for years after recovery of normal urea clearance. That the urine contains abnormalities (protein, casts and erythrocytes) in cases showing impaired concentrating ability and normal urea clearance, both in initial stages and recovery periods, indicates that these kidneys are not normal. There can be no doubt, therefore, that the concentration test is a more sensitive measure of functional ability in these cases than is the urea clearance.

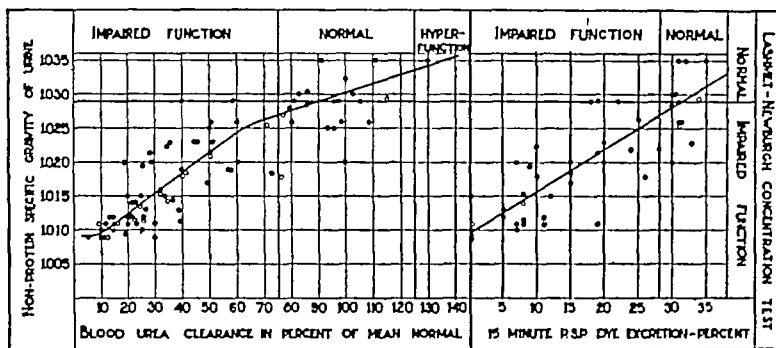


Chart 1—A comparison of the urea clearance (left) and the fifteen minute dye excretion (right) with the concentrating ability of the kidneys in cases of hemorrhagic nephritis. Circles indicate results in cases without edema and the dots show results in patients with the nephrotic syndrome. The line in each graph represents the average urea clearance and the fifteen minute dye excretion respectively, in terms of the maximum nonprotein specific gravities obtained in concentration tests.

values below 75 per cent as indicating a renal deficit. Chapman and Halstead found the lowest fifteen-minute dye excretion by normal individuals to be 28 per cent, and I found it to be 29 per cent. The excretion of less than 28 per cent of the injected dye during the first fifteen minutes is therefore considered to indicate impairment of this function of the kidneys.

RESULTS

In chart 1, the blood urea clearance and fifteen-minute dye excretion are compared to the concentrating ability of the kidneys in cases of hemorrhagic nephritis. There is seen to be quite close parallelism between these different functions of the kidneys. In general, as the kidneys lose their ability to excrete concentrated urine, their urea excreting and dye eliminating function also becomes impaired. The line drawn in each graph shows the average urea clearance and dye excretion at different levels of concentrating ability. When the kidneys are able to concentrate urine to a specific gravity of only 1 025, the average urea clearance is 62 per cent, although the range is seen to be from 50 to 96 per cent. When the concentrating ability has fallen to 1 015 the average urea clearance is 28 per cent, and the range from 20 to 33 per cent. When the specific gravity is fixed at 1 010, the average urea clearance is 12 per cent, although it may range between 10 and 25 per cent. Although it may appear that there is quite a wide variation between the results of the tests studied, when one realizes that these tests are based on entirely different principles and measure totally different functions of the kidneys, it seems quite remarkable that there is the degree of parallelism that has been found.

When the relationship between the concentrating ability of the kidneys and the urea clearance in hemorrhagic nephritis (left-hand graph, chart 1) is carefully studied, several noteworthy facts become evident. In the first place, it is seen that whereas there are only two individuals able to concentrate the urine normally who failed to excrete urea normally, there are twelve individuals with normal urea clearance who were unable

As more and more renal damage occurs, it is seen that the concentrating ability and the urea clearance decrease quite in parallel until extreme renal damage exists. Then the specific gravity of the urine tends to become fixed at about 1 010 and further damage is not reflected by a decrease in concentrating ability but is indicated by a continual decrease in urea clearance. In one case it was observed that the specific gravity of the urine remained fixed while the urea clearance progressively fell from 15 to 3 per cent of normal, at which level death occurred.

When the fifteen-minute dye excretion is compared with the concentration test (right-hand graph, chart 1),

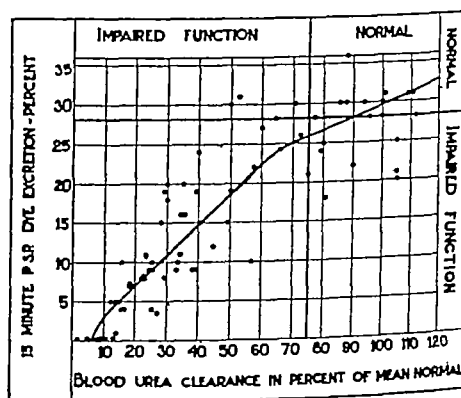


Chart 2—Urea clearance plotted against fifteen minute dye excretion in cases of hemorrhagic nephritis. The line represents the average urea clearance in terms of different percentage dye excretion.

it is seen that, although in general they give comparable results, the deviation from the average is wider (greater scatter in the graph). Reasons for this will be discussed in full.

In chart 2, the results of urea clearance are compared to those of the fifteen-minute dye test, in cases

⁹ Alving, A., and Van Slyke, D. D. The Significance of Concentration and Dilution Tests in Bright's Disease. *J. Clin. Investigation* 13: 969-998 (Nov.) 1934.

of hemorrhagic nephritis Here again there is a wide variation of results, especially when only mild or moderate renal damage exists

The results in patients with arteriosclerotic Bright's disease are shown in chart 3 The urea clearance and concentrating ability are seen to differ more in these patients than in cases of hemorrhagic nephritis The most important observation is that, whereas only four cases show impaired urea excreting ability (and three

these tests in this miscellaneous group of clinical entities is demonstrated by the general parallelism of the results

THE UREA RATIO

Within the past year, Mosenthal and Bruger¹⁰ have reported that the urea ratio (the percentage of the nonprotein nitrogen which is urea nitrogen, i e, $\frac{100 \times \text{urea nitrogen}}{\text{nonprotein nitrogen}}$) is a satisfactory index of renal efficiency These investigators point out that the urea ratio is a correct indication of kidney function even though the concentrations of both urea and nonprotein nitrogen in the blood are within normal limits Their report shows excellent agreement between the urea ratio and the urea clearance This method is most attractive, since it requires only one sample of blood in order to obtain the result

During the past few months the urea ratio has been employed along with the other procedures mentioned The results are shown in table 2 The general parallelism of results is evident Patients J R, C D, and S L show normal urea ratios, when other tests show impairment of renal function This lack of agreement may be due to differences in technique¹¹ This brief experience with the urea ratio has encouraged me to plan a careful comparative study of this test, using the chemical procedures employed by Mosenthal

CONDITIONS INVALIDATING THE VARIOUS TESTS

Even when the technical manipulations are satisfactorily executed, tests of renal function may fail to measure truly the renal efficiency The most important conditions that tend to falsify results are noted farther on

Concentration Test—When the concentration test is employed as described by Lashmet and Newburgh, the only clinical condition found to invalidate the results is the presence of edema held loosely in the body tissues Even though fluid is withheld from the patient, the urine may be diluted by the excretion of edema and

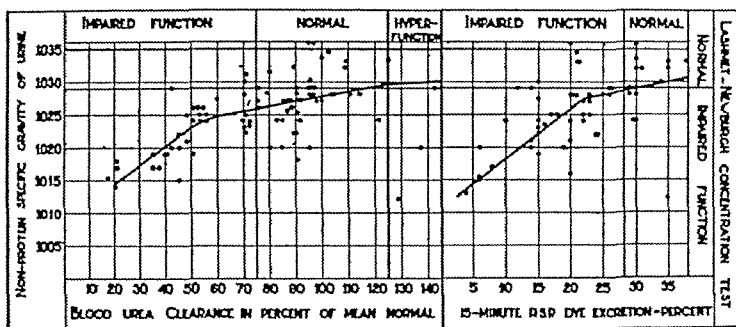


Chart 3—A comparison of the urea clearance (left) and the fifteen minute dye excretion (right) with the concentrating ability of the kidneys in cases of arteriosclerotic Bright's disease. The line in each graph represents the average urea clearance and fifteen-minute dye excretion respectively in terms of maximum nonprotein specific gravities obtained in concentration tests

very slightly) together with normal concentrating ability, thirty-eight cases are seen to present impaired concentrating ability together with normal urea clearance, and four cases show hyperfunction by urea clearance at the time when the concentrating ability is impaired Abnormal urine (proteinuria, cylindruria and occasionally hematuria) was found in all but a few of this group So, even more frequently in arteriosclerotic Bright's disease than in hemorrhagic nephritis is the concentration test a more sensitive indication of functional impairment It should be noted that the majority of these cases show less severe renal damage than do patients with hemorrhagic nephritis When more extensive renal damage exists, the two tests parallel each other more closely

When the fifteen-minute dye excretion is compared with the concentrating ability (right-hand graph, chart 3), it is seen that there are twelve cases in which a low dye excretion was found together with normal concentrating ability Most of these patients had normal urea clearance and normal urine When the dye test was repeated, in many cases normal values were obtained These facts show that most of these low dye excretions are erroneous indications of renal function Eight cases showed normal fifteen-minute dye excretion, together with lowered concentrating ability, but (except for one case) the specific gravity was only slightly below normal All of the latter cases presented normal clearance Thus it may be concluded that when fifteen-minute dye excretion is normal the kidney function is normal (or the concentrating ability only slightly impaired) but that when low values are obtained for fifteen minute dye excretion they may not be true indications of renal function

In chart 4 are shown the results of kidney function studies that were performed on patients who were suffering from different illnesses in whom impairment of kidney function was suspected The applicability of

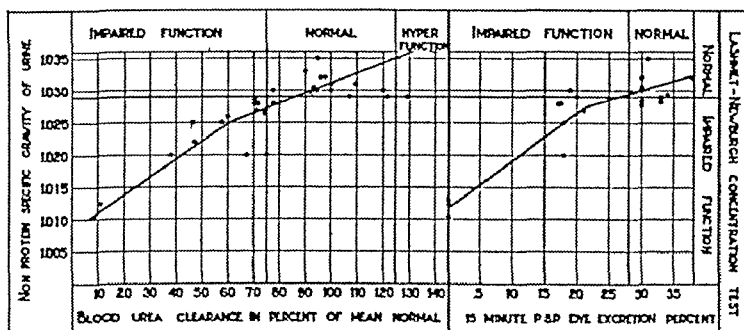


Chart 4—Results of renal function studies in patients with various illnesses other than hemorrhagic or arteriosclerotic Bright's disease, in whom tests were performed because of suspected impairment of renal function

have a specific gravity lower than the maximum that could be produced by the kidneys This is especially true in cases of congestive heart failure In patients with the "nephrotic syndrome" this error is less apt

¹⁰ Mosenthal H O and Bruger Maurice The Urea Ratio (Urea Nitrogen per Cent of Total Nonprotein Nitrogen in the Blood) as a Measure of Renal Function, *Tr A Am Physicians* 49:82 92, 1934

¹¹ The blood urea was determined in our laboratory by the method described by Van Slyke and Flazin (Peters J P and Van Slyke D D Quantitative Clinical Chemistry, Methods, Baltimore Williams & Wilkins Company 2:558 1932), whereas the gasometric urease method of Van Slyke was used by Mosenthal

to occur because the edema is in most cases firmly held by the tissues. Of six patients with the "nephrotic syndrome" who were studied, in two the maximal concentrating ability of the kidneys was apparently not obtained during the concentration test (table 3)

TABLE 2—A Comparison of the Urea Ratio with Other Methods of Measuring Renal Efficiency in a Short Series of Cases

| Patient | Diagnosis | Blood | | Urea Ratio | Urea Clearance, per Cent | Concentrating Ability, Specific Gravity | 15-Minute Phenol sulphalein per Cent |
|---------|-----------|-----------------------------------|-----------------------------|------------|--------------------------|---|--------------------------------------|
| | | Nonprotein Nitrogen, mg. per Cent | Urea Nitrogen, mg. per Cent | | | | |
| E V | H N | 29.2 | 7.9 | 27.0 | 104 | | |
| J H | Art | 32.0 | 11.4 | 34.0 | 126 | 1.033 | 34 |
| B S | N.A. | 35.2 | 12.5 | 35.5 | 91 | 1.030 | 29 |
| J R | H N | 35.7 | 13.5 | 37.8 | 64 | 1.022 | 28 |
| O D | Art | 39.5 | 15.0 | 38.0 | 75 | 1.027 | 22 |
| S L | H N | 27.0 | 10.7 | 39.6 | 93 | 1.025 | 29 |
| S B | Art | 42.6 | 18.7 | 44.0 | 77 | 1.027 | 20 |
| B R | Art | 30.9 | 13.6 | 44.0 | 94 | 1.032 | 31 |
| L M | Art | 41.1 | 18.3 | 44.5 | 74 | 1.026 | 22 |
| F M | Art | 41.9 | 17.6 | 46.0 | 71 | 1.027 | 24 |
| W W | H N | 40.5 | 21.5 | 46.9 | 17 | | |
| W S | Art | 29.7 | 14.3 | 48.1 | 97 | 1.023 | 25 |
| C V | Art | 40.6 | 21.0 | 51.7 | 47 | 1.019 | 15 |
| J M | Art | 54.8 | 30.0 | 54.9 | 37 | 1.017 | |
| K | Art | 63.2 | 37.5 | 59.0 | 45 | | |
| R. B | H N | 90.7 | 64.3 | 66.5 | 10 | 1.011 | |
| C A | Art | 61.0 | 43.0 | 69.4 | 45 | 1.015 | 6 |
| S M | H N | 178.0 | 144.0 | 81.0 | 5 | | |
| S J | H N | 162.0 | 125.0 | 82.2 | 7 | | 1 |
| B B | H N | 60.2 | 50.0 | 83.0 | 16 | | |
| N H | H N | 70.5 | 61.0 | 87.0 | 6 | | |
| O G | H N | 140.3 | 130.0 | 88.8 | 4 | | 0 |

H N = Hemorrhagic nephritis

Art = Arteriosclerotic Bright's disease

N A = Nutritional anemia

Blood Urea Clearance Test—The accuracy of this test depends in part on measuring the urea excreted in the urine during an exact interval of time. The most important single factor tending to falsify results is the failure to obtain all the urine formed by the kidneys during the test. Prostatic obstruction, bladder diverticula, cystocele and incontinence usually account for these failures. They can often be prevented if the urine is obtained by catheter. When there is a constant amount of residual bladder urine, the urea clear-

TABLE 3—Cases of Hemorrhagic Nephritis with "Nephrotic Syndrome" in Which Urine of Maximal Specific Gravity Was Not Excreted During a Concentration Test

| Patient | Date | Edema | Concentration Test | | Urea Clearance, per Cent | 15-Minute Phenol sulphalein per Cent |
|---------|----------|---------|--------------------------|---|--------------------------|--------------------------------------|
| | | | 23-Hour Urine Volume, Cc | Maximal Concentrating Ability, Specific Gravity | | |
| R. P. | 1/28/34 | Massive | 1 910 | 1 015 | 24 | 0 |
| | 4/1/34 | None | | | 23 | 1 |
| | 6/22/34 | None | 944 | 1 022 | 27 | 3 |
| | 10/17/34 | None | 693 | 1 025 | 33 | 10 |
| | 1/23/35 | None | 749 | 1 023 | 43 | |
| L. F. | 4/18/34 | Massive | 1 388 | 1 020 | 100 | |
| | 6/13/34 | None | 795 | 1 029 | 58 | 22 |
| | 10/9/34 | None | 902 | 1 029 | 80 | 31 |

ance is only slightly falsified because the urea excretion is compared with the concentration of urea in the blood, which varies but little during short periods of time.

The formulas used in calculating urea clearance contain a factor that corrects for variations in urea excretion at different rates of urine formation. However, when the urine flow is very small the urea clearance

calculated as usual fails to indicate the renal efficiency correctly. This is well demonstrated by the data in table 4, which shows urea clearance determined in the same subjects when the urine flow was small (during a concentration test) and within twenty-four hours later, when the urine volume was greater. It is seen that in most cases when the volume of urine is 20 cc. per hour or less the urea clearance is low.

Fifteen-Minute Dye Test—Besides the numerous opportunities for error in technic (quantitative injection, timing, and the like), the most frequent cause for false results with this test is again failure to obtain all the urine formed by the kidneys during this short interval of time. The error is usually of a much greater magnitude than in the urea clearance test, because the quantitative recovery of a substance not normally present in the blood and urine is required. Obtaining the urine by catheter will eliminate some but not all of the failures from this cause.

In a series of kidney function studies performed during the course of pregnancy, good agreement existed between the concentration and urea clearance tests, but low results were the rule with the fifteen

TABLE 4—Urea Clearance When Urine Volume is Very Small

| Subject | During Dehydration (Concentration Test) | | During Free Fluid Intake | |
|---------|---|--------------------------|---------------------------|--------------------------|
| | Urine Volume per Hour, Cc | Urea Clearance, per Cent | Urine Volume per Hour, Cc | Urea Clearance, per Cent |
| H J | 8 | 38 | 31 | 116 |
| | 11 | 41 | 25 | 104 |
| I F | 12 | 50 | 45 | 100 |
| | 12 | 67 | 36 | 77 |
| | 12.4 | 60 | 21 | 68 |
| | 13.5 | 53 | 23 | 88 |
| T B | 15.5 | 30 | 72 | 103 |
| | 17.5 | 48 | | |
| P G | 18 | 53 | 39 | 100 |
| | 15 | 44 | 39 | 110 |
| M P | 18 | 37 | 120 | 95 |
| | 10.5 | 73 | 32 | 130 |
| T | 17 | 47 | 73 | 91 |
| L G | 19.5 | 55 | 67 | 93 |
| | 17.5 | 53 | 38.5 | 98 |
| O V | 17 | 31 | 59 | 42 |
| | 17 | 35 | 27 | 71 |
| H J | 18 | 42 | 707 | 63 |
| | | | | |
| Z A | 24 | 88 | 180 | 75 |
| | 15 | 55 | 200 | 90 |
| J B | 19 | 56 | 37 | 90 |
| | 22 | 63 | 50 | 103 |
| M F | 20 | 58 | 84 | 103 |
| | 14 | 34 | 180 | 41 |
| L B | 23 | 48 | | |
| | | | | |
| O L | 23 | 55 | 24 | 31 |
| | 24 | 42 | 57 | 49 |

minute dye excretion in voided urine during the latter part of pregnancy (table 5). When the urine for the dye test was obtained by catheter, the results were in most cases no better (table 6). The explanation for this low dye excretion is no doubt a combination of several factors: additional circulation (fetal), altered blood flow through the kidneys due to the tumor of pregnancy, and the hydronephrosis known to exist commonly during pregnancy.

THE INTERPRETATION OF TESTS OF RENAL EFFICIENCY

How are the results of the various tests of kidney function to be interpreted? When the procedures for performing these tests are kept in mind, it is at once evident that only during the concentration test are conditions such that the kidney function is measured

while the kidneys are under functional strain. Consequently, this is the only test that is designed to measure maximal function. The results of this test tend to answer the question "How efficiently can the kidneys perform their function?" whereas the other tests tend to answer the question "How efficiently are the kidneys performing their function?" It is not surprising, then, that the concentration test registers impairment of function when other tests do not, and that it is therefore a more sensitive measure of renal efficiency. Furthermore, unless falsified by the urinary excretion of edema, low specific gravity of the urine obtained during a concentration test always indicates abnormality of the kidneys.

The urea clearance test measures the urea excreting ability of the kidneys under no strain. It is therefore less sensitive, but when impairment of urea excretion is found, except when the rate of urine formation is very slow (less than 20 cc per hour), it indicates renal abnormality.

Low fifteen-minute dye excretion theoretically should indicate renal abnormality, but in my experience the urine formed by the kidneys during this short period of time is so infrequently quantitatively recovered that I have come to interpret this test as follows. If the fifteen-minute dye excretion is normal, no appreciable

impairment of different functions of the kidney. For example, it is said that impairment of concentrating ability indicates tubular abnormality, for the normal function of the tubule is to reabsorb water and so concentrate the urine. In the present state of knowledge, it is my opinion that abnormal function, as demonstrated by clinical tests, cannot be interpreted in terms of specific renal pathologic changes.

not because of kidney disease but because of a nonrenal abnormality, in this case dehydration. Consequently, high blood urea, nonprotein nitrogen, and urea ratios do not necessarily indicate abnormality of the kidneys. Interpretation of these values requires a knowledge of the state of hydration of the body.

It has been suggested by a number of authors that various pathologic states of the kidney are indicated by

TABLE 6—Kidney Function During Pregnancy

| Patient | Month of Pregnancy | Urea Clearance per Cent | Phenolsulphonphthalein Excretion | | |
|---------|--------------------|-------------------------|----------------------------------|--------------------------------------|-----------------------|
| | | | 15-Minute Voided Urine per Cent | 15-Minute Urine by Catheter per Cent | 2 Hour Total per Cent |
| C W | 7 | 133 | 19 | 22 | 68 |
| M K | 8 | 110 | 16 | 19 | 67 |
| R B | 9 | 94 | 13 | 20 | 63 |
| M M | 9 | 108 | 21 | 24 | 75 |
| J R | 9 | 130 | 24 | 17 | 77 |
| M E | 9 | 99 | 23 | 19 | 92 |
| L M | 9 | 134 | 21 | 20 | 80 |
| B A | 8 | 100 | 25 | 23 | 71 |
| I M | 9 | 82 | 21 | 22 | |
| V A | 9 | 109 | 8 | 10 | 93 |
| F P | 9 | 83 | 8 | 10 | 54 |
| M F | 9 | 79 | 8 | 4 | 78 |

TABLE 5—Kidney Function During Pregnancy

| Patient | Month of Pregnancy | Concentration Ability Specific Gravity | Urea Clearance per Cent | Phenolsulphonphthalein Excretion | |
|-------------|--------------------|--|-------------------------|----------------------------------|-----------------|
| | | | | 15-Minute per Cent | 2 Hour per Cent |
| M L | 2 | 1 029 | 86 | 85 | 18 |
| L K | 2 | 1 030 | 86 | 28 | 72 |
| F W | 8 | 1 032 | 128 | 30 | 67 |
| K | 9 | 1 031 | 77 | 28 | 78 |
| | 9 | 1 035 | 140 | 32 | 68 |
| E H | 7 | 1 029 | 92 | 17 | 62 |
| T B | 8 | 1 035 | 115 | 18 | 79 |
| W | 8 | 1 035 | 100 | 13 | 81 |
| V B | 8 | 1 031 | 79 | 17 | 65 |
| A B | 9 | 1 030 | 112 | 9 | 85 |
| B M | 9 | 1 030 | 103 | 19 | 45 |
| E S | 9 | 1 029 | 83 | 6 | 50 |
| B A | 9 | | 100 | 25 | 71 |
| L L | 9 | | 109 | 8 | 59 |
| H M | 9 | | 105 | 15 | 65 |
| post partum | | | | 30 | |

renal abnormality exists, however, if the excretion is below normal, the function should be checked by another test.

It has already been pointed out that a normal concentration of catabolic wastes in the blood does not necessarily indicate normal kidneys. A number of investigators have shown that extensive renal damage may exist and the blood urea and nonprotein nitrogen may still be within normal limits. Does abnormally high blood urea, nonprotein nitrogen or urea ratio indicate abnormality of the kidneys? This question is clearly answered by results of a controlled study of dehydration performed recently in conjunction with Drs Maddock and Collier.¹² During dehydration produced by the omission of fluids and the administration of a dry diet to a normal adult, various tests of renal function were performed. The data presented in table 7 show that during dehydration the blood urea progressively increased, thereby increasing the blood nonprotein nitrogen and the urea ratio until all three were well above normal limits, even though the kidneys were normal, as shown by the persistence of normal urea clearance and by the excretion of urine having a very high specific gravity. Inadequate renal function existed,

PRACTICAL CONSIDERATIONS

The training, equipment and time necessary to perform satisfactorily tests of renal efficiency involving quantitative chemical determinations practically limit the use of such tests to institutions. The independent practitioner of medicine has left only the concentration

TABLE 7—Kidney Function During Dehydration of a Normal Adult

| Date | Water Balance Grams | Blood | | Urea Ratio | Urea Clearance, per Cent | Urine | |
|--------------------|---------------------|---|---|------------|--------------------------|------------------|------------------------------|
| | | Nonprotein Nitro- gen Mg per Cent | Urea Nitro- gen Mg per Cent | | | Specific Gravity | 24- Hour Urea Grams |
| | | | | | | | |
| Preliminary period | | | | | | | |
| Feb 24 | + 370 | 33.5 | | | | 1 015 | 7.40 |
| Feb 25 | + 12 | 31.0 | | | | 1 012 | 7.20 |
| Dehydration | | | | | | | |
| Feb 26 | -1 145 | 32.6 | 13.3 | 40.8 | 80 | 1 031 | 4.83 |
| Feb 27 | -1 047 | 34.5 | 15.6 | 45.8 | 80 | 1 028 | 5.40 |
| Feb 28 { a m | -1 156 | 35.4 | 18.7 | 52.9 | 66 | 1 035 | 6.60 |
| { p m | | | 20.0 | | 91 | 1 0385 | |
| March 1 { a m | - 630† | 42.2 | 26.8 | 63.5 | 70* | 1 0352 | 8.20 |
| { p m | | | 27.3 | | 91 | 1 041 | |
| Recovery | | | | | | | |
| March 2 { a m | +4 513 | 4.7 | 2.0 | 55.6 | | 1 006 | 12.00 |
| { p m | | | 16.3 | | | | |
| March 3 a m | - 709 | 32.3 | 12.3 | 58.1 | 60 | 1 016 | 7.60 |

* Extremely small urine volume

† Ingested 500 cc water during this day

test and the dye excretion tests. For reasons already mentioned, the test of choice in these circumstances is the concentration test, which can be performed with very little equipment and in a very short time.

SUMMARY AND CONCLUSIONS

This study demonstrates that the Lashmet-Newburgh concentration test is the only test which tends to

measure the maximal function of the kidneys, and for this reason it is the most sensitive test of renal efficiency, often demonstrating impairment of function when other tests fail to do so. This test does not require the quantitative collection of urine. Except when performed in the presence of loosely held edema, it always gives accurate results, and low specific gravities always indicate renal abnormality.

The urea excreting function of the kidneys, as measured by the urea clearance test, becomes impaired in many cases after the concentrating ability is diminished, so that the urea clearance is a less sensitive test of renal efficiency. Throughout the greatest part of the range of kidney function, the urea clearance and concentrating ability in general parallel each other. When the renal damage is severe, the specific gravity becomes fixed at a low level and the urea clearance alone indicates progression of the renal lesion. Failure to obtain quantitatively the urine formed by the kidneys during the urea clearance test will falsify the results. Low urea clearance always indicates renal abnormality, except when the urine volume is less than 20 cc per hour.

The two-hour phenolsulphonphthalein excretion is not a sensitive test of renal efficiency. Theoretically, the fifteen-minute dye excretion is a sensitive test of kidney function, but the obstacles to satisfactory execution of this test cause it to be unreliable. When a normal amount of dye (28 per cent or more) is excreted during the fifteen minutes after injection, one is safe in assuming that no appreciable renal damage exists. When low excretion is found, interpretation is hazardous.

Normal blood urea and nonprotein nitrogen may exist even when extensive renal damage is present, so that these values are poor indications of renal functional ability. Elevated blood urea, nonprotein nitrogen and urea ratio indicates only that the renal excretion of protein wastes is inefficient and does not necessarily indicate renal abnormality. Experience with the urea ratio has been too limited to allow an expression of opinion regarding the comparative value of this test as a measure of renal efficiency.

It is my opinion that, in order to have the most accurate and complete information regarding functional ability of the kidneys, the concentrating ability and the urea clearance should be determined.

University Hospital

ABSTRACT OF DISCUSSION

DR. HERMAN O. MOSENTHAL, New York. Impaired function of the kidney, as Dr. Freyberg says, is not a single process nor does it necessarily parallel the other disturbances in chronic interstitial nephritis, such as hypertension, albuminuria, edema or uremia. There are roughly four ways in which the activity of the kidney may be curtailed, and the tests for renal function, when properly interpreted, will reveal them. 1. A restriction in the urine volume, without loss of power of concentration of solids, signalized by a high specific gravity, a low percentage of phenolsulphonphthalein excretion, an elevation of the blood urea, an increase in the urea ratio and a lowering of the urea clearance, this occurs with heart failure, in acute nephritis and in chronic nephritis with edema formation. 2. A period of normal kidney function, with the exception that there is a low specific gravity indicating inability to concentrate the urine, which follows on the conditions mentioned under 1, that is, when the passive congestion, or the edema from whatever cause, diminishes and is lifted through polyuria. 3. The same is true, that is, a diminished ability to concentrate while elimination of solids is good, in the earlier stages of chronic interstitial nephritis, when there is nocturnal polyuria and the urinary specific gravity approaches 1.010 in a

fixed way, still, through the elimination of large amounts of fluid, the solids are eliminated, and that is why it is spoken of as a compensatory polyuria. That is why the low fixed specific gravity precedes the other signs of impaired renal function in chronic interstitial nephritis and why the specific gravity tests reach their maximal degree of impairment long before the other tests of renal function. 4. In the advanced cases of chronic interstitial nephritis, when only 10 per cent or less of the kidney tissue is functioning, according to urea clearance determination, there is both a low fixed specific gravity and an impaired elimination of solids, that is, the blood urea and the urea ratio rise while the urea clearance and the phenolsulphonphthalein excretion diminish. The urea determinations are the best way of measuring the impairment of the kidney to eliminate solids. The ordinary blood urea test is usually perfectly satisfactory. However, as Dr. Freyberg has said, in cases in which the level of the blood urea is normal there may still be impairment of renal function. The urea clearance test eliminates that diagnostic hazard. The urea clearance test is somewhat impractical, however, because it requires two hours to carry through. The urea ratio, the relationship between the blood urea nitrogen and the nonprotein nitrogen, requires only one specimen of blood and is reliable. I reported the first results on it twenty years ago. I have been using it ever since and have found it to yield satisfactory results.

STUDIES ON CRYSTALLINE VITAMIN B₁

EXPERIMENTAL AND CLINICAL OBSERVATIONS

MARTIN G. VORHAUS, M.D.

ROBERT R. WILLIAMS, M.S.

AND

ROBERT E. WATERMAN, B.S.

NEW YORK

The vast amount of literature that is accumulating on this question of vitamins and their deficiency states has, unfortunately, served to confuse rather than to clarify the clinical aspects of this subject. Very few of the publications available to the profession shed a clear light on the problems involved or offer a satisfactory mode of approach to them.

One of the principal reasons for the prevalent confusion is the growing use of pharmaceutical preparations containing more than one vitamin. The effects attributed to these multiple agents cannot be evaluated accurately. The only hope of ascertaining fundamental data and bringing order out of this chaos is to abandon the use of compound vitamin preparations in experimental clinical work and employ only known quantities of single, pure substances.

Acting on this principle, we have conducted a series of experiments relative to the nature and therapeutic potentialities of the antineuritic vitamin B₁, so designated to indicate its origin in the old vitamin complex known as B. It is safe to assume that our results were due to this single substance, since we employed the pure crystalline material, of known molecular weight and formula.

The normal adult human intake of B₁ is said to be approximately 1 mg daily, the richest sources being the bran coats of grains, leguminous seeds and lean pork. None of the concentrates on the market permit a liberal dosage of this vitamin without the ingestion of considerable amounts of inert or objectionable foreign matter. The pure crystals, which are now available, overcome this objection.

Read before the Section on Gastro-Enterology and Proctology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J. June 12, 1935.

Our first report¹ showed the striking increase in the growth rates of rats that received their supply of vitamin B₁ in the form of weighed amounts of the pure crystalline material. It was found that many factors influence the effect of a given amount of this vitamin, so that it is fallacious to speak absolutely of "the B₁ requirement" of a species, whether man or rat. The amount needed is indeterminate unless every component

TABLE 1—Classification of Neuritides

| | Cases |
|--|-------|
| Polyneuritis of infectious origin | 20 |
| So-called metabolic polyneuritis | 41 |
| Localized neuritis | 22 |
| Neuritis associated with anemia | 11 |
| Neuritis associated with pregnancy | 3 |
| Suspected advanced B ₁ deficiency state | 3 |
| Total | 100 |

of the diet is fixed and well defined standards of function are specified. Besides these general considerations there is the factor of individual variation: an individual's requirements may far exceed the normal as a result of abnormalities in digestion and assimilation, impairment of glandular function by an infectious disease, changes resulting from a high carbohydrate intake, or special demands such as those of pregnancy and lactation.

Because true beriberi responds to remarkably small quantities of vitamin B₁, it has been assumed erroneously that a similar situation exists with respect to all B₁ deficiencies. We believe that the minimum therapeutic dose that can be relied on to abolish any accumulated deficit below normal storage capacity and supply current needs is 10 mg daily. Adequate dosage is doubly important in view of the fact that the thera-

peutic response is often the main diagnostic test of the more obscure types of B₁ deficiency. Our first report¹ showed the striking increase in the growth rates of rats that received their supply of vitamin B₁ in the form of weighed amounts of the pure crystalline material. It was found that many factors influence the effect of a given amount of this vitamin, so that it is fallacious to speak absolutely of "the B₁ requirement" of a species, whether man or rat. The amount needed is indeterminate unless every component of 10 mg of this vitamin was administered, orally, daily for four consecutive weeks, to eleven patients with proved diabetes according to present-day standards. Six showed an increased utilization of carbohydrates, five did not. Of the positive cases, two are still maintaining the gain (after five and ten months respectively), two retained the increase for several months, and the remaining two reverted to their previous levels of blood and urinary sugar as soon as administration of the vitamin was stopped. Many factors pointed to a direct causal relationship between the intake of the vitamin and the increased carbohydrate tolerance in 54.6 per cent of the cases, with strong evidence that the action of B₁ in this condition is a catalytic one.

As B₁ is known specifically as the antineuritic vitamin, the third phase of our experiment, presented herewith, consisted of studies of the effects of this substance on a group of patients complaining of nerve pain. These neuritides have been divided, according to accepted clinical classifications, into the types given in table 1.

In table 2 the symptoms of these hundred cases are tabulated and the response to vitamin therapy described. Taking the series as a whole, only 8 per cent failed to react favorably, 44 per cent became entirely symptom free and 48 per cent were definitely improved. These cases have been under observation for periods ranging from three to fourteen months. Up to the present, no recurrence has been noted in any of the forty-four patients in the symptom-free group.

Among the 8 per cent who showed no improvement are several patients with proved organic pathologic conditions to explain their continued symptoms. They were included in this report, however, because their outstanding clinical manifestations were those of either

TABLE 2—Analysis of One Hundred Cases of Neuritis Treated with Vitamin B₁ (Oral Administration)

| | Num ber of Cases | Symptom Free | | Improved | | Unim- proved | | Tenderness | | | | Paresthesia | | | | Anorexia | | | | Weakness | | | | Age | | Sex | | |
|-----------------------|---------------------------|-----------------|-----|----------|----|-----------------|----|------------|-----|--------|----|--------------|----|--------|-----|--------------|-----|--------|-----|--------------|-----|--------|-----|------------------|------------|------|--------|----|
| | | | | | | | | Present | | Absent | | Pres- ent | | Absent | | Pres- ent | | Absent | | Pres- ent | | Absent | | | | | | |
| | | No | % | No | % | No | % | | | | | | | | | | | | | | | | | No | % | No | % | No |
| | | No | % | No | % | No | % | No | % | No | % | No | % | No | % | No | % | No | % | No | % | No | % | Un- der 40 | Over 40 | Male | Female | |
| 1. Polyneuritis | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Metabolic | 41 | 14 | 34 | 24 | 58 | 3 | 7+ | 23 | 56 | 13 | 32 | 18 | 43 | 23 | 57 | 1* | 31 | 29 | 69 | 29 | 69 | 12 | 31 | 13 | 23 | 17 | 24 | |
| B. Infectious | 20 | 10 | 50 | 9 | 45 | 1 | 5 | 16 | 80 | 4 | 20 | 8 | 40 | 12 | 60 | 8 | 40 | 12 | 60 | 11 | 55 | 9 | 45 | 9 | 11 | 4 | 16 | |
| C. With anemia | 11 | 5 | 45 | 4 | 36 | 2 | 18 | 5 | 45 | 6 | 55 | 3 | 27 | 8 | 73 | 7 | 63 | 4 | 37 | 8 | 73 | 3 | 27 | 7 | 4 | 0 | 11 | |
| D. With pregnancy | 3 | 3 | 100 | | | | | 3 | 100 | | | | | 3 | 100 | | | 3 | 100 | | | 3 | 100 | | | 1 | 0 | 3 |
| E. Of unknown origin | 3 | 1 | 33 | 2 | 67 | | | 3 | 100 | | | 2 | 67 | 1 | 33 | 3 | 100 | | | 3 | 100 | | | 2 | 1 | 0 | 1 | 2 |
| 2. Localized neuritis | 22 | 11 | 50 | 9 | 41 | 2 | 9 | 20 | 91 | 2 | 9 | 7 | 32 | 15 | 68 | 8 | 36 | 19 | 86 | 4 | 18 | 18 | 82 | 16 | 6 | 7 | 15 | |
| Totals. | | 44 | | 48 | | 8 | | 75 | | 25 | | 38 | | 62 | | 33 | | 67 | | 55 | | 45 | | 49 | 51 | 29 | 71 | |

peutic response is often the main diagnostic test of the more obscure types of B₁ deficiency.

The second stage of our experiment² dealt with the disturbance of the carbohydrate metabolism that has been reported repeatedly in experimental B₁ deficiency. Although a diminished carbohydrate tolerance is encountered in other abnormal states, it is most consistent and marked in B₁ avitaminosis.

The clinical syndrome of diabetes mellitus has many characteristics of a nutritional disturbance the etiology of which is still unknown. Proceeding on the hypothesis that a deficiency of B₁ may be a factor in the production and clinical course of this condition, an average

localized or generalized neuritis and we felt that the presence of definite organic disease was no reason for the rejection of a case. From the beginning, we assumed that the antineuritic vitamin might have a non-specific effect in neuritis, regardless of cause. With this in mind, it seemed of interest to determine whether or not the response of patients without demonstrable basis for the neuritic pain differed from that of patients with known organic disease.

When the cases are classified as to age and sex, it is seen that the number above and below 40 years is virtually the same. Almost three fourths of the patients were females, but allowance must be made for the fact that the series included three pregnancies, as well as eleven anemias of a type having a predilection for women.

It is of interest to note that 75 per cent of the cases demonstrated localized tenderness at one or more points related to pain. Almost invariably this tenderness dis-

1. Vorhaus M G, Williams R R and Keresztes J C. Studies on Crystalline Vitamin B₁. A Therapeutic Survey read before the American Therapeutic Society June 8 1935.

2. Vorhaus M G, Williams R R and Waterman R E. Studies on Crystalline Vitamin B₁. Observations in Diabetes read before the American Gastro-Enterological Association June 10 1935. A complete bibliography is given by Cowgill G R. The Vitamin B Requirement of Man New Haven Yale University Press, 1934.

appeared as the pain improved. The amelioration of associated symptoms, such as weakness, loss of appetite and paresthesia, far exceeded the relief of pain.

Since many of the acute neuritides subside spontaneously, the duration of symptoms must be considered in interpreting therapeutic results. The preponderant tendency toward chronicity in our cases is therefore noteworthy. In only 15 per cent had the symptoms been

TABLE 3—Duration of Symptoms in One Hundred Cases of Neuritis Before Treatment

| | Upto 1 Week | 1 to 4 Weeks | 4 to 12 Weeks | 3 to 12 Months | 1 to 5 Years | Over 5 Years | Total |
|-----------------------|-------------|--------------|---------------|----------------|--------------|--------------|-------|
| 1. Polyneuritis | | | | | | | |
| (a) Metabolic | 2 | 7 | 0 | 12 | 9 | 5 | 41 |
| (b) Infectious | 0 | 0 | 8 | 2 | 6 | 4 | 20 |
| (c) With anemia | 0 | 0 | 2 | 3 | 5 | 1 | 11 |
| (d) With pregnancy | 0 | 1 | 2 | 0 | 0 | 0 | 3 |
| (e) Of unknown origin | 0 | 0 | 1 | 2 | 0 | 0 | 3 |
| 2. Localized neuritis | 1 | 4 | 8 | 4 | 3 | 2 | 22 |
| Percentage | 3 | 12 | 27 | 23 | 23 | 12 | 100 |

present for less than four weeks, in 50 per cent the duration ranged from one to twelve months, in 35 per cent it was over a year. Twelve per cent of the cases were of more than five years' standing, 23 per cent of one to five years', and 23 per cent of three to twelve months', making a total of 58 per cent in which symptoms had existed for more than three months. This element of time diminishes the probability of spontaneous recovery and appears to confirm the instrumentality of the vitamin therapy.

No claim is made of a "cure" in these cases—any more than it may be said that insulin "cures" diabetes. It is not illogical to assume, however, in an unknown percentage of the patients who were rendered symptom free and have remained so for a long time since the cessation of B₁ therapy that the neuritis may have been due solely to a B₁ deficiency, but this is pure speculation. At the present time there is no way of making such a clinical diagnosis with certainty. The only basis for this theory lies in the clinical response to B₁.

On the other hand, it seems apparent that B₁ has a nonspecific effect in neuritis if the forty-eight cases that were improved but not rendered entirely symptom free are studied. If there had been a B₁ avitaminosis in these patients their symptoms would have disappeared entirely on specific therapy in adequate amounts. Cannot their improvement be ascribed to the action of the vitamin, their failure to become completely well to the continued toxic effects of the original cause?

An analogy may be drawn with the action of iron in the anemias. Just as there is a small group of hypochromic anemias in whom the administration of adequate amounts of iron will result in a complete cure, it is conceivable that there may be a small group of neuritides (usually polyneuritis) in which the ingestion of vitamin B₁ brings about a thoroughly normal state, which is maintained after medication is stopped.

Carrying the analogy further, since the fact is recognized that large doses of iron will improve secondary anemias associated with a large variety of causes such as malnutrition, infection, metabolic diseases and even malignancy, why cannot it be assumed that adequate amounts of B₁ may stimulate reparative processes in the neuraxon, resulting in progress toward the normal state, even in the absence of a B₁ deficiency and regardless of the continued presence of neurotoxins?

An additional series of eight cases, all proved by roentgen examination to be hypotonia of the gastrointestinal tract for which no organic cause could be

demonstrated, was also studied. Three males and five females comprised this group, ranging in age from 19 to 37 years. All complained of marked loss of appetite. There were definite localized or generalized pains in six. In seven, the duration of the constipation was upward of four years, the remaining patient gave a history of alternating diarrhea and constipation for many years.

Since the combination of anorexia and gastrointestinal hypotonia has been observed in experimental animals known to have a B₁ avitaminosis, it was decided to study the effects of B₁ in this group. In all cases, normal appetite returned and the weakness disappeared. Six of the eight experienced a complete restoration of normal bowel function, continuing after medication was stopped. The remaining two showed a marked improvement in elimination, although occasional constipation occurred even during administration of the vitamin. Pain disappeared entirely in five cases and was greatly improved in one.

Reviewing the results in this brief series, it is important to emphasize that these eight patients represent a carefully selected group, in contrast to the neuritic cases, which were accepted at random. We had already observed in the latter that relief of the neuritic pain was not associated with any improvement in the bowel function of those patients suffering from coexisting constipation, so that we had no delusions of dealing with an efficacious constipation remedy. What was sought was a clinical counterpart of the condition of generalized gastro-intestinal hypotonia and marked anorexia that has been observed frequently in experimental animals with B₁ deficiency. The small series

TABLE 4—Analysis of Eight Cases of Unexplained Gastro-Intestinal Hypotonia with Anorexia*

| Name | Sex | Age | Bowel Function | Anorexia | Weakness | Neuritic Pain | Vitamin Therapy | Result |
|------|-----|-----|---------------------------------------|----------|----------|---------------|-----------------|--|
| A D | ♀ | 31 | Constipation since infancy | +++ | +++ | + | 4 | Bowels regular no pain appetite normal |
| C E | ♂ | 33 | Alternating diarrhea and constipation | ++ | 0 | + | 2 | Bowels regular no pain appetite normal |
| F G | ♀ | 17 | Constipation for 4 years | +++ | ++ | + | 3 | Bowels regular no pain appetite normal |
| R H | ♀ | 37 | Constipation for 10 years | +++ | +++ | + | 5 | Bowel function much improved appetite normal no pain |
| P L | ♂ | 34 | Constipation for 8 years | ++ | + | + | 6 | Bowels regular no pain appetite normal |
| B S | ♀ | 27 | Constipation for 6 years | ++ | ++ | + | 12 | Bowel function much improved appetite normal no pain |
| A F | ♀ | 19 | Constipation since infancy | +++ | + | 0 | 2 | Bowels regular appetite normal |
| R S | ♂ | 33 | Constipation for 10 years | ++ | + | 0 | 2 | Bowels regular, appetitenormal |

* Roentgen examination in all cases revealed generalized gastrointestinal hypotonia without any demonstrable causes present.

reported herewith presents a similar syndrome. There is no doubt that this type of case represents only a minute fraction of the patients with constipation who are observed clinically.

In view of the large proportion of cases in these studies in which the administration of vitamin B₁ resulted in an amelioration of symptoms, it seems logical to assume that deficiency states are far more frequent than has been thought heretofore. The fact

that most of these cases have not been recognized as such indicates the need for some clinical method of differentiating the various stages of B_1 avitaminosis that will embrace the lesser as well as more intense states. We have attempted to formulate such a concept of vitamin B_1 deficiency in human beings. This is, admittedly, in the formative stage and far from final, but we believe that the time has come, with the material and observations at our disposition, to attempt to define the several clinical phases of B_1 avitaminosis. Recognizing that further research will unquestionably necessitate some revision, we suggest the following tentative basis for continued study.

1 The state of total (?) deficiency of vitamin B_1 that is known clinically as beriberi is well recognized. It is characterized by weakness, pains in the extremities followed by paralysis of the legs, fever, anorexia, diarrhea or constipation, signs of myocardial insufficiency, secondary anemia and, at times, marked edema (dry or wet form). If untreated, it usually results in death, frequently sudden (acute cardiac type).

2 The next most advanced stage, that of severe deficiency of vitamin B_1 , is also recognizable clinically as a state of avitaminosis. Its symptoms are weakness, severe persistent pain in the extremities, paresthesia, anorexia and mild signs of myocardial insufficiency. Sometimes it is associated with edema of the legs and a history of dietary restriction (nutritional edema). In the tropics it is frequently diagnosed as rudimentary beriberi; it may develop into typical beriberi or subside spontaneously.

3 The third stage, continuing in the direction of diminishing severity, is the advanced deficiency of vitamin B_1 , recognized clinically as polyneuritis. Here the principal symptoms are weakness, anorexia and severe pain in one or more of the extremities or elsewhere in the body. This type is sometimes classified as alcoholic polyneuritis or toxic neuritis. It may be associated with bacterial infections, alcoholism, gastrointestinal disease or a deranged carbohydrate metabolism. In some cases it is possible that the deficiency is due less to an insufficient supply of the vitamin than to inadequate absorption.

4 The state of moderate deficiency of vitamin B_1 is usually unrecognized clinically. The symptoms include localized, persistent pain, usually in an extremity or in the back, and anorexia. Paresthesia is frequently present. There is little or no weakness. This condition is usually associated with obesity and a disturbed carbohydrate metabolism. It is frequently classified as diabetic or metabolic neuritis.

5 The least severe stage, mild deficiency of vitamin B_1 , also goes unrecognized. There are vague pains, usually elicited only by pressure over the nerve roots, general malaise, anorexia and constipation. Small amounts of sugar may be present in the urine, without hyperglycemia. There is usually a large carbohydrate intake, often associated with a tendency to obesity. These cases are frequently classified as potential diabetes.

At the present time, as already stated, only the most severe forms of B_1 avitaminosis are wont to receive clinical recognition. In view of the frequent occurrence of lesser degrees of B_1 deficiency, as indicated by an accumulating mass of evidence, a concerted effort should be made to clarify the clinical boundaries that demarcate its various stages. This requires extended research, which will yield reliable results only if known quantities of the pure substance are used in therapeutic

tests. As an aid to further study, the pathologic states in which we believe the administration of vitamin B_1 is indicated are presented.

- 1 Beriberi
- 2 Suspected beriberi
- 3 Polyneuritis
 - (a) Alcoholic.
 - (b) Infectious
 - (c) Toxic.
 - (d) So-called metabolic.
 - (e) Associated with anemia
 - (f) Associated with pregnancy
- 4 Disturbances of the carbohydrate metabolism (including cases now classified as diabetes mellitus)
- 5 Localized neuritis, resistant to usual therapy
- 6 Unexplained anorexia and gastro-intestinal hypotonia

CONCLUSIONS

1 There is evidence to suggest frequent deficiency of vitamin B_1 in the human dietary.

2 At the present time only the state of extreme vitamin B_1 deficiency is usually diagnosed. Lesser degrees of B_1 avitaminosis in human beings rarely receive clinical recognition.

3 Experimental results indicate that amounts of B_1 greater than the quantity necessary to protect against extreme deficiency (i. e., beriberi) produce beneficial effects in lesser deficiencies in both animals and man.

4 Results of a previous study indicate a relationship between vitamin B_1 deficiency and disturbances of the carbohydrate metabolism.

5 In a study of 100 cases of clinical neuritis in which vitamin B_1 was administered orally, forty-four were rendered symptom free, forty-eight were improved and eight showed no benefits.

6 In a group of eight cases of unexplained gastro-intestinal hypotonicity and anorexia, six became free from all symptoms on ingestion of vitamin B_1 , two were improved.

7 The use of a single agent—pure vitamin B_1 —is urged in the study and treatment of suspected B_1 avitaminosis.

145 West Fifty-Eighth Street

ABSTRACT OF DISCUSSION

DR. FREDERICK F. TISDALL, Toronto. So many of us have been accustomed to thinking of a deficiency of vitamin A as showing itself only as xerophthalmia, of B_1 as beriberi, of C as scurvy or of D as rickets, that we frequently lose sight of the fact that a relative deficiency of any one of these vitamins, if carried on over a sufficient length of time, will result in other and just as important signs of ill health. The authors have reported that in 100 cases of nerve pain they obtained improvement and cure by the administration of crystalline vitamin B_1 . How is it that any one could run into such a large number of cases that have formerly not been recognized in which there is a deficiency of this food element? At the Department of Pediatrics of the University of Toronto we took two groups of children in one institution and fed to one group a small amount of a vitamin B_1 and B_2 concentrate and observed their growth. These children were on an excellent diet the same as any one might recommend to one's patients, built up around milk, meat, eggs, vegetables and fruit. The normal children getting the additional B_1 and B_2 grew at a considerably faster rate than those not getting it. This is evidence that children on our present-day excellent diet are not getting an optimal amount of this food element. In view of the fact that in one's diet today from 30 to 40 or even 50 per cent of the calories consumed are supplied by purified food substances, purified flours and sugars that contain no vitamin B_1 , it is obviously deficient in this vitamin. Although vitamin B_1 is widely dis-

tributed in milk, eggs, liver, kidney, vegetables and fruit, it is not abundantly distributed. The work done has shown that in the cooking of vegetables more than 50 per cent of the B_1 vitamin present may be lost. It is not destroyed by heat, but it is destroyed by going into solution in the water that is thrown away. When one stops to consider that the diet is made up of from 30 to 50 per cent of food that contains no vitamin B_1 and from food cooked in water that is thrown away, one can see how the amount of vitamin B_1 necessary for optimal health is not obtained.

DR. MARTIN G. VORHAUS, New York. I want to add one point to the discussion of the frequency of B_1 deficiency. It is one of the few vitamins that the experimental workers in the field believe is not stored in the body, so that, without the normal protection of storage that exists with other vitamins, the probability of a deficiency state is that much more frequent, secondly, experimental workers have shown, and our clinical experience is along the same line, that there is some relation between the degree of carbohydrate intake and the utilization of the vitamin, i. e., the larger the carbohydrate intake, the greater the demand for vitamin B_1 in the human and animal body. Consequently a depletion of B_1 will take place more rapidly on a high carbohydrate diet than it will on a low carbohydrate diet.

DIURETIC ACTION OF POTASSIUM SALTS

NORMAN M. KEITH, MD
AND
MELVIN W. BINGER, MD
ROCHESTER, MINN.

For two centuries certain potassium salts have been employed as diuretics in clinical medicine. In 1679 Thomas Willis¹ recommended the use of potassium nitrate or "salt of niter" in the treatment of dropsy. Wilks and Taylor² used it successfully in 1863. In 1921 Blum³ and Magnus-Levy⁴ were able to show that potassium chloride could be administered safely by mouth in relatively large doses and that it produced frequently a satisfactory diuresis. Since then, McCann and his co-workers,⁵ Osman⁶ and Barker⁷ have obtained similar results with potassium citrate, bicarbonate and chloride. Barker emphasized the importance of giving a diet in which the sodium content was low and that of potassium relatively high. It occurred to us in 1932 that potassium nitrate might be the salt of choice, if potassium itself should have an additional diuretic action to the well known effect of the nitrate radical. We then outlined the present study, which included observations on the relative effect of different potassium salts in both the normal individual and patients having various types of dropsy.

From the Division of Medicine the Mayo Clinic. Owing to lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the authors' reprints.

Read before the Section on Pharmacology and Therapeutics at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

¹ Willis, Thomas. *Pharmaceutice Rationalis*. London: C. Dring & C. Harper and J. Leigh, 1679, p. 74.

² Wilks, Samuel and Taylor, A. S. A Case in Which a Large Quantity of Nitrate of Potash Was Taken Medicinally. *Elimination of This Salt by the Urine*. With Remarks. *Guy's Hosp. Rep.* 9: 173-179, 1863.

³ Blum, Léon. Recherches sur le rôle des sels alcalins dans la pathogénie des œdèmes. *Action diurétique du chlorure de potassium*. *Presse méd.* 28: 685-688 (Sept. 29) 1920.

⁴ Magnus-Levy, A. Alkalichloride und Alkalikarbonate bei Oedemen. *Deutsche med. Wchnschr.* 46: 594-596 (May 27) 1920.

⁵ Basset, Samuel, Elden, C. A., and McCann, W. S. The Mineral Exchanges of Man. II. Effect of Excess Potassium and of Calcium on Two Normal Men and on an Edematous Nephritic. *J. Nutrition* 5: 1-27 (Jan.) 1932.

⁶ Osman, A. A. Studies in Bright's Disease. The Use of Alkalies in the Treatment of Bright's Disease and Their Prophylactic Value in This and Other Conditions Associated with Impairment of Renal Function. *Guy's Hosp. Rep.* 77: 386-435 (July Oct.) 1927.

⁷ Barker, M. H. Edema as Influenced by a Low Ratio of Sodium to Potassium Intake. *Clinical Observations*. *J. A. M. A.* 98: 2193-2197 (June 18) 1932.

ACTION OF POTASSIUM SALTS ON THE NORMAL INDIVIDUAL

In previous studies⁸ on the action of acid-forming salts our procedure was to give normal individuals a measured amount of a given salt under strict experimental conditions and to compare the urinary output of water and other constituents with that in control periods before and after the ingestion of the salt. The weighed diet was low in water and mineral content, particularly as to chloride and sodium. It was calculated to be sufficient in calories and protein to keep the individual in nitrogen balance. The intake of fluid, in addition to that in the food, was limited to 800 cc daily. The experiment extended over a period of from ten to four teen days, a specific salt being given on five of these days. The potassium salts given were potassium chloride, bicarbonate, nitrate, acetate and citrate. Sodium chloride was given in a single experiment, chiefly to bring out by contrast the relative effects of the potassium and sodium radicals. The salts were administered in 25 per cent solution in a single dose of from 7.5 to 14 Gm. (0.13 to 0.2 Gm. per kilogram of body weight). All five potassium salts produced diuresis with loss of weight (charts 1 and 2).

The sudden decrease in the excretion of water and minerals after discontinuing administration of the salt was a striking finding in each experiment. The nitrate caused a relatively greater diuresis than any of the other salts. The chloride was next in efficiency, and still less efficient were the bicarbonate, acetate and citrate. The nitrate also caused a greater excretion of chloride and sodium than the bicarbonate, acetate and citrate. Potassium was readily excreted after the ingestion of all five salts.⁹ The concentration rose from 0.50 to 0.96 Gm. per hundred cubic centimeters. Thus even with diuresis the normal kidney excreted a urine in which the concentration of potassium reached a figure approximately fifty times greater than that of the blood serum. Such results indicate that potassium concentration by the kidney is similar to that of creatinine, urea and sulphate. It is obviously concentrated in a much greater degree than sodium. The excretion of calcium remained unaltered throughout these experiments. A decrease in ammonia nitrogen, and an increase in the excretion of bicarbonate along with a rise in pH , invariably occurred after the ingestion of potassium bicarbonate, acetate and citrate. These results are similar to those reported with sodium bicarbonate, carbonate and citrate.¹⁰ Changes in the excretion of total nitrogen and inorganic sulphates and phosphates were not uniform and were difficult to interpret. Each twenty-four hour specimen was tested qualitatively for protein, and the result was invariably negative.

The results in subject V (chart 1) after taking sodium chloride are in sharp contrast to those after taking potassium salts. There is an early retention of water, chloride and sodium with a gain in body weight. Later there is an increased excretion of these con-

⁸ Keith, N. M. and Whelan, Mary. A Study of the Action of Ammonium Chloride and Organic Mercury Compounds. *J. Clin. Investigation* 3: 149-202 (Oct.) 1926. Keith, Whelan and Baunick.¹¹

⁹ Potassium was estimated by the Kramer and Tisdall methods in blood serum and urine. Any serum suggesting the presence of hemolysis was discarded (Kramer, Benjamin and Tisdall, F. F. A Clinical Method for the Quantitative Determination of Potassium in Small Amounts of Serum, *J. Biol. Chem.* 46: 339-349 [April] 1921. Tisdall, F. F. and Kramer, Benjamin. Methods for the Direct Quantitative Determination of Sodium, Potassium, Calcium and Magnesium in Urine and Stools. *Ibid.* 48: 1-12 [Sept.] 1921).

¹⁰ Stadelmann, Ernst. Ueber den Einfluss der Alkalien auf den menschlichen Stoffwechsel. Stuttgart: F. Enke, 1890, 176 pp.

stituents and a slight fall in weight. These results simply confirm many similar previous experiments with sodium salts.¹¹

In all of our eight experiments with normal individuals (colleagues who kindly consented to undergo the tests), the serum potassium was estimated before the ingestion of the given salt, sometime during its ingestion, and after its administration was discontinued

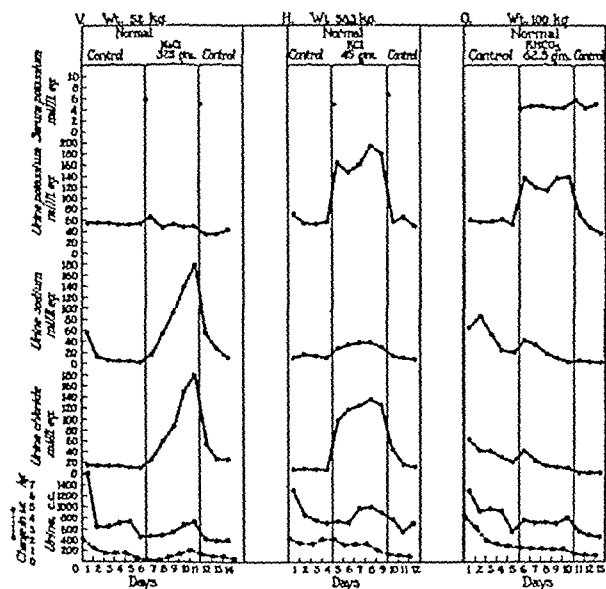


Chart 1—Normal subjects V, H and O showing daily excretion of water, chloride, sodium and potassium in the urine and the concentration of potassium in the serum after they had ingested sodium chloride, potassium chloride and potassium bicarbonate.

The sample of serum was withdrawn in the morning at the end of the twenty-four hour period. No change was observed in the serum of subject V, who received sodium chloride. This constituted a control for the seven individuals who were given potassium salts. In the latter, the potassium of the serum either rose a few milligrams or, as in M (chart 2), T and H (chart 1), increased distinctly to 33, 37 and 40 mg per hundred cubic centimeters, or 84, 95, 102 milliequivalents, respectively.¹² No toxic symptoms were noted in any of the seven individuals. Thus, in seven normal subjects under the same experimental conditions, including diet and intake of fluid, the potassium was readily absorbed and excreted, yet the concentration of the serum varied only from 20 to 40 mg per hundred cubic centimeters (51 to 102 milliequivalents). Further study is necessary to explain these variations in the concentration of the serum.

In order to study the initial effects produced by administration of potassium salts, two short experiments, nine hours in duration, were carried out with two normal individuals, K and B (chart 3). No food was taken for twelve hours preceding or during the experiment, however, 600 cc of water was ingested during the experiment. A control specimen of urine was collected from 7 to 8 a. m. At 8 a. m., 125 Gm of potassium acetate or nitrate was ingested and specimens of urine were collected at 8 15, 8 30, and 9 o'clock, and subsequently at hourly intervals for the next seven hours. Specimens of venous blood were

withdrawn frequently during the experiment. After potassium acetate was taken by subject K there was an increase in the renal excretion of water, chloride, carbonate and potassium, the p_H of the urine rose from 5.9 to 8.3. The changes in the blood were a small increase in the carbon dioxide capacity of the plasma, from 62 to 69 volumes per cent, and a slight rise in the serum concentration of potassium, from 18 to 20 mg per hundred cubic centimeters, 46 to 51 milliequivalents. The concentration of potassium in the urine rose to 0.95 Gm per hundred cubic centimeters, or fifty times that of the serum. After deducting the probable excretion of potassium by a starving individual, estimated from the excretion on the first day of a prolonged fast by Benedict's subject,¹³ this individual excreted 49 per cent of that ingested in eight hours.

The experiment with subject B was similar in every detail to that with K with the single exception that the same amount of potassium nitrate was ingested instead of potassium acetate. The results were in many respects similar, although there was a relatively greater diuresis and a greater excretion of chloride and potassium than in the previous experiment. The p_H did rise, but it fluctuated quite markedly from specimen to specimen. The changes in the blood were (1) a slight decrease in the carbon dioxide capacity of the plasma, from 66 to 55 volumes per cent, and (2) a small rise in the concentration of potassium in the serum from 18 to 23 mg per hundred cubic centimeters (46 to 59 milliequivalents). The maximal concentration of potassium in the urine was 0.76 Gm per hundred cubic centimeters, or forty-two times that of the serum. This is a slightly lower figure than in the previous experiment and is probably to be accounted for by the greater

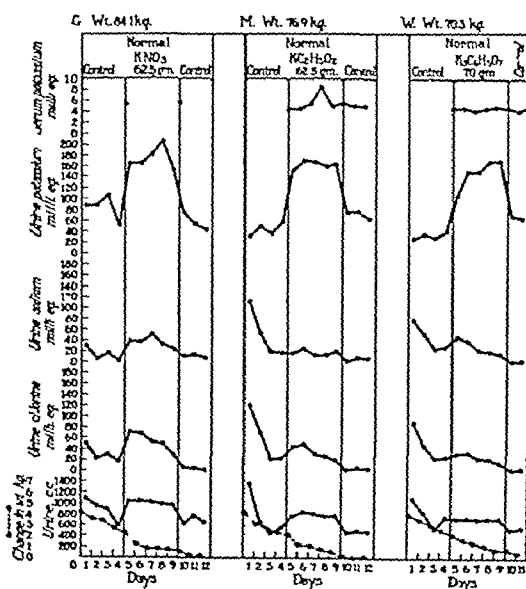


Chart 2—Normal subjects G, M and W showing daily excretion of water, chloride, sodium and potassium in the urine and the concentration of potassium in the serum after they had ingested potassium nitrate, potassium acetate and potassium citrate.

increase in the volume of urine. The calculated percentage excretion of potassium ingested was 64. A routine qualitative test for protein was made in each specimen of urine in these two experiments, and no protein was demonstrated.

¹¹ Blum, Leon. Ueber die Rolle von Salzen bei der Entstehung von Oedem. Verhandl. d. Kongr. f. inn. Med. 122:126, 1909. Meyer, L. F. Verhandl. d. Versamml. d. Gesellsch. f. Kinderh. 14:1909.

¹² Twenty milligrams per hundred cubic centimeters of potassium a mean normal figure = 51 milliequivalents per liter.

¹³ Benedict, F. G. A Study of Prolonged Fasting. Washington: Carnegie publication 203, 1915.

These two short experiments indicate that potassium salts are promptly absorbed and readily excreted and that the changes in blood and urine are very similar to those obtained in the previous experiments extending over a period of several days

ACTION OF POTASSIUM SALTS ON PATIENTS WITH EDEMA

During the last three years we have administered potassium salts to sixty patients with edema. Twenty-nine patients had chronic nephritis with edema, twenty had myocardial degeneration with decompensation, seven had cirrhosis of the liver with ascites and edema, one had polyserositis with tuberculosis of the peritoneum, and in three cases there was edema of indeterminate origin. The diuretic results were very satisfactory in twenty-nine cases (48 per cent), fair in twenty (33 per cent), and a failure in eleven (18 per cent). An increased urinary output was thus observed in 80 per cent of the cases. In four cases

sweat obviously could not account for this marked discrepancy between intake and urinary output. This result suggested replacement of sodium by potassium in the tissues. Throughout diuresis the daily excretion of protein in the urine was from 1.5 to 5.2 Gm per hundred cubic centimeters.¹⁴ At the time the patient was free from edema, the analysis of the chemical constituents of the blood indicated a slight reduction in the plasma alkali reserve, but otherwise there was an improvement in renal function. In spite of a retention of potassium the rise in serum concentration was slight.

CASE 2 (subject G, chart 4)—A woman, aged 24, gave a history of albuminuria for one year and of general edema for six months. On examination there was no gross anemia, but there was slight puffiness of the eyelids and moderate edema of the lower part of the back and legs. The blood pressure in millimeters of mercury was 105 systolic and 75 diastolic, and the ocular fundi appeared normal. Routine urinalyses revealed a heavy precipitation of albumin, a few hyaline casts and a few leukocytes, but no erythrocytes. Values for certain constituents of the blood are given in the table. A diagnosis of chronic glomerulonephritis with features of chronic lipid nephrosis was made.

Results of Examination of the Blood of Various Subjects

| Sub- ject | Chart | Potassium Salt Given | Diuresis | Plasma | | | | | | | | | | | |
|--------------|-------|-------------------------|---------------------------|-------------------------------------|---------------------------|--------------------------------|--|--|--------------------------------------|-----------------------------|-----------------------------------|------------------------------|----------------------------|------------------------------------|------------------------------|
| | | | | Whole Blood | | | Carbon Dioxide Com- bining Power | Serum | | | | | | | |
| | | | | Hemo- globin Gm per 100 Cc | Urea, Mg per 100 Cc | Chloride * Mg per 100 Cc | | Nitrate Nitrogen, Mg per 100 Cc | Choles- terol Mg per 100 Cc | Protein Gm per 100 Cc | Albu- min, Gm per 100 Cc | Sulphate Mg per 100 Cc | Sodium Mg per 100 Cc | Potas- sium Mg per 100 Cc | Calcium, Mg per 100 Cc |
| A | 4 | Potassium chloride | Before During After | 11.1 42 40 | 72 668 627 | 627 40 43 | 47 40 43 | | 340 263 | 4.1 3.6 | 1.7 0.9 8.5 | 11.0 8.4 8.5 | 330 340 | 24 23 | |
| G | 4 | Potassium nitrate | Before After | 14.0 22 | 20 58.5 | 627 50 | 50 4.1 | 512 | 4.0 4.3 | 1.0 1.9 | 6.0 | | 318 | 19 | 8.1 |
| S | | Potassium nitrate | Before During After | 12.0 21 14.4 | 22 627 618 | 627 48 54 | 47 48 54 | 0.7 | 133 3.1 181 | 2.7 1.9 | 1.4 4.3 5.6 | 3.5 4.3 5.6 | 357 301 226 | 18 24 18 | 6.5 8.1 8.5 |
| Pe † | 5 | Potassium chloride | Before During After | 13.7 13.5 | 22 22 | 585 593 | 51 46 | | | | | 5.2 5.6 | 310 310 327 | 20 37 20 | |
| Pw | | Potassium nitrate | Before After | 13.7 83 | 40 660 601 | 40 53 | | 470 | 3.4 | 1.2 | 6.8 | | 10 | | |
| B | 6 | Potassium nitrate | Before After | | 100 20 | | | | | | | | | | |

* Calculated as NaCl
† Very slight or no diuresis occurred in this case (chart 5)

quantitative studies similar to those just described for normal subjects were carried out

CASE 1 (subject A, chart 4)—A youth, aged 19 years, who had had albuminuria and edema for five weeks, was given potassium chloride. Preliminary examination showed that he had a moderate degree of general edema, some anemia, with a hemoglobin concentration of 11.1 Gm per hundred cubic centimeters, and erythrocytes numbering 3,560,000 per cubic millimeter. The urinary changes were characteristic of sub-acute glomerulonephritis and there were definite renal functional disturbances. The blood pressure was usually normal and the ocular fundi showed no abnormalities. The values for certain constituents of the blood are given in the accompanying table.

Following the exhibition of a weighed diet consisting of from 1,600 to 2,500 calories, 40 to 50 Gm of protein, a low mineral and water content, 600 cc of extra fluid, and 105 Gm of potassium chloride in thirteen days, the edema disappeared and the patient's weight decreased 24 pounds (11 Kg). Diuresis was indicated by a rise in the daily volume of urine from 600 to 1,480 cc. There was an increased excretion of chloride, sodium and potassium. The potassium concentration rose to 0.41 per cent, seventeen times the concentration in the serum. The total output of sodium was relatively much greater than that of potassium. The comparatively small urinary output of potassium indicated that potassium was retained in considerable quantity. The amount of potassium excreted in the stools and

Treatment consisted of a weighed diet of 2,500 calories, 77 Gm of protein, a low mineral and water content and 600 cc. of extra fluid, and potassium nitrate, 12 Gm. (0.2 Gm. per kilogram of body weight) daily. Mild diuresis followed, with a loss of weight of 15 pounds (6.8 Kg) in five days. The patient was now free from visible edema. The diuresis was accompanied by a considerable increase in the excretion of potassium, chloride and nitrate, but by a relatively small increase in sodium. The concentration of potassium rose to 0.95 Gm. per hundred cubic centimeters, or fifty times that of the serum. These results in regard to the relative amounts of sodium and potassium excreted are somewhat the reverse of the results in case 1 (subject A). The excretion of calcium was extremely small. The daily output of protein was considerable, varying from 5.2 to 8.2 Gm. Both in this and in the previous case the presence of a considerable amount of protein in the urine did not seem to hinder the diuretic response, nor was the function of the kidney further impaired. At the termination of diuresis the changes in the blood were a slight retention of nitrate, without retention of potassium or a notable shift in the alkali reserve.

CASE 3 (subject S in the table)—A married woman, aged 35, complained chiefly that for six months she had had edema of the feet, legs and face. On physical examination there was no

14 The protein in the urine was determined by subtracting the non-protein nitrogen from the total nitrogen and by multiplying the result by 6.25. The nonprotein nitrogen was estimated after precipitating the protein with Folin's tungstic acid reagent.

demonstrable anemia. The blood pressure was 100 systolic and 60 diastolic. There was definite edema of the feet, legs and lumbosacral region, reaching as high as the eighth thoracic vertebra. Further studies showed that there were no abnormal constituents in the urine, which included examination for lipid bodies. The basal metabolic rate was +2. The serologic test for syphilis was negative. All tests of renal function gave normal readings. However, the concentration of serum protein was very greatly reduced, to 27 Gm, the albumin content to 14 Gm and the calcium content to 65 Mg per hundred cubic centimeters, as shown in the table. Edema fluid obtained through a needle inserted in the leg was water clear and contained only 0.1 per cent of protein. A diagnosis of an indeterminate type of edema associated with hypoproteinemia was made.

Treatment consisted of a weighed diet of approximately 2,000 calories, from 80 to 100 Gm of protein, and a low mineral and water content. Extra fluid was limited to 800 cc. Nine grams of potassium nitrate was administered daily for fourteen days and, because of the low serum calcium from the fifth to the fourteenth day, 12 Gm of calcium lactate was also given daily. On this regimen diuresis developed, the volume of urine varying from 900 to 2,080 cc. There was an increased excretion of chloride, nitrate, sodium and potassium. The concentration of potassium increased to 0.41 Gm per hundred cubic centimeters, seventeen times that of the serum. A slight increase in calcium output occurred. No demonstrable amount of protein was excreted during this experimental period. When the patient became edema free, she had lost 14 pounds (6.4 Kg).

The noticeable changes in the blood were the considerable rise in serum protein and albumin and calcium contents. During diuresis the serum potassium rose to 24 mg per hundred cubic centimeters (6.2 milliequivalents), but it fell to 18 mg (4.6 milliequivalents) at the termination of the diuresis. Similarly, the plasma nitrate rose to 0.7 mg per hundred cubic centimeters during diuresis.

CASE 4 (subject Pe., chart 5)—A man, aged 58, a city clerk, had always been a heavy drinker of alcohol, and five months before admission the abdomen had become swollen. During the last four months abdominal paracentesis was performed on five occasions, several liters of fluid being drained at each operation. The patient's ankles had been swollen for three

25 mg per hundred cubic centimeters (direct reaction). A provisional diagnosis of hepatic insufficiency, cirrhosis (?) ascites and left pleural effusion was made. The etiology of the patient's disease remained obscure. Treatment consisted of paracentesis of the left pleural cavity on three occasions and of the abdominal cavity twice. Fluid in the amount of 12,500 cc was removed in this manner. After paracentesis a firm edge presumably of the liver, was palpated 6 cm below the right costal margin.

The results of examination of the blood are given in the table.

For a period of twelve days the patient was given a weighed diet consisting of from 1,335 to 2,350 calories, 35 to 49 Gm of protein, and a low intake of minerals and water. Extra fluid was limited to 800 cc. The patient also ingested potassium chloride, 5 Gm daily. On this regimen there was a loss in weight of 2 Kg, probably due to withdrawal of 1,000 cc. from the left part of the chest and 2,500 cc from the peritoneal cavity, a decrease in the dependent edema and at times a slight increase in the volume of urine but no actual and steady diuresis. The excretion of chloride and potassium was increased, the concentration of the latter rising to 0.6 Gm per hundred cubic centimeters. The excretion of sodium was very small and was uniform throughout. On the seventh day the serum potassium rose to 37 mg per hundred cubic centimeters (9.1 milliequivalents), but later fell to the initial figure of 20 mg (5.1 milliequivalents). In this case there occurred a distinct retention of potassium and a slight decrease in the alkali reserve, even though the dose of potassium chloride was small.

Two further cases are of interest because of the excellent diuretic response obtained. Detailed chemical analyses of the urine were not made as in the previous four cases.

CASE 5 (subject Pw in the table)—A farmer, aged 39, when admitted to the clinic stated that his illness had begun eight months previously with general edema and albuminuria. A diagnosis of chronic glomerulonephritis with edema was made.

CASE 6 (subject B., chart 6)—The patient was a rancher, aged 56. A diagnosis of myxedema, myocardial degeneration with decompensation and renal insufficiency was made.

DOSE OF POTASSIUM SALTS

The amount of a given salt administered in order to produce diuresis is considerably greater than the dose given in the United States and British pharmacopoeias. Taking 12.5 Gm of potassium nitrate as a useful standard daily dose, we gave to normal individuals, for comparative purposes, approximately its atomic equivalent of the other potassium salts. The content of potassium was about 5 Gm. This amount has been the usual maximal dose given to patients with edema. However, subject H was given 24.5 Gm of potassium salts, 12 Gm of nitrate, and 12.5 Gm of the bicarbonate, daily, for a period of thirteen days. The

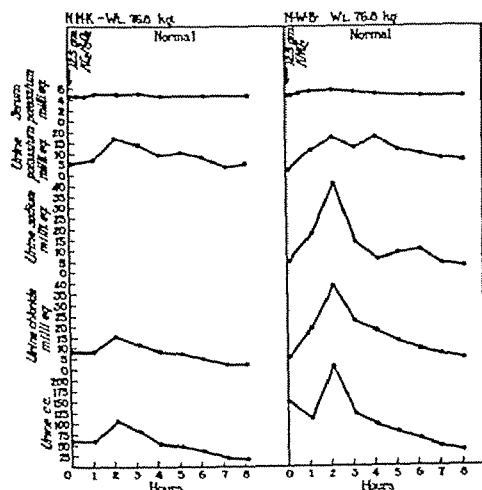


Chart 3—Normal subjects K and B showing hourly excretion of water, chloride, sodium (B) and potassium in the urine and the concentration of potassium in the serum after they had ingested potassium acetate and potassium nitrate.

months. On examination there was evidence of fluid in the left pleural cavity, marked ascites was present, and there was moderate edema of the lumbosacral region and of the legs. There were no definite evidences of myocardial insufficiency. Secondary anemia was slight. Routine urinalyses and tests of renal function were essentially normal. The serologic test for syphilis was negative. The dye test of hepatic function revealed marked retention in the blood, and the serum bilirubin was

potassium content amounted to 9.5 Gm daily. No ill effects were observed. Similar maximal daily doses of the chloride, nitrate, bicarbonate, acetate and citrate have been successfully employed previously by Blum,³ Wilks and Taylor,² Nonnenbruch,¹⁵ Fleckseder,¹⁶ and Basset, Elden and McCann.⁵ Their doses varied from 16.5 to 30 Gm of the salt and from 6.6 to 13 Gm of potassium.

Caution must be used in administering these large doses, and all are agreed that smaller trial doses should

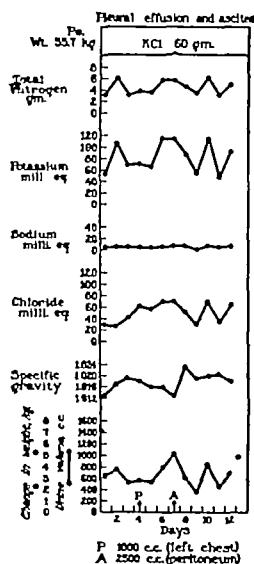


Chart 5—Subject Pe, showing daily excretion of water, chloride, sodium, potassium and total nitrogen in the urine after ingestion of potassium chloride. Para centesis of left pleura at P and of peritoneal cavity at A.

effect is similar to that of the acid-producing salts and organic mercury and these salts and caffeine compounds.

TOXIC ACTION

Potassium salts, when injected intravenously into animals, can cause rapid toxic effects, particularly on the heart. The experiments of Blake,¹⁷ Grandeau¹⁸ and Traube¹⁹ carried out years ago are often quoted to emphasize this fact. Mathison²⁰ in 1911 was able to show that potassium chloride, when injected into the central portion of the carotid artery of the cat, not only was less toxic but actually caused a rise in blood pressure in contrast to a fall after intravenous injection. He attributed the toxic action after intravenous injection to the high concentration of potassium, which almost at once reaches the heart muscle. Amberg and Helmholz²¹ in 1916 determined the toxicity of intravenously injected potassium chloride and sulphate in the guinea-pig. They found that the lethal dose was

very small, from 10 to 17.5 mg per hundred grams of body weight, when the solutions, 1 per cent potassium chloride and 1.75 per cent sulphate, were injected at the rate of 1 cc per minute. A much larger dose was necessary to kill the animal if it had received a previous injection of sodium chloride. In 1925 Whelan,²² studying some biochemical effects of intravenously injected chlorides in dogs, noted that seven animals, when given 0.1 Gm of potassium chloride per kilogram of body weight, in ten minutes showed no obvious toxic effects. Such results seem to show that slowing the rate of injection is an important factor in protecting the heart from too concentrated a solution of the potassium salt. Two experiments reported by Nicholson and Soffer²³ early this year also support the view that slow intravenous injections can be much better tolerated than rapid ones.

What is the concentration of potassium in the blood serum that is toxic to the heart? McLean, Bay and Hastings²⁴ have recently carried out a series of perfusion experiments on the isolated heart of the rabbit and found that when the concentration of potassium in the perfusion fluid was increased to 48 mg per hundred cubic centimeters (120 milliequivalents per liter) ventricular fibrillation and minimal ventricular contractions were observed. These results support Cushny's statement²⁵ that a concentration of potassium in the serum of greater than about 50 mg per hundred cubic centimeters (128 milliequivalents) is highly poisonous to the heart. The highest concentration of potassium in the serum of our normal controls and of patients when taking potassium salts has been 40 mg per hundred cubic centimeters (102 milliequivalents), or well under this figure. Rabinowitch,²⁶ however, reported serum concentration of 58 and 72 mg per hundred cubic centimeters (149 and 185 milliequivalents) in two cases, one of eclampsia and the other of uremia, but he does not mention any outspoken and noticeably toxic effect on the heart. Magnus-Levy⁴ and others have stressed

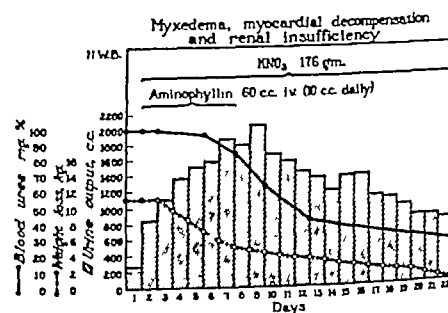


Chart 6—Subject B showing daily volume of urine and changes in blood urea and body weight after ingestion of potassium nitrate.

that toxic effects produced during a perfusion experiment may not necessarily occur in the intact animal.

We believe that the results of experimental studies on animals contraindicate, at present at least, the intravenous administration of any considerable amount of

15 Nonnenbruch W. Diurese. Sonderdruck aus klinische Fortbildung, Neue deutsche Klin 1: 697-764, 1933.

16 Fleckseder Rudolf. Gebrauchliche Diuretika und ihr Anwendungsgebiet für den praktischen Arzt, Wien klin Wchnschr 41: 816-818 (June 7) 1928.

17 Blake J. Observations on the Physiological Effects of the Various Agents Introduced into the Circulation as Indicated by the Haema dynamometer. Edinburgh M J 51: 330-345 1839.

18 Grandeau Louis. Experiences sur l'action physiologique des sels de potassium, de sodium et de rubidium injectés dans les veines. Robin J anat 1: 378-385 1864.

19 Traube, L. Ueber die Wirkung des salpetersauren Kali auf das Herz. Berl klin. Wchnschr 1: 250 (June) 1864.

20 Mathison G C. The Effect of Potassium Salts upon the Circulation and Their Action on Plain Muscle. J Physiol 42: 471-494 (July 15) 1911.

21 Amberg S and Helmholz H F. The Detoxifying Action of Sodium Salts upon Potassium Salts on Intravenous Injection. J Pharmacol & Exper Therap 8: 120 (Feb) 1916.

22 Whelan Mary. Effect of Intravenous Injection of Inorganic Chlorides on the Composition of the Blood and Urine, J Biol. Chem. 63: 585-620 (April) 1925.

23 Nicholson, William and Soffer L. J. Cardiac Arrhythmia in Experimental Supranal Insufficiency in Dogs, Bull Johns Hopkins Hosp 58: 236-243 (April) 1935.

24 McLean F C, Bay, E. B. and Hastings A B. On the Mechanical and Electrical Changes in the Isolated Heart of the Rabbit Following Changes in Potassium Content of the Perfusing Fluid, Am. J. Physiol., to be published.

25 Cushny, A. R. The Secretion of the Urine, London, Longman, Green and Co., 1926, pp 191.

26 Rabinowitch I M. Relative Proportions of Sodium, Potassium, Calcium and Magnesium in Blood Plasma in Renal Disease, J Biol. Chem 62: 667-673 (Jan) 1925.

potassium salts in clinical medicine. On the other hand we have shown that normal individuals can take a large dose of a potassium salt by mouth without demonstrable toxic effects. Many observers have given really enormous doses of potassium salts for a considerable period to patients with edema and no untoward effects have occurred. In our present series subject H, previously mentioned, took by mouth 871 Gm of potassium salts (358 Gm of potassium) in a period of sixty-eight days. The patient during this entire period took the diet and potassium salts regularly, the salts including potassium nitrate, chloride and bicarbonate. There were no complaints and no definite toxic symptoms. These large doses of potassium salts failed to establish satisfactory diuresis but produced a condition favorable for the accumulation of potassium in the body. However, the rise of potassium in the serum was very small, 26 mg per hundred cubic centimeters (6.6 milliequivalents), on the thirty-ninth day, and 24 mg (6.2 milliequivalents), on the sixty-eighth day.

Even the aforementioned large doses of potassium by mouth are often exceeded by normal individuals whose diet includes large quantities of food rich in potassium. Bunge²⁷ stated that certain Irish laborers eating chiefly potatoes and certain African tribes living on native foods may ingest as much as 50 Gm of potassium daily without toxic symptoms. The daily ration of our hospital diets contains from 3 to 5 Gm of potassium. The comparative safety with which one can administer food containing potassium and potassium salts by mouth is probably due to several factors, the most important being the rate of absorption from the intestine into the portal system, the dilution or detoxification of the salts in the blood stream or during their passage through the liver, and their rapid excretion by the kidney.

Magnus-Levy,⁴ Blum⁵ and Smellie²⁸ reported toxic effects in a few patients with cardiac decompensation and edema but no fatalities. Estimations of potassium in serum or urine were not made. We have found it difficult in the written descriptions of these few cases to eliminate entirely the possibility of independent accidents, such as coronary occlusion and acute myocardial failure, so that it is not possible to ascribe the symptoms definitely to potassium intoxication. Pilcher, Calhoun, Cullen and Harrison²⁹ have also shown that the potassium content of skeletal muscle is decreased in congestive heart failure and have administered potassium dibasic phosphate (up to 14 Gm daily) in such cases. In order to avoid any toxic effects, Blum⁵ and Magnus-Levy⁴ advise giving small, initial trial doses in this type of cardiac case, and this is undoubtedly a wise procedure. Up to the present we have never given potassium salts to a patient with extreme oliguria or anuria, or to one whose blood urea was greater than 100 mg per hundred cubic centimeters. In case 6 (subject B) a urea content of 100 mg per hundred cubic centimeters did not prevent satisfactory diuretic action. Small initial doses, advocated in cardiac cases, would also seem to be indicated in cases of dropsy with severe renal insufficiency. Bolliger and Breh³⁰ demonstrated

that in experimental chronic renal insufficiency in the dog the potassium concentration of the blood serum invariably rises. On the other hand, Rabinowitch³¹ found a remarkable variation in the concentration of potassium in the serum of patients in severe uremia. In one such case the concentration rose to 72 mg per hundred cubic centimeters (18.5 milliequivalents), but in several other cases with just as severe retention of urea and creatinine in the blood the values were normal. The distribution of potassium in the tissues of uremic patients would therefore appear to be regulated by factors other than simply a reduced permeability of the kidneys for potassium.

In the experiments of Amberg and Helmholtz just mentioned, a preliminary injection of sodium chloride made it necessary to increase the lethal dose of a potassium salt. Osman,⁶ in giving large amounts of alkalis to patients with edema, combined potassium and sodium salts in order to protect the patient against the possible toxic effects of potassium. These facts bring up the question as to whether the actual amount of sodium in the body is a determining factor in potassium poisoning. In adrenal insufficiency the amount of sodium is reduced both in the blood serum and in the tissues, while there is often an increase in the concentration of potassium in the serum. Potassium poisoning, therefore, has been suggested as a cause of the serious symptoms. No such toxic symptoms or relationship have been observed in the present study. The concentration of sodium in the serum varied from 285 to 374 mg per hundred cubic centimeters without any demonstrable relation to the potassium content. Rabinowitch's observations on uremic blood did not show any definite relationship between the sodium and the potassium content. Further experimental work in actual potassium toxemia is necessary to determine the relative significance of the potassium, the sodium and possibly the calcium content of the blood serum.

In any discussion of toxicity of potassium salts the action of the specific anion must be considered. One of us³¹ has described the possible toxic effects of the nitrate radical and how these can usually be prevented. The chloride ion has a stronger tendency than the nitrate ion to cause a shift in the acid-base equilibrium to the acid side. Undoubtedly the acid producing salts ammonium chloride and ammonium nitrate have produced an acidosis, with further reduction of renal function in certain types of renal disease.³² Potassium, bicarbonate, acetate and citrate cause an increased renal excretion of carbonate with a decided shift of the urinary p_H to the alkaline side, and we have not seen any definite harmful action from these effects. This observation agrees with previous clinical experience that potassium bicarbonate, citrate and acetate can be given safely in comparatively large doses.

COMMENT

These biochemical studies indicate that potassium is readily absorbed from the intestine, disappears quickly into the tissues, and can be rapidly excreted by the kidney. The small amount in the blood serum, even after ingestion of a considerable quantity, raises the question as to its manner of storage and subsequent liberation for excretion. The two chief storehouses of potassium are the erythrocytes of the blood stream and the cells of voluntary muscle. In health, any excess

27 Bunge G. Ueber die Bedeutung des Kochsalzes und das Verhalten der Kalisalze im menschlichen Organismus. *Ztschr f Biol* 9:104 1873.
28 Smellie W G. Potassium Poisoning in Nephritis. *Arch Int Med* 40:330-339 (Aug.) 1915.

29 Pilcher, Cobb, Calhoun J A, Cullen G E and Harrison T R. Studies in Congestive Heart Failure V. The Potassium Content of Skeletal Muscle Obtained by Biopsy. *J Clin Investigation* 9:191 196 (Oct.) 1930.

30 Bolliger Adolf and Breh Fritz. Ueber die Mineralstoffveränderungen des Blutes bei experimenteller Nephritis mit spezieller Berücksichtigung des Kalium Kalziumspiegels im Serum. *Zentralbl f inn Med* 49:825-831 (Sept. 1) 1928.

31 Keith N M, Whelan Mary and Bannick E G. The Action and Excretion of Nitrates. *Arch Int Med* 46:797-832 (Nov.) 1930.
32 Binger M W and Keith N M. The Effect of Diuretics in Different Types of Edema. *J A M A* 101:2009-2015 (Dec 23) 1933.

seems to be quickly removed from the blood serum and is then gradually excreted by the kidneys. Following depletion of potassium due to starvation and that seen in cardiac edema, there is retention with a refilling of the muscle storehouse. Was the potassium retention in case 1 (subject A) with anemia due to an analogous need for the refilling of the potassium storehouse in the erythrocytes? The efficiency with which the kidney concentrates potassium, at least fifty times, readily explains the rapid elimination of a great excess taken in the diet by eaters of potatoes, for example. The sustained high concentration in the urine in case 2 (subject G), in which there was a definite renal lesion, suggests that the ability of the kidney to excrete potassium may be maintained late in chronic nephritis in a similar way to its ability to eliminate creatinine. The much greater concentration by the kidneys of potassium than sodium may possibly be explained by less reabsorption of the former in the renal tubules.

Bunge²⁷ suggested that potassium and sodium may replace each other in the animal organism. The experimental evidence he gave was that the ingestion of potassium salts resulted in a definitely increased excretion of sodium in the urine. Our data reveal an increased excretion of sodium by some of our normal individuals and in case 1 (subject A), in the normal individual M and in cases 2 and 4 (subjects G and Pe respectively), however, the increase was insignificant. These results together with those of Miller³³ again emphasize the well known fact that potassium and sodium have certain independent biologic functions, as, for instance, the high concentration of sodium in blood serum and interstitial fluid in contrast to the small content of potassium, the high concentration of potassium in the erythrocytes with little or no sodium present, and also the initial retention of water with the ingestion of sodium salts in contrast to loss of water after taking potassium salts.

In the present study five potassium salts have been shown to cause diuresis. The cation potassium is readily excreted in each instance by the kidney, it also brings about a definite shift of the acid-base equilibrium in the urine toward the alkaline side. These two facts offer a possible explanation for its diuretic action. It should be pointed out, however, that of the five salts the nitrate produced the most marked effect, which emphasizes the importance of the anion as well as the cation in considering the diuretic action of a given salt.

Our clinical results with potassium salts have been encouraging. They confirm the results of the therapeutists of the last eighty years³⁵. We prefer potassium nitrate because, after its use, diuresis frequently occurs. In our experience it is less likely to cause toxic symptoms than ammonium nitrate. Its action, when combined with other diuretics, is also often satisfactory. Diuresis from potassium nitrate may be initiated more slowly and be of longer duration than that of other diuretics, but it is less likely to cause untoward effects. Organic compounds of mercury act more rapidly but in so doing may injure tissues, such as those of a diseased kidney. Potassium salts, more particularly the bicarbonate, acetate and citrate, produce a rapid shift in the acid-base balance, rendering the plasma and urine more alkaline. This action sug-

gests that these potassium salts may be more effective and less likely to cause edema in combating acidosis than sodium salts. They might also be used when a strongly alkaline urine is desired.

ABSTRACT OF DISCUSSION

DR HERBERT BARKER, Chicago. Drs Keith and Binger's paper brings out two points that are of special interest to me: that the potassium salts may be used in a variety of conditions for their diuretic effect and that they may be used in those conditions without fear of toxicity. Their report should aid in dispelling fears in connection with the administration of potassium to patients with renal disease. Five years' use of potassium chloride has not given any untoward effects except in possibly three instances. All three patients were suffering from advanced glomerular nephritis with edema, hypertension and nitrogen retention, so that there were many factors entering into the symptomatology. The symptoms in question were those of weakness and increased feeble heart action with a gallop rhythm. The blood potassiums at that time were 35, 35 and 40 mg per hundred cubic centimeters. These are the highest blood potassium readings I have obtained with doses ranging from 3 to 10 Gm daily. Doses as great as 60 Gm daily have been reported in the literature and the only untoward effects recorded are nausea, vomiting and diarrhea. I have had no experience with potassium nitrate. Chemically it should be effective when the acid base equilibrium is not greatly disturbed. My experience with potassium chloride has been largely confined to the chronic cardiac edemas of valvular and hypertensive vascular types. In these cases the reduction of chlorides in the body due to long standing salt restriction renders a diuresis very poor with diuretics, especially the mercurials. It is therefore especially important to administer chlorides, as the potassium or ammonium salts, until blood chlorides are raised to 500 mg or more per hundred cubic centimeters. I feel, therefore, that the mineral control of fluid balance, though relatively simple to operate, is often much more effective when blood chemical determinations are used to assist in choosing the proper salt for administration, and it is equally important as a guide to probable desirable changes from one salt to another as the course of the disorder progresses.

DR CARL H. GREENE, New York. A great deal of credit is due to the men who pointed out the relationship between water retention and salt metabolism in the body and demonstrated the clinical application of these facts in the management of cases of renal disease. When ammonium chloride and calcium chloride were first introduced it was believed that diuresis was due to the acidifying action of the chloride ion. When ammonium nitrate was introduced it was suggested that the nitrate ion perhaps had a specific diuretic action of its own. The diuretic action of potassium chloride, on the other hand, has been explained in part at least as the displacement of sodium salts in the body by potassium salts. I hope that the authors will tell us a little more with regard to their conclusions as to the relative importance of these various effects in determining the diuretic action of potassium nitrate. The administration of ammonium salts must be carried out with care to avoid unpleasant gastro-intestinal symptoms. How do the authors administer potassium nitrate and in what medium or vehicle? Do they consider that there are specific indications which would lead them to use potassium nitrate in a case instead of the other acid salts with which the profession is more familiar?

DR MELVIN W. BINGER, Rochester, Minn. Dr Greene has asked a difficult question regarding the point of action of potassium salts. I feel that there is certain displacement of sodium in the blood and in the tissues by potassium, but I do not feel that this is the total action of potassium as a diuretic. The red blood cells contain a larger percentage of potassium than the plasma. The plasma contains more sodium, and it is not known whether there is a shift in this balance in the administration of potassium salts. I rather feel that there is some shift in electrolytic ionization, although there may be a direct action on the kidney itself. Regarding the administration of potassium nitrate, we are using enteric-coated pills of 0.5 Gm., and we

33 Miller H. G. Potassium in Animal Nutrition. Influence of Potassium on Urinary Sodium and Chlorine Excretion. *J. Biol. Chem.* 55: 45-59 (Jan.) 1923.

35 Wood G. B. A Treatise on Therapeutics and Pharmacology or Materia Medica. Philadelphia J. B. Lippincott Company 2: 595 1856.

give from sixteen to twenty-four of these daily Potassium nitrate can be given in a 12 per cent solution, two tablespoonfuls three or four times a day, but it does upset the stomach and, if given on an empty stomach in a 12 or 25 per cent solution, it will cause irritation. In fact, the morning that I took 125 Gm (25 per cent solution) I developed severe abdominal cramps, which lasted about half an hour. Of course, it was on an empty stomach and double the concentration that is usually given. We advise patients to take potassium nitrate after their meals. They are put on a salt-free, low-fluid (from 800 to 1,000 cc) diet and usually 50 Gm of protein daily unless the serum protein is low, as in the nephrosis type of case. In such cases the protein intake is increased to 75 or 100 Gm daily.

PRIMARY ESOPHAGEAL CARCINOMA, WITH ESPECIAL REFERENCE TO A NONSTENOSING VARIETY

A CLINICOPATHOLOGIC STUDY BASED ON ONE
HUNDRED AND EIGHT NECROPSIES

ROBERT W. MATHEWS, MD

AND

TRUMAN G. SCHNABEL, MD

PHILADELPHIA

Recently, within a comparatively short period, autopsies revealed esophageal carcinoma in four patients who had not presented dysphagia, pain, regurgitation of food and vomiting, the characteristic symptoms. In the absence of the usual clinical picture presented by the disease, their physicians had not appreciated the presence of a new growth in the esophagus; they found some consolation for their failure in diagnosis, however, in the fact that the postmortem examination presented carcinomatous lesions which were nonstenosing and therefore did not obstruct the passage of food.

The evidence in these four cases prompted the undertaking of a clinicopathologic analysis of the Philadelphia General Hospital series of patients from 1920 to 1933. It was hoped that such a study might point the way to certain conclusions concerning the incidence of nonobstructive carcinomatous lesions in the esophagus, that distinguishing clinical evidences might be brought to light, that the relative degree of clinical and pathologic malignancy of stenosing and nonstenosing tumors might be illuminated, and that perhaps other important changes concerning both the obstructive and the non-obstructive variety might be revealed.

MATERIAL

During the thirteen year period approximately 260,000 patients were admitted to this institution. Of this number, 247 had carcinoma of the esophagus, making an admission rate of slightly less than 0.1 per cent. Two hundred and twenty-six of this group died in the hospital and the remainder died after being discharged. One hundred and eight came to autopsy, of this number twenty-two, or 20.3 per cent, exhibited a nonstenosing variety of lesion, and in eighty-six the lesion was certainly obstructive. The results of the clinicopathologic study of these autopsies are presented herewith.

SEX

The general admission records of this hospital show that 56 per cent are females. The general autopsy

record shows that 40 per cent are females. In this especial group of 247 patients presenting esophageal carcinoma, including both the 108 cases that came to autopsy and the 139 cases in which an autopsy was not done, 73 per cent were women. Among the number with obstructive tumors 58 per cent were women, and among the number with the nonobstructive variety of the disease 13.6 per cent were women.

AGE AND RACE

A majority of the patients were between 50 and 70 years of age. Among those with stenosing carcinoma 67 per cent were within this age range, and among those with the nonstenosing form 68 per cent were within the same range. In the first group the youngest patient was 42 and the oldest 85, while in the latter group the youngest was 35 and the oldest was 91.

There were eighty-four white (77.7 per cent), twenty-two Negro (20.3 per cent), and two Chinese (1.9 per cent) patients in the autopsy series of 108. Both the admission and the autopsy records show that 33.3 per cent were Negroes. In the entire series of 247, the percentage of Negroes was 11.5.

HISTORICAL DATA

The historical data obtained from these patients were much alike as to both the obstructive and the non-obstructive type. In the combined group the history of five patients showed familial cancer, and in the history of two patients there was a vague suggestion of it. The

TABLE 1—Incidence

| Sex | Stenosing | Nonstenosing |
|---------|-----------|--------------|
| Males | 61 | 15 |
| Females | 5 | 3 |

father of one patient had died of carcinoma of the esophagus. The histories as to previous illnesses, occupations and habits of life were so varied that they did not warrant definite conclusions. The fact that the group history was singularly free from evidence of alcoholism may be the more in point because the patients

TABLE 2—Metastases

| | Stenosing | Nonstenosing |
|-----------------|-----------|--------------|
| Number of cases | 80 | 22 |
| Regional nodes | 60 | 21 |
| Abdominal nodes | 34 | 10 |
| Lungs | 16 | 4 |
| Liver | 21 | 0 |

represented, generally speaking, a low economic and cultural level. It has been suggested, indeed, that hardship may be a predisposing factor in the development of cancer of the esophagus. Five of the autopsy group had positive Wassermann reactions and a few had pulmonary tuberculosis.

PATHOLOGIC CHANGES

The three gross anatomic types of esophageal carcinoma found at postmortem examination were:

First, a large fungating carcinoma which protruded into the lumen, producing obstruction with dilatation proximal to the new growth. This type was responsible for the well known clinical syndrome of obstruction.

Second, an annular type, often partially or completely surrounding the lumen of the esophagus, extending out-

ward and adhering to adjacent structures but not encroaching on the lumen. This type was ordinarily nonstenosing but produced dysphagia in some instances by reason of the esophagus being anchored (as often occurs in this type) at an unusual point or points. The mucosa often appeared grossly to be intact.

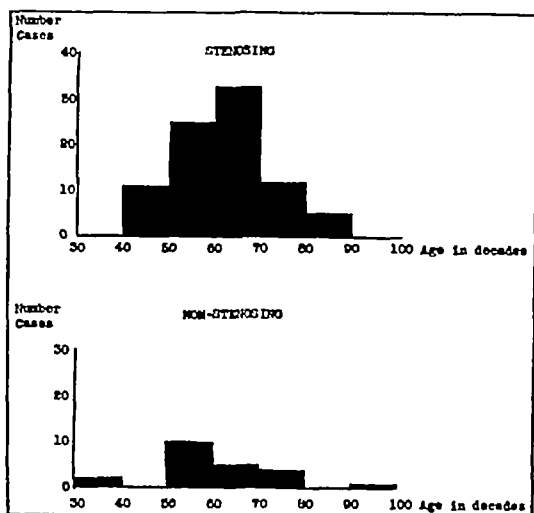


Chart 1—Age incidence in stenosing and nonstenosing tumors

Third, the ulcerating type, with no narrowing of the lumen, usually with dilatation of the esophagus. This variety was always nonstenosing.

Fifty-one per cent of the new growths were located in the middle third of the esophagus. In this autopsy series there were no nonstenosing lesions found in the upper third. Eighty per cent of the stenotic tumors were found in the lower two thirds while all the nonstenosing variety were discovered there.

Histologic study showed all the tumors to be of either squamous or undifferentiated types of carcinoma. Some patients in the records were diagnosed as having cancer of the esophagus, but further study of the stained sections and the description of gross lesions

record, diagnosed grossly and microscopically as having primary cancer of the esophagus, ten slides were not available to this analysis for graded study.

According to Broders' classification, approximately 52.5 per cent of the stenosing and nonstenosing tumors revealed grade 2 carcinoma structure, 40.7 per cent of the stenosing group were grades 3 and 4, while 47 per cent of the nonstenosing group showed cells of the same grades.

The average prehospital duration of symptoms for the patients of the stenosing type was 193 days. The average of their hospital stay was forty-one days. For the nonstenosing type, the average symptom time was seventy-five days and the average hospital stay thirteen days. One patient with nonobstructing carcinoma had had symptoms for two years, while another had complained for only two days before admission to the hospital.

Chart 5 shows that the patients having grade 2 stenosing tumors complained of their symptoms on an average of 225 days before death. The shortest period of illness, 180 days, occurred in the grade 3 class of stenosing tumors. This apparently indicates an approximate difference of only a month and a half. Undifferentiated nonstenosing grades of tumors were characterized by an average duration of symptoms of

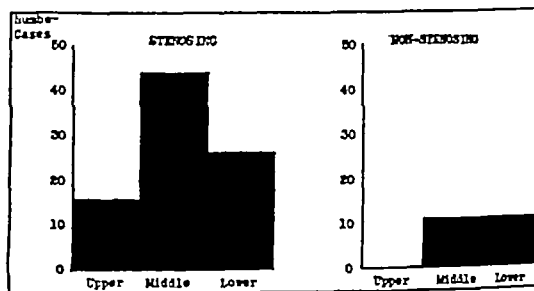


Chart 3—Location of pain in cases of stenosing and nonstenosing tumors

116 days and grade 3 by a duration of about seventy-five days, showing also an approximate difference of a month and a half.

Table 2 indicates the sites to which the primary esophageal lesion most frequently metastasized. The location and degree of metastasis did not seem to vary perceptibly as between the stenosing and nonstenosing types. Occasional metastases were found in the stomach, pancreas, kidneys, adrenals, diaphragm, pleurae, pericardium, spleen, thyroid, trachea and aorta. From the histopathologic point of view, all the various types of carcinoma showed a tendency toward infiltration, permeation and/or metastasis, and no relation was noted between the grade found and the degree of extension.

CLINICAL FEATURES

Dysphagia was the earliest and most frequent complaint among the eighty-six patients with stenosing tumors. It was recorded in 94 per cent of such cases. In the nonobstructive group of twenty-two, three complained of dysphagia. In one of these three the esophagus was found to be adherent to the aorta. In another a mediastinal abscess was found. In the third there was an extensive permeation of the posterior mediastinum. Weight loss ranging from a few to a hundred pounds or more occurred in about 75 per cent of the patients, in both the obstructive and the nonobstructive

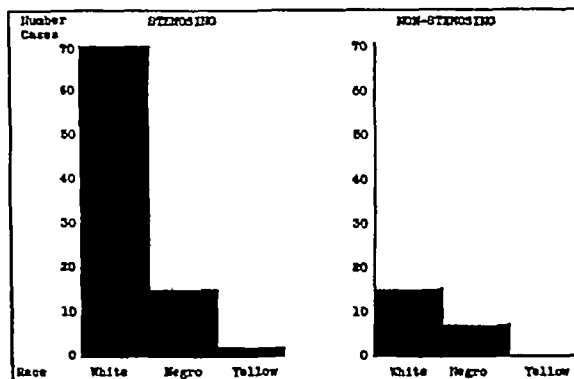


Chart 2—Race incidence in stenosing and nonstenosing tumors

showed very clearly that they were examples of adenocarcinoma involving the cardia and represented secondary extension to the esophagus from primary cancer of the stomach. Such patients have not been included in this study, contrary to the habit of some writers who have presented analytic reports on carcinoma of the esophagus, based at times on tissue secured through the esophagoscope for biopsy. Of the patients on original

group While pain was complained of in both groups, it was noted in 60 per cent of the nonstenosing tumors as against only 39 per cent of the stenosing The pain varied greatly in character and location, sometimes it was complained of in more than one region It might be by turns dull, sharp, boring or burning, in some

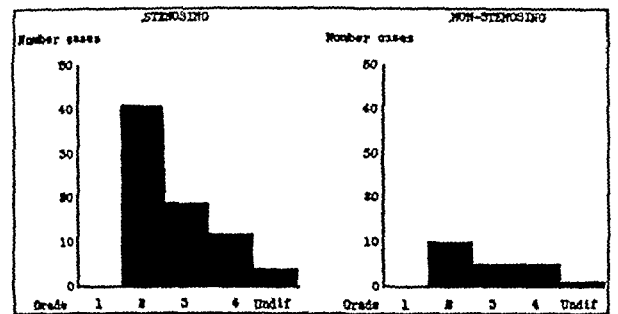


Chart 4—Cell grade (Broders) of stenosing and nonstenosing tumors Undif indicates undifferentiated grade consisting of small, round cells impossible to classify except as carcinoma

cases it was present only during swallowing, in other cases it was continuous While it occurred more frequently in the epigastrium, it was also related to various parts of the chest, chiefly retrosternal, lateral, interscapular and middorsal, and in a few instances it was complained of in the shoulder and down the arm In 61 per cent of the cases of stenosing and 40 per cent of nonstenosing tumors there was no pain Vomiting occurred in both types of patients at the time of admission to the hospital—in 14 per cent of the cases

TABLE 3—Symptoms

| | Stenosing | Nonstenosing |
|-----------------|-----------|--------------|
| Number of cases | 86 | 22 |
| Dysphagia | 81 | 3 |
| Loss of weight | 64 | 17 |
| Pain | 33 | 13 |
| Chest | 11 | 6 |
| Epigastrium | 20 | 0 |
| Back | 6 | 3 |
| Retrosternal | 4 | 1 |
| No pain | 53 | 0 |
| Vomiting | 12 | 6 |
| Regurgitation | 7 | 0 |
| Cough | 13 | 8 |
| Hoarseness | 6 | 3 |
| Weakness | 22 | 3 |
| Hematemesis | 0 | 1 |
| Tarry stool | 0 | 1 |

with obstruction and in 27 per cent without obstruction It transpired, however, following a close review of the case histories, that the rather surprisingly low percentage of the instances of vomiting in the cases showing obstruction could be accounted for, in part at least, by the fact that patients with obstructive lesions had gradually learned so to regulate the type and the amount of food taken as to avoid regurgitation and vomiting They progressed from solids to semisolids and finally to small quantities of liquid only They also limited their intake because of a loss of appetite and because of the development of pain in swallowing Food was not regurgitated in any cases in which there was no stenosis Cough was present in 15 per cent of the stenosing type and in 36 per cent of the nonstenosing Hoarseness was apparent in 7 per cent of the stenosing and in 13 per cent of the nonstenosing type

It can be said for the group as a whole that the blood picture, including both blood counts and chemical analyses, was highly variable, permitting no significant deductions and indicating no consistent trend There were of course some unusual manifestations in the blood studies, some of which may have been attributable to dehydration and to starvation Gross hemorrhage was conspicuous by its absence, hematemesis occurred in only one case, and tarry stool was observed in only one other

DIAGNOSES

Correct diagnoses were made in 92 per cent of the eighty-one cases of stenosis For the other seven patients the diagnoses recorded were mediastinal tumor,

TABLE 4—Diagnoses of Clinical Record in Twenty-Two Cases of Nonstenosing Tumors

| | Cases |
|---|-------|
| Carcinoma of esophagus | 2 |
| Pulmonary tuberculosis | 6 |
| Tuberculosis with empyema | 1 |
| Lung abscess | 1 |
| Bronchopneumonia | 1 |
| Carcinoma of stomach | 1 |
| Carcinoma of lungs and liver (metastatic) | 1 |
| Carcinoma of liver | 1 |
| Cirrhosis of liver | 1 |
| Aneurysm of abdominal aorta | 1 |
| Aneurysm of thoracic aorta | 2 |
| Chronic alcoholism | 1 |
| Cardiovascular disease (senile dementia) | 2 |

esophageal obstruction (not specified), carcinoma of the liver, carcinoma of the stomach (two cases), acute nephritis and pulmonary tuberculosis These errors in diagnosis were made in the case of persons who were not dysphagic and who were not studied roentgenographically with reference to the swallowing function The clinical impression for carcinoma was supported by characteristic roentgen changes in the greater number of stenosed patients Examination of biopsies in turn corroborated both the clinical and the roentgenologic opinion in respect to twenty-one patients In two other cases esophagoscopy was done, and the tissues obtained were reported as being of the chronic inflammatory type The tissues removed at autopsy, however, showed carcinoma

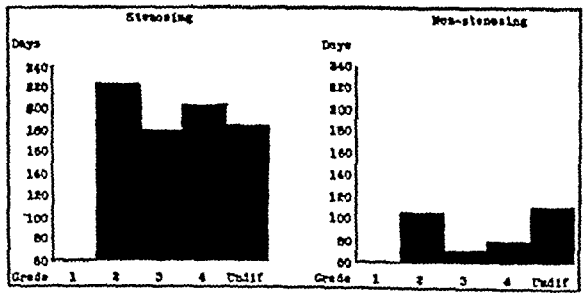


Chart 5—Average duration of symptoms according to cell grade in stenosing and nonstenosing tumors

The errors of diagnosis in table 4 are all explicable in the absence of dysphagia For instance, an emaciated patient with some febrile reaction and with equivocal signs in the chest might easily, in the absence of another explanation, suggest pulmonary tuberculosis And equally plausible reasoning might be applicable to others of these erroneously diagnosed cases One of the two correct diagnoses was reached because the patient evi-

denced a certain difficulty in swallowing during the last days of his illness. The other correct diagnosis was arrived at by roentgen study. This patient was one of four of the nonstenosing group for whom a complete roentgenologic study of the gastro-intestinal tract was made. Reports on three of these patients were negative for carcinoma of the esophagus. The fourth for whom the correct diagnosis was made had an annular type of lesion, adherent to the trachea, and registered delay in the time of transit of the barium sulphate meal.

GASTROSTOMY

Thirty-five patients had had gastrostomies performed at some time before death. The average length of life after hospitalization of the patients who were operated on was sixty-eight days, as compared with eighteen days for those not operated on. A majority of the patients who were operated on lived less than thirty days, and the greatest length of life after operation was 450 days.

The part that bronchopneumonia plays in the termination of life for these patients is noteworthy. Sixty-seven per cent of the stenosed patients died from this immediate cause. In some of these cases the pneumonia clearly developed from the aspiration of food.

SUMMARY AND COMMENT

A review of the data as presented makes it quite clear that the generally recognized description of carcinoma of the esophagus applies, in the main, to both

was of only moderate malignancy and that it was apparently of the same degree in the stenosing and nonstenosing varieties. It would also appear to follow that the grade of squamous cell carcinoma does not determine the stenosing and nonstenosing possibilities of a carcinomatous lesion in the esophagus. Grossly ulcerative lesions showed all grades of malignancy.

From the clinical point of view, these studies confirm the generally accepted belief that carcinoma of the esophagus is a rapidly malignant disease. This would seem to apply particularly to the nonobstructed patients whose brief course of illness was only approximately a third of the course of illness of the patients in the obstructed group. In this regard, however, some account should be taken of the fact that patients obviously found difficulty in establishing definitely the exact time of onset of symptoms.

On the whole, our analysis (chart 5) would seem to indicate no significant relationship between the grade of carcinoma and the duration of symptoms. This may mean that grading does not actually measure the degree of malignancy or it may mean that the duration of apparent symptoms in this disease is no real measure of the degree of malignancy. It is quite possible that a lesion in the esophagus, occupying as it does a relatively cryptic position, may in the case of the better differentiated tumor actually exist for a longer time than the symptoms seem to indicate. This is a reasonable inference if one judges by the life history of similarly graded tumors growing in easily observed locations, such as the skin and the cervix uteri. It seems reasonable to believe, on the basis of the studies here reviewed, that the clinical picture of esophageal carcinoma takes its character largely from the presence or absence of stenosis and is not dependent on the relative differentiation of the neoplastic squamous cell found under the microscope.

The outstanding implication is that the usual description of esophageal carcinoma has not sufficiently taken into account the nonstenosing variety, which very obviously cannot be responsible for difficulty in swallowing. In our patients with nonstenosing lesions the striking symptoms were loss of weight, pains in or about the chest, vomiting, cough and hoarseness. The loss of weight is apparently due to some subtle effect of carcinoma other than that resulting from a decreased caloric intake. In both the stenosing and the nonstenosing variety there would seem to be no direct relationship between the location of the carcinoma and the site of the pain.

It is probable that both varieties of lesions are fairly well advanced before symptoms become evident. Very early diagnosis is therefore rather a remote possibility unless a thorough investigation of the esophagus is made part of a periodic or otherwise routine examination, or unless the diagnostician has a lively and consistent recognition of the possibility that a patient with no difficulties in swallowing, with emaciation, perhaps with vomiting, with pain in the chest, cough and hoarseness, otherwise unexplained, may present this picture because he has carcinoma of the esophagus.

It may be pointed out that gastrostomy afforded in the cases reviewed very little extension of life beyond that of the patients who were not operated on. The failure of therapy thus far, together with the fatal outlook for this disease, should not discourage attempts at very early diagnosis, these sinister factors should, on the contrary, emphasize the need for calling into play at an early stage every diagnostic resource.

TABLE 5—Causes of Death

| | Stenosing | Nonstenosing |
|---|-----------|--------------|
| Number of patients | 66 | 22 |
| Carcinoma (uncomplicated) | 18 | 10 |
| Bronchopneumonia | 68 | 9 |
| Pulmonary tuberculosis | 5 | 0 |
| Postgastrostomy peritonitis | 2 | 0 |
| Suppurative mediastinitis with bronchopneumonia | 0 | 1 |
| Infiltration of aorta rupture fatal hemorrhage | 0 | 1 |
| Suppurative mediastinitis | 0 | 1 |
| Mediastinal abscess | 1 | 0 |
| Empyema | 1 | 0 |
| Postesophagectomy hemorrhage | 1 | 0 |

types. These studies corroborate the prevailing impression that men are more frequently afflicted than women, in a variable ratio. No evidence to account for this has been brought to light by this or by other studies. The age of the patients in the group studied here corresponds with the generally observed cancer-bearing years of life. As to race incidence, although our figures seem to suggest that the Negro is less likely than the white person to develop carcinoma of the esophagus, this study does not seem to furnish sufficient evidence for a conclusion in this regard. Nor can any decisive point be made concerning heredity, previous illnesses and habits of life as affecting the development of carcinoma of the esophagus.

The gross pathologic lesions observed in the group described are those generally recognized and the positions of these lesions are the positions heretofore generally noted. It is worth remarking, for further study or demonstration, that this particular study revealed not a single instance of a nonstenosing lesion in the upper third of the esophagus.

From the histopathologic aspect, if the Broders method of classification is also a measure of malignancy, it would seem that the cancer of cases reviewed here

CONCLUSIONS

1 Of the esophageal carcinomas in a series of 108 cases that came to autopsy, 20.3 per cent were of the nonstenosing type

2 Patients in this series with nonstenosing esophageal carcinoma presented weight loss, pains in the chest, vomiting, cough, hoarseness and weakness as outstanding symptoms. Dysphagia was distinguished by its relative infrequency, whereas in the stenosing group it was the dominant symptom

3 The sex, age and race incidence, the location of pain, the metastases, and the immediate causes of death were much alike in patients with stenosing and nonstenosing lesions

4 While clinically both the stenosing and the nonstenosing lesions were rapidly malignant, the clinical course in the nonstenosing group was only one third as long as that of the stenosing

5 Pathologically, these tumors were not particularly malignant, and there was no correlation between the grade of the tumor, the clinical course and the stenosing or nonstenosing tendencies

6 Whether roentgen investigation is positive or negative for this disease, the suspected patient should be subsequently studied by esophagoscopy, and, at the same time, properly selected tissue should be procured for histologic study. A single or even a subsequent report of failure to find tumor, however, should not be considered as finally precluding a diagnosis of carcinoma

Thirty-Fourth and Pine streets—1704 Pine Street

ABSTRACT OF DISCUSSION

DR. GABRIEL TUCKER, Philadelphia. The evidence presented is incontrovertible because it is obtained by necropsy. I should like to ask the authors whether postmortem examination showed gross evidence of stenoses in any case in which there had been no complaint of dysphagia. Clinically I have seen patients without any complaint of dysphagia when a routine roentgen study of the neck, chest and swallowing function showed the lodgment of a large capsule in the lower third of the esophagus. On esophagoscopic examination a nonstenosing lesion was found and biopsy showed carcinoma. The inspection of the lesion through the esophagoscope gives a characteristic appearance. One may see at times that the location of the lesion makes it inadvisable to do a biopsy. A negative biopsy should not be considered conclusive. The second, third or fourth biopsy may show cancer. The symptom of hoarseness is usually due either to involvement of the laryngeal nerve or in the stenosing type of cancer, to overflow of secretion from the pharynx producing inflammatory changes in the larynx. In hoarseness cancer of the esophagus is to be excluded as a possible etiologic factor. Esophagoscopy is a major diagnostic procedure and should be done with every possible precaution to avoid injury. The conclusions drawn by the authors from their studies should lead to earlier and more thorough examination of every patient for evidence of esophageal disease. Cancer of the esophagus should be recognized earlier. The advancement of the technique of irradiation and surgery of the esophagus leads to the hope that the authors have advanced one step nearer to finding a cure for cancer of the esophagus. A woman 39 years of age had marked obstructive symptoms in the esophagus. Roentgen examination showed a large dilatation of the esophagus with the typical picture of achalasia (so-called cardiospasm) with a stenosis at the level of the diaphragm. There was retention of a great deal of food in the esophagus and after lavage of the esophagus and thorough cleansing esophagoscopy was done and revealed a fungating ulcerating lesion on the left anterolateral wall about 5 inches above the level of the diaphragm. The esophagus at this level was so dilated that the fungating lesion did not come in contact with the wall of the esophagus

except at the point of its attachment and, although of considerable size was not obstructing the lumen of the esophagus. A biopsy showed the lesion to be cancer. At the time of the examination, the esophagoscope was passed into the stomach through the stenosed area at the level of the diaphragm and the typical picture of achalasia was found there being no lesion discernible. This case illustrates a nonstenosing type of cancer with esophageal stenosis due to achalasia, in which the esophagoscope was the only means by which a positive diagnosis could be made. However after the esophagus had been thoroughly cleansed the roentgen examination showed an irregularity in the anterior wall, with dilatation of the esophagus at the level of the cancerous lesion.

DR. TRUMAN G. SCHNABEL, Philadelphia. We were surprised after we had analyzed this group of autopsies to find that nonstenotic carcinoma of the esophagus had been present in 20.3 per cent. We had anticipated a short average clinical course for the 108 patients seven and a half months, but were particularly surprised that those of this series with nonstenotic lesions had lived only a little less than an average of three months after the onset of their symptoms. It was also surprising not to have found a correlation between the grade of the tumor according to the Broder classification, the length of the clinical course and the presence of a stenosing or a nonstenosing lesion. Tissue obtained by way of the esophagoscope may not show the malignant nature of esophageal lesions, particularly if dependence is placed on a single specimen. Esophagoscopy becomes more important when it demonstrates that esophageal dysfunction as exhibited by roentgen study is not due to an intrinsic lesion in the esophagus. I know of a patient who had a number of roentgen treatments, following what seemed to be positive roentgen evidence for carcinoma. Autopsy after sudden death demonstrated mitral stenosis with a large left auricle pressing on the esophagus. Here better roentgen studies and esophagoscopy would have established the correct diagnosis and therefore the futility of the treatment. After we had completed this analysis we saw a patient who had lost weight and who had unusually palpable cervical glands, some inequality of the pupils and hoarseness. With nonstenosing esophageal carcinoma fresh in our minds, we ordered roentgen investigation of the esophagus, even though there were no suggestive symptoms pointing to an esophageal lesion. The evidence from this source showed, what was borne out by subsequent biopsy investigation that we were dealing with carcinoma of the esophagus. A year ago the patient would have remained a diagnostic puzzle. The results of these studies should serve to remind one that carcinoma of the esophagus may not cause dysphagia. I should like to point out in answer to Dr. Tucker's question that five patients of this group with obstructing lesions did not complain of difficulty in swallowing. Long before patients present dysphagia as a symptom and even if they never refer to pain or difficulty in swallowing one should be conscious of carcinoma of the esophagus. Early roentgen investigation and esophagoscopy should be practiced to establish the presence or absence of this malady.

Too Many Mothers Make the Mistake—The period of menstruation is commonly referred to as the period of being 'unwell' and this is a rather unfortunate concept of the function. It is a perfectly normal phase and this is the idea of it which should be impressed upon young girls. Too many mothers make the mistake of impressing their daughters with the importance of coddling themselves during the periods, of abstaining from play and exercise at this time and, in short of actually considering themselves sick. As a consequence, because of the power of mind over body, many girls do actually become sick and develop into menstrual invalids of one sort or another as I shall have occasion to discuss later. This is particularly true if the mother, or perhaps an older sister, herself suffers with menstrual disorders of one sort or another, for the impressionable child just beginning to menstruate soon comes to look forward to each period as one when she must expect to suffer incapacity of one degree or another.—Novak, Emil. *The Woman Asks the Doctor*. Baltimore, Williams and Wilkins Company, 1935.

Clinical Notes, Suggestions and New Instruments

A NEW METHOD OF REMOVAL OF FOREIGN BODIES FROM STOMACH WITH THE AUTHOR'S SHEATHED FLEXIBLE GASTROSCOPIC FORCEPS

GABRIEL TUCKER, M D PHILADELPHIA

About a year ago I suggested and published a method of localization of foreign bodies in the stomach by means of roentgen examination by fluoroscopy and films following the introduction of an opaque feeding tube through the esophagus and the inflation of air into the stomach. This method has proved quite successful, and while using it it occurred to me that, if a flexible forceps should be devised that might be introduced into the stomach in the same manner as the feeding tube had been introduced for localization purposes, the removal of foreign bodies from the stomach could be carried out, and that, if this method should prove successful and a safe technic be developed, it would be very much simpler than the method of open tube gastroscopy now in use.

In foreign body removal the open tube gastroscope under double plane fluoroscopic guidance is generally used. In many cases great difficulty is encountered because the foreign body falls back alongside the spine in the left half of the stomach or on the right side of the spine in the pyloric end, where it is difficult to grasp through the gastroscope when the patient is placed in the usual dorsal recumbency for gastroscopic removal. Fluoroscopic guidance is always a necessity in the open tube method of gastroscopic removal of foreign bodies from the stomach. With the use of a sheathed flexible forceps, dispensing with a rigid open tube gastroscope, the patient can be

on the table until gravity and inflation of the stomach allow the foreign body to be grasped by the use of the sheathed flexible forceps under fluoroscopic guidance.

The sheathed flexible forceps (fig 1) that I¹ devised is of the cannula and stylet type with a modified handle and has a very strong and secure grasp. The flexible forceps is covered with a rubber tube sheath or jacket, the size of which is No. 18 French in the child size instrument and No. 20 French in the adult size. The sheath has attached to it a metal ball at the lower end, which is perforated for the passage of the forceps blades, at the upper end of the jacket is a slotted metal sleeve attachment that permits the adjustment of the jacket so that

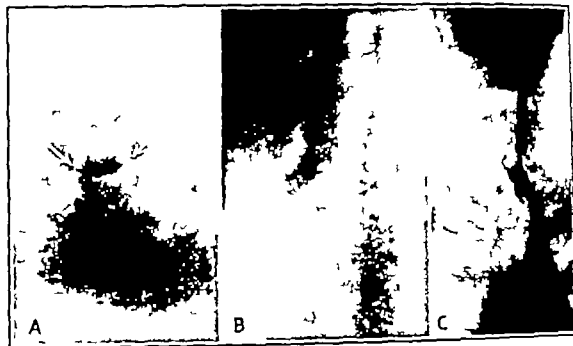


Fig. 2—A, tooth plate in the stomach. B, sheathed flexible forceps grasping the artificial denture which has been withdrawn upward into the lower end of the esophagus. C, denture in the upper end of the esophagus. The grasp of the forceps covers the projecting point of the gold clasp. The curved clasp opposite was withdrawn through the esophagus without trauma. Roentgenograms by Dr. Karl Kornblum.

the forceps blades will be covered for introduction. After the forceps is introduced and fluoroscopic guidance indicates that it is in contact with the foreign body, the rubber tube jacket is drawn up about 1 cm and secured by the handle mechanism, allowing the forceps to protrude beyond the metal ball at the end of the jacket so that the foreign body can be grasped. The metal sleeve at the upper end of the rubber sheath is provided with an attachment that permits the introduction of air by means of a double bulb, so that the stomach can be inflated, thus releasing the foreign body from the folds of the stomach. The metal ball on the lower end of the rubber jacket guides the forceps around the greater curvature and prevents trauma during the introduction.

TECHNIC OF INTRODUCTION AND USE OF THE SHEATHED FLEXIBLE FORCEPS

In working out a technic for the use of this instrument I had the expert advice and invaluable assistance of Dr. Eugene Pendergrass of the Hospital of the University of Pennsylvania and of Dr. Karl Kornblum of the Graduate Hospital of the University of Pennsylvania. The entire procedure for removal of foreign body and introduction of the flexible forceps should be carried out under biplane fluoroscopic guidance, with the assistance of an expert roentgenologist with whom the endoscopist is accustomed to work. With adults a vertical plane fluoroscope of the motor driven tilt table type may be used. The patient is placed in the semirecumbent or upright position and rotated in front of the fluoroscopic screen giving biplane fluoroscopic guidance. For use in children, biplane fluoroscopic guidance in dorsal recumbency is necessary in order to control the patient. With the flexible forceps introduced into the stomach, however, the patient may be rotated so that gravity will carry the foreign body to a point at which it is accessible to the grasp of the forceps.

Introduction—In adults the sheathed forceps may be introduced like the ordinary stomach tube under fluoroscopic guidance. Previous roentgen study in all patients should exclude esophageal disease that would contraindicate introduction of the sheathed forceps. In children, when the patient is placed in dorsal recumbency, a child-size direct laryngoscope may be used to lift the cricoid forward so that the tip of the sheathed forceps

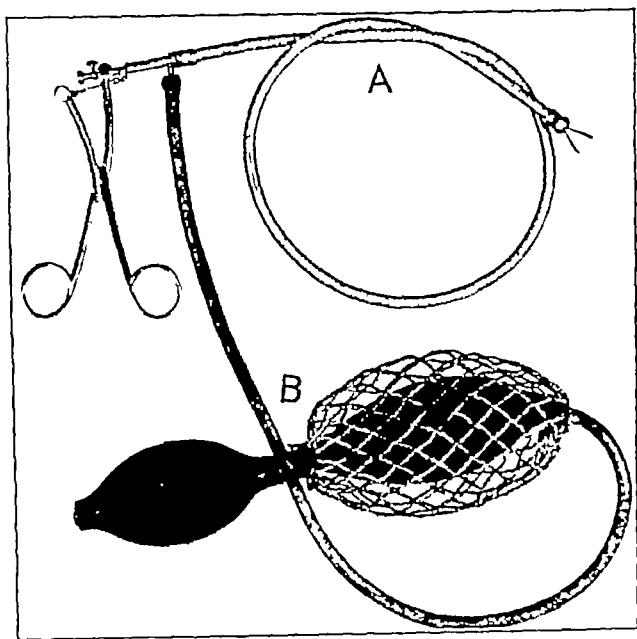


Fig. 1—The author's sheathed flexible forceps made by Geo. P. Pilling and Son Co., Philadelphia. A, flexible portion of the forceps coiled showing the degree of flexibility that will be permitted by the forceps. The blades are in the open position for grasping. B, the double bulb arrangement for inflation either for diagnostic examination or for assistance in grasping and removing a foreign body. Inflation may be carried out with the forceps blades either sheathed or unsheathed.

placed in the upright or semiupright position after the forceps is in position and gravity carries the foreign body to the greater curvature of the stomach, where it is easily accessible. In the case of a child in dorsal recumbency, the patient can be rotated

can be placed in the upper esophagus by sight. It is then gently passed downward and the laryngoscope removed. Further introduction is carried out under fluoroscopic guidance. This technique may be used also in the adult if any difficulty is anticipated. When the sheathed forceps has entered the stomach it is passed farther in until the metal tip comes in contact with the greater curvature of the stomach. If there is a question of the foreign body not being in the stomach, the stomach can be inflated through the sheathed forceps and the location of the foreign body with reference to the cavity of the stomach can be definitely determined by fluoroscopic observation. If the foreign body is in the stomach the patient can be rotated and the forceps manipulated until the metal end of the sheathed forceps is in contact with the foreign body. The sheath is then withdrawn sufficiently to allow grasping of the foreign body. The foreign body may be manipulated and turned until the proper grasp for withdrawal is obtained by inflation of the stomach with air through the forceps and manipulation with the forceps, the patient being rotated if necessary. Withdrawal of the foreign body after it has reached the hiatal esophagus is facilitated by slight inflation through the forceps with a hand bulb. Gentle traction is made and the additional air that has been introduced may produce regurgitation with consequent relaxation of the hiatal esophagus, and the foreign body will slip easily into the lower end of the esophagus while the hiatal sphincter is relaxed. Sufficient time for the hiatal sphincter to relax while gentle traction is made is necessary to avoid trauma. When the foreign body has been brought into the upper end of the esophagus, the laryngoscope may be reintroduced over the sheathed forceps and the cricoid lifted forward. During the introduction and use of the forceps a trained assistant to hold the head and another assistant to maintain the

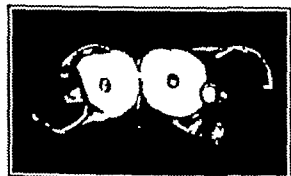


Fig 3—Gold denture removed from the stomach with the sheathed flexible forceps

position of the shoulders are necessary in addition to the fluoroscopic aid of an expert roentgenologist.

Caution—Extreme gentleness should be used and plenty of time allowed for the musculature of the esophagus to relax during all manipulations to prevent trauma. With the use of the sheathed flexible forceps, as in all examinations

and treatments of the esophagus haste and undue force have no place. They will result in disaster. Even the ordinary stomach tube will rupture the esophagus if sufficient force is used in introduction.

REPORT OF CASES

The method has not been in use long enough to establish definite conclusions. However a number of foreign bodies have been removed without any difficulty and the reports of two cases are submitted.

CASE 1—A physician, aged 63 dislodged a gold dental bridge containing two teeth while eating his breakfast two weeks before he came to me for removal of the foreign body. Repeated roentgen examination before admission showed the denture in the stomach. It apparently would enter the pyloric end of the stomach and then be regurgitated into the stomach not passing through the pylorus. I explained to the physician my new forceps and method of removal and he requested that I remove the foreign body from the stomach by this method. The patient was placed on a fluoroscopic motor driven, tilt table and the forceps was introduced in the same manner as the ordinary stomach tube. Under fluoroscopic guidance by Dr Karl Kornblum the gold denture could be visualized in the stomach at the greater curvature (fig 2 A). The sheathed forceps was introduced until the tip came near the foreign body. A small amount of air was then insufflated and the foreign body was released from the stomach folds and was easily grasped by one of the sharp points of the clasp that had been constructed to hold the denture in place in the mouth. This grasp on the foreign body protected the sharp points, making it safe for withdrawal through the esophagus. As the

foreign body was withdrawn to the level of the diaphragm a small quantity of air was insufflated, and the foreign body came easily into the esophagus. Slight difficulty was encountered as the foreign body was brought through the cricopharyngeus but it came readily through the esophagus without trauma (fig 2 B and C). The procedure required only a few minutes the patient experiencing only slight discomfort.

CASE 2—A baby girl, aged 6 months, admitted to the Graduate Hospital of the University of Pennsylvania, choked on



Fig 4—A sheathed flexible forceps grasping the open safety pin in the stomach in a child aged 6 months. B open pin after cephalic version withdrawn into the lower end of the esophagus with the sheathed flexible forceps. Roentgenograms by Dr Karl Kornblum.

safety pin the night previous to her admission. Roentgen examination showed the pin to be in the esophagus just entering the stomach. The child was placed on a fluoroscopic table, and the child size sheathed flexible forceps was introduced. As the forceps passed downward in the esophagus the pin passed on to the greater curvature of the stomach. The forceps was introduced into the stomach, a small amount of air insufflated and the pin manipulated with the forceps. The sheath of the forceps was retracted so that the pin could be grasped with the rotation blades in the ring (fig 4 A). A cephalic version was done with the pin and it was withdrawn with the point downward (fig 4 B). Slight difficulty was encountered in getting the pin out of the pharynx, and in my future case in an infant I should introduce a laryngoscope into the hypopharynx and lift the larynx and base of the tongue forward as the pin comes through the upper end of the esophagus (fig 5).

COMMENT

1 It is believed that the proposed method of removal of foreign bodies from the stomach with the author's sheathed flexible forceps is safe and effective and will produce less discomfort than the ordinary method of gastrosopic foreign body removal.

2 Owing to the fact that air can be insufflated through the forceps, the operator can at all times determine readily the position of the foreign body with relation to the cavity of the stomach, and the stomach folds can be obliterated so that the foreign body can easily be grasped.

3 The instrument should be used by those who are experienced in endoscopic work and intraesophageal manipulations. Biplane fluoroscopic guidance with the aid of an expert roentgenologist who has developed with the endoscopist a team for the removal of foreign bodies under fluoroscopic guidance is an indispensable part of the technique.

4 Because of the fact that the patient can be rotated and the position changed with safety while under fluoroscopic observation the method will permit the removal of foreign bodies that would be inaccessible to the ordinary gastrosopic method.

326 South Nineteenth Street



Fig 5—Safety pin removed from the stomach with the sheathed flexible forceps under fluoroscopic guidance.

AN OUTBREAK OF FOOD POISONING APPARENTLY DUE TO STAPHYLOCOCCI

G M DACK PH D M D CHICAGO

GEORGE W BOWMAN M D

State Medical Director Indiana Transient Service Activities

AND

R. N HARGER PH D, INDIANAPOLIS

A number of outbreaks of food poisoning due to staphylococci have been studied in recent years. Jordan and Burrows¹ have cited nine such outbreaks.

The outbreak reported here is of interest since it involved a large number of people (206) and since specimens of food collected immediately following the illness were refrigerated and later frozen, so that the bacteriologic analyses are representative of the foods at the time of consumption.

A recent outbreak of food illness occurred in a group from one of the shelters of the federal Transient Service Activities in Indianapolis. The men affected were only those on outside work relief projects. The menu, outlined by a trained dietitian, was served throughout all transient centers in the state with identical foods, the same meat, from the same source lots of food products of standardized quality from recognized reputable packers. The outbreak did not occur or recur in the other shelters in the same city. Lunches were prepared for these men on Thursday, June 13, 1935 between midnight and early morning. The lunches consisted of sandwiches wrapped in wax paper, which were put up in bags and given to the men in the morning when they were sent out on work relief projects. Records were obtained from 206 men who were ill and 161 who were not ill although a total of 471 men were sent out with the same lunch. The lunches were eaten at about 11:30 a. m., and about 2 p. m. of the same day the men affected were seized with epigastric distress, vomiting, diarrhea and marked prostration, the acute symptoms lasting for several hours.

A sharp rise in temperature following a long period of rain came during the day (90° F.) as a contributory factor. The ingestion of varying grades of alcohol from canned heat, but not always admitted on interview, malingering, and the psychic element were no doubt also contributory factors. One other suspicious factor was a much used driven well near an old fish pool in a nearby city park. Although not dangerously contaminated or unsafe for drinking purposes, it has since been closed.

The epidemiologic data are summarized in table 1.

From a study of table 1 it is obvious that the greatest number of men were ill in the group eating the tongue sandwiches. Since 206 men became ill and 187 of this number ate tongue sandwiches, the difference of nineteen must be explained. Gastro-intestinal upsets might well have occurred in this small number (nineteen) simply from being with the others who were so violently ill.

A thorough general chemical analysis of all mentioned foods for extraneous poisons was negative, this analysis was made by one of us (R. N. H.).

A bacteriologic examination was made of the following specimens:

- | | |
|--|--------------------------------------|
| 1 Pickle | 9 Fig |
| 2 Scraps of bread from sandwiches | 10 Sugar |
| 3 Jelly sandwich | 11 Cream—evaporated milk |
| 4 Jelly used for preparing sandwiches | 12 Coffee |
| 5 Tongue from sandwich | 13 Vomitus |
| 6 Crumbs of bread from tongue sandwich | 14 Cheese |
| 7 Cheese sandwich | 15 Peanut butter from sandwich |
| 8 Tongue—stock used in making sandwiches | 16 Bread from peanut butter sandwich |

Portions of the solid specimens were emulsified in sterile salt solution. One small loopful of each specimen was streaked on blood agar and eosin methylene blue agar plates. Serial dilutions were made and pour plates prepared, veal infusion agar and eosin methylene blue agar being used. The plates were

incubated for twenty-four hours and then examined. Some of the plates showing no growth were incubated for an additional period of twenty-four hours, after which they were again examined.

Numerous hemolytic *Staphylococcus aureus* colonies were present on the blood agar plates streaked with samples 2, 3, 6 and 8. These staphylococcus colonies predominated over all others in the plate containing specimen 2. No paratyphoid organisms were found on any of the eosin methylene blue agar plates. No growth occurred on the eosin methylene blue, blood agar or veal infusion agar plates inoculated with samples 1, 4, 10, 11 and 12. Green streptococci were present in samples 7 and 9. No organisms of known significance were found in any of the other samples.

TABLE 1—Epidemiologic Data

| Food | Ill | Not Ill | Total |
|------------------------|-----|---------|-------|
| Tongue sandwich | 187 | 85 | 272 |
| Peanut butter sandwich | 148 | 123 | 271 |
| Cheese sandwich | 162 | 126 | 288 |
| Jelly sandwich | 167 | 149 | 316 |
| Coffee and cream | 127 | 104 | 231 |
| Coffee without cream | 14 | 13 | 27 |
| Pickle | 133 | 101 | 234 |

The large number of hemolytic yellow staphylococci in the scraps of bread from the sandwiches and the presence of these organisms in the tongue, together with the statistical data on the foods eaten, seemed further to incriminate the tongue sandwiches as the source of the food poisoning. Strains of these staphylococci were therefore isolated from samples 2, 6 and 8. These cultures were tested for food poisoning toxic substance by feeding experiments on *Macacus rhesus* monkeys. For this purpose the cultures were inoculated into 1 per cent veal infusion agar, pH 7.0, and grown in an environment of about 25 per cent carbon dioxide for thirty-nine hours at an incubation temperature of 37° C. After incubation, the agar was removed by filtering through cheese cloth, and the remaining liquid culture was fed to the monkeys. Each culture was fed by stomach tube to two monkeys. The results are listed in table 2.

TABLE 2—Results of Culture

| Monkey | Culture from Specimen | Amount Fed | Results |
|--------|-----------------------|--|--|
| 1 | 2 | 4 cc | Vomited 40 minutes after feeding |
| 2 | 2 | 40 cc | Several paroxysms of vomiting beginning 2½ hours after feeding |
| 3 | 6 | 55 cc | Several paroxysms of vomiting beginning ½ hour after feeding |
| 4 | 6 | 50 cc ? | No reaction in 4½ hours |
| | | Much of sample regurgitated at time of feeding | |
| 5 | 8 | 40 cc | Several paroxysms of vomiting beginning 25 minutes after feeding |
| 6 | 8 | 48 cc | Vomited 3½ hours |

The results obtained by feeding cultures of the yellow hemolytic staphylococcus isolated from the scraps of bread (sample 2), the crumbs of bread from the tongue sandwich (sample 6), and the tongue used in making the sandwiches (sample 8) indicated that these strains were of the food poisoning type.

The presence of the food poisoning type of hemolytic yellow staphylococci in the tongue could well account for the distribution of this organism in the sandwiches. The absence of this organism in the cheese sandwich (sample 7) and the bread from the peanut butter sandwich (sample 16) would indicate that the bread was not the source of these organisms. When proper conditions of moisture and temperature occur, the organisms probably spread into the bread from the meat filling of the sandwich. This spread of the bacteria is associated with growth of the organism with apparent elaboration of the toxic substance responsible for food poisoning. Favorable conditions for the development of this organism were not attained in all cases, since many of the men eating tongue sandwiches did not become ill.

There were no fatalities directly traceable to the food poisoning, although one death followed about a week later from pneumonia. All made a rapid uneventful recovery within a few hours.

From the Department of Hygiene and Bacteriology, University of Chicago, and the Department of Biochemistry and Pharmacology, Indiana University School of Medicine.

¹ Jordan, E. O. and Burrows, William. *Am J Hyg* 20: 604 (Nov.) 1934.

CONCLUSION

A food poisoning outbreak involving 206 men was apparently due to eating tongue sandwiches that were contaminated with a yellow hemolytic staphylococcus. The staphylococci were shown by monkey feeding experiments to be of the food poisoning type.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE AND REPORT

HOWARD A. CARTER, Secretary

LIGHT THERAPY AND ROENTGEN THERAPY IN TUBERCULOSIS

PRESENT EVALUATION

EDGAR MAYER, M.D.

NEW YORK

Light therapy, both natural and artificial, is of definite value in the treatment of some forms of tuberculosis. There is still considerable difference of opinion on which regions of the light spectrum are most efficacious, as well as confusion as to the tuberculous conditions that respond best to this treatment.

Natural heliotherapists, especially those working in high altitudes, emphasize solar radiation and aërotherapy. On the other hand, those in cloudy climates have stressed the use of artificial lights and still others, on occasion, the x-rays.

CLINICALLY EFFECTIVE SPECTRAL REGIONS

There is much dispute as to the relative therapeutic values of infra-red, visible and ultraviolet rays, but, unfortunately, most observers, enthusiastic over their own results, seem to be biased in their opinions. The effective heat rays of the light spectrum lie at the red end and include visible red and invisible infra-red rays, while actinic rays found at the other end comprise that visible region extending from the blue, through indigo, violet and the invisible ultraviolet rays.

Sonne found that the infra-red heat rays from the carbon arc light set up a cutaneous erythema leading in animals to the production of blisters through rapid elevation of the skin temperature. The luminous heat rays, on the other hand, without producing bodily fever could heat a very essential portion of the aggregate blood volume of the body to a temperature possibly exceeding the highest bodily temperature ever measured. Those stressing therapeutically the heat radiation have described experiments in which animals whose body temperature has been elevated to a high degree have shown extreme tolerance of infection. Rabbits subjected to exposures of dry heat sufficient to increase activity of the lymphoid organs have been shown to develop on immunization antibodies in much larger quantity than did untreated animals immunized in the same fashion.

Danish workers stress particularly carbon arc radiation for all types of tuberculosis. This arc emits much visible red and invisible infra-red energy. Its total visible rays furnish energy equal to about 20 per cent of its aggregate radiant energy, and this is increased proportionately with its ampere volume.

Hyperemia due to heat radiation has been credited with favorable clinical results. Bier and others

employed heat lamps at high temperatures which produced hyperemia of long duration and elevated the cutaneous temperature to that produced by sunlight, rapid clinical recoveries ensued.

Bernhard of St. Moritz, a pioneer in solar therapy, never filters out the infra-red in his treatment of wounds. He ascribes his recoveries to the green-yellow and shorter infra-red rays. This was borne out by poor results of wound healing obtained with ultraviolet rays emitted by the mercury vapor arc in quartz.

The physiologic effects of radiant heat energy suggest that clinical results of therapy with sunlight are at least in part dependent on the red and infra-red region.¹ Most recently the response of certain forms of superficial tuberculosis, especially of the skin, to heat radiation, speaks very clearly for this.

The exact part played in the clinical usage of light by the total visible spectrum is difficult to say, although in all probability it is in some way physiologically effective.

The role of ultraviolet energy has been much more definitely established through animal and human studies in calcium-deficient diseases in which it has specific effect. Furthermore, in tuberculosis, on the basis of the quality of ultraviolet wavelengths and of the results obtained at the seashore, at inland sea level and in the mountains, Danish workers are convinced that ultraviolet energy of the region longer than 313 millimicrons is the one effective in the treatment.

The additional part played by the action of moving air on the skin in the solar treatment of extrapulmonary tuberculosis must not be discredited. Probably the combination of all factors contributes to the end result.

MERCURY VAPOR ARC IN QUARTZ COMPARED WITH CARBON ARC LIGHT²

The radiations of artificial sources represent approximations to sunlight and no two sources are alike in respect to the distribution of the energy they emit. Therefore different sources do not produce the same physiologic or therapeutic action. The energy emitted by various artificial sources varies in intensity and in spectral distribution. The intensity of the radiation of sunlight on the earth's surface varies considerably, particularly on account of location, season and time of day. It will vary as much as 5 per cent in total intensity and a variation of 5 to 10 times in noon-hour ultraviolet winter to summer.

In the choice of an artificial source of light, one must consider the quantity and quality of the energy emitted by the lamp. A sufficient quantity of radiation must be present which corresponds to the particular parts of the spectrum found most efficient in the disease to be treated. Under different conditions all parts of the light spectrum will yield results if particular conditions demand the wavelengths that a special source of light emits strongly.

For therapeutic purposes the sun, the mercury vapor arc in quartz and the flaming carbon arc burning cored carbons filled with mixtures of carbon dust and metals have been the chief ones of practical importance. The mercury vapor lamp has been particularly developed for its emission of ultraviolet, although it emits also well in the visible part of the spectrum. Its ultraviolet component represents between 9 and 28 per cent

¹ Pemberton, Ralph. Influence and Therapeutic Use of Heat. *J. A. M. A.* 105:275 (July 27) 1935.

² Laurens, Henry. Factors Influencing the Choice of a Source of Radiant Energy. *J. A. M. A.* 103:1447 (Nov. 10) 1934.

of the total energy of all wavelengths emitted by the lamp. A carbon arc consuming 25 amperes or more and burning specific carbons, such as "sunshine" carbons, closely approximates highland sunshine. Carbon arcs of varying amperage and with special cored carbons will emit, almost according to the needs, widely varying intensities in many regions of the light spectrum.

An important question in the selection of these various sources of light is the minimum ultraviolet radiant power that a source must emit in order to insure effective therapeutic action. The amount of ultraviolet that can be applied to the body without producing a burn depends on the tolerance of the skin. The erythema reaction is really the only physiologic one that is established with a relatively high degree of accuracy. As a criterion it is a simple and practical means of preventing severe burns and as a reaction it is a good means of judging the effectiveness of a lamp.

Exact clinical indications for different sources of light have not yet been defined. For rickets and tetany, both the carbon arc and the mercury arc as well as sunlight have proved curative. For extrapulmonary tuberculosis, as that of the skin, bones and joints, intestine, peritoneum and lymph nodes, both sources of light have had strong adherents and both have shown their value. The enthusiasts for solar treatment will insist that a spectrum closely approximating that of sunlight is necessary, and therefore they particularly advocate certain carbon arcs. Others who have gotten favorable clinical results with mercury quartz lights argue in their behalf.

The conditions, clinical and otherwise, indicating the selection of one source of light in preference to others depend in part also on the convenience of usage, the availability of the source of light, and the cost of running. In the past, carbon arc lamps of high amperage have been more generally applied for exposures of groups. The mercury quartz lights are now applicable for exposures of groups as well as individual patients. The carbon arcs of lower amperage, as well as mercury arcs, can be used for single patients. Irradiation with artificial light, as ordinarily employed indoors, lacks some apparently important accompaniments of outdoor solar exposures, such as constantly moving fresh air with its deeper effects produced through the skin and respiration, and in colder weather the uniform warming of the whole cutaneous surface with its production of a sense of comfort, well being and relaxation. Workers aim to produce this with artificial sources of light and some added means of ventilation indoors.

PULMONARY TUBERCULOSIS

For uncomplicated pulmonary tuberculosis, no clinical evidence is at hand to prove the indication for light therapy. The lack of accurately controlled observations among certain workers makes it necessary to accept their favorable reports most cautiously. Until contrary evidence is at hand, uncomplicated exudative pulmonary tuberculosis is a contraindication to light therapy, with proliferative or fibrotic pulmonary tuberculosis, which may be accompanied by elevation of temperature, sunlight or artificial lights, if employed at all, should be used cautiously. Intense sunlight should be avoided, and diffuse daylight or early morning and late afternoon sunlight should be used. Focal or constitutional reactions should be watched for. The indications here resemble those of tuberculin therapy.

In pulmonary tuberculosis, even when quiescent, harm has been done by sunlight exposures, especially with too intense and prolonged irradiations. Solar heat alone, especially in summer, can prove very exhausting. An observing patient will note fatigue, exhaustion, irritability or even overstimulation after these solar baths. With this reaction, sunlight should be discontinued. If symptoms are due to overdosage only, exposures may be resumed after an interval, shorter or less intense exposures being employed. Increase of local symptoms, such as cough and expectoration, and pleurisy, or of systemic symptoms, such as elevated pulse and temperature, serves as a guide. In these cases it may be advisable to substitute irradiations of diffuse daylight of longer duration, or of low intensity sunlight in the early morning and late afternoon hours.

A moot question is the exposure of active febrile pulmonary tuberculosis, with or without extrapulmonary complications, to light irradiations. As regards x-ray exposures, workers with extensive experience caution strongly against irradiating exudative pulmonary tuberculosis but emphasize as suitable only the stationary proliferative and fibrotic forms with little or no fever. Do similar indications hold for light radiation?

Lo Grasso and others have employed sunlight of weak intensity (in the early morning and late afternoon hours) for uncomplicated febrile pulmonary tuberculosis and have claimed favorable results. On the other hand, the reports of Bronfin from the sunny resort of Denver and of Jacquerod in Leysin, Switzerland, contradicted this. My own experience is strongly in agreement with the latter.

In an active febrile pulmonary tuberculosis complicated by active intestinal tuberculosis, mercury quartz irradiations have been regularly used by many for the intestinal complication and not infrequently with favorable effect. In such cases the activity and nature of the pathologic changes of the pulmonary disease have been disregarded. The favorable empirical results thus obtained and the poor results obtained when other treatments have been used justify this as an indicated therapy.

For other forms of active extrapulmonary tuberculosis, such as that of bones and joints, or lymph nodes complicating active pulmonary tuberculosis, light exposures have been often used to advantage, so that the pulmonary disease, if not rapidly progressive, offers no contraindications. However, careful observations, especially in exudative forms of pulmonary disease, will not rarely reveal the development of harmful pulmonary focal reactions due to excessive exposures to light. This should deter one from exposing such patients indiscriminately.

Focal reactions have been shown to occur in the lungs, even when direct sunlight is reflected in overdosage on a tuberculous larynx. Some workers observed their occurrence when the limbs alone were irradiated with the mercury quartz and carbon arc lights. In the use of both lamps and sunlight, one often notices on beginning treatment a slight elevation of temperature with mildly increased focal pulmonary symptoms. This reaction has been likened by some observers to a tuberculin reaction. Jesonek believed that the pigment could act specifically, just as tuberculin, and that when carried by the blood it set up a focal reaction such as he had observed in the lungs, larynx and joints. He obtained these only in cases in

which good pigmentation developed, and a latent period always existed before signs of the reaction appeared. By the screening of lupus areas from the light and exposing the rest of the body, the diseased tissue has often healed, indicating apparently the transport by the blood of some substance to the focus. However, therapy is preferably carried out by exposing the diseased parts in addition, because the local inflammatory reactions obtained through direct irradiations may be of importance.

In tuberculosis of the urinary bladder, under general irradiations, small nodules have been reported to develop in the bladder, which were considered as focal reactions. In animal experiments irradiation of the posterior part of a frog's body produced vascular changes in the retina. Isolated instances of disappearance of tubercle in the retina under general irradiation have been cited. Reyn and Strauss found that thirty cases of lupus, which had not been affected by previous local treatment, healed when general irradiations were added.

After an experience of eight years with irradiation from the mercury quartz lights of 655 patients in all stages of tuberculosis and with thousands of exposures, Godde reported definite focal reactions set up in fifty-seven of them, manifested by an increase of constitutional symptoms and a spread of the pulmonary disease. He was strongly of the opinion that quartz light treatment was not a harmless procedure and might do damage unless the irradiations were carefully graded and slight reactions were heeded. Other workers, including Marfan, Grau, Brecke, Bacmeister and Harms, have similarly warned against such focal reactions.

Harm due to irradiation of patients with pulmonary tuberculosis results almost always from an indiscriminate use of light, with overdosage. It manifested itself in my experience with increased local symptoms, namely, increased cough and expectoration, localized pain, blood-streaked sputum or hemoptysis, and, following these, fever and tachycardia. The exposures had then to be shortened, discontinued or given over less surface of the body. I have seen genito-urinary tuberculosis become definitely aggravated because of overexposure.

Even though only occasional undue focal reactions happen, caution is justified. They can easily be avoided. Their importance has been emphasized to warn against careless usage of light with little regard for dosage.

Roentgen therapy of pulmonary tuberculosis is effective for the proliferative and fibrous forms when the disease is stationary. The response is characteristically slow. Exudative tuberculosis is a contraindication. Overdosage produces damaging focal reactions, often of caseous pneumonia. The best results are had with doses of about three fourths to four fifths of an erythema dose. The quality of the rays should vary according to the depth, extent and nature of the pathologic condition. Tumor or tolerance doses should not be used for tuberculosis.

PLEURAL TUBERCULOSIS

Pleural tuberculosis, dry or serous, especially if it is the initial clinical manifestation, is occasionally aided by light therapy. The acute serous form is not to be irradiated. A tuberculous pleurisy with no obvious pulmonary disease usually responds to ordinary rest and hygienic-dietetic treatment, those cases not responding after about a month of such treatment may

call for irradiations. Pleurisies occurring in the course of obvious pulmonary tuberculosis, as well as pneumothorax cases, offer the same indications as the lung disease. Tuberculous empyemas do not respond. If sinuses are present, they are rarely helped by local and general light applications. Pleural tuberculosis in the Negro, peculiarly enough, has been cited as favorably responsive to light.

LARYNGEAL TUBERCULOSIS

Laryngeal tuberculosis is practically always secondary to pulmonary tuberculosis, so that the indications for the treatment of the larynx depend on the nature of the disease in the lungs. Here, again, light by itself is not curative but exercises its part only as an adjuvant to the other mainstays of treatment. These, in addition to the enforced rest and hygienic regimen, include local measures to the larynx applied as they are indicated. Such local measures in particular include absolute vocal rest (silence), local medications and sprays, and local application of the galvanic cautery. General light exposures are made to the body, with at times additional laryngeal local exposures. The acute forms of laryngeal tuberculosis, particularly those with edema, are not indications for light therapy.

Often vocal silence and bodily rest comprise the only treatment required for healing this complication of pulmonary tuberculosis. A large percentage of the patients will get well in this way and frequently, therefore, the irradiation employed is unjustifiably credited with the result. If these measures have not brought about improvement in the larynx within a reasonable time, light exposures are indicated.

Local exposures of sunlight may be made by means of metallic reflectors (chiefly magnalium). With artificial sources, local irradiation has been carried out by reflected light through special means devised to employ the maximum intensity of ultraviolet or by direct irradiation through quartz applicators attached to water-cooled mercury arcs or through especially constructed direct water-cooled sources of light. Exposures are made with the aim of producing a mild focal reaction, the reaction being allowed to subside before the next exposure is made. Those patients in whom mild focal reactions developed through irradiation showed often a greater tendency to heal, but no advantage to be gotten from a local treatment to the larynx is cause enough to compel a patient to leave his bed when his active disease indicates bed rest. Furthermore, general body irradiation in this complication plays a large part.

Direct local exposures have been made with a special carbon arc through a Seifert apparatus, originated at Hayek's clinic in Vienna. This is a direct irradiation procedure in which the epiglottis is elevated and the pharynx and larynx are narcotized as for direct laryngoscopy. The patient (lying down) then receives direct exposure of the larynx, ranging from one to fifteen minutes, depending on the stage of treatment and the reactions. Exposures are made generally biweekly and extend over a period of a year or more. The results with all these local irradiating methods must still be adjudged with caution.

The electrocautery is one of the best methods of treatment in laryngeal tuberculosis and is the form of local treatment most used by laryngologists with experience in handling this disease. Local light therapy has proved useful as a postoperative measure in cauterization cases, and as a sedative measure in cases in which cauterization cannot be done.

involved, and whether the disease is caseous or fibrous. At times complete radical excisions of the whole tract or the major part of the tract are indicated.

BONE AND JOINT TUBERCULOSIS

In bone and joint tuberculosis, heliotherapy, although not the mainstay of treatment, is always employed in combination with other forms of therapy. Orthopedic measures, rest in the open and light form the basis of conservative therapy.

Combined conservative treatment includes orthopedic measures, such as immobilization of joints, traction, and careful use of passive and active motion, use of light, air, tuberculin and diet, judicious application of surgery, and, rarely, roentgen therapy.

There are at present three definite schools of treatment, each with adherents. The first emphasizes the need for surgical intervention, especially fusion, in all cases of joint tuberculosis. This school maintains that cure can occur only through ankylosis and that this ankylosis is produced more rapidly and safely by the surgeon than by nature.

The second school, as represented by Rollier, is rigidly set against surgery except in unusual instances. This school holds that light therapy with orthopedics can do far more than the surgeon's knife. The latter destroys while radiation heals.

The third school adopts a more conservative attitude. Its leaders think that the problem of joint tuberculosis is much too complicated and difficult to be settled by one mode of attack and that in each instance numerous points of view and fine differentiations must be considered in reaching the maximum therapeutic effect. Surgery, solar therapy, artificial light therapy, braces, even in some cases the much maligned plaster-of-paris cast, all have their place in the treatment of bone and joint tuberculosis. Only the future can decide which of these three schools comes nearest to the truth, although advocates of surgical fusion are steadily increasing.

Light therapy must be admitted to be a real addition to our resources. It is not to be expected that it will produce new cartilage in place of that which has been utterly destroyed, it does not make the process of fusion less necessary than it has been hitherto, but it can help this develop. It is wrong to expect that its use will bring about regeneration of bone equal to that of a few vertebral bodies when they have been destroyed, but when this has occurred and a gibbous deformity exists, light therapy has aided orthopedic treatment in fusing these diseased surfaces, especially when employed together with postural treatment.

Surgical fusions are less commonly performed on children under 12 years of age. If performed on adults or children, the disease must first show some evidence of retrogression, thus surgery is to help nature. Following operation, patients are still treated for from one to two years, and during this period heliotherapy plays an important part.

Both mercury arc in quartz and carbon arc irradiations, employed as general and local exposures for prolonged periods of time, have proved aids in the treatment of bone and joint tuberculosis. The technic of irradiation is the same as that described with other forms of tuberculosis. With early exposures, the joints or bones often respond with increase of the local swelling and pain and, if a sinus is present, increased secretion. These in turn subside. Small joints yield more quickly to treatment than large ones. The knee joint is

refractory, and particularly obstinate are old fistulas of the spinal column, pelvis or hip. Treatment demands two years or more in many instances.

Roentgen therapy is occasionally added and has at times shortened the period of treatment. As a rule, however, it is not enthusiastically advised except in involvement of the smaller and superficial bones, those of the tarsus, metatarsus, carpus, metacarpus, fingers and toes, sternum and ribs. Even with these, results are not rapidly obtained. In tuberculosis of the spine, hip, knee and sacro-iliac joint, x-rays are practically never used.

OTHER FORMS OF TUBERCULOSIS

Various other forms of tuberculosis indicate light therapy. With the cutaneous tuberculosis, lupus vulgaris responds almost specifically. Scrofuloderma and erythema induratum react less constantly but very favorably at times. Papulonecrotic tubercles are resistant. Lupus erythematosus is often aggravated by light. Tuberculous ulcers of the mouth and pharynx, usually secondary to advanced pulmonary or laryngeal tuberculosis or to hematogenous dissemination, are most resistant. Electrocoagulation is a more effective therapy.

X-rays are of definite value in most cutaneous tuberculosis due directly or indirectly to the tubercle bacillus and in a few results are spectacular.⁴ Those which are amenable to x-rays respond well to suberythema or sub-intensive and fractional dosage. Suberythema doses of from one half to two thirds of a skin unit, repeated in a month or more, give excellent results in scrofuloderma and disseminated miliary lupus. This method of irradiation, alone or combined with various medical and surgical methods, benefits or cures also lupus vulgaris, sarcoid, erythema induratum, tuberculosis orificialis and tuberculosis verrucosa cutis. The tubercles and lupus erythematosus temporarily involute under x-rays, but recurrences are not prevented.

Aural and ocular tuberculosis are difficult to affect with light, although corneal ulcers and phlyctenular conjunctivitis have not infrequently healed under local exposures. Roentgen therapy has proved effective with tuberculosis of the cornea and iris, but its dose must be moderate and repeated regularly at intervals of about four weeks. These measures are indicated when tuberculin therapy has failed.

RELATIVE MERITS OF DIFFERENT FORMS OF RADIATION

The following outline is constructed with the realization that as yet the relative merits are not accurately defined and not accepted by all. It is offered merely as a possible working basis.

Sunlight is available in almost every locality at some season of the year. Its intensity is variable, but moving air and low intensity sunlight or diffuse daylight can generally be used. In some places, where the extreme cold of winter prevents outdoor exposures for a few months, artificial sources of light should be resorted to.

1 *Uncomplicated Pulmonary Tuberculosis*—(a) Sunlight is to be used only after prolonged trial of routine rest, hygienic-dietetic treatment, and perhaps in cases in which surgical treatment has failed to cause satisfactory healing (exudative tuberculosis always excluded). Carefully graduated general body exposures are to be made to sunlight of low intensity or to diffuse daylight, together with air baths in the earlier morning or later afternoon hours. The so-called pre

⁴ MacKee, G. M. Cutaneous Roentgen and Curie Therapy. *Science of Radiology* 1933, p. 291.

tuberculosis of children, as well as chronic pleurisies, are all forms in which sunlight can be the treatment of choice

(b) Artificial lights (mercury arc in quartz and carbon arc) deserve a trial only after routine therapy has failed, but one should not expect promising results except in isolated instances. They may occasionally help as an adjuvant. Progressive cases with fever and exudative tuberculosis are excluded. Pleurisies and the "pretuberculosis" of children can be favorably influenced.

(c) X-rays are to be confined to the proliferative and fibrotic forms with little or no fever, and then used rarely, if at all. Progressive pulmonary tuberculosis and all exudative forms strongly contraindicate x-ray exposures.

2 Active Extrapulmonary Tuberculosis Without Active Pulmonary Tuberculosis—Tuberculosis of the skin, lymph nodes, bones, joints, genito-urinary tract, peritoneum, intestine. By this is meant that the signs and symptoms of active or progressive disease are due, not to the pulmonary tuberculosis, but to the extrapulmonary focus. Signs of active disease include both local and constitutional signs.

(a) Sunlight is the treatment of choice for bones and joints, lymph nodes and genito-urinary tract, especially in the highlands. Graduated exposures of the body are to be made to sunlight, together with the use of rest and hygiene and whatever surgical and orthopedic measures may be necessary. Results are excellent if sunlight is employed over prolonged periods, even in active but not rapidly progressive forms of the disease. Artificial lights should be used, in addition, on cloudy days, especially in cases of cutaneous tuberculosis or discharging sinuses.

(b) Artificial lights (mercury arc in quartz and carbon arc) are to be used usually as substitutes for sunlight. However, they may be preferable to sunlight for certain complications, such as superficial, peritoneal and intestinal tuberculosis. Superficial forms include lupus vulgaris and scrofuloderma, keratitis and phlyctenular conjunctivitis. General exposures are always made with additional local exposures over the area of disease.

(c) Roentgen therapy may be the treatment of choice in the infiltrative stage of lymph node tuberculosis. Employed locally with other measures, results are often hastened in tuberculosis of the small bones, superficial joints, and skin. The locally applied x-rays and general sunlight or lamp irradiations can be combined. When x-ray exposures are thus added to light therapy, the duration of treatment is at times shortened.

3 Active Extrapulmonary Tuberculosis with Active Pulmonary Tuberculosis Accompanied by Fever—Both pulmonary and extrapulmonary tuberculosis show subjective and objective evidence of active or progressive disease.

(a) Sunlight is the treatment of choice in tuberculosis of the bones and joints and in genito-urinary tuberculosis, sunlight of low intensity in the early morning and late afternoon hours being used. The solar and air exposures should be given very gradually.

(b) Artificial lights (mercury arc in quartz and carbon arc). The mercury quartz light is often preferred when pulmonary disease is exudative and febrile, because of its great deficiency in heat rays. Better results are then had in tuberculosis of the intestine, peritoneum, epididymis and lymph nodes. It is advis-

able to alternate mercury quartz irradiations with exposure to the outside air and diffuse daylight.

(c) X-rays should not be applied locally to an exudative or progressive form of tuberculosis. If not progressive, the same conditions exist as for 2 c.

With an acute progressive tuberculous laryngitis, light irradiations applied locally are inadvisable until the acuteness has subsided, but, if other measures have failed, light irradiations may be tried as a final treatment, if only for their possible analgesic effect. Combinations of local irradiations of light and general body exposures are always employed, if possible, according to the indications mentioned.

CONCLUSION

Benefits are undoubtedly obtained by patients suffering from tuberculosis of the bones, articulations, peritoneum, intestine, lymph nodes and larynx when the entire body is exposed to carefully graded doses of natural sunlight or to radiation emitted by certain artificial sources of light rays. The beneficial results of such irradiation are due not only to ultraviolet rays. The visible and infra-red rays, as well as the conditions of the atmosphere, play a certain part in the therapeutic effect.

In tuberculosis of the skin, lupus vulgaris alone can be said to respond specifically to light. Scrofuloderma and erythema induratum react favorably at times to general and local exposure, although not as constantly. Lupus erythematosus does not respond to and may be aggravated by light.

In tuberculosis of the bones and articulations, it is generally agreed that suitable, graded exposure to natural sunlight is most effective in aiding the healing accomplished by orthopedic and other measures. Exposure to artificial sources of radiation is valuable here as a second choice.

Pulmonary tuberculosis, per se, is not an indication for light therapy, stationary pleural tuberculosis has often been helped by this measure.

Genito-urinary tuberculosis deserves a trial of such treatment in combination with other measures. Local exposure to ultraviolet rays of circumscribed tuberculous lesions of the urinary bladder has been shown to yield favorable results, but the method requires special applying devices and, above all, skilful treatment of the bladder lesion.

Ocular tuberculosis and aural tuberculosis respond infrequently to light. Oral tuberculosis is most resistant.

Fistulas are often resistant to such treatment. Post-operative sinuses, in contrast, are most responsive.

Intestinal, peritoneal and lymph node tuberculosis especially indicate light therapy and often are rapidly responsive.

In tuberculosis, overdosage has produced harmful focal reactions. Here light may set up a focal reaction similar to that of tuberculin.

The erythemic reaction is an accurate indicator of skin tolerance. Hence a preliminary exposure of a small area to gauge the minimal perceptible erythema will avoid undue burns.

Surgical versus conservative treatment of bone and joint tuberculosis. With any form of tuberculosis, light is to be used merely as an adjuvant and should be combined with all other indicated forms of therapy. The mainstays of treatment still remain, such as rest, proper dietary, and hygienic outdoor life.

With bone and joint tuberculosis, orthopedic measures combined with light still play the major rôle.

Indications for surgical intervention may depend on many factors economic and social conditions, the age of the patient, the joint involved, their number and the stage and extent of the disease, involvement of other organs such as the lungs and kidneys, and complicating abscesses or sinuses. Joint tuberculosis is still a local manifestation of a constitutional disease. Surgical measures are therefore in turn to be recognized as adjuvant procedures to be followed by prolonged conservative therapy. Intervention by surgical fusion is always to be seriously considered in the presence of advanced joint destruction. Restoration of function may occur in the synovial form of joint tuberculosis, even in the presence of large effusions, but complete functional return of motion in a joint is doubtful when the bony parts have been destroyed to a marked degree.

Roentgen therapy of pulmonary tuberculosis has many restrictions and important contraindications. Its healing effect in certain forms of extrapulmonary tuberculosis has been definitely established, but the limitations must be recognized, dosage carefully regulated, and treatments given only by experts in the field.

470 Park Avenue

LEPEL ULTRA-SHORT WAVE MACHINE ACCEPTABLE

Manufacturer: Lepel High Frequency Laboratories, Inc., New York

The manufacturer recommends this machine for medical and surgical diathermy. The unit is of the spark gap type. The wavelength is approximately 95 meters, although there is a second resonance point which generates a wavelength a few meters longer. The spark gap and transformer are kept cool by means of an electric fan, which operates while the unit is turned on.

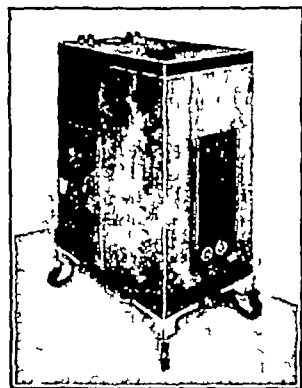


Fig. 1—Lepel Ultra Short Wave Machine

Temperature measurements were taken on a spark gap and the transformer to determine whether they overheated. The temperature rises, after the machine had been operated on a full load for one hour, did not exceed the upper limits adopted by the Council. It is well fitted in a substantial cabinet and appears to be well made. The shipping weight is about 150 pounds.

The tissue heating ability of the unit was investigated in a clinic acceptable to the Council. According to a technic recommended by the manufacturer, cuff electrodes 25 cm wide and 50 cm long were applied to the human thigh, one near the hip

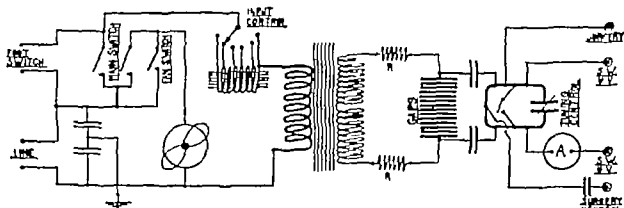


Fig. 2—Schematic diagram of circuit

and the other just above the knee. Felt and toweling about 25 cm thick separated the skin from the cuffs.

Thermocouples were inserted directly into the tissues. All thermometric devices were checked against a standard mercury thermometer. Thermocouples were in place during treatment. After twenty minutes treatment, the machine being operated at

the patient's tolerance, the temperature rise (average of eight tests) was observed to be more than that for conventional diathermy—the criterion for evaluating short wave machines which the Council has adopted.

Burns may be produced by this machine, but, with ordinary care, they may be avoided, their likelihood to occur is much less than with conventional diathermy.

In view of the foregoing report, the Council on Physical Therapy voted to include the Lepel Ultra Short Wave Machine in its list of accepted apparatus.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary

DIPHTHERIA ANTITOXIN—For description see the U S Pharmacopeia and Useful Drugs

Lederle Laboratories, Inc., Pearl River, N Y

Diphtheria Antitoxin Globulin Lederle Modified—This preparation differs from diphtheria antitoxin U S P chiefly in the method of refinement. The process of refinement is based essentially on a controlled method of selective digestion of the proteins of the immune horse blood with pepsin. As a result of this process as much as 90 per cent of the coagulable protein may be digested; a smaller portion is precipitated, and the remainder, a pseudoglobulin fraction is purified first by ordinary filtration and then by ultrafiltration and dialysis. Diphtheria antitoxin, globulin Lederle-modified is marketed in single syringe packages representing 1 000, 5 000, 10 000, 20 000 and 40 000 units of diphtheria antitoxin respectively.

RABIES VACCINE (See New and Nonofficial Remedies, 1935, p 380)

Lederle Laboratories, Inc., Pearl River, N Y

Rabies Vaccine Lederle (Semple Method)—(See New and Nonofficial Remedies, 1935, p 382)—Also marketed in packages of fourteen vials each containing 2 cc

TETANUS ANTITOXIN—For description see the U S Pharmacopeia and Useful Drugs

Lederle Laboratories, Inc., Pearl River, N Y

Tetanus Antitoxin, Globulin Lederle Modified—This preparation differs from tetanus antitoxin U S P chiefly in the method of refinement. The process of refinement is based essentially on a controlled method of selective digestion of the proteins of the immune horse blood with pepsin. As a result of this process as much as 90 per cent of the coagulable protein may be digested; a smaller portion is precipitated, and the remainder, a pseudoglobulin fraction is purified first by ordinary filtration and then by ultrafiltration and dialysis. Tetanus antitoxin, globulin Lederle-modified is marketed in packages of one vial containing 1,500 units of tetanus antitoxin in single syringe packages representing 1,500, 3,000, 5 000, 10 000, 20 000 and 40 000 units of tetanus antitoxin, respectively, and in packages of one cylinder containing 10 000 units of tetanus antitoxin for intraspinal administration.

NOVOCAIN (See New and Nonofficial Remedies, 1935, p 63, and THE JOURNAL, June 22, 1935, p 2256)

The following dosage forms have been accepted

Ampules Solution Novocain 2 per cent 3 cc Novocain 0.06 Gm. in distilled water to make 3 cc

Ampules Novocain Solution 10 per cent 2 cc (For Spinal Anesthesia) Novocain 0.2 Gm. in distilled water to make 2 cc.

WHITE'S COD LIVER OIL CONCENTRATE (LIQUID) (See THE JOURNAL, Sept 21, 1935, p 966)

The following dosage form has been accepted

White's Cod Liver Oil Concentrate Liquid Vials 5 cc—Each two-thirds minim (0.038 Gm.) has a vitamin A potency of not less than 2 280 units (U S P \ Revised 1934) and a vitamin D potency of not less than 320 units (U S P \ Revised 1934)

MERCUROCHROME (See New and Nonofficial Remedies, 1935, p 309)

The following dosage form has been accepted

Surgical Solution of Mercurochrome—Mercurochrome 2 per cent dissolved in a vehicle consisting of 55 parts of 95 per cent alcohol U S P, 10 parts of acetone-U S P, and 35 parts of water, to which has been added sodium carbonate in the proportion of 0.1 per cent

METAPHEN (See New and Nonofficial Remedies, 1935, p 314)

The following dosage form has been accepted

Saf T Top Tincture Metaphen Tincture of metaphen 1 200 marketed in ampules having a capillary opening containing 2 cc and 15 cc.

Prepared by Robert A. Bernhard Rochester N Y

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS
RAYMOND HERTWIG Secretary

ACCEPTANCE WITHDRAWN

LISTER'S DIETETIC FLOUR (SELF RISING)

Manufacturer—Lister Bros, Inc, New York

Description—Self-rising mix, containing casein, sodium caseinate, ground ivory or palm nut (*Phytalephas macrocarpa*), sodium bicarbonate and calcium acid phosphate

Manufacture—The casein curd is precipitated from milk with hydrochloric acid. The curd is worked and washed with water at least five times, dried and ground. The sodium caseinate is prepared by adding four parts of sodium bicarbonate to the curd (described above) from 100 pounds of milk. The mass is dried on hot rolls.

Definite proportions of the formula ingredients are automatically mixed and packed in cartons

Analysis (submitted by manufacturer) —

| | per cent |
|--|----------|
| Moisture | 7.0 |
| Ash | 6.6 |
| Fat (ether extract) | 0.05 |
| Protein (N \times 6.25) | 56.9 |
| Reducing sugars | 0.0 |
| Sucrose | 0.0 |
| Starch (diastase method) | 0.0 |
| Dextrins (alcohol precipitation method) | 0.0 |
| Crude fiber | 1.0 |
| Carbohydrates other than crude fiber (by difference) | 28.5 |

Calories (available) — 2.3 per gram 65 per ounce

Claims of Manufacturer—Recommended for diets low in carbohydrates

Uselessness as a Special Purpose Food—Lister's Dietetic Flour, manufactured specially for use in diets restricted in dextrose formers, was accepted in November 1933, before the Committee adopted definite requirements for a special purpose flour of this character. To be eligible for acceptance at this time, such type of flour shall contain dextrose formers yielding dextrose in an amount not greater than 3.3 Gm per hundred cubic centimeters (the dextrose equivalence being computed as the carbohydrate, plus 58 per cent of the protein, plus 10 per cent of the fat content of the food). Dextrose formers of Lister's Dietetic Flour, on the other hand yield 13 Gm of dextrose per hundred cubic centimeters (based on submitted information that 100 cc of the product weighs 39 Gm).

There is authoritative evidence that commercially prepared special diabetic foods such as this flour are of limited usefulness to the diabetic patient and that the availability of insulin makes them no longer necessary. Artificial substitutes for ordinary foods are not to be favored, it is much better for the diabetic patient to learn how to plan his diet with foods in common use and readily available. The diet should be exactly prescribed in carbohydrate, protein and fat, and total calories.

The designation of a food as a diabetic food merely because it is low in carbohydrates is now unwarranted and misleading and gives the erroneous impression either that the food taken in unrestricted quantities in diabetes is harmless or that it has remedial action. Except for the necessity of restricting foods to avoid overstepping the food tolerance there are no special diabetic nutritional requirements. The exploitation of starch-free or low carbohydrate foods containing an excess of protein for use by diabetic patients is unwarranted. Protein may be tolerated almost as poorly, if not quite as poorly as starch in diabetes.

Because Lister's Dietetic Flour is adjudged without usefulness or special adaptability for inclusion in diets restricted in dextrose formers, it no longer will be listed among the accepted foods of the Committee on Foods.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.



RAYMOND HERTWIG Secretary

RUGER'S PURINA BRAND WHEAT BREAD

Manufacturer—John B. Ruger Sons Company, La Fayette, Ind.

Description—A whole wheat and white flour bread made by the sponge dough method (method described in THE JOURNAL, March 5 1932, p 817), prepared from whole wheat flour, water, white flour, sweetened condensed skim milk, leaf lard, yeast, salt sugar partially defatted soy bean flour (omitted in summer) and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate.

HIDEX

Manufacturer—Scientific Sugars Company, Indianapolis, subsidiary of Union Starch & Refining Company.

Description—Essentially a powdered mixture of dextrans (64 per cent) and maltose (32 per cent), obtained from diastatic conversion of corn starch.

Manufacture—A mixture of formula proportions of ground corn (hulls and germ removed), water and diastatic barley malt is held at the proper temperature until the starch is converted into dextrans and maltose in the ratio of approximately 64 to 32 respectively. The resulting mash is filtered, the filtrate is heated to 85 C, admixed with charcoal, filtered, concentrated in vacuum, heated to 95 C, drum-dried in vacuum, ground and packaged.

Analysis —

| | per cent |
|----------------------------|----------|
| Moisture | 3.0 |
| Total solids | 97.0 |
| Ash | 0.5 |
| Fat (ether extract) | 0.0 |
| Protein (N \times 6.25) | 0.5 |
| Reducing sugars as maltose | 32.0 |
| Crude fiber | 0.0 |
| Dextrans (by difference) | 64.0 |

Calories — 3.9 per gram 111 per ounce

Claims of Manufacturer—A high dextrin carbohydrate food for supplementing milk in infant feeding. Of especial advantage in diarrhea and postoperative feeding in that the dextrans do not readily ferment. Relatively slowly digested, the dextrose produced is only gradually made available for absorption.

JENNY LEE BRAND LONG MACARONI
JENNY LEE BRAND LONG SPAGHETTI
JENNY LEE BRAND ELBOW MACARONI
JENNY LEE BRAND ELBOW SPAGHETTI
JENNY LEE BRAND MACARONI SHELLS

Manufacturer—Minnesota Macaroni Company, St Paul

Description—Macaroni of various shapes prepared from durum semolina.

Manufacture—Same as for Minnesota Brand macaroni products (THE JOURNAL, Aug 3, 1935, p 369).

GRISDALE BRAND TOMATO JUICE

Distributor—Gristede Bros., Inc., New York

Manufacturer—P. J. Ritter Company, Philadelphia

Description—Canned tomato juice, retaining in high degree the natural minerals and vitamins. Seasoned with salt. The same as Ritter Tomato Juice (THE JOURNAL, Oct. 6, 1934, p 1069).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO, ILL

Cable Address

Medic, Chicago"

Subscription price

Seven dollars per annum in advance

Please send in promptly notice of change of address giving both old and new always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, NOVEMBER 16, 1935

CLINICAL ASPECTS OF AVITAMINOSIS A

The relatively recent and eagerly awaited development of knowledge of the chemistry of vitamins has been preceded and paralleled by the compilation of information concerning the physiologic importance of the substances so designated. It is now evident that a number of descriptions of disease appearing in the early medical literature are largely manifestations of avitaminosis. Fundamental discoveries in the organic chemical, the physiologic chemical and the physiology laboratories have explained in many instances the rationale of certain historic dietary therapeutic measures. Although the major portion of the biologic results have been obtained with experimental animals, this information has gradually led to a recognition of conditions in the clinic which simulate those produced in the laboratory.

The fat-soluble factor, vitamin A, has not yet been isolated in pure form but has interested clinicians since early times through the manifestations of its deficiency. Accumulating medical literature testifies to the manifold functions in which this vitamin is involved. Avitaminosis A has been described as the cause of xerophthalmia, as an alleged etiologic factor in the formation of urinary calculi, as being of significance in creating a resistance to infections in the respiratory organs, as related to keratomalacia and other pathologic lesions of the cutaneous system, and as a necessary dietary constituent for prevention of lesions of the nervous system. The skin changes of chronic avitaminosis A are particularly striking, many varieties of dermatitis may be seen before xerophthalmia makes its appearance. Mackay¹ recently made a critical review of the clinical literature and concluded that the earliest effects of vitamin A deficiency could probably be detected in the skin. This author undertook a large scale test on infants to determine the effects of prophylactic treatment with vitamin A. The results² taken

as a whole indicate a perceptible increase in the resistance to minor infections of the skin in those infants given the extra vitamin A. Mackay concludes that, although only a fraction of the minor skin infections seen in the infants studied by her could be attributed solely to a lack of vitamin A, there is in avitaminosis A a generally lowered resistance in these cases. She believes that infants fed on dried milk should have their dietary supplemented with vitamin A as a routine measure.

The relationship of keratomalacia to vitamin A deficiency was demonstrated conclusively by Bloch,³ who was one of the first to stress the fact that the disease is characterized by general manifestations of which the ocular symptoms are only a part. Despite the fact that a considerable amount of literature has appeared on this aspect of avitaminosis A, the reports have dealt primarily with experimental problems and with reports of ophthalmologists. Clinical and pathologic studies have been few and there has been little effort to correlate the general symptomatology and the pathology. A good beginning toward satisfying the need for this type of data has been made in the excellent clinical and anatomic study of avitaminosis A among the Chinese⁴ reported from Peiping Union Medical College. The investigators have studied the records of 203 patients suffering from various manifestations of avitaminosis A and the material obtained from seventeen necropsies and twenty-two biopsies. The results are discussed from the points of view of etiology, pathology, symptomatology, physical examination and diagnosis, and an attempt is made to correlate the clinical and pathologic pictures. Sweet and K'ang find that diet is, of course, the factor of prime importance in the causation of the deficiency disease of keratomalacia. Other factors are related to incomplete utilization of the ingested vitamin sources. The pathologic studies are of particular interest because there have been few thorough investigations of the pathology of avitaminosis A in man. In the necropsies performed by Sweet and K'ang, lesions of the eye were most frequent, changes in the respiratory tract ranked next in frequency. The pathologic appearances are described in good detail, as are the symptomatology and the observations in the physical examinations. The authors also present the diagnosis and treatment of the cases under their observation and finally offer cogent comment designed to correlate the results. Case histories of the seventeen patients who provided the material for the necropsies add to the value of their contribution. This most complete investigation offers a model for further reports, wherever possible, of this type.

³ Bloch, C. E. Clinical Investigation of Xerophthalmia and Dry-trophy in Infants and Young Children. *J. Hygiene* 10:283 (Jan.) 1921. Blindness and Other Diseases in Children Arising from Deficient Nutrition (Lack of Fat Soluble A Factor), *Am. J. Dis. Child.* 27:139 (Feb.) 1924.
⁴ Sweet, L. K. and Kang, H. J. Clinical and Anatomic Study of Avitaminosis A Among the Chinese. *Am. J. Dis. Child.* 50:699 (Sept.) 1935.

¹ Mackay, Helen M. M. Vitamin A Deficiency in Children. *Arch. Dis. Childhood* 9: 65 (April) 1934.
² Mackay, Helen M. M. Vitamin A Deficiency in Children, *Arch. Dis. Childhood* 9:133 (June) 1934.

and should serve as a stimulus for obtaining additional information in the clinic of some of the more practical aspects of the disease condition resulting from lack of vitamin A

VITAMIN C AND INFECTION

Few more cogent examples of the justification for the painstaking and deliberate methods of scientific research have developed than is shown in the story of cevitamic acid (vitamin C). Once the evidence had been obtained that a deficiency in this food factor could be produced at will in experimental animals, great effort was made to find sources of it in nature. Concentrates were made from the richest of these and, when they had been sufficiently purified, the chemical constitution was at length established. The goal of this study was reached in 1933, when the synthesis of cevitamic acid was achieved. Thus, in the interval of a quarter of a century from the recognition of experimental scurvy, the factor the absence of which is responsible for the development of this disease was artificially prepared in the laboratory. Perhaps the story is the more thrilling because of the long history of the tacit recognition of human scurvy as a deficiency disorder. However, current events are demonstrating the value of a chemically pure food essential in medicine and the possibility of using such a substance in explaining certain biochemical phenomena.

Cevitamic acid is readily obtainable as pure white crystals, soluble in water and with a somewhat acid taste. Its value as a preventive and cure of human and experimental scurvy has been demonstrated repeatedly. Studies on scorbutic guinea-pigs have shown that the typical defects in bones and teeth caused by the disease are repaired by cevitamic acid just as they are when orange juice is administered.¹ One of the earliest signs of experimental scurvy is an increased clotting time of the blood, decrease in platelets and erythrocytes and a subnormal concentration of pigment.² It has been reported that after the administration of 150 mg of cevitamic acid in acute essential thrombopenia the bleeding ceased and there was an increase in thrombocytes.³ Cevitamic acid can be determined chemically, the time required for an assay for vitamin C has thereby been greatly shortened. As this substance can be detected and measured in tissues, its distribution and function can be followed with reasonable accuracy.

Jungblut and Zwemer⁴ have recently reported that diphtheria toxin is inactivated by vitamin C in vitro. Furthermore, cevitamic acid seems to be able to protect guinea-pigs against the fatal outcome of diphtheria intoxication. Animals given liberal amounts of cevi-

tamic acid were much less sensitive to small doses of the toxin as measured by the intracutaneous test. Similar studies of King and Menten⁵ have demonstrated the marked influence of vitamin C in promoting the resistance of guinea-pigs to diphtheria toxin. In their investigation, in which growth was one of the criteria used, it was shown that animals receiving a restricted amount of cevitamic acid, yet enough to prevent any outward signs of scurvy, nevertheless were unable to resist the effects of the toxin as were those fortified with a greater dose of vitamin C. These conclusions seem to indicate that cevitamic acid bears a relation to immunologic reactions. This may be associated with its chemical reaction with the toxin or with an effect on the resistance of the host organism, perhaps motivated through the chemical state of the tissues.

The apparent association of cevitamic acid with resistance to infection is in a way paradoxical. The conception of a foreign agent (bacteria) as the cause of disease was so firmly established through the work of Pasteur, Koch and others that the idea of a deficiency of a dietary essential as an etiologic factor did not receive serious attention until the beginning of the present century. The recent studies emphasize that these two factors may be closely allied in the struggle for maintenance of physiologic well being.

Current Comment

DEATH OF OVUM AND PREGNANCY TEST

The value of the biologic tests for pregnancy in determining intra-uterine viability is not yet established. In an attempt to solve this question Bishop¹ has summarized the results given by the test in a series of cases in which the date of fetal death could be determined clinically with some degree of certainty. The Friedman test was employed in the eleven cases of the series. In two instances the test was still positive six weeks after the death of the fetus. With these exceptions the test tends to become negative between ten and twenty-four days after intra-uterine death has taken place. The Aschheim-Zondek test, according to other reports, tends to remain positive even longer. The reason for this apparently lies in the greater sensitivity of infantile mice to pregnancy urine than that of adult rabbits. Evidence exists that the Aschheim-Zondek and Friedman tests depend primarily on the presence or absence of functional chorionic tissue rather than on the life or death of the ovum. Since, however, the main function of the placenta is to provide a means of nourishing the living embryo, it might be expected to become inactive on the death of that embryo. Practically, however, it is clear that there is no direct relation between the death of the ovum and the disappearance of gonadotropic substance from the urine.

¹ Menken Vally Wolbach S B and Menken M F *Am J Path* 10: 569 (Sept.), 1934

² Presnell A K *J Nutrition* 8: 69 (July) 1934

³ Boger, A and Schroder H *Munchen med Wchnschr* 81: 1335 (Aug. 31) 1934

⁴ Jungblut C W and Zwemer R L *Proc Soc Exper Biol & Med* 32: 1229 (May) 1935

⁵ King C G and Menten M L *J Nutrition* 10 129 (Aug) 1935

¹ Bishop P M F *The Pregnancy Test in Relation to Death of the Ovum* *Lancet* 2 364 (Aug 17) 1935

Furthermore, the time after death of the ovum at which the placenta ceases to elaborate the gonadotropic hormone seems to vary considerably in individual cases and to be determined by no mechanism so far understood. The cases here investigated throw no fresh light on these factors

IMPROVED BUILDING FOR AMERICAN MEDICAL ASSOCIATION

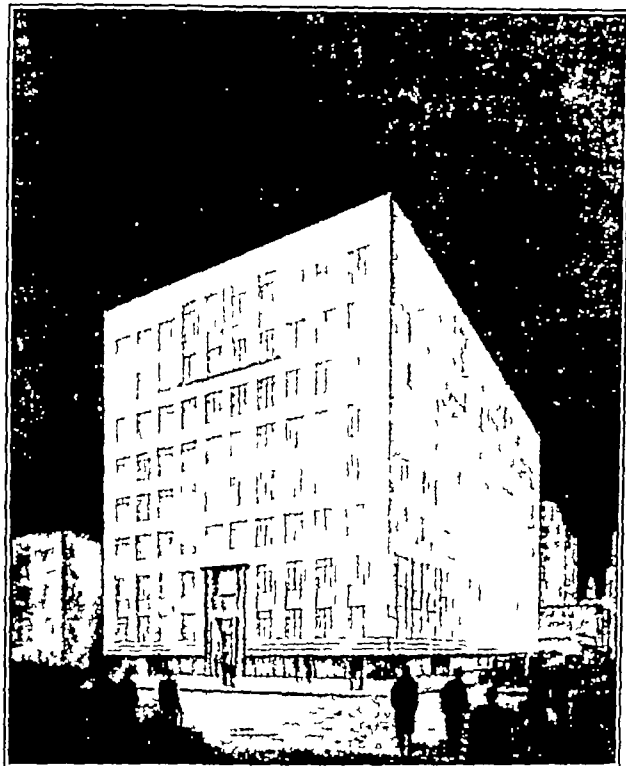
As was noted in the minutes of the Board of Trustees, published recently in *THE JOURNAL*, visitors to Chicago will see next year a striking improvement in the headquarters office of the American Medical Association. The changes contemplated include the addition of two stories and a roof assembly hall as additional structure, a re-finishing of the exterior of the building in limestone, and many other improvements in the arrangement and equipment of the various bureaus and headquarters offices. The changes are made necessary by the vast increase in the amount of work carried on by the headquarters office in recent years and with a view to still further demands in the future. The Association is now publishing many special periodicals in addition to *THE JOURNAL*, *Hygeia* and the *Quarterly Cumulative Index Medicus*, applications from additional specialties await opportunity to take over periodicals in these fields. The increasing demands on the councils that investigate and classify drugs, foods, educational activities, laboratories and other medical materials and functions are finding greater demands made on them every year. The Bureau of Legal Medicine and Medical Legislation finds its work greatly increased, and the growth of the Association indicates considerable expansion necessary in the Secretary's office. Moreover, the Bureau of Health and Public Instruction and the Bureau of Medical Economics have multiplied their work from three to five times in the last two years. These facts prompted the Board of Trustees to undertake the improvements that have been mentioned. Again and again the question was raised as to whether or not the Association ought to buy additional land and arrange for building a new structure at some other site or on the same site. In view of the exigencies of the present economic situation and the nature of the organization of the Association, the Board of Trustees considered it far more advisable to make a contract for immediate improvements in the present building. It is hoped that

visitors to Chicago in the future will avail themselves of the opportunity to observe the improved headquarters office in action

BOONDOGLING WITH A HEALTH SURVEY IN NEW YORK

Among the peculiar projects proposed by the WPA in New York State is one that has aroused the wrath and ridicule of a good many people. It was proposed to survey the deaf children in the county of Monroe at an estimated cost of \$10,440, Monroe County to pay \$1,390. In opposition to the survey, the Subcommittee on Deafness and Hard of Hearing of the Public Health Committee of the Medical Society of the County of Monroe offers the statement that it is impossible

to detect deaf children before the age of 3 years. The public and special schools take these children over at 5 years of age. Therefore, the whole project is limited to children between the ages of 3 and 5 years. There is good evidence that the county of Monroe contains several of these children. Evidence from the headquarters of the bureau for handicapped children in the New York State Education Department at Albany accounts for only fourteen such children, exclusive of those already cared for. Hence it is proposed to spend \$10,440 to survey fourteen children.¹ Furthermore, the survey proposes subsequent training of the deaf child but the project makes no provision for such training. If ever a project was



Proposed reconstruction of headquarters office.

developed to which the word boondoggling could quite certainly be applied, this project qualifies

PLACARDING INFECTIOUS DISEASES

The commissioner of health of the village of White Fish Bay, Wis., Edwin B. Gute, has designed an interesting new type of placard for the infectious diseases. For such infectious conditions as mumps, German measles, chickenpox, whooping cough and measles, placards have been developed which include not only a sign to be placed on the front and back doors of the house but also a card to be hung in the home containing information and advice to the members of the family on each of the conditions concerned. The cards describe not only the early signs and symptoms, the incubation period and the period of communicability but also the regulations regarding attendance at school.

¹ Boondoggling editorial. *New York State J. Med.* 35:1106 (Nov 1935)

and the conduct of the family during the period of illness. In addition, the card includes care of the sick-room, disinfection, and general information to the parents concerning the disease. The placard, which was recently exhibited at the meeting of the American Public Health Association, has attracted wide general attention and is likely to be adopted in other parts of the country.

Association News

RADIO BROADCASTS

The American Medical Association broadcasts over the Blue network and certain additional stations of the National Broadcasting Company at 5 p. m. eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time) each Tuesday, presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers a toast "Ladies and gentlemen, your health!" The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

The next three programs are as follows:

| | | |
|-------------|------------------------------|----------------------|
| November 19 | Infection | Morris Fishbein M.D. |
| November 26 | Common Household Emergencies | W. W. Bauer M.D. |
| December 3 | Tuberculosis | Morris Fishbein M.D. |

This program is broadcast also on the short waves through KDKA, Pittsburgh, over station W8XK, 11,870 and 12,210 kilocycles.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Another Full Time Health Unit—The establishment of the Henry County Health Department on a full time basis brings the total number of these full time units in the state to fifty-six. The new unit will begin functioning January 1. An effort is being made to place all county health departments on a full time basis.

Regional Headquarters for National Health Survey—Willis C. Beasley, A.M., formerly instructor in psychology, Johns Hopkins University, Baltimore, is in Alabama establishing headquarters for four states now being studied in the national survey of health conducted by the U. S. Public Health Service. Montgomery has been designated regional headquarters for Alabama, Georgia, Louisiana and Texas. In Alabama the study will be carried on at Montgomery, Birmingham, Anniston, Eufaula and Greenville.

CALIFORNIA

Examiners Reelect Officers—At a meeting of the state board of medical examiners in Sacramento, October 21, Dr. William R. Molony, Sr., Los Angeles, was reelected president, Dr. Clark L. Abbott, Oakland, vice president, and Dr. Charles B. Pinkham, San Francisco, secretary.

Semiannual Medical Meeting—The Southern California Medical Association will hold its ninety-third semiannual meeting at the Los Angeles County Medical Building, November 29-30. Guest speakers will be Drs. Edwin E. Osgood, assistant professor of biochemistry and medicine, University of Oregon,

Medical School and George Gill Richards, Salt Lake City, Utah. Other speakers will include:

- Dr. Harold L. Thompson, Los Angeles, Perforated Peptic Ulcer.
- Dr. Joseph Salem Rubin, Los Angeles, Bilateral Spermatocoele with Report.
- Dr. Wilbur P. Bailey, Los Angeles, Usual and Unusual Manifestations of Hodgkin's Disease.
- Dr. John Luther Maroon, Santa Ana, Subacute Bacterial Endocarditis.
- Dr. Edward C. Pallette, Los Angeles, Portal Thrombosis.
- Dr. Milo K. Tedstrom, Santa Ana, Spontaneous Hypoglycemia with Especial Reference to Cardiac Symptoms.

Society News—Dr. Neil Hamilton Fairley, secretary, Royal Society of Tropical Medicine and Hygiene, London, addressed the San Francisco County Medical Society, November 13, on "Present-Day Ideas of Blackwater Fever in Relation to Malaria." A discussion of the Ceylon malaria epidemic was included. Speakers before the society, November 12, included Drs. Fred H. Kruse on "Medical Aspects of Esophageal Disorders", Thomas F. Mullen, "Surgical Treatment of Benign Stricture of the Esophagus", and Montague S. Woolf, "Benign Fibrous Stricture of the Rectum (Lymphogranuloma Inguinale)". Dr. Ben L. Bryant, Cincinnati, among others, will address the section on eye, ear, nose and throat, November 26, on "Hypothyroidism in the Practice of Otorhinolaryngology."

University News—The Northern California Alumni Association of the College of Medical Evangelists was addressed at its semiannual meeting in San Francisco, October 27, by Drs. George V. Kulchar on "Clinical Management of Syphilis", George D. Barnett, "Cardiac Problems as seen by the General Practitioner", Leroy C. Abbott, "Skeletal Traction in Fractures of the Long Bones, and Especially of the Shaft of the Femur", and Edmund W. Butler, "Diagnosis of the Acutely Shocked Patient."—The annual Alumni Day of the University of California School of Medicine, San Francisco, will be observed, November 22. The day will be devoted to the reading of papers, clinics and conferences. Dr. John C. Ruddock, Los Angeles, class of 1916, will deliver the annual Alpha Omega Alpha lecture in the late afternoon.

DISTRICT OF COLUMBIA

University News—Major Gen. Charles R. Reynolds, surgeon general, U. S. Army, gave the first lecture in the Smith-Reed-Russell series at George Washington University School of Medicine, October 24. The title of his address was "The Medical Corps of the United States Army."

Tuberculosis Campaign with WPA Funds—With \$99,000 available from the Works Progress Administration, a campaign to eradicate tuberculosis in the District of Columbia will begin, November 25. X-ray machines will be placed at strategic positions in the city to take roentgenograms by means of the paper method. Physicians may refer patients either for an initial film or for a check on a patient under treatment. All the work will be done without cost to the patient. A special effort will be made to investigate persons in homes where recognized cases exist. The Medical Society of the District of Columbia is cooperating in the drive.

Society News—Dr. Claude S. Beck, associate professor of medicine, Western Reserve University School of Medicine, Cleveland, will address a joint meeting of the Medical Society of the District of Columbia and the Washington Heart Association, November 20, on "The Heart as a Surgical Organ."—Dr. Grace G. Purse, Washington, discussed pernicious anemia before the Women's Medical Society of the District of Columbia, November 5.—Dr. Walter Timme, New York, discussed "Status Hypoplasticus", with its involvement of the Internal Glandular Mechanisms, before the naval medical officers of the District of Columbia at their first regular monthly meeting, October 7. Dr. Oswald S. Lowinsky, New York, discussed "New and Improved Developments in Urologic Surgery" at the meeting, November 4.

ILLINOIS

Personal—Dr. Maskell Lee, Atlanta, observed his eightieth birthday with a dinner, October 17.—Dr. Walter H. Baer has been appointed managing officer of the Peoria State Hospital.

Meeting of Bacteriologists—The first annual meeting of the Society of Illinois Bacteriologists was held at the Chicago Woman's Club, Chicago, November 1. Fred W. Tanner, Ph.D., Urbana, president of the society, opened the meeting. Dr. Alexander A. Day, chairman, department of bacteriology, Northwestern University Medical School, Chicago, spoke on "Trends of Medical Bacteriology", A. L. Whiting, Urbana, "High Points of Agricultural Bacteriology", and Winford Lee Lewis, Ph.D., director, scientific research, Institute of American Meat Packers, Chicago, "What Bacteriology Means to Industry." The society was organized May 8.

Chicago

Physicians Invited to History Lectures—Physicians are cordially invited to attend a course of lectures on the history of medicine at the University of Illinois College of Medicine. Dr Morris Fishbein, editor of THE JOURNAL is lecturing every Monday through the semester from 5 to 6 o'clock.

Hospital News—Construction has begun on a new \$75,000 two story addition to Michael Reese Hospital. The first floor and basement of the new building will be occupied by a medical library, given by Louis Florsheim in memory of his wife, Lillian. The Samuel Deutsch Human Convalescent Serum Center will be on the second floor. The center prepares human serum mainly for infantile paralysis, scarlet fever and measles.

University News—Dr Charles W Hughes, assistant in anatomy at Loyola University School of Medicine, has been appointed associate professor of anatomy, succeeding Dr Simon B Chandler. Forty-nine students in the school of medicine were awarded certificates of membership in honorary seminars, October 14. Membership in the seminars is restricted to students of high scholastic standing who are in a position to handle difficult diagnosis, technic and treatment of cases presented for discussion at seminar meetings. Of ten clinics now operating in the Loyola University Dispensary, the allergy clinic is the most frequented, it is reported.

INDIANA

Society News—Dr Homer H Wheeler will discuss diseases of the anorectal region before the Indianapolis Medical Society, November 19, Dr Julius H P Gauss, jaundice, its significance and implication, and Dr Walter Stoeffler, intussusception. The society held a joint meeting with the Seventh District Medical Society, November 12, at which Dr Paul D White, Boston, discussed various phases of heart disease. Dr George J Garceau talked on backache before the Indianapolis Medical Society, November 5.

Personal—Dr Dunn Hamilton Row, Indianapolis, sailed, November 1, for Shikarpur, Baluchistan, India, where, with four other eye specialists, he will conduct an eye clinic.—Dr James E McMeel, South Bend, has been made medical supervisor and director of Notre Dame University, succeeding the late Dr Francis J Powers.—Dr Charles C Holland has been appointed health officer of Bloomington, succeeding Dr Russell A De Motte.—Dr Holger M Andersen, formerly on the staff of the Epworth Hospital, South Bend, has been appointed to the medical staff of Culver Military Academy, Culver.

IOWA

Personal—Dr Fred H Howard, Strawberry Point, was guest of honor at a banquet, October 14, in celebration of his completion of fifty years' practice in the community.—Dr Charles F Schilling, Takoma Park, Md., has been appointed medical director of Iowa Sanatorium and Hospital, Nevada, succeeding the late Dr John F Morse.

Society News—A symposium on unusual goiter problems was presented before the Des Moines Academy of Medicine and Polk County Medical Society, November 12, by Drs Ben F Kilgore, John B Synhorst and Harry A Collins. A symposium on appendicitis was presented at the meeting, October 29, by Drs Bernard C Barnes, Earl D McClean, Harold N Anderson and William E Sanders.

KENTUCKY

Society News—At a meeting of the Northeastern Kentucky Medical Association in Paintsville, October 17, speakers were Drs Ray M Bobbitt, Huntington, W Va., on "Management of Infections of the Urinary Tract", Samuel C Smith, Ashland, "Why We Should Belong to and Attend Medical Organizations", Samuel Overstreet, Louisville, "Significance and Treatment of Upper Abdominal Pain", Albert L Bass, Louisville, "Ciliary Action of Respiratory Epithelium," and Philip F Barbour, Louisville, "Anorexia of Children, Cause and Treatment".—A symposium on poliomyelitis was presented at a meeting of the Jefferson County Medical Society, Louisville, November 4, by Drs Hugh R Leavell, Aura J Miller, William W Nicholson and Richard T Hudson. In a symposium on anemia, November 18, speakers will be Drs William H Allen, Arthur T Hurst and Edward C Humphrey.—Dr Aura Jones Miller addressed the Louisville Medical-Chirurgical Society, November 8, on "Present-Day Problems in Typhoid Fever".—Dr Owsley Grant addressed the Louisville Surgical Society, November 1, on "Infectious Surgical Conditions of the Kidney".—Dr Frank A Simon presented a paper on "Hypersensitiveness to Pituitary Extracts" and Dr Arthur T Hurst on "Treatment of Anemia" at a meeting of the Transylvania Medical Society, Louisville, November 7.

MAINE

Society News—The Washington County Medical Society was addressed in Calais recently by Drs Reginald L Cameron, Eastport, on health problems in Washington County, and Norman E Cobb, Calais, "Craniorachischisis Type of Fetal Monstrosities".

MARYLAND

Society News—At a meeting of the Society of Hygiene of Johns Hopkins University, October 23, in Baltimore, speakers were Janet H Clark, Ph D, on "Effect of Ultraviolet Radiation on Lens Protein and the Relation of Radiation to Industrial and Senile Cataract," and Raymond Pearl, LL.D., "Incidence of Tuberculosis Among the Offspring of Tuberculous Parents".

Attendance of Midwives at Births Decline—Of 27,317 births recorded in Maryland in 1934, 90 per cent were attended by physicians and 10 per cent by midwives. According to the state department of health, the records of the bureau of vital statistics show a decline in the attendance of midwives at births since 1916, when the state was admitted to the birth registration area. In Baltimore the attendance of physicians at white births increased from 67.3 per cent of the total in 1916 to 95.1 per cent in 1934. The attendance of physicians at Negro births increased from 76.2 per cent of the total in 1916 to 92.9 per cent in 1934. There were 2,617 physicians practicing in the state in 1934, 872 in the counties and 1,745 in Baltimore. There were 313 midwives, 244 in the counties and sixty-nine in Baltimore.

MASSACHUSETTS

Clinical Lectures—Dr Siegfried Thannhauser, formerly director of the medical clinic and professor of internal medicine at the University of Freiburg in Bremen and now associate professor of medicine at Tufts College Medical School, Boston, opened a series of clinical lectures at the Boston Dispensary, November 2, with a talk on diabetes. November 9 he also spoke on diabetes. He is giving a lecture on liver disease, November 16, and on November 23 will discuss peptic ulcer.

Dr Houssay Gives Dunham Lectures—Dr Bernardo A. Houssay, professor of physiology and director of the Institute of Physiology, University of Buenos Aires, will deliver three lectures under the Edward K. Dunham Lectureship for the Promotion of the Medical Sciences, on "Recent Studies on the Functions of the Hypophysis". The lectures will be given at the Harvard Medical School, November 22, on "What We Have Learned from the Toad Concerning Hypophyseal Functions", November 25, "Metabolic Functions of the Hypophysis," and November 27, "The Hypophysis and Diabetes". The lectureship was founded in 1923 in honor of Dr Dunham, who graduated from Harvard in 1886, it is given annually.

MICHIGAN

Commission on Medical Economics—The Medical Economics Commission of the Wayne County Medical Society was recently formed to initiate and coordinate studies and investigations in the field of medical economics and recommend policies of medical, hospital and public health practice and medicocivic relations to the council of the society. The former committees on public health, medicocivic relations, industrial relations and unauthorized practice of medicine have been merged into the medical economics commission as four of its six sections. The section on lay cooperation will study the any encroachment of lay workers in the professional field, the work of school nurses and laboratory technicians, plans of sickness insurance will be investigated and a program of public information to secure lay cooperation will be developed. The section on public health relations will study and develop cooperation with health departments and with the officials of the Emergency Relief and Works Progress Administrations in providing medical service to relief clients. It will aid the local medical school in any necessary modification of its curriculum. The section on coordination of medical services will study hospital and dispensary economics and reported abuses, medical representation on hospital boards, hospital staff cooperation, relations between hospitals and physicians, social service departments including intake policy, pay clinics and diagnostic clinics and nurse anesthetists. Counter prescribing and other drug store abuses will be studied by the section on coordination of pharmaceutical service. It will also recommend ways of cooperation with ethical pharmacists. The section on legislation in relation to medical economics will study bills and proposals for presentation to the Michigan legislature and to Congress to aid the physician. The work of the section on industrial relations will deal with workmen's compensation, contract prac

tice, the activities of insurance companies and industrial plants in the medical field and the relation of industry in general to the physician. Dr Frank W Stafford is chairman of the new commission

MINNESOTA

Dr Cottam Named Director of Health of Minneapolis—Dr Gilbert G Cottam was recently appointed to the newly created position of director of health and hospitals for Minneapolis. The new position has jurisdiction over the Minneapolis General Hospital and the city health department, it was stated. Dr Cottam was graduated from Marion-Sims Medical College, St Louis, in 1893.

University Courses—A night course in preventive medicine was opened, October 3, by the extension division of the University of Minnesota, Minneapolis. It will continue for seventeen weeks under the direction of Dr Harold S Diehl, dean of medical sciences. A course in tuberculosis and other diseases of the chest by Dr Jay Arthur Myers is given the same evening following the course in preventive medicine.

Society News—Dr Frederick H K Schaaf, Minneapolis, among others, addressed the Renville County Medical Society in Olivia, recently, on "Advances in Therapeutics"—The St. Paul Surgical Society has been organized with Drs Harry B Zimmermann as president, Elmer M Jones, vice president, and Nathaniel L Leven, secretary—At a meeting of the Minnesota Academy of Medicine in Minneapolis, November 13, theses were presented by Drs Robert G Allison, Minneapolis, and Lyle C Bacon, St. Paul, entitled "Radiation Therapy" and "Schlatter's Disease," respectively.

MISSOURI

Personal—Dr John R Bruce, Marshfield, has been appointed health commissioner of Webster County; he formerly served as county physician—Dr Charles W Burrill observed his ninetieth birthday at his home in Kansas City October 20. Dr Burrill graduated from Northwestern University Medical School in 1872 and has been a member of the Jackson County Medical Society since 1883.

NEW HAMPSHIRE

Dr Bielschowsky at Dartmouth—Dr Alfred A Bielschowsky, formerly professor of ophthalmology at the University of Breslau Germany, who spent six months last year at Dartmouth Medical School, Hanover, doing special research in physiologic optics, has now joined the faculty as visiting lecturer in ophthalmology, Science reports. Dr Bielschowsky was at the University of Breslau for about ten years and had previously been on the faculties of the Universities of Marburg and Leipzig.

NEW YORK

Society News—Dr Pol N Coryllos, New York, addressed the Broome County Medical Society, Binghamton, November 5 on empyema—Dr Bret Ratner, New York, addressed the Schenectady County Medical Society, Schenectady, November 5 on "The Problem of Allergy in Childhood"—Dr Jane Sands Robb addressed the Onondaga Medical Society Syracuse, November 5, on "Studies of the Physiology of Cardiac Conduction"—Drs William A Groat and Tyree C Wyatt reported a case of acute basophilic leukemia.

Dr Pinner Appointed Pathologist—Dr Max Pinner, Tucson, Ariz, has been appointed principal diagnostic pathologist for the state tuberculosis hospitals of New York with headquarters at the Biggs Memorial Hospital, Ithaca. Dr Pinner received his medical education at the Universities of Tübingen and Berlin, Germany. Before going to Tucson he was engaged in research at the Municipal Tuberculosis Sanatorium in Chicago and later was director of laboratories at the Maybury Sanatorium, Northville, Mich and pathologist at the Herman Kiefer Hospital Detroit.

Study of Maternal Mortality—The Medical Society of the County of Erie is making a study through its maternal mortality survey committee, of maternal deaths. From January 1 to June 1, thirty-two deaths were studied with special reference to the preventability of the death and where the responsibility lay. Supplemental obstetric information is obtained from special sheets sent out with birth certificates from the Buffalo health department from this information a study will be made of types of delivery. Obstetric nursing is also being considered in the survey and a program of public educational work is being carried on in cooperation with the local child health week committee. The survey committee asks the cooperation of physicians, families and medical examiners in obtaining necropsies on every maternal death.

New York City

Brickner Lecture—Dr David Marine will deliver the fifth Walter M Brickner Lecture of the Hospital for Joint Diseases, November 21, at the hospital. Dr Marine's subject will be "Some Practical Aspects of Thyroid Physiology."

Second Harvey Lecture—Robert M Yerkes, Sc D, professor of psychobiology, Yale University School of Medicine, New Haven, will deliver the second Harvey Lecture of the winter at the New York Academy of Medicine November 21. The title of the lecture will be "The Significance of Chimpanzee-Culture for Biological Research."

Personal—Dr Thomas A Martin, medical director of Harlem Hospital, has been made director of medical services at Saint Vincent's Hospital—Dr August W F Westhoff has been appointed chief of the medical staff of Wyckoff Heights Hospital. Members of the staff entertained Dr Westhoff at dinner to mark the event and presented him with a gold watch.

Clinical Meeting of Diabetes Association—The first meeting of the clinical section of the New York Diabetes Association was held, November 15, at New York University College of Medicine. Speakers were Louis I Dublin, Ph D, on "Statistics of Diabetes in the United States", Dr Herman O Mosenthal, "The New York Diabetes Association", F W Nordsiek, executive secretary of the association, "Survey of Diabetic Clinics in New York City," and Dr Charles F Bolduan, "Diabetes—A Health Problem in New York City."

Twenty Thousand Warnings—New York's campaign against unnecessary noise entered its second phase, November 1, when the ban on noise, first applied only at night during October was extended to include the day as well. Police were instructed to warn all persons who caused noises they could have avoided by being considerate. Typical instances included the unnecessary sounding of horns by motorists trying to blast their way through traffic, loud radios either in automobiles or in homes attempting to call persons to windows by blowing horns, unnecessary racing of motors, workers congregating in front of establishments talking in loud tones at night, truck deliveries with undue noise, persons returning home in groups singing or talking loudly, cut outs open on motorcycles, or trucks or vehicles with mufflers functioning badly, operators of cabarets, restaurants and dance halls in residential neighborhoods permitting loud music at unreasonable hours, and patrons of these places leaving at closing times using loud and boisterous language. During October the police issued 20,334 warnings and 172 summonses to noise offenders. Mayor La Guardia reported that notable progress had been made.

NORTH CAROLINA

Personal—Dr Ransom L Carr, Rose Hill, has been appointed health officer of Duplin County to succeed Dr Clarence H White, Kenansville, resigned.

Society News—Dr Olin B Chamberlain, Charleston S C, was guest speaker at the fall meeting of the Tenth District Medical Society in Tryon October 16, his subject was "Anemia and the Nervous System." Other speakers were Drs Paul T McBee, Marion, on peptic ulcer, John C Young, Asheville, genito-urinary diseases, Roy H Moore, Canton, blood transfusion, and Cecil C Swann, Asheville, sinus disease and chronic conditions of the chest—Dr Harold S Clark, Asheville, addressed the Buncombe County Medical Society, Asheville, October 7 on "Acute Virulent Infections of the Hand"—Dr Edwin A Merritt, Washington D C, addressed the Wayne Medical Society, Goldsboro, October 4, on radiotherapy in treatment of tumors and cancer.

OHIO

Personal—Dr Herbert D Chamberlain, McArthur, has been appointed health commissioner in charge of a new health unit in Vinton County—Dr Fred G Carter superintendent of the Ancker Hospital St Paul, has been placed in charge of Christ Hospital, Cincinnati.

Annual Health Conference—The sixteenth annual conference of health commissioners with the state department of health was held in Columbus November 13-15. Guest speakers were Drs Jay Arthur Myers, Minneapolis, on tuberculosis, Eugene L Bishop, Knoxville, Tenn, on health and sanitation in the Tennessee Valley, Martha M Eliot, Washington, D C, maternal and child health, John Collinson, U S Bureau of the Census, Washington, vital statistics, and James A Doull, Cleveland a survey of the state health department.

New Huron Road Hospital—A new building for the Huron Road Hospital, Cleveland with an eventual capacity of 300 beds, was recently opened. The building is six stories high.

and is arranged in three wings, one of which is used for a nurses' home at present. The two wings forming the front of the building provide 200 beds. Five floors are devoted to regular service, on the fifth is a nursery, and the operating suite is on the sixth. There are no wards as such. Each room unit consists of two semiprivate two-bed rooms separated by a service area. On the ground floor are the outpatient department, dining rooms and kitchen, the pharmacy and the physical therapy department.

Society News—Dr. Homer F. Swift of the Rockefeller Institute for Medical Research, New York, addressed the Cleveland Academy of Medicine, November 15, on rheumatic fever. Major Gen. Charles R. Reynolds, surgeon general of the U. S. Army, addressed a special meeting of the military medicine section of the academy, November 6, on "The Employment of the Medical Profession in Time of a National Emergency."—Dr. Henri Coutard, chief of service of roentgenology, Curie Institute, University of Paris, gave a lecture on radiation therapy at the University of Cincinnati, October 11, under the auspices of the university and the Cincinnati Cancer Control Clinic.—Dr. Edward C. Rosenow, Rochester, Minn., addressed the annual joint meeting of the Toledo Academy of Medicine and the Toledo Dental Society, November 1, on "Focal Infection and Elective Localization of Bacteria."

PENNSYLVANIA

Personal—The trustees and staff of Allentown Hospital gave a testimonial dinner in honor of Dr. Robert L. Schaeffer, chief surgeon at the hospital, October 31, celebrating the twenty-fifth anniversary of his association with the institution.

Society News—Drs. William Bates and Robert H. Ivy, Philadelphia, conducted the fall clinic of the Locomotor County Medical Society, Williamsport, November 8. Dr. Bates discussed "Back Sprains—First Lumbar Neuralgia" and Dr. Ivy "Maxillofacial Surgery."—Drs. Ralph P. Beatty, Uniontown, and Harry J. Bell, Dawson, addressed the Fayette County Medical Society, Uniontown, November 7, on "Prostatic Obstruction" and "The Art of Prognosis," respectively.

Hospital News—A campaign for funds for the Warren General Hospital, Warren, resulted in raising \$56,000, which was \$11,000 more than the amount sought. Physicians subscribed \$1,800, it is reported.—The first annual meeting of the Association of Resident and Ex-Resident Physicians of the George F. Geisinger Memorial Hospital, Danville, was held October 25-26. Drs. Harold L. Foss and Carl L. Evin conducted surgical and medical clinics and members of the association presented papers. Dr. Henry K. Seelaus, Philadelphia, was elected president.

Philadelphia

Society News—Speakers before the Philadelphia Academy of Surgery, November 4, were Drs. William R. Gilmour, on "Gas Gangrene in Civil Practice", John W. Klopp, "Tetanus: Experience of the Episcopal Hospital in the Past Thirty Years" and Ralph S. Bromer, "X-Ray Treatment of Acute Infections."—At a meeting of the Philadelphia Laryngological Association, November 5, speakers were Drs. Samuel Cohen, on "Present Status of Rhinoplastic Surgery", Matthew S. Ersner, "Amputation of the Nose, Corrected by Various Forms of Prostheses," and George W. MacKenzie, "Nystagmus."—Edgar A. Doll, Ph.D., Vineland, N. J., and Dr. Bronson Crothers, Boston, addressed the Obstetrical Society of Philadelphia, November 7, on "The Behavioral Consequences of Birth Injuries" and "The Validity of the Diagnosis of Birth Injury After the Neonatal Period," respectively.—Drs. Eldridge L. Eliason and Lewis K. Ferguson addressed the Philadelphia Roentgen Ray Society, November 7, on "Intestinal Obstruction" and "Epiphyseal Separation," respectively.

SOUTH CAROLINA

Founders Day at Medical College—Dr. David Riesman, Philadelphia, delivered the Founders Day lecture at the annual celebration of the Medical College of the State of South Carolina, November 13. Dr. Riesman's subject was "The Clinical Approach." During the day members of the faculty conducted clinics on various subjects and Dr. Riesman conducted a medical clinic in the afternoon. The occasion was the one hundred and eleventh anniversary of the opening of the college.

Society News—At a meeting of the Fourth District Medical Association, Gaffney, October 15, speakers included Drs. John R. Harrison, Greer, on "Infections of the Upper Respiratory Tract", Everett B. Poole, Greenville, "Physiologic Factors in the Production of the Allergic State," and William McNeill Carpenter, Greenville, "What the General Practitioner Should Know About Glaucoma."—Speakers at a meeting of the

Third District Medical Association, October 18, included Drs. Abraham Ellis Poliakoff, Abbeville, on "Treatment of Nephritis", William S. Judy, Greenville, "Treatment of Certain Endocrine Disorders," and George R. Wilkinson, Greenville, "Principal Cause of Backache in the Latter Half of Life."—Dr. Grady S. Clinkscales, Anderson, presented a paper on artificial pneumothorax at a meeting of the Anderson County Medical Society, Anderson, October 9.—Dr. Kenneth M. Lynch, Charleston, addressed the Columbia Medical Society, October 14, on cancer of the liver.

TENNESSEE

Health at Nashville—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million indicate that the highest mortality rate (21.4) for the week ended November 2 appeared for Nashville and that the rate for the group of cities was 10.9. The mortality rate for the corresponding week of 1934 was 15.8 for Nashville and 10.6 for the group of cities. The annual rate for the eighty-six cities was 11.3 for the forty-four weeks of 1935 and the same rate appeared for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

TEXAS

Society News—A symposium on medical economics will be presented at a meeting of the Dallas County Medical Society, November 27, by Drs. Holman Taylor, Fort Worth, Martin L. Wilbanks, Greenville, Texas, John H. Burleson, San Antonio, and Oscar M. Marchman, Dallas. Drs. John R. Lehmann and James T. Mills, Dallas, addressed the society, October 24, on "The Marijuana Menace" and "Treatment of X-Ray Burns," respectively.

Relief Agreement Terminated—The Texas State Medical Association terminated its agreement with the Texas Relief Commission governing emergency medical relief, October 1. Any further service of this kind will be carried on through agreements between county medical societies and county relief administrations, the state medical journal announces. Under the arrangement the state association made no contracts, the journal points out, but agreed to foster contracts of the county societies and to serve as a board of adjustment. The whole affair has been a service, and the majority of those who have served under these contracts have done so at a loss and with no little discomfort. On the whole, it was conducted effectively both on the part of the medical society and on the part of the relief commission, the editorial concludes.

VIRGINIA

State Medical Election—Dr. James Morrison Hutcheson, Richmond, was chosen president-elect and Dr. Philip St. Leger Moncre, Norfolk, was installed as president of the Medical Society of Virginia at the annual meeting in Norfolk, October 15-17. Vice presidents elected are Drs. Charles Lydon Harrell, Norfolk, Edmund M. Chitwood, Wytheville, and John A. Owen, Turbeville. Miss Agnes Edwards was reelected executive secretary and treasurer.

Personal—Dr. William Grossmann Jr., Petersburg, has been appointed assistant epidemiologist in the state department of health.—Dr. Shockley D. Gardner, South Boston, has been appointed health officer of the Valley Health District, with headquarters in Harrisonburg.—Dr. James N. Dudley, Danville, has been appointed director of the Henrico County Health District with headquarters in Richmond.—Dr. Thomas B. Payne has been appointed health officer of Fredericksburg to succeed the late Dr. Justus Lee Cooke.

Centennial of Dr. Hunter McGuire—The one hundredth anniversary of the birth of Dr. Hunter Holmes McGuire, distinguished Virginia surgeon, was celebrated by a ceremony in Richmond, October 11. William T. Sanger, LL.D., president of the Medical College of Virginia, presided at the exercises, which were held at Dr. McGuire's monument in Capitol Square. Speakers were Gov. George C. Peery, Drs. Marshall J. Payne, Staunton, and W. Lowndes Peple, Richmond, former students of Dr. McGuire, and Col. Robert T. Barton Jr., son of an intimate friend of Dr. McGuire. During the Civil War Dr. McGuire was medical director of the Army of the Shenandoah under the command of Stonewall Jackson, later surgeon to the Second Army Corps and medical director of the Army of Northern Virginia. After the close of the war he was for several years professor of surgery at the Medical College of Virginia. In 1893 he was instrumental in the founding of

the University College of Medicine and the Virginia Hospital and was president of both institutions. He was also professor of surgery. He was one of the founders of the Medical Society of Virginia of which he was president in 1880-1881. He was president of the American Surgical Association in 1886 and of the American Medical Association in 1893. He died Sept. 19, 1900.

WEST VIRGINIA

Society News—Dr. William J. Engel, Cleveland, addressed the Cabell County Medical Society, Huntington, October 10 on "Diagnosis and Treatment of Cystitis in the Female." At a joint meeting of the Harrison, Monongalia and Marion county medical societies in Clarksburg, October 3, Drs. Harvey G. Beck and Albert E. Goldstein, Baltimore spoke on "Chronic Carbon Monoxide Anoxemia" and "Nephralgia—Symptomatology, Diagnosis and Treatment," respectively. Dr. John A. Kolmer, Philadelphia, addressed the Fayette County Medical Society, Montgomery, October 17, on "Infection, Immunity and Vaccination in Infantile Paralysis." Dr. Vincent V. Smith, Ironton, Ohio, discussed "Injection Treatment of Hemorrhoids" before the Logan County Medical Society, Logan, October 16. At a meeting of the Greenbrier Valley Medical Society, Roncove, October 15, Drs. Andrew E. Amick and William P. Black, Charleston, spoke on infant feeding and treatment of hemorrhoids, respectively.

GENERAL

Award for Exhibit of Diagnostic Tests—The U. S. Public Health Service and the American Society of Clinical Pathologists were awarded a certificate of merit for an exhibit on the evaluation of serodiagnostic tests for syphilis. A preliminary article describing the study now in progress on this subject appeared in THE JOURNAL, June 8, page 2083.

Search for Szent Norager—The Minnesota State Board of Medical Examiners is attempting to find one Szent Norager, who has used the aliases Dr. James Edw. Petri and Dr. E. Mendoza. This man is of Danish descent, is between 35 and 40 years of age, and speaks English brokenly. He has represented himself in Minneapolis as being a doctor of medicine. Within the past year he has lived at the following addresses in Minneapolis: 1110 Ulysses Street, N. E., 4008 Thirty-Seventh Avenue, S., and 3863 Minnehaha Avenue. His present whereabouts are unknown. He has been represented as a "patent medicine" salesman and a fortune teller. Any information about this person will be appreciated by the Minnesota State Board of Medical Examiners, St. Paul.

National Academy of Sciences—At the autumn meeting of the National Academy of Sciences at the University of Virginia, University, November 18-20, speakers will include:

Dr. Charles R. Stockard, New York: Giant Skin Growth on Mammals with Normal Sized Skeletons.
Dr. William H. Howell, Baltimore: The Production of Blood Platelets in the Lungs.
Dr. David I. Macht, Baltimore: Experimental and Clinical Study of Cobra Venom as an Analgesic.
Lyndon F. Small, Ph.D., University Va.: Studies of New Narcotics.
Carl C. Speidel, Ph.D., University Va.: Effects of Alcohol on Nerves in Living Frog Tadpoles.
Yandell Henderson, Ph.D., New Haven, Conn.: How Cars Go Out of Control: Analysis of the Driver's Reflexes.

Nearly Nine Thousand Cases of Poliomyelitis—While the number of cases of poliomyelitis reported this year is in excess of those reported for earlier years, the disease is on the decline at this time. According to *Public Health Reports* 8,884 cases were reported throughout the country for the twenty-four weeks ended October 12, as compared with 5,944 during the similar period in 1934, 3,862 in 1933 and 2,843 in 1932. In this period this year, 2,601 cases were reported in New York and 1,232 in Massachusetts. Last year during this period the greatest number of cases, 2,937, was recorded for California. The cases reported were 3,625 for the four weeks ended September 7 and 2,528 for the four weeks ended October 5. Poliomyelitis has been most prevalent in the regions along the Atlantic coast. The South Atlantic states continue to report a rather high incidence, and in some states in the East North Central and South Central regions the incidence was somewhat above the seasonal expectancy. In the Mountain and Pacific regions the number of cases was only about 20 per cent of last year's figures for the period ended October 5 but it was slightly above that for each of the three preceding years. The West North Central states reported about the normal incidence for this season.

Society News—At the fourth annual meeting of the Society of Plastic and Reconstructive Surgeons in Detroit, October 19, speakers were Drs. George M. Dorrance, Philadelphia on "Surgical Treatment of Different Varieties of Cleft Palate," Grover C. Penberthy, Detroit, "Treatment of Burns," John

M. Wheeler, New York, "Transplantation of the Human Cornea: Its Present Status," and George V. I. Brown, Milwaukee, "Restoration of Motion in Cases of Traumatic Facial Paralysis."—Dr. Charles A. Waters, Baltimore, was named president-elect of the American Roentgen Ray Society at its recent annual meeting in Atlantic City. Dr. Frederick M. Hodges, Richmond, was installed as president and Dr. Bernard H. Nichols, Cleveland, and Major John J. Moore, San Francisco were elected vice presidents. Dr. Eugene P. Pendergrass, Philadelphia, was reelected secretary. The 1936 meeting will be held in Cleveland.—Dr. Lemuel Whittington Gorham, Albany, N. Y., was elected president of the American Clinical and Climatological Association at its annual meeting in Princeton, N. J., October 21-23. Drs. Alvah H. Gordon, Montreal, and Chauncey W. Dowden, Louisville, Ky., were named vice presidents and Dr. Francis M. Rackemann, Boston, was reelected secretary.—Dr. Eugene H. Pool, New York, was chosen president-elect of the American College of Surgeons at the annual meeting in San Francisco, October 31. Dr. Donald C. Balfour, Rochester, Minn., was installed as president and Drs. Emile F. Holman, San Francisco, and George E. Wilson, Toronto, were elected vice presidents.—Dr. William C. Menninger, Topeka, was elected president of the Central Neuropsychiatric Hospital Association, which met in Topeka, October 26, in conjunction with the Central Neuropsychiatric Association. The next meeting will be in Chicago in March.

CANADA

Society News—The annual meeting of the British Columbia Medical Society was held in Vancouver recently. Speakers at the annual dinner were Drs. James Tate Mason, Seattle, President-Elect of the American Medical Association, on "Medicine and Social Progress" and George J. Wherrett, Ottawa, executive secretary of the Canadian Tuberculosis Association, "Progress of Tuberculosis Control in Canada."—Drs. George F. Strong and Alec M. Agnew addressed the Vancouver Medical Association, Vancouver, B. C., October 2, on "Cardiac Pain" and "Vaginal Plastic Surgery," respectively.

LATIN AMERICA

Appointed to Leprosy Center—Howard I. Cole, Ph.D., formerly chief chemist of the Culion Leper Colony, P. I., has been appointed by the League of Nations to conduct research at the new International Leprosy Center in Rio de Janeiro, according to *Science*.

Society News—The Medical Society of Mendoza, the Argentine Society of Regional Pathology of the North, dedicated its ninth meeting to Prof. Carlos Chagas, Rio de Janeiro, who died in December 1934. The session was held in Mendoza, October 1-3.—The third Pan-American Red Cross Conference was held in Rio de Janeiro, Brazil, recently.

FOREIGN

International Congress of Surgery in Cairo—The tenth International Congress of Surgery will be held in Cairo, Egypt, December 30 to January 4 under the presidency of Prof. Anton von Eiselsberg of Vienna. Subjects of the scientific sessions will be surgery of the parathyroids, surgery of the lumbar sympathetics, surgery of the colon exclusive of cancer, and surgical conditions in bilharziasis. For information address Dr. L. Mayer, general secretary, 72 rue de la Loi, Brussels, Belgium.

Personal—Dr. Ernest W. H. Cruickshank, professor of physiology, Dalhousie University Faculty of Medicine, Halifax, N. S., has been appointed to the regius chair of physiology at the University of Aberdeen to succeed the late Dr. John J. R. Macleod.—Drs. John A. Ryle, Cambridge University, and Matthew J. Stewart, professor of pathology, University of Leeds, have been appointed members of the Medical Research Council of Great Britain to succeed Lord Dawson of Penn and Prof. Arthur E. Boycott.

Dr. Birkhaug Returns to Norway—Dr. Konrad E. Birkhaug, who was for several years associate professor of bacteriology at the University of Rochester School of Medicine and Dentistry, Rochester, N. Y., has been appointed to the chair of experimental medicine at Christran Michelsens Institutt, Bergen, Norway, a position created for him. Dr. Birkhaug is a native of Bergen. He received his medical education partly in Europe and graduated from Johns Hopkins University School of Medicine, Baltimore, in 1924. He went to Rochester in 1925 remaining until 1932, when he joined the Pasteur Institute in Paris as an investigator. At Bergen he will work on experimental tuberculosis and leprosy. While in Rochester Dr. Birkhaug was honored with a civic award in recognition of his work on erysipelas.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct 19, 1935

"A Nation of Medicine Drinkers"

Sir Kingsley Wood, the minister of health, attended a meeting of the London Insurance Committee (a committee of physicians, which administers the panel system). He made a comparison between the conditions of today and those of 1917-1918, when he himself was chairman of the committee. They showed a tremendous increase not only in the numbers entitled to medical benefit but in the number of physicians. The latter had increased from 1,300 to 2,174, and it was satisfactory to note that the payments had gone up from \$2,330,000 to \$3,500,000. But the figures which took his eye were those indicating a rise in the number and cost of the prescriptions in London. The prescriptions dispensed in the year he was chairman totaled 4,377,000, last year they numbered 8,482,000. This was partly accounted for by the increase in the number of the insured persons and the fact that new and expensive medicines had been introduced. But we in England were apparently becoming "a nation of confirmed medicine drinkers," and he doubted whether that was to our good. In England many patients had come to regard a visit to the doctor as synonymous with the receipt of medicine. Scotland, however, had no such love for bottles of medicine. The result was that the cost of medicine under the panel in England exceeded that in Scotland by 58 per cent. There were no known facts connected with the incidence of disease to account for that wide difference. He did not think that the standard of treatment in Scotland was lower or the results of treatment less satisfactory. A considerable portion of the outlay on drugs could be eliminated with advantage to the proper treatment of the people. Sir Kingsley did not go to the root of the matter, which is that the English working class has a profound belief in bottles of medicine and likes to take it. Under the panel system it is to be had without payment, and physicians do not care to endanger their popularity by refusing to prescribe. Of course the placebo has always existed in medical practice and sometimes is unavoidable, but, when it is to be had only for the trouble of visiting or sending to the panel physician, the result is obvious. As reported previously in *THE JOURNAL*, a small payment for each bottle of medicine has been suggested as a check, and this has actually been adopted in Canada.

The Right to Die

Euthanasia is a constantly recurring subject of discussion both in the profession and among the people. Various proposals have been made to give the physician the legal power to terminate suffering in incurable disease, and of course objections have been made on religious or other grounds. At last a society called the Voluntary Euthanasia Legalisation Society has been formed. Its object is summed up in the following words: "Individuals who have attained to years of discretion, and who are suffering from an incurable and fatal disease which usually entails a slow and painful death should be allowed by law, if they so desire and if they have complied with requisite conditions, to substitute for the slow and painful death a quick and painless one." The society has received influential support from physicians, lawyers, churchmen, politicians and others. Lord Moynihan is the president, and the executive committee includes Sir Humphry Rolleston, formerly president of the Royal College of Physicians, Sir Walter Langdon Brown, emeritus professor of physic, Cambridge University, Sir James Purves-Stewart, neurologist, Sir Leonard Hill, physiologist, Sir Pendrill Varrier-Jones, founder and director of the Papworth Village Settlement for Tuberculosis, Sir George Seaton

Buchanan, vice president, League of Nations Health Committee, Sir W. Arbuthnot Lane, Prof. Julian Huxley, biologist and author, Prof. H. J. Laski, professor of political science, London University, Rev. Prof. J. M. Creed, professor of divinity, Cambridge University, and the earl of Listowel, a writer whose books include "The Values of Life." To meet possible objections on religious grounds, a statement that what is proposed is not contrary to Christian principles has been signed by well known churchmen such as Dean Inge, Dr. Matthews, dean of St. Pauls, Canon H. R. L. Sheppard, and Dr. T. Rhondda Williams, chairman of the Congregational Union. An inaugural public meeting of the society will be held in London in December. Any one can become a member for the single minimum payment of \$1. A lawyer has superintended the drafting of a bill entitled "The Voluntary Euthanasia Bill," which will be brought forward by Lord Moynihan in the house of lords. It is hoped to arouse public support for the bill to enable persons in great pain and with no hope of recovery to be relieved with their own consent. There is no question of enabling a person to be put out of pain against his will. The public will be safeguarded by the necessity of obtaining the signatures of two physicians. The idea has been in the minds of many people for a long time. The bill and the formation of the society are the result of four years of untiring work by Dr. C. Killick Millard, until recently health officer for Leicester. The wording of the application form as proposed in the bill is as follows: "I am _____ years of age and am suffering from a disease involving severe pain, which, as I am informed, is of an incurable and fatal character. I have consulted my nearest relatives and have to the best of my ability set my affairs in order. I have requested _____, a medical practitioner holding a license under the act, to administer euthanasia if permission is granted and he has consented to act. I am desirous of anticipating death by euthanasia and hereby make application for permission to receive euthanasia." If the referee, after seeing the applicant, gives his permission, the applicant would be given seven days to change his mind.

In a press interview Lord Moynihan said that he did not think there was a physician of long experience in this country who had not had requests for death made to him by patients. "Many people," he added, "insist that 'God sent suffering into the world.' But they seem to forget that God also sent the means of relief. Our duty at present seems to be to keep people alive, even when their lives are useless, at the expense of great suffering. Some of us in the medical profession are unhappy when this necessity is inflicted upon us. We feel that under the strictest supervision power should be given to end life that is a curse to itself and a torture to all who love the afflicted individual. There is nothing compulsory about our proposals. The patient would decide for himself or herself whether the right to die should be exercised." Asked if he himself would submit to euthanasia if he were suffering from a painful incurable complaint, Lord Moynihan said, "I do not know any body who would not."

THE RIGHT TO KILL

English law recognizes no right to kill except in cases of self defense. The termination of hopeless suffering gave rise to a trial for murder a few days before the formation of the Voluntary Euthanasia Legislation Society was announced. There was the difference that death was not voluntary on the part of the patient. At the central criminal court a woman, aged 22, was tried for matricide. Her mother was in a hospital suffering from dementia paralytica. Evidence was given that she was devoted to her mother and that her great interest in life was the hope of her recovery. Her visits to the hospital so distressed her that friends tried to prevent her from going. Finally she got hold of a prescription for soluble barbital and by going to various pharmacists obtained 160 grains (10 Gm). She stated

that she put the barbitol in four peppermint creams and gave it to her mother "as an act of pity." The mother died and Dr Roche Lynch, government analyst, gave evidence that death was due to bronchopneumonia and that a fatal dose of barbitol had been administered. He did not think that the sweets could have contained as much as 160 grains, having regard to their size, but 50 grains (3.25 Gm) was an average fatal dose. The judge pointed out to the jury the danger of accepting the defendant's plea, "I killed in pity." Sympathy had no place in the finding of a verdict, but if they returned a verdict of "guilty" they might make what recommendation for mercy they desired. They should do their duty with firmness and resolution. The case was of great public importance. If the defendant caused death, she did so for a reason which could not be justified in this or any other country. Whether the disease from which her mother was suffering was incurable or not was not a question for them or for him. If life was shortened only by a day, that constituted murder. However, the jury returned a verdict of "Not guilty" and the prisoner was discharged. There does not appear to be any other case in which such a plea was accepted, and the verdict was clearly contrary to the law.

Facilities for Physical Training

Representatives of 140 national organizations concerned with recreative physical activity, with other delegates numbering over 300, attended a conference in London organized by the Central Council of Recreative Physical Training. Lord Astor, who presided, said that at present only 10 per cent of the juvenile population had facilities after they left school for regular exercise. Many young persons deteriorated physically when they no longer had organized exercise or the discipline of school, and the enforced idleness endured by some sapped their mental and physical alertness. Capt S J Parker, government staff inspector of physical training, said that the conference marked the beginning of an effort long overdue to provide means whereby the benefits of physical training and recreative activity might be made readily available to those of post-school age. The work of national voluntary associations was of inestimable value as a foundation, but correlation of their activities was necessary. It then remained to provide for those not associated with any organized body. There was a widespread demand among people living in unfavorable social conditions for help to get things going. They must consider what could be done to ensure the continuity of rational physical training from the school onward. The board of education was about to issue for the guidance of voluntary bodies and local authorities two books on recreation and physical fitness, one for youths and men and another for girls and women. Another publication would give advice with regard to gymnasiums and equipment. An adequate supply of trained leaders was a necessary preliminary to progress. The central council proposed to organize a summer vacation course for 500 leaders at the Carnegie Physical Training College. One member suggested the establishment of a national physical training college and stated that he happened to have a site which he thought would be ideal for the purpose. He would be glad to hand over to the council as much land as it desired for the erection of the college. It was announced that this offer would be considered by the executive committee.

Social Progress and the Unfit

In an address to the York Medical Society Lord Dawson, president of the Royal College of Physicians, said that as society had developed natural selection had lessened. Today the progress of medical science, the qualities of justice and mercy, and the organized efforts of the community were bringing it to naught. And so the "unfit" were preserved. Nature's method of securing quality of population involved a high death rate as well as a high birth rate. In this way there was a wide though rough selection. If nature's method of a high death rate was displaced,

quality of population must be secured in another way. Much was heard of economic 'planning' in order to secure greater welfare for the people. What would this avail unless a like attention was given to "planning" for a healthy race?

Civilization having in large measure nullified nature's methods of eliminating the unfit, needed to replace these methods by control of environment and inheritance. This could be done by methods of nurture to build up fit citizens, having regard to their biologic capacities, and by preventing damage to the community by the 'unfit' producing bad stock and bad homes. A missionary campaign throughout the land to teach housewives the values of essential foodstuffs and how to cook was desirable. The right nourishment of the young body was so important that the assumption by the state of an adjunctive responsibility for the feeding of children became justified. Physical education should be a prominent, if not the first, item in the school curriculum.

Turning to prevention, Lord Dawson said that sterilization should be done in the interests of the race. It was a branch of therapy comparable to inoculation. But there were no means by which carriers of defects that would appear when mating took place with a similar carrier could be detected, though it was not unreasonable to hope that such might be discovered. On the other hand, persons with mental defects were a demonstrable danger, and those with the milder forms were able to live in the community. Sterilization was a restraint of freedom to procreate, but the law already restrained liberty in matters of communal health. Why, therefore, should not future generations be protected? The practice of sterilization was not new, rather, this country had lagged behind. It had been in force in Switzerland for nearly fifty years, and in California and certain other states for a long period. It was now recognized in Denmark, Sweden, Norway, Finland and Germany as a means of preventing hereditary physical and mental defects from damaging the stock.

British Ambulance for Abyssinia

The British Ambulance for Abyssinia has been officially recognized by the British and Ethiopian governments. Advance officers dispatched from this country have reached their destinations and are making arrangements for the entry of personnel and transport into Ethiopia through French or British Somaliland. In the neighboring British colonies of Kenya and Uganda, trained native medical personnel is being recruited with the cooperation of the governor. It is already stated that forty native dressers and three Indian subassistant surgeons are available. Arrangements are being made in London, as far as the funds allow, to dispatch medical officers. Young unmarried men with some surgical experience are preferred. An appeal for funds has been made to the British public and the response has been remarkable in the large number of small subscriptions received, showing the sympathy of persons who are not in affluent circumstances. When complete, the unit will consist of one field hospital and one casualty clearing station with seven medical officers, two administrative officers, transport officers, trained dressers and equipment. The sum of \$175,000 is required for sending out this ambulance and maintaining it in the field. An urgent message has been received in London from the emperor of Ethiopia stating that the northern army is without medical aid and urging that an ambulance unit should be sent. The address of the British Ambulance Service in Ethiopia is 33 Alfred Place London, S W 7. At the same time the Save the Children Fund is organizing relief for Abyssinian refugees in the neighboring British colonies of Somaliland and Kenya. The London missionary societies are making arrangements for their missionaries of whom some are physicians and others have had some medical training, to do ambulance and hospital work. There are also American missionaries taking up this work.

PARIS

(From Our Regular Correspondent)

Oct 11, 1935

Forty-Fourth Annual Surgical Congress

The French Surgical Association held its annual congress at Paris during the week of October 7. The subjects chosen last year to be discussed at the present meeting were (1) infarct of the mesentery, (2) fractures of the os calcis and (3) technic and physiologic sequelae of operations on the diaphragm. As is customary in the larger French societies, two members are appointed at the preceding annual meeting to prepare a complete survey of a given subject and to read this report in abstract form at the following annual congress. A copy of such a report in monograph form is sent to each fellow of a society a month before the meeting, so that a complete discussion can take place as soon as the abstract has been read at the congress.

Drs. Ameline of Paris and Lefebvre of Toulouse submitted an exhaustive review on "Infarct of the Mesentery." Although it was originally considered as always due to a mechanical obstruction of the mesenteric vessels, more recent clinical and experimental observations have shown that other causes play an important part in the etiology, hence the best definition of the infarct is an "ensemble of circulatory disturbances, ending in the escape of blood into the tissues of the mesentery and of the corresponding portion of the intestine."

(a) Pathologic Anatomy. Recent studies, especially those of Hovelacque, show that a free anastomosis exists between the mesenteric vessels. It is impossible to distinguish, on naked-eye or microscopic examination, an infarct of arterial from one of venous origin. Of special interest are the cases of infarct without apparent vascular lesions and also those of infarct that recover spontaneously. The infarct is always limited to a certain segment and is accompanied by a serosanguineous peritoneal exudate and a hemorrhagic exudate into the wall of the involved small intestine.

(b) Etiology. A hard and fast line can no longer be drawn between venous and arterial lesions, because they are constantly associated, from both the anatomic and the pathologic standpoints, even without intervening involvement of the capillaries. Infarction can occur at any age and not, as was formerly believed, only in elderly persons. About two thirds of the reported cases have been in males. Among local causes, appendicitis, salpingitis, enteritis and gastroduodenal ulcers deserve mention. Among general causes, cardiovascular disease, blood dyscrasias such as purpura and hemophilia, infections, diabetes and operations on the gastro intestinal tract are to be considered. In seventy-one of 490 cases there was a history of such an operation within a reasonable period before the infarct. In ninety-seven cases, referred to for the present as cryptogenic, no local or general cause could be found.

(c) Clinical Aspects. Infarct of the mesentery as a rule presents the clinical picture of an acute onset, with a pain of variable intensity, most often referred to the right iliac or umbilical or epigastric region and accompanied by vomiting of a bilious or bloody (10 per cent of the cases) character. Although signs of intestinal paresis are most frequently observed, a serous diarrhea may occur. Bloody stools were formerly believed to be pathognomonic of infarct, but this symptom was observed in only one fifth of the cases. The abdominal examination is of little aid, because rigidity is generally absent and there may be only slight tenderness, which increases as one approaches the involved segment. On percussion, according to Mondor and Ameline, there is well marked dullness over the infarcted segment.

Shock appears early. None of these clinical signs are pathognomonic for infarct. Examination of the blood reveals a rapidly increasing leukocytosis. Roentgenographic study has thus far not been of any aid.

The acute conditions that are most frequently mistaken for infarct are ileus, peritonitis and acute appendicitis. The clinical signs of these are not so different in type from infarct but they differ sufficiently to enable a preoperative diagnosis of infarct to be made. In ileus the abdominal distention is more marked, there is little pain or shock and vomiting occurs later.

In diffuse peritonitis the abdominal distention is more generalized, the vomiting is more of the projectile type and the pain is not localized. In acute appendicitis the abdominal rigidity and tenderness are in the right iliac region, the pain is less intense and there is no shock.

The prognosis of mesenteric infarct has not improved much recently. There were 331 deaths (operative and nonoperative), or 73.55 per cent, among 450 collected cases, and 120 cures, or 26.45 per cent. The most unfavorable cases are those of cardiovascular origin, the mortality rate being 90.67 per cent. The more favorable cases are those in which there has been no previous illness. In these the mortality was 62.2 per cent. The authors were able to collect twenty-one cases in which spontaneous recovery occurred.

(d) Pathogenesis and Mechanism. Simultaneous arterial and venous obstruction is most common, but infarct may occur without a vascular lesion. The role of the nervous system in the form of vascular spasm is certainly more important than has heretofore been considered to be the case. The same is true of infection and of anaphylactic or toxic shock.

(e) Treatment. Of the 450 collected cases, operation was performed in 332. After simple exploration there were eighty-seven deaths and twenty-one recoveries. After resection, short circuiting, and so on, there were 131 deaths and ninety-three cures. Resection hence offers the best chances of success.

In the discussion, Havlicek of Czechoslovakia called attention to his work showing direct anastomosis between arteries and veins without intervening capillaries. This has been confirmed by others for various viscera.

Leriche of Strasbourg believed that the anatomic and not the physiologic factor had been considered too long. The intestinal circulation possesses a vasomotor regulatory mechanism, as does that of the vessels of the extremities.

Arterial pathology is primarily a functional disturbance, and mesenteric infarct is due to the same mechanism as vascular troubles in general. The infarct is the result of the anemia, the hemorrhagic infiltration being secondary. For this reason the process may cease in the "spasm" stage and recovery may result.

Important Notice on BCG Vaccination

The commission appointed by the Pasteur Institute to investigate the efficacy and also to receive reports of the failures of the BCG vaccination method against tuberculosis in infants has issued a statement to the effect that animal experiments and clinical observation show that the immunity conferred by the BCG (Calmette-Guerin vaccine) is established only after a certain length of time, often only after a long interval, and that during this period the infant is susceptible and can be infected as if it had not been vaccinated. Hence it is essential to avoid all contacts with tuberculous individuals during this period. Such isolation is as necessary for vaccinated as for nonvaccinated infants.

Opposition to Social Insurance Orders

A recent order by social insurance authorities, to the effect that records of insured workers while under treatment in private hospitals must be accessible to medical inspectors for the social insurance organizations, is arousing both criticism and protests. The Société de chirurgie passed a resolution at the June 20 meeting to the effect that such a rule is contrary to the duty of a physician or surgeon as to professional secrecy, and placed itself on record as opposed to any ruling that would allow such records to be open to inspection by representatives of the social insurance authorities.

BERLIN

(From Our Regular Correspondent)

Sept 23, 1935

Rigorous Requirements for Obtaining the Title of Doctor

For many years attention has been called, both at home and abroad, to the fact that the bestowal of the title of doctor by German universities is not in keeping with the dignity that the title is supposed to convey. Particularly during the period immediately following the World War, things went so far that every one who planned to play any prominent part in society or in industrial life felt obliged to secure some sort of doctor's title. It has been rumored that at many universities, particularly at the smaller provincial institutions, there has been a tendency to "let down the bars," and even the comic journals have made the new "doctors" the butt of their jokes. It is alleged also that the honorary title *doctor honoris causa* has often been attained in the simplest manner—sometimes as evidence of appreciation of a considerable gift of money. Respect for the doctor's degree has consequently been lowered in the public mind, in spite of many attempts on the part of the more discerning members of academic circles to check the growing lack of confidence. Some sixty years ago Theodor Mommsen, historian of the University of Berlin, published his article on "The German Pseudo Doctors" which aroused a great furor. The publication of this revealing article led to the adoption of the regulation that a certain number of copies of a doctor's thesis must be printed and circulated which furnished an effective means of public control of the various faculties of the universities. At that time the examinations for the doctor's degree constituted also a considerable source of income. The pecuniary feature of the problem was later partly solved by issuance of the decree that the examination fees should not be credited in full to the examiners but should go chiefly into library, university and faculty funds. What did not go into these funds was to be divided among the four examiners who held the oral examinations and the two persons selected to discuss the contents of the thesis presented by the candidate for the doctor's degree.

Now the minister of public instruction (Rust) has made several sharp changes in the regulations. The graduation fees incident to the obtaining of the doctor's degree at any German university have been placed uniformly at 200 marks (\$80, current), which sum is payable in full into the government treasury, the professors receiving no part of it. University instructors will henceforth perform the work of examiners as part of their regular duties. The reasons assigned for this decree are significant. The bestowal of the title of doctor is one of the most exalted rights of the faculties of the German universities. The exercise of this right is associated however, with certain high obligations.

Under all circumstances, therefore, the university authorities must see to it that only such students or scholars are admitted to the examination for the doctor's degree as have shown that they are competent to state a problem correctly to grasp its significance and to elaborate on it in accordance with scientific methods. The doctor's degree must never be bestowed for superficial reasons as a complement of a successfully passed government (or similar) examination on the basis of a more or less formal performance. Through the granting of degrees on a flimsy basis the German doctor's degree has already lost much of its former prestige. The decree stipulates also that candidates for the doctor's degree must be the actual pupils and scientific collaborators of the instructor and that between pupil and instructor a spirit of camaraderie must exist. Only under these points of view shall candidates for the doctor's degree be accepted and aided and the rectors or presidents of the universities shall see that these requirements are observed.

This decree is intended to have a salutary effect on the conferring of the title of doctor of medicine. In the past it has often been granted in a routine way on the basis of a report on some clinical case or other which had no scientific value. The number of applicants for the doctor's title was greatly influenced by the actual or supposed advantages accruing therefrom to the possessor, that is, by the esteem in which it was held in the public mind. Through the operation of this decree the German doctor's degree will gain in prestige, although it may take some time for it to recover its former status.

Distribution of Medical Students in Germany

The matriculation of medical students at German universities for the summer semester 1934 (which included 890 foreigners) numbered 23,028. The largest proportion of these students are derived from the families of middle rank officials (5,892) and merchants and industrialists (4,547). Only 2,391, or 10.8 per cent, are the sons of physicians, while about 30 per cent of the fathers of these students had a complete university training. It is evident, therefore, that our future physicians are recruited mainly from nonmedical circles. Slightly more than 1,000 students are from the families of agriculturists—chiefly from those of middle rank. Children of laborers have a comparatively high representation (315), being greater, for example, than the children of pharmacists (214). About 25 per cent of the women medical students are the daughters of higher officials and a further 25 per cent are from the families of middle rank officials. The University of Munich has the highest representation of medical students (2,528), the University of Berlin comes next with 2,273 students. Next in descending order come the universities of Würzburg, Königsberg, Bonn and Heidelberg. The University of Gießen has the smallest representation. Of the 890 foreign students (120 women), 517 are from Europe, most of them from Poland, Rumania, Danzig and Switzerland. There are only nine students from England and only one from France. From Asia there are seventy-one, forty-two being from China. Africa has furnished thirteen and North America 207, 206 being from the United States. From South America come forty-six, twenty-four from Peru. From the religious point of view 327 foreigners were of the Protestant faith, 209 were Catholics and 173 were Jewish.

Criteria for Correct Nutrition

For some time the health authorities have given increased attention to the problems of nutrition. Another evidence of increased interest in nutritional problems is the fact that on August 1 a 'department of physiologic nutrition' was established within the federal bureau of health, of which Professor Floessner was appointed director. Furthermore the creation of a special official commission to deal with purely scientific nutritional problems is contemplated. The Reichsarbeitsgemeinschaft für Volksernährung which recently established a set of criteria for correct nutrition, to be used in connection with the educational campaign, is working along the same line. The criteria state that an effective nutrition can be accomplished by means of a wide variety of diets and with the aid of widely different food articles. A one-sided diet is condemned, irrespective as to whether it is a meat diet or a vegetarian or raw-food diet. The most important prerequisites of any diet are full food value and price-worthiness.

The basis of the educational and the publicity campaign for better nutrition lies in the paramount emphasis that is placed on a mixed or well assorted diet which should comprise adequate amounts of fruits, green vegetables, and milk and milk products. Purely vegetarian nutrition is not advocated. If certain persons for some special reason wish to adopt a vegetarian diet, no objections need be made. However an abrupt transition from a mixed diet to an exclusively vegetarian diet should not be undertaken without consultation with a physician. Raw food

is valuable as supplementary nutrition, in the form of salads, fruit and the like, but an exclusive diet of raw foods should not be adopted by any one without a physician's endorsement. Diets influenced by cultist trends the *reichsarbeitsgemeinschaft* refuses to approve. As to what constitutes a suitable diet for various types of patients must not be made the subject of public lectures or of educational or publicity campaigns.

AUSTRALIA

(From Our Regular Correspondent)

Sept. 30, 1935

Annual Meeting of British Medical Association at Melbourne

In recognition of the development of medicine in Australia, the one hundred and third annual meeting of the British Medical Association opened in Melbourne September 9 and continued for that week. On only three occasions has the annual meeting been held outside Great Britain, and Canada had been chosen for the previous two.

It became apparent at this meeting that Australian medicine possesses a tradition and a character of its own. In a country where many local delegates travel 2,000 miles in a straight line to the meeting but which contains a mere seven million people there are problems of medical care that are unique in the world. The juxtaposition of the temperate and tropical zones provides a range of pathologic possibilities and physiologic permutations that gives a lively variety to Australian medicine.

For the first time in the history of the association an Australian born was chosen as the president. In thus honoring Sir James Barrett, K.B.E., CB, CMG, LL.D., M.S., F.R.C.S., a distinguished ophthalmic surgeon and medicosocial organizer, the association also honored the illustrious sons of Australia, who in their native country and overseas have achieved eminence in most branches of their profession.

The meeting was also honored by the presence of medical scientists from Great Britain, who passed through the United States on the way. Incidentally, the British delegates expressed gratification at their kind reception during their crossing of America, their most intriguing experience being their tour of Chicago with the police patrol.

ANNUAL GENERAL MEETING

Adjourned July 23 from London across the world to Melbourne September 10, the annual general meeting opened the proceedings in the Town Hall in an atmosphere of austere procedure and colorful pageantry. One of the first acts of the newly elected president was to send, with the approval of the meeting, a cablegram to King George, the patron of the association, expressing loyalty and devotion. Before the conclusion of the meeting, a suitable reply was received. The governor general of Australia welcomed the members who had come from other parts of the empire and said that the importance of mankind which every congress of this nature carries is heightened by the inspiring fact that this notable assembly is an inter-imperial one. The following representatives of other associations were introduced and welcomed to the meeting: Canadian Medical Association, Dr. R. D. Rudolph and Dr. Ritchie, Federal Council of the Medical Association of South Africa, Dr. C. M. Murray, Chinese government and Chinese Medical Association, Dr. Wu Lien-teh, Japanese Medical Association, Dr. Genzo Katoh, Australian Federal Council, Sir Henry Newland. A distinguished foreign guest, Dr. K. Herman Bouman of Amsterdam, and delegates from overseas dominions, colonies, dependencies and mandated territories, were also received officially. An award of the association was presented to a Melbourne scientist, Dr. F. M. Burnet, for his work on bacteriophage and virus diseases.

THE PROBLEMS OF THE HOSPITAL SYSTEM

In his presidential address, Sir James Barrett urged the members to take charge of the future of the hospital system. "If hospitals are nationalized, the whole medical profession will inevitably sooner or later be nationalized," he declared. "The choice must be made, or we may drift by indecision into a position difficult to justify or to alter. The fault of the present hospital system is that the economic gap between the public hospitals and the so called intermediate hospitals and the private hospitals is too great and should be bridged by a contributory system such as bush nursing, in which case the hospital charges for intermediate patients may be made very small. If such a contributory system is adopted by the profession, the profession will exercise its just influence in managing it. If, on the other hand, it is supplied by the state or other organizations and the members of the medical profession do not play an active part in its establishment, then their control and influence will probably be negligible. Now is the time to decide and to choose which system is preferable." In dealing with the main subject, Sir James Barrett discussed four different systems: (1) the Victorian Bush Nursing Association, (2) the hospital system of Victoria, (3) the hospital system of Great Britain and (4) the hospital system of New Zealand.

The bush nursing movement began in 1911 and had developed steadily until in 1925 there were forty four nursing centers and three hospitals. As hospitals were established the contributory scheme that had been applied to the nursing centers was transferred to them. Contributors could obtain unlimited nursing and hospital attention for themselves and their dependents up to a certain age for £2/2/- a week, but all patients had to make their own arrangements with their medical attendant, a system which, being essentially human, had worked exceedingly well. These hospitals receive and request nothing from the government for construction and, except in six instances of special and really historical interest, nothing for maintenance. They must maintain themselves or close. So far none have closed, and at present these hospitals, staffed by doubly and trebly certificated nurses and not by trainees, by nurses who are the best paid nurses in the state, provide the cheapest hospital accommodation in the state. From one third to one sixth of the cost of construction has been borne by the Edward Wilson partnership and the H. V. McKay trust. The remainder has been provided by the districts that own them.

Sir James Barrett explained that the public hospitals in Victoria were maintained by voluntary contributions, by government subsidy and by the contributions of patients. There were also intermediate hospitals, mostly organized by religious bodies, at which the charges, although in his opinion too high, were less than those of the private hospitals. In pointing out the difficulties of financing the present system, he said that 85 per cent of the taxpayers in Victoria received £300 a year or less. Many of that percentage would have to receive necessary hospital and nursing attention at rates within their means. The sole cause of the hospital problem was that thousands of people now resorted to the public hospitals who did not before. A great change of attitude has taken place and we shall have to alter our ideas and outlook and meet the difficulties arising from it. "Are we to abandon our voluntary charitable system and nationalize—that soothing word!—our hospital service?" asked Sir James Barrett. "If so, we shall lose the humane feelings of the public and of the profession which brought the hospitals into existence and which have ensured their continuance. The medical staff must then cease to be honorary. Unless the experience of other countries misleads us, the cost will be great if efficiency is to be maintained. One essential factor has not been faced. It is quietly assumed that the medical expert will continue to act as if the system were a charitable one, so far as he is concerned. If nationalized hospitals make their appearance, the medical officers must be adequately paid if efficiency

is desired. Intermediate hospitals are not cheap enough. Why should the contributory bush nursing principle not be applied, and the cost to the patients be substantially reduced? Why should there not be hospitals of the bush nursing type in the suburbs?"

PUBLIC CONTROL OF HOSPITALS

The author of a surgical textbook of world-wide use, Prof E. W. Hey Groves, professor of surgery at the Belfast University, delivered the first Hamilton Russell memorial lecture at the Royal Australasian College of Surgeons. I say with all the emphasis at my command that the time has come when every hospital which undertakes the treatment of the sick and the investigation of disease must come under public control. The multiplication in the number and variety of hospitals was a very real problem. In the old days the only reason and justification for hospitals was the charitable desire that poor people should be housed, fed, nursed and doctored during illness. No person who had a house and servants and who could be attended at home would have thought of going to a hospital. Actually hospitals in those prehistoric days were hotbeds of disease and infection. "But since surgery has become a science and since all manner of investigations are necessary for the diagnosis and treatment of disease, the hospital has become the essential place where all surgical work must be done," continued the lecturer. "It is no longer a question of the man of means being treated at home while the poor man is sent to an institution. Unfortunately, this changed relationship of hospitals to the community has come about so slowly that it is not realized and there are many even today who do not appreciate its significance. Therefore, we have the present muddle of various types of institutions, provided for the sick, without clear definition of the scope of each or the proper relationship to one another."

"First, there are the voluntary hospitals. In our country it is usual and right to express admiration and gratitude for these voluntary hospitals, which have been the scene of nearly all the advances of discovery and technique. But however sincere may be our admiration for their work in the past, we are bound to criticize their present position and their relationship to the public health service. The voluntary hospital is essentially an institution founded and, to some extent, endowed and wholly managed by private individuals. At one time they were supported entirely by voluntary subscriptions, and the patients were treated free of charge. Now this is all changed. A large proportion of their maintenance charge has to be borne by fees paid by the patients, but in spite of this and they are all finding it hard to live, while extensions and improvements have to be delayed until some wealthy benefactor can be found to present them with the needed money. To me this has always seemed wrong in principle and bad in practice, and I have always protested against the indignity of medicine being a mendicant. But the essential fault in the voluntary hospital system is the much vaunted independence of control of the voluntary hospitals. The time has come when every hospital which undertakes the treatment of the sick and the investigation of disease must come under public control, for example, that of the Ministry of Health. It should be no longer possible for a private person to give or bequeath a hospital to the community without inquiry by the Ministry of Health as to how that hospital is to be supported whether it is needed and above all how it is to be staffed. Now that the hospital represents a scientific clinical laboratory in which the work must be highly differentiated and specialized, it is obvious that multiple small hospitals with no connection with one another and no responsibility except to their own directors, are an absurdity. Uncontrolled independence of voluntary hospitals presents one of the most urgent problems of today. Either the voluntary hospitals must set their own house in order and set up a council of government which shall be concerned only for the good of the community and of scientific progress or else the state must control them."

Maintenance must be met by insurance instead of mendicancy, and new hospitals and new buildings must be provided by the public funds."

Professor Hey Groves referred briefly to municipal hospitals in Britain and to nursing homes, of which he said "Let us hope that the force of circumstances will speed up the disappearance of the proprietary nursing home, which is surely an anachronism today. In the future all the best hospitals should have ample accommodation for private patients who can pay their own fees and maintenance and at the same time obtain the benefit of all the refinements of scientific medicine and surgery."

In the early part of his lecture, which was entitled "The Romance of Surgery," Professor Hey Groves gave an outline of the life and work of Hamilton Russell, who died in Melbourne in 1933. The professor said that Hamilton Russell's innate modesty forbade him to take pride in anything but the fact that he was the pupil and last house surgeon of Lister, whom he ever delighted to honor and to imitate. Professor Hey Groves discussed Russell's sacral theory of herma, his simple and effective method of treating fractured femurs (known now as the Melbourne method), and his contribution to the surgical technique of treating strictures.

SKIN DISEASES IN AUSTRALIA

Dr Herman Lawrence of Melbourne stated that the Australian people were more subject to skin diseases than any other people in the world. This was due to the dry atmosphere and the outdoor life of the people. A suggested investigation was the relationship of mice plagues to skin disease.

THE FLYING DOCTORS

Relating the history of the services, Dr Vickers paid a tribute to Rev John Flynn, superintendent of the Australian Inland Mission of the Presbyterian church, to whose inspiration and tenacity of purpose they owed these services today. Prior to 1914 he realized the need for medical facilities for the lonely settlers in remote parts and conceived the idea of having a doctor at a central base, with an airplane to visit and, if necessary, transport patients to hospitals. Wireless was essential as a means of communication, and in 1926 a complete transmitting and receiving set was evolved. The power of this type of set was derived from a small high tension generator driven by bicycle gears, which ensured an unfailing supply of electricity and made the set capable of being operated by anybody. For distances up to 200 miles vocal messages could be sent and received. Outside that radius Morse code was transmitted from a simple typewriter keyboard, which made actual knowledge of Morse unnecessary. There were at present thirty-five of these sets at station homesteads, mission hospitals and police stations, but the objective was to increase that number to 500 as finances permitted. When vocal messages were received the doctor was often able to give simple instructions, particularly in the case of minor ailments of children to worried mothers 200 miles away from medical aid. In urgent cases, such as severe injury or internal operations, the combination of wireless and airplane meant a saving in many cases of days, and patients transported by air were remarkably free from surgical shock inseparable from practically every other form of transport.

The loneliness of Australia's frontiers was unique. Of Australian cities with a population of more than 10,000, all, with few exceptions, were on or near the coast. In difficult medical cases it was necessary to reach a city of 10,000 or more people to guarantee reasonably adequate hospital facilities. The loneliness was likely to continue for some time, as apart from the transcontinental and mining lines no attempt was being made to build railways into the tropical belt. It was desirable not only to convey patients to the hospital by aerial ambulance

but to bring them back when discharged. A patient brought to a hospital in four hours might have to travel over rough country for three weeks to get home.

AUSTRALIA'S FUTURE

"Our moonlight civilization in Australia mirrors most alarmingly the decline in birth rate and population seen in western Europe, for these things act here, not as a safeguard, but toward disaster" declared Sir Raphael Cilento of Queensland at the combined sessions of public medicine and medical sociology. We cannot preserve our frontiers unless we can effectively occupy the land we claim, and the problem is vast. Certainly we have done well in actual figures. During the period 1911-1921 our annual increase corresponded to 2.01 per cent and from 1921 to 1933, in spite of actual loss owing to the depression, it was 1.83 per cent, the chief increase going to Queensland. But, with regard to distribution, Australia is becoming more urbanized without provision in the secondary field. The percentage of population in country districts fell from 37.35 in 1921 to 35.92 in 1933, and this is the tendency of several decades. "It is in respect of natural increase that our figures are most disturbing. From 1861 to 1931, 75.92 per cent of the population was provided by natural increase and 24.08 per cent by immigration. But during the thirty-two years of recorded figures since 1900 this figure has fallen to 19.23 per cent, and from 1927 the figures for the individual years show a decline that resulted in an actual loss in 1930, 1931 and 1932. (Incidentally, the nominated and selected immigrants fell in number from 30,123 in 1927 to 275 in 1931 and 175 in 1932.)

"The Australian birth rate is now one of the lowest in the world, but fortunately the death rate is phenomenally small, so that a reasonably good showing is made in respect of natural increase, but, as Dublin recently pointed out, the natural increase rate is fallacious. In his experience an American rate of 10.99 per thousand when corrected in terms of the biologic constitution (age frequency of material pregnancy and mortality) becomes no more than 5.47 per thousand. This criterion applied to Australian figures by Exley shows several tendencies that are unfavorable. The average age of the population is rising rapidly, and the proportion of youth is declining. The Year Book of 1933 shows that young and middle aged arrivals have fallen from two thirds to little more than one half, the proportion of older people among them has risen from one in seven to one in three, and, in respect of departures from Australia, the depression prompted many people in the age group 15 to 35 to leave Australia for other lands in search of employment. The best of all immigrants, the baby, formerly represented by 3.34 (1911) per family, has fallen to 2.95 (1932), so that the average issue of mothers has fallen 13.22 per cent and there are considerably fewer potential mothers. The natural increase for 1931 was half that of 1891. Exley concluded from his study that, in terms of natural increase, the stable population of Australia, on present figures, would represent no more than 8,500,000 and would contain an excess of females of approximately 35 per thousand. The solution is immigration or ultimate invasion. Australia depends today for her defense and her development on peace and security, for which there is no guaranty. Health—that is, protection against external disease and a vigorous vitality from right living that is internal excellence—and the dominant mentality that goes with abounding health are both essential to ensure our survival in the period of increasing pressure in the Pacific that appears imminent and inevitable."

THE DOCTOR AS EUGENIST

In clear and candid language the principles of eugenics and the aims of the Eugenics Society of Great Britain were explained by Lord Horder, president of the society. Lord Horder said that those who urged the claims of eugenics found themselves for the most part crying in the wilderness, but they

believed that the gospel which they preached would usher in an epic in the physical and intellectual progress of the human race which would have comparably good results. Eugenics had been defined as "the study of agencies under social control that might improve or impair the racial qualities of the future generations, either physically or mentally." The eugenicist did not believe that permanent results would accrue from pampering the individual. To do one's utmost to start every new life on a sound and sturdy basis was the greatest service one human being could render to another. In medicine there had been a tendency to get back further and further in outlook and in practice. From the cure of the individual patient, medical men had turned to the control of the disease and the increase of the patient's resistance to infection. They called this preventive medicine. They had attended more to the child and less to the adult, and from the child they had passed to the infant and even to prenatal life. But they must go back further still, for, by the time a new individual was conceived, heredity had already stamped on it the power to live healthily or had loaded it with handicaps from which it might never be able to shake itself free. Eugenics in actual fact was the soundest and by far the most profitable form of preventive medicine. Lord Horder suggested that civilization had advanced far enough to enable them to achieve biologic control just as completely as they had achieved physical control. He meant biologic control in the human sphere, since no one seemed to question either the wisdom or the morality of achieving biologic control in the animal and in the plant world. People accepted the principle in relation to horses, cattle and plants but gasped at the idea of accepting the principle in respect of men and women. The principle offended the religious emotions and ideas of some. He did not propose to enter into that arena, for the degree to which a man's religion determined his views on questions of this kind must be settled in the sanctity of his own heart. Supposing the main principle of eugenics to be accepted, the speaker proceeded what should be done to act on it? In the first place, the study of eugenics should be encouraged in the universities and schools, and by the institution of scholarships and research studentships. Eugenics should be taught to medical students. Then the compilation of family pedigrees should be encouraged.

Marriages

- ROBERT D. SCHROCK, Omaha, to Miss Elizabeth Winslow Wetherbee of Newton Highlands, Mass., August 20.
JAMES FRANCIS WILKINSON, Oconomowoc, Wis., to Miss Patricia Phelan Hebert, at Clintonville, August 28.
ALDEN W. SQUIRES, Ann Arbor, Mich., to Miss Marguerite B. Parker of Newton Highlands, Mass., August 5.
HENRY CLAY HARRILL, Ellenboro, N. C., to Miss Maxine Patricia Stout of Pierre, S. D., August 8.
GEORGE ALFRED HESS, Bridgewater, Va., to Miss Helen May Carter of Trenton, N. J., August 18.
JUNIUS RICHARDSON VANN, Spring Hope, N. C., to Miss Matilda Mayo of Clayton, August 18.
LAWRENCE F. STEFFEN, to Miss Aileen Marie Conlan, both of St. Marys, Kan., August 29.
AVISON GANO, Carrollton, Ill., to Miss Maude E. Gronerell of Muskegon, Mich., August 3.
DONALD F. MARION, Harrisburg, Pa., to Miss Mabel Floyd of Fairmont, N. C., in August.
CLINTON S. M. KOERNER, Chicago, to Miss Rosella Fredendall of Rankin, Ill., August 31.
HARRY LINWOOD LEAVITT, Seattle, to Miss Teresa Drumheller of New York, August 22.
FRANCIS LAMBERT MCGANNON, to Miss Louise Houch, both of Cleveland, in August.
FRANCIS X. GRAFF, Freeport, Ill., to Miss Constance Ford of Gary, Ind., August 24.

Deaths

Alexander Crever Abbott, Philadelphia, University of Maryland School of Medicine, Baltimore, 1884, emeritus professor of hygiene and bacteriology, University of Pennsylvania School of Medicine, formerly lecturer in hygiene, Johns Hopkins University School of Medicine, Baltimore, member of the Society of American Bacteriologists, for many years member of the city board of health, served during the World War author of "The Principles of Bacteriology" and "The Hygiene of Transmissible Diseases," aged 75, died, September 11, at his summer home on Cape Cod, of cerebral hemorrhage.

Richard Clinton Bunting, Memphis, Tenn., University of Maryland School of Medicine, Baltimore, 1899, member of the Tennessee State Medical Association, formerly clinical assistant, associate and associate professor of neurology University of Tennessee College of Medicine, on the staffs of the Methodist, St. Joseph's and Crippled Children's hospitals and the Western State Hospital, aged 58, died, September 30, of carcinoma of the pancreas and hemorrhagic pancreatitis.

Henry Schwarz, St. Louis, St. Louis Medical College, 1879, member of the Missouri State Medical Association, professor emeritus of obstetrics and gynecology, Washington University School of Medicine, fellow of the American College of Surgeons, past president of St. Louis Medical Society, aged 79, consulting obstetrician to St. Louis Maternity Hospital and Barnes Hospital, where he died, October 23, of leukemia.

Edward Wells Brown, Northampton, Mass., College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1894, medical examiner of Hampshire County for many years, on the staff of the Cooley Dickinson Hospital, consulting surgeon to the Veterans Administration Facility and the Northampton State Hospital, aged 64, died, October 25, of coronary thrombosis.

David Walker Houston, Troy, N. Y., McGill University Faculty of Medicine, Montreal, Que., Canada, 1881, fellow of the American College of Surgeons, veteran of the Spanish-American War, at one time police surgeon in Cohoes, N. Y., and member of the board of health consulting surgeon to the Troy and Leonard hospitals, aged 78, died, September 11, of carcinoma of the esophagus.

William Henry Clancy, Cambridge, Mass., University of the City of New York Medical Department, 1886, member of the Massachusetts Medical Society, for thirty-five years physician for the Cambridge schools, physician for the Middlesex County Jail, on the staffs of the Cambridge City Hospital and the Holy Ghost Hospital, aged 70, died, September 21, of chronic myocarditis.

Frederick Laurence Flynn, New York, Cornell University Medical College, New York, 1902, member of the Medical Society of the State of New York, visiting surgeon to the Morrisania City Hospital consulting surgeon to the Fordham Hospital and formerly visiting surgeon to the Lincoln Hospital, aged 57, died, October 17, of diabetes mellitus and coronary heart disease.

Edmund Walters Warren, Palatka, Fla., University of Georgia Medical Department, Augusta, 1902, member, past president and secretary of the Florida Medical Association secretary of the Putnam County Medical Society formerly mayor on the staff of the Mary Lawson Sanatorium, aged 60, died, September 24, in the East Court Hospital, St. Augustine.

William Cohen, Brooklyn, Long Island College Hospital, Brooklyn, 1915, member of the American Academy of Ophthalmology and Oto-Laryngology assistant visiting ophthalmologist at the Gouverneur Hospital and an assistant in the ophthalmological department of the dispensary of the Long Island College Hospital, aged 45, died, September 10.

George H. Westinghouse, Buffalo, University of Buffalo School of Medicine, 1886, member of the Medical Society of the State of New York, formerly registrar of vital statistics city board of health for many years on the staff of the Buffalo Hospital of the Sisters of Charity, aged 74, died, October 8, of coronary thrombosis.

John Breckinridge Catlett, Staunton, Va., University of Virginia Department of Medicine, Charlottesville, 1888, formerly city physician, member of the board of health and county coroner for many years on the staff of the King's Daughters Hospital, aged 69, died, September 24, of malignant disease of the pelvic bones.

Roy Arthur Townsend, Fairgrove, Mich., University of Michigan Department of Medicine and Surgery, Ann Arbor

1910, member of the Michigan State Medical Society, health officer of Fairgrove township, aged 52, died, September 18, in the Unionville (Mich.) Hospital, of nephritis and arteriosclerosis.

William Lewis Conklin, Poughkeepsie, N. Y., University of the City of New York Medical Department, 1885, past president of the Monroe County Medical Society, on the staff of the Bowne Memorial Hospital, 1923-1925, aged 77, died, October 4, of cardiovascular disease and hypertrophy of the prostate.

Edward William Cooney, Appleton, Wis., College of Physicians and Surgeons of Chicago School of Medicine of the University of Illinois, 1904, member of the State Medical Society of Wisconsin, on the staff of St. Elizabeth Hospital, aged 61, died, September 11, of coronary thrombosis.

Silas Green Cain, Somerset, Ky., University of Louisville Medical Department, 1893, member of the Kentucky State Medical Association, served during the World War, on the staff of the Somerset General Hospital, aged 64, was found dead in bed, September 12, of coronary thrombosis.

Lester Blake Cavins, Bloomington, Ill., Baltimore Medical College, 1904, medical director of the State Farm Life Insurance Company, served during the World War, aged 58, on the staff of the Brokaw Hospital, Normal, where he died, September 28, of coronary thrombosis.

Maria Mitchell Vinton, Brightwaters, N. Y., Woman's Medical College of the New York Infirmary for Women and Children, New York, 1886, formerly medical inspector of the New York City Health Department, aged 72, died, September 20, of carcinoma of the stomach.

Allen Tindolph Agnew, International Falls, Minn., University of Minnesota Medical School, Minneapolis, 1917, member of the Minnesota State Medical Association, served during the World War, aged 44, died, September 28, in the Northwestern Hospital, Minneapolis.

John Hamilton Hastie, Stockton, Ala., University of Tennessee Medical Department, Nashville, 1899, member of the Medical Association of the State of Alabama, aged 57, died in September at an infirmary in Mobile of injuries received when his car crashed into a tree.

Charles David O'Hara, Williamstown, Ky., Medical College of Ohio, Cincinnati, 1895, member of the Kentucky State Medical Association, past president of the Grant County Medical Society, aged 61, was found dead in his office, September 18, of cerebral hemorrhage.

Thomas R. Barker, Danville, Ind., Central College of Physicians and Surgeons, Indianapolis, 1901, past president of the Hendricks County Medical Society, for many years on the staff of the Methodist Hospital, Indianapolis, aged 60, died, October 7, of heart disease.

Robert Abbott Donahoe, Lowell, Mass., University of Vermont College of Medicine, Burlington, 1921, member of the Massachusetts Medical Society, aged 43, on the staff of St. John's Hospital, where he died, August 20, of acute hepatitis and cirrhosis of the liver.

Arthur T. Caine, Anoka, Minn., University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis, 1899, medical superintendent of the Anoka State Asylum, aged 60, died, September 12, in the Littel Hospital, Minneapolis, of cardiac decompensation.

Neil McLeod, Philadelphia, McGill University Faculty of Medicine, Montreal, Que., Canada, 1927, instructor in pathology, University of Pennsylvania School of Medicine, aged 34, was instantly killed, September 23, in an automobile accident near Lakewood, N. J.

Albert Henry Fridenberg, New York, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1877, at various times on the staffs of the Mount Sinai and Beth Israel hospitals, aged 80, died, October 3, of chronic myocarditis.

Spencer C. Alexander, Salt Lick, Ky., University of Louisville Medical Department, 1890, member of the Kentucky State Medical Association, formerly county coroner, aged 78, died, September 21, in the Good Samaritan Hospital, Lexington, of heart disease.

David James Molumphy, West Hartford, Conn., Jefferson Medical College of Philadelphia, 1906, for many years medical inspector of the city board of health, on the staff of St. Francis Hospital, Hartford, aged 59, died, August 31, of hypernephroma.

John A. Campbell, Nahant, Ga., Medical College of the State of South Carolina, Charleston, 1911, member of the

Medical Association of Georgia, also a druggist, aged 50, died, September 20, in a hospital at Waycross, of gangrenous appendicitis

Julius Crisler ⊕ Jackson, Miss., Jefferson Medical College of Philadelphia, 1898, past president of the Central Medical Society, fellow of the American College of Surgeons, aged 59, on the staff of the Jackson Infirmary, where he died, September 13

Hezekiah Levin Martin, Birmingham, Ala., Vanderbilt University School of Medicine, Nashville, Tenn., 1881, member of the Medical Association of the State of Alabama, Confederate veteran, aged 87, died, September 2, of cardiovascular disease.

John Sullivan Clifford, Rochester, N. Y., George Washington University School of Medicine, Washington, D. C., 1906, for many years on the staff of St. Mary's Hospital, aged 57, died, September 6, of cerebral hemorrhage and arteriosclerosis

Abram Burton Jones, Tyrone, Ga., Atlanta School of Medicine, 1907, member of the Medical Association of Georgia, mayor of Tyrone and member of the board of education, aged 59, died, September 6, of carcinoma of the liver

Benjamin L. Simmons, Nashville, Tenn., Georgia College of Eclectic Medicine and Surgery, Atlanta, 1890, president of the state board of medical examiners, aged 72, died, September 23, of valvular heart disease and hemiplegia

George Zina Goodell, Salem, Mass., Harvard University Medical School, Boston, 1881, member of the Massachusetts Medical Society, formerly on the staff and superintendent of the Salem Hospital, aged 76, died, September 9

Thomas Joseph Cronin ⊕ Worcester, Mass., Baltimore University School of Medicine, 1898, on the consulting staff of the Fairlawn Hospital, aged 69, died, September 10, in the Memorial Hospital, of carcinoma of the sigmoid

Abraham A. Pless, Philadelphia, Temple University School of Medicine, Philadelphia, 1918, member of the Medical Society of the State of Pennsylvania, aged 47, died, October 8, in the Mount Sinai Hospital, of lymphatic leukemia

Harmon Arthur Staley, Schenectady, N. Y., Albany (N. Y.) Medical College, 1891, member of the Medical Society of the State of New York, aged 70, died, September 21, of cerebral hemorrhage and arteriosclerosis

David Jacob Hyman, New York, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1895, on the staff of the Beth Israel Hospital, aged 62, died, October 3, of coronary thrombosis

Oscar Lee Ashby Torbett, Marlin, Texas, Atlanta (Ga.) College of Physicians and Surgeons, 1909, member of the State Medical Association of Texas, aged 60, died, September 13, of agranulocytopenia and septicemia

Augustus Burt Coolidge, Washington, D. C., Howard University College of Medicine, Washington, 1884, aged 78, died, September 22, in the Emergency Hospital, of hemorrhagic pancreatitis and right pyonephrosis

John Eastman Belding, Worcester, Mass., Harvard University Medical School, Boston, 1902, served during the World War, aged 62, died suddenly, September 16, in Northfield, of coronary occlusion.

Charles Frederick Culley, Cleves, Ohio, Eclectic Medical College, Cincinnati, 1918, aged 41, died, September 2, in the Deaconess Hospital, Cincinnati, of cerebral and pulmonary edema and acute nephritis

Frank Boogher ⊕ St. Louis, University of Virginia Department of Medicine, Charlottesville, 1895, served during the World War, aged 69, died, September 2, in the Barnes Hospital, of heart disease

John Woodson Gillespie, Sherman, Miss., Memphis (Tenn.) Hospital Medical College, 1903, member of the Mississippi State Medical Association, aged 61, died, August 24, of coronary thrombosis

Leonard Charbonneau, Ogdensburg, N. Y., School of Medicine and Surgery of Montreal, Que., Canada, 1891, aged 72, died suddenly, October 1, in the Hepburn Hospital, of coronary thrombosis

Charles P. Brown ⊕ Oklahoma City, Okla., University Medical College of Kansas City, Mo., 1900, on the staff of the Oklahoma City General Hospital, aged 68, died, September 13, of heart disease.

George Washington Conterno, New York, Long Island College Hospital, Brooklyn, 1891, aged 66, died, September 9, in the Veterans' Administration Facility, of myocarditis and arteriosclerosis

Hosea August Vise, Benton, Ill., St. Louis College of Physicians and Surgeons, 1905, member of the Illinois State Medical Society, aged 52, died, September 16, of carcinoma of the rectum

Thomas Foster Cleaver, Lebanon, Ky., University of Louisville Medical Department, 1887, member of the Kentucky State Medical Association, aged 69, died, October 9, of heart disease

William J. Childress, Greenwood, Ind., Hospital College of Medicine, Louisville, 1900, aged 61, died, September 5, of pulmonary edema, acute cardiac dilatation and cirrhosis of the liver

Ernest de Mary Brumback, New York, Hahnemann Medical College and Hospital of Philadelphia, 1899, aged 61, hanged himself, October 2, at his home in White Plains

John H. Buschemeyer, Louisville, Ky., University of Louisville Medical Department, 1891, formerly mayor of Louisville, aged 65, died, October 7, of coronary occlusion.

Lyme Harry Blanchard ⊕ Oakland, Calif., University of Vermont College of Medicine, Burlington, 1895, aged 62, died, September 5, of cerebral hemorrhage and myocarditis

Daniel A. Carlyle, Alba, Mo., McGill University Faculty of Medicine, Montreal, Que. Canada, 1901, aged 64, died, September 27, of paralysis agitans and arteriosclerosis.

Thomas R. Whitley, Douglasville, Ga., Atlanta Medical College, 1876, formerly member of the state legislature and mayor of Douglasville, aged 80, died, September 3

Cicero Minor Nichols, Houston, Texas, Medico-Chirurgical College of Philadelphia, 1899, aged 77, died, July 25, of injuries received when struck by an automobile.

Mary J. Henry Aiton, Summer Hill, Ill., Northwestern University Woman's Medical School, Chicago, 1901, aged 70, died, September 1, of multiple neuritis

John Rufus Allen, Haldton, Okla., Hospital College of Medicine, Louisville, Ky., 1905, aged 54, was found dead, September 18, of cerebral hemorrhage.

Sebastian Stol ⊕ Chicago, College of Physicians and Surgeons of Chicago, 1892, aged 66, died, October 27, in St. Elizabeth's Hospital, of coronary sclerosis

John B. Burford, Rosebud, Texas, Tulane University of Louisiana Medical Department, New Orleans, 1890, aged 70, died August 15, of diabetes mellitus

John Calhoun Harris, New Hope, Ala., Chattanooga (Tenn.) Medical College, 1900, aged 61, died, July 14, in Albertville, of cirrhosis of the liver

Jay Wesley Hollis, Mullins, S. C., Lincoln Memorial University Medical Department, Knoxville, 1912, aged 46, died, July 14, in Greenville, of pellagra

Alfred Harris Abernathy, Erin, Tenn., Vanderbilt University School of Medicine, Nashville, 1888, aged 72, died, September 17, of heart disease

Upton Hollifield Kelley, Waynesboro, Ga., University of Georgia Medical Department, Augusta, 1907, aged 54, died, July 10, of chronic myocarditis

George W. Wallace, Middletown, Ind., Medical College of Indiana, Indianapolis, 1895, aged 69, died, September 4, of acute dilatation of the heart

Samuel Martin Fraser, Westmount, Que., Canada, Western University Faculty of Medicine, London, Ont., 1889, aged 65, died, August 31

Lewis A. Thomason, Texarkana, Ark., Memphis (Tenn.) Hospital Medical College, 1894, aged 78, died, July 10, of heart disease.

James Edward Hanna, Ottawa, Ont., Canada, Queen's University Faculty of Medicine, Kingston, 1886, aged 74, died, August 30

Hartley Orin Baker, Los Angeles, Denver and Gross College of Medicine, 1906, aged 65, died, September 28, of heart disease

Pink Howe Howard, St. Louis, St. Louis College of Physicians and Surgeons, 1914, aged 49, died, September 7, of heart disease.

John L. Cox, Lyons, Ind., Hospital College of Medicine, Louisville, 1898, aged 74, died, August 25, of arteriosclerosis

William Marcus Lee, Fair Oaks, Calif., St. Louis University School of Medicine, 1927, aged 31, died, August 5

Joseph L. Russell, Chicago, Jenner Medical College, Chicago, 1902, aged 65, died, October 28, of carcinoma

William Cannon Kennedy, New York, Missouri Medical College, St. Louis, 1880, aged 79, died, September 13

Bureau of Investigation

NEW SCIENCE INSTITUTE

A Fraudulent Rupture Cure Debarred from the Mails

For some years one John G. Homan of Steubenville, Ohio, has been a mail-order quack. He is not a physician, a pharmacist or a chemist, yet he has put out pieces of quackery that have been sold under the implied claims that they would cure "prostate trouble" and rupture. In the prostate field Homan has operated under the name of "Electro Thermal Company," which puts out a device that is essentially a rectal dilator with a thermostat attachment that permits the device, when placed in the rectum, to have its temperature raised by the electric current. In the same field Homan has also operated under the trade name "Harmless Remedy Company" which put out, among other things, a rectal suppository containing a mixture of substances which, when a small amount of water was added to them, would generate heat.

In the "rupture cure" field he has done business under the trade name "New Science Institute," which put out a truss that was sold under the claim that it was not a truss and to which has been given such fancy names as "Magic Dot," "Suction-Cell," "New Science Retainer," etc.

In 1929 the Federal Trade Commission issued a complaint against John G. Homan, connected with his New Science Institute quackery. After an extended hearing, the Federal Trade Commission issued a Cease and Desist Order in November 1931. Under this Homan was ordered to cease exaggerating the value of his so-called system and disparaging the products or methods of treatment offered by competitors. He was ordered to cease alleging that by the use of his device, the so-called Magic Dot, every reducible rupture could be supported or cured in a considerable proportion of the cases.

Homan evaded the orders of the Federal Trade Commission, by the usual advertising method of lying by implication instead of directly. As Homan's quackeries have always been carried on through the agency of the United States mails, the Post Office Department turned its attention to him in connection with the rupture-cure fake. In November 1934 the New Science Institute and John G. Homan were called upon to show cause why a fraud order should not be issued against them. A hearing which lasted three and a half days was held in January 1935 at the conclusion of which Homan and his so-called Institute were granted three weeks in which to submit a brief. Following the submission of the brief the Hon. Karl A. Crowley, Solicitor for the Post Office Department, carefully reviewed all of the evidence in the case and summed it up in an extensive memorandum addressed to the Postmaster General. From the Solicitor's memorandum and the files of the Bureau of Investigation the following data have been obtained:

The New Science Institute was a trade name used by John G. Homan and his wife operating as partners. It was started originally as a department of Homan's prostate-cure quackery

and operations were begun under the name of New Science Institute in 1923. Homan has advertised extensively and the files of the Bureau of Investigation of the American Medical Association contain large display advertisements from the following newspapers and magazines that have appeared at one time or another during the period that the New Science Institute has operated. Among the newspapers that have carried New Science Institute advertisements were the following: *Chicago Herald and Examiner*, *Daily Times*, *Chicago Democrat* and *Chronicle*, *Rochester (N. Y.) Daily Times*, *Davenport, Iowa Illinois States Register* and *Toledo News-Bee*. Some of the magazines that sold space to this piece of quackery were *Physical Culture*, *Popular Mechanics*, *Real Detective*, *Pathfinder Psychology*, *Strength*, *Real America*, *Shrine Magazine*, *Kivuanis Magazine*, *Modern Woodman Magazine*, and *Modern Living*.

The advertisements were invariably illustrated with many of them showing women in bathing suits doing acrobatic stunts, and implying that the women were ruptured but could do these tricks because they wore Homan's device. At the hearing Homan admitted that the persons shown in such advertisements were professional models and that he had no knowledge of whether or not they were ruptured or were, in fact, using any appliance.

In common with all mail-order quacks, Homan published testimonials. He preferred the publication of such testimonials with the statement that they were "representations of the writers of them and not us." As Solicitor Crowley pointed out, although the New Science Institute attempted to escape responsibility for publishing these testimonials by stating that they were representations of the writers, the printing of them was manifestly designed to, and did actually, convey the impression that the purchasers of the Magic Dot or the Suction Retainer, or whatever name the piece of quackery happened to go by at that time, would secure the curative and other results claimed by the testimonial writers. Homan

also admitted during the hearing that he had unfavorable letters from persons who had bought his device, and when asked why he did not publish any of these, replied "That would be foolish."

While Homan declared at the hearing that his appliances were sold for "reducible" ruptures only, he admitted on questioning that they were actually furnished in cases in which the question of reducibility was undetermined and evidence was submitted to show that the device was sold in one instance to a person who described his hernia as being as large as a goose egg!

The New Science Retainer, as Homan's device was called more latterly, was a flat circular, rubber pad having about the approximate circumference of a silver dollar, it was about three-quarters of an inch thick and had a number of shallow indentations on its surface. Although Homan's advertising claimed that his appliance worked without belts the New Science Retainer actually had attached to its outer surface a catch for the express purpose of enabling it to be attached to

Beware the Small Rupture that Doesn't Bother Much



Light as a Feather Yet Holds Rupture!

An Ohio Salesman is now helping Nature rescue thousands of rupture victims. No more surgery. No more embarrassing contractions of ancient times. No more appliances worn without embarrassing bulk, without leg straps or springs or laces or leathers. You will be astonished. He may show, his revolutionary medicine will overcome. His test after actually includes an free appliance sent to you absolutely FREE. Mail coupon today for the most astounding rupture information you ever read. It is Free and will come in plain cover.

PERSONAL GUARANTEE
Suction-Cell Retainer must give the results that you require or you may return it. If your rupture is not actually held, promptly reduced in size during the first trial we offer you a full refund. If you do not need it back and demand the return of your money we agree. If 10 days trial are not enough, write us and we will extend the trial to 30 days or even longer.

NEW SCIENCE INSTITUTE
2000 New South Bldg.
Birmingham, Ala.

Now rupture victims can abandon the painful and discomfort of your truss. Science has at last developed a comfortable appliance of tremendous support for every rupture sufferer. This device is called "Suction-Cell Retainer." It has been developed and perfected as a result of having made many close studies rupture appliances. With it comes an extraordinary natural help.

in bulk and weight that even most rupture victims who have not known they were ruptured.

Reasonable in price. And you don't need to wait forever for results!

Get Free Offer
Send no money. Just mail coupon and you will receive our famous best selling rupture, together with our attractive bonus-size offer of special FREE appliance, all in plain packet. I will open your eyes.

Reproduction (greatly reduced) of a full page advertisement that appeared in *Kivuanis Magazine* September 1932

a belt to which Homan gave the name "Duogirdle." In spite of this, Homan represented, iterated and reiterated throughout his advertising that belts and leg straps were unnecessary in connection with the utilization of his so-called system.

Much was made by Homan in his advertising of what he called "Seaver Essentials," which was said to be the adoption of a method of treatment by which Dr. J. W. Seaver of "a great Eastern University" was alleged to have cured seven out of ten persons of rupture. These so-called Seaver Essentials were furnished by Homan in a booklet entitled "How to Aid Nature in Rupture—Quickly." They consisted merely of descriptions of a number of movements of the arms, legs and torso, including instructions for the massage of the area surrounding the rupture, and advice for the relief of constipation. It appeared that Homan appropriated the so-called Seaver Method from an old textbook. There was a Dr. J. W. Seaver who forty years ago was associate director of Yale University gymnasium, he died twenty years ago. A physician who had been associated with Dr. Seaver during his connection with the gymnasium furnished the Post Office Department with some facts in the matter. It appears that Dr. Seaver carried on some emergency medical oversight in a few students, among whom some few cases of rupture were noted, and, not being satisfied with the available trusses, the doctor devised a rubber attachment of his own and, in collaboration with his associates, also arranged a series of safe exercises. Dr. Seaver's associate stated that the doctor never cured seven out of ten cases of rupture, as Homan had claimed, and that it was doubtful if he had, in fact, ever cured a single case. It was further shown that the brochure written by Dr. Seaver was hopelessly outdated, a view that was substantiated by medical expert testimony adduced by the government at the hearing.

It was brought out at the hearing, also, that no physicians were employed by the New Science Institute, and even a so-called truss fitter that was employed by the New Science Institute admitted during the course of testimony that he was quite unable to answer questions of a medical nature with respect to rupture. Homan's own attorney also had to concede that a number of answers given by Homan himself to similar questions were erroneous.

Aside from the quackery involved in the sale of Homan's device, there was also commercial trickery. The Solicitor for the Post Office Department stated that it was proved that it was the established practice of the New Science Institute to send the so-called free Activator Model and leg strap in a separate package so sealed as to prevent a trial or even a complete examination. Then there was printed on the outside of the wrapper a warning to the effect that the contents could not be returned if the seal was broken, but there was a careful avoidance of any statement that such breaking of the seal would result in the loss of the right of refund. It was shown in a number of cases that many persons who had purchased the so-called System and found both the sealed and unsealed portion thereof unsatisfactory were denied the return of their money on the ground that they had broken their "contract." In fact, Homan admitted at the hearing that his concern endeavored to escape making refunds whenever possible, and he also admitted that it was probably true that the statements in his literature were calculated to induce patrons to open the sealed packages. It was brought out, further, at the hearing that Homan had a "stool-pigeon" described in the quack literature as "Herbert Ayers, Box 402, Wheeling, W. Va." Homan when questioned, could not say who Herbert Ayers was. The postmaster at Wheeling, W. Va., however, reported that Box 402 was rented by one Carl Schumann, who was an employee of the New Science Institute.

The government had no difficulty in showing that the claim that the Homan device would cure rupture was false and fraudulent. Mr. Crowley closes his memorandum to the Postmaster General with the statement that he recommended that a fraud order be issued against the New Science Institute and its officers and agents as such. The Postmaster General notified the postmaster at Steubenville, Ohio, to return all letters and other mail matter that came addressed to the New Science Institute to the senders with the word "Fraudulent" plainly written or stamped on the outside of such letters. The order went into effect April 25, 1935.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

STITCH ABSCESS—FOOD PRESERVATIVES— AUTOGENOUS VACCINE

To the Editor—Would you kindly give 1 The correct treatment of a stitch abscess according to various stages 2 Names and dosages of several food preservatives 3 Practical method of preparing an autogenous vaccine from a pustule and a pathologic urine. Please omit name. M.D., Michigan.

ANSWER.—1 A stitch abscess is one arising round or limited to the region of a suture. The term is used in most hospitals improperly to cover any infection of a wound. In the early stages there may be some redness round the approximating stitches of a wound. If examined microscopically, a small abscess probably could be demonstrated round the stitch. Most of these stitch infections terminate with little gross suppuration, and healing is prompt after removal of the stitches. As soon as redness is noted round skin sutures, warm moist compresses of boric solution should be applied. Usually the stitches that are most involved, especially if interrupted in type, should be removed. If the infection has progressed to the stage of gross abscess about the sutures, the same treatment will usually be satisfactory, as the pus usually drains out through suture holes. In other instances the infection has spread from the stitches to the edges of the wound with the development of free pus between them. The skin may look perfectly healed on the surface, with little redness, or there may be considerable inflammation with induration about the wound. Warm boric compresses should be applied if there is considerable induration without free pus. When free pus can be demonstrated or is suspected the edges of the skin should be separated by a sterile probe and if pus is present it may be drained by the removal of a few stitches. If there tends to be a pocket, a small rubber drain may be inserted or the superficial tissues opened widely. In the presence of any infection of a wound there is usually delayed healing of all the tissues with great danger of separation of the wound because of early digestion of the catgut sutures. Wide tension sutures should always be used and adhesive straps applied to bridge the wound on the removal of any sutures to prevent hernia or excoriation.

2 The bureau of chemistry of the U. S. Department of Agriculture determines the use of any substance used as a food preservative. Inquiry and access to bulletins should give further information than can be given here. Probably the most important preservative is sodium benzoate. Under President Theodore Roosevelt a board of consulting experts from three universities studied the effects of sodium benzoate on man under careful experimental conditions. They all concluded essentially that sodium benzoate in small doses (under 0.5 Gm. daily) mixed with food was without deleterious or poisonous action and is not injurious to health, sodium benzoate in large doses (up to 4 Gm. daily) was found not to be injurious to health, and the admixture of sodium benzoate with food in small or large doses was found not to affect injuriously or impair the quality or nutritive value of such food. The secretary of agriculture ruled that sodium benzoate was permissible for use as a preservative of food if so stated on the label. Manufacturers of food products which in their view require the use of a preservative are in general content with 0.1 per cent of sodium benzoate. In eating such a preserved food the consumer would need to take 300 Gm. daily, or nearly two thirds of a pound, to ingest an amount of sodium benzoate equal to the minimal dose of 0.3 Gm. daily used in the experiments on man. The large doses given to human subjects ranged from 0.6 Gm. to 4 Gm. daily over one month and even larger doses were given. The chief objection to the use of chemical preservatives is that their addition makes it easier to use inferior or partially spoiled raw materials and it prevents the natural fermentation and spoilage following insatisfactory conditions of handling food. The use of sulphur dioxide, copper sulphate, alum, gluside, borax or borates has been referred to the board, whose further reports were not available.

3 In the preparation of autogenous vaccine, the bacteria must be obtained without contamination. The surface of a pustule may be seared with a hot instrument or cleaned with an antiseptic solution that evaporates quickly, such as alcohol. The pustule is lanced or a sterile needle inserted and the pus obtained for growth. A specimen of urine must be obtained by catheterization after surgical cleansing of the field, by means of sterile instruments. Suitable mediums are inoculated and after growth

the bacteria are washed off in salt solution. They may be standardized by means of the Hopkins calibrated vaccine centrifuge tube. After centrifugation the salt solution is largely removed and the bacteria are suspended in 1 1000 merthiolate solution. They are placed in an incubator from four to six days and then tested for sterility. They are diluted as desired, usually from 100 million to 1 billion to a cubic centimeter for clinical use. An older method was to wash off the bacteria in salt solution and kill by heating to 57 C for half an hour. Bacteria may be counted directly with a hemocytometer, with the use of a dilute aniline dye such as an alcoholic solution of methylene blue. The bacterial suspension may be mixed with blood corpuscles and, after counting, their number may be estimated by determining the ratio between them. After standardization, they may be preserved in salt solution to which 0.5 per cent of phenol (carbolic acid) is added.

PANCREATIC EXTRACT IN CLAUDICATION

To the Editor—In Queries and Minor Notes in THE JOURNAL March 23 you mention a pancreatic extract insulin free used in claudication. I have been unable to get any information from New York dealers in reference to this product. Can you tell me where it may be obtained?

EDWARD S. NEWELL, M.D., Pelham Manor, N.Y.

ANSWER.—Various tissue and urine extracts have been used in intermittent claudication. Intramuscular administration has been effective in some cases with the active extracts. Two pancreatic extracts are now available. The extract isolated by Frey and Kraut from urine was first called kallikrein, later padutin. A preparation called padutin is now made from pancreas and can be obtained from the Winthrop Chemical Company, New York. Pancreatic Tissue Extract No. 568, produced by Sharp and Dohme, Baltimore, has been used effectively in some cases. More recently an active principle has been found in other tissues. Several skeletal muscle extracts have been reported to be useful, namely, Myoston and MAP (muscle adenosin phosphoric acid) prepared by Dr. Henning of Berlin. A tissue extract said to be equally effective is Heart Muscle Extract, prepared by Eli Lilly Company in Indianapolis. These extracts are entirely in an experimental stage. They have not been accepted by the Council on Pharmacy and Chemistry of the American Medical Association. Controlled clinical trials have indicated that the active principle or principles of these extracts affects the pain of contracting muscle in the presence of a diminished blood supply. It is not certain that the active principle is the same in all cases and it appears that the principle or principles of these preparations may not properly be considered hormones.

THE POLARITY OF CHEST LEADS

To the Editor—Probably many physicians have wondered why electrocardiograms made by chest leads appear to be upside down. P, R and T of normal records all inverted and S alone upright. The answer is that some one started making them that way and others have followed the lead. If the first news reel showing Chinese scenes had been exhibited upside down because the producer thought that would insure recognition of the part of the earth portrayed it is not unlikely that all subsequent films from the antipodes would by force of cinema convention necessarily be shown in the same confusing fashion. For myself I prefer to see a normal P, R or T wave made by any derivation erect and healthy looking. Made by the inverse polarity they look sick. In spite of some criticism on the score of unconventionality I have insisted in my own hospital service on the use of the normal polarity. Until recently however it had not seemed to me a very serious matter for physicians as well as dentists can interpret a mirror image. But now I observe it is becoming customary to call the initial downward ventricular deflection a Q wave. This is serious confusion for the large downward deflection is unquestionably an R wave upside down, the true Q wave is usually entirely lacking. But if present what shall it be called? Since chest leads have been in use for only a relatively short time the pattern of these deflections has not yet become stereotyped in the medical mind as is the case with the standard leads. It is therefore not too late to reform. The obliging quartz fiber will deflect as willingly the other way if one will only interchange the lead wires.

FREDERICK H. HOWARD, M.D., New York

ANSWER.—Many have had the same reaction as that expressed in this communication to the introduction of the inverted complexes P, QRS and T waves in the precordial lead commonly called lead 4 in normal individuals. Doubtless some have been on the verge of initiating a campaign similar to that suggested here to reverse the lead points so that the chest lead will be normally composed of upright P, QRS and T waves, but later reflection has made it seem desirable to retain the precordial lead or lead 4 as proposed by several of those originally urging its routine adoption. The chief reason for this change of view being that, as commonly taken now, lead 4 is easily distinguished from the other leads, and since it is a newly introduced

lead it is well to have it readily distinguished from the other three. Practice makes one quite familiar with the inverted complexes and after the original irritation produced by seeing the upside down waves has passed one becomes content even with the appearance of the curve. Furthermore, so much has already been written during the last year or two about lead 4 as ordinarily taken that it would create a considerable bother and confusion to make the change.

However the criticism with reference to the nomenclature of the QRS wave is pertinent. As stated the Q is really not a Q but an inverted R, and the R is not an R wave but an upright S. The same criticism holds for the nomenclature of the QRS waves in the ordinary leads, and this was emphasized in a recent paper by Sylvester McGinn and P. D. White (The Duration of the QRS Complex in the Normal and in the Abnormal Electrocardiogram, *Am Heart J* 9:642 [June] 1934). McGinn and White have suggested a way out of the difficulty in their note on nomenclature at the end of the paper. They have advised that a more satisfactory method of describing the QRS complex would be to state positive and negative deflections by appropriate signs with amplitudes expressed in millimeters, thus QRS might equal $-2 +12, -5$, without Q, R and S being specified separately. The same procedure could easily be applied to lead 4.

RUGGLES' CREAM

To the Editor—Can you find for me in some of the formularies available in your office the composition of so-called Ruggles' Cream a mixture used on the hands?

M.D. Chicago

ANSWER.—The A. M. A. Chemical Laboratory inquired of Melvin & Badger Company, the manufacturers of this cream, whether or not the product was secret in composition, and if not, what was the quantitative statement of ingredients. The firm replied:

The Melvin & Badger Company Ruggles' Cream Formulae was originated by this company for Dr. Ruggles of Rochester, New York and Dr. Charles J. White of Boston and we do not feel disposed to furnish the composition to anyone.

Inquiry was then made of Dr. E. Wood Ruggles, who has kindly supplied the following information:

In reply to your communication to me regarding the Ruggles' Cream I wish to state most emphatically that I have never received one penny of compensation from any firm engaged in making it. I presume the Melvin & Badger Company prefer to keep the working formula to themselves as they sell a great deal of the cream which they explain by saying that no other drug firm has been able to manufacture the cream as it should be done. Or perhaps they thought no one should have the formula without obtaining it directly from me.

I published the working formula in the *Archives of Dermatology and Syphilology* some years ago and firms in various cities make a very fair cream. Most of them will not take pains to have the three component parts at exactly the same temperature when mixing them. I take pleasure in enclosing the formula used by the Company in this city and shall be glad to have you send it to any inquiring physicians or pharmacists always warning them that it is extremely difficult to manufacture properly.

"I think I should add that it would be well to write any one inquiring about the formula that they should only have it manufactured by an especially fine pharmacist and one who takes pride in his work. Other wise it will be a failure."

The formula supplied by Dr. Ruggles is as follows:

| | Gm or Cc |
|-----------------------|----------|
| Powdered stearic acid | 75 |
| Potassium carbonate | 15 |
| Distilled water | 320 |
| Powdered borax | 5 |
| Quince jelly | 75 |
| Distilled water | 100 |
| Powdered zinc oxide | 10 |
| Glycerite starch | 400 |

Melt the stearic acid. At the same time dissolve the potassium carbonate in 320 cc of distilled water and heat to about 170 F on water bath. Bring stearic acid to the same temperature and mix them. Continue this temperature on the water bath with occasional stirring until the reaction is perfectly complete.

Dissolve the powdered borax in 100 cc of distilled water, add the quince jelly and heat on water bath to about 170 F. Add this mixture to the first which should be at the same temperature and again leave on water bath until reaction is complete.

Heat the glycerite of starch to the same temperature, stir in the powdered zinc oxide with a glass stirring rod and add to the other mixture, stirring occasionally.

Let cool and add perfume (Oil Ylang Ylang recommended).

The most important essential is to employ a perfect glycerite of starch. Use Kingford's or other suitable grade of corn starch and U. S. P. Glycerin and make it up fresh for each batch.

Also essential is to have all three batches at exactly the same temperature when mixing them.

POSSIBLE LEAD POISONING

To the Editor—May I take the liberty of asking your opinion concerning a case of suspected lead poisoning which recently came under my care. Briefly, the case is as follows: A man, aged 32, a Mexican, employed for ten years as a sprayer (using black paint said to contain no lead) and for the past two and one-half years as an enameler (enamel containing frit—ground glass—in which is found a certain amount of lead—about 27 per cent according to report), enjoyed good health and had never been ill or had an acute infection of any kind and his family and marital histories were negative. During the past two years he had complained of occasional headache, usually frontal and in the last two weeks of his employment these headaches became so severe that he was obliged to quit work. In addition he complained of vertigo, blurring of vision, weakness, anorexia and vomiting, loss of weight and a recent nocturia. There was no history or stigmas of syphilis, and the Wassermann reaction was negative. On examination he was found to be in a state of fairly good nourishment but appeared pale (noticeable even with the dark skin). He was found to present most of the elements of a chronic nephritis with hypertension and evidence of albuminuric retinopathy, the picture of a so-called malignant hypertension, and within ten weeks the patient died after presenting for a week the picture of uremic poisoning. The blood pressure on first examination was 206 systolic, 150 diastolic. The urine always contained much albumin and some casts hyaline and granular, with occasionally a few red blood cells. The specific gravity was usually about 1.010. The first quantitative lead determination on the urine (taken about three weeks after the last day of exposure to this metal while at work) showed an excretion of 0.17 mg to 1.500 cc, or about 0.12 mg per liter. After three days on a "deleading" regimen, urine was again collected for twenty-four hours and showed an excretion of 0.202 mg per liter or nearly double the former reading. After an interim of about six weeks on a regular diet (in which calcium had not been restricted) the excretion was a little more than 0.12 mg per liter and this was the last such test made. No test was made of the lead content of the feces or blood serum. The patient presented practically none of the so-called classic symptoms of chronic plumbism. There was at first no anemia, although all subsequent blood counts disclosed a moderate anemia and at no time was there stippling observed. A reticulocyte count was not made. There was no lead line in the gums, but neither was there any pyorrhea or carious teeth clinically or roentgenographically. There were at no time symptoms of colic or of marked constipation, and no palsies were noted. The deep reflexes were increased however and toward the close there were muscular twitchings and protracted hiccuping. Vomiting was quite a prominent symptom throughout and headache chiefly frontal and suboccipital was almost constant and frequently severe. There was complaint of some muscle pain in the extremities but no evidence of muscular weakness or palsy. He had no convulsions and was never in deep coma although he was semicomatose during the last two days. I trust that I have not omitted anything of great importance in this brief history of the case.

The question that arises specifically in my mind and concerning which your opinion would be greatly appreciated is this: In the absence of a history of any acute infection in the absence of any demonstrable foci of infection in teeth, tonsils, sinuses or prostate, in the absence of a familial history of hypertensive disease with a history of contact with lead over a period of several years with an onset of ill health dating back only two years but not disabling until a month or two preceding his gradual demise and with the rather meager observations suggesting chronic plumbism,

1. Could this be a case of chronic plumbism?
2. Is it likely that it was chronic plumbism?
3. Is it feasible that a so-called normal person not in intimate contact with lead could
 - (a) Show the amount of lead excretion found in this case (0.12 plus mg per liter of urine)?
 - (b) Show an increase such as this (0.202 mg per liter) after a few days on a deleading regimen? (Note: In addition to the restricted calcium diet the patient was given phosphoric acid by mouth but vomited after nearly each dose so ammonium chloride was substituted, and viosterol was also given orally.)
4. Have you knowledge of patients who have died of chronic plumbism who have shown no greater amounts of lead excretion in the urine than this case did?

I shall truly be grateful to you for an expression of your opinion in this matter.

P. K. EDMUNDS, MD, Los Angeles

ANSWER—The question that this communication propounds is essentially as follows: Can a small exposure to lead account for a malignant hypertension and prompt death from kidney insufficiency? That lead causes nephritis is often suggested in the literature, but the evidence for this is not satisfactory. There are two investigations that are suggestive. Workers with Blair Bell noted a small quantity of albumin and casts after the injection of lead intravenously. This was given for the treatment of cancer. This was an evidence of small kidney damage in spite of flooding the organism with lead. Dr. L. J. Nye published an article (*M. J. Australia* 2:145 [Aug. 3] 1929) which showed that children who had had lead poisoning had a high incidence of chronic nephritis.

The patient described in the query had an excretion of lead slightly greater than so-called normal. This indicated that he had absorbed a little more lead than the normal individual, but without evidence in the blood or other signs it would be difficult to make the diagnosis of lead poisoning. One may well make the diagnosis of lead absorption, but to link the

severe renal damage to chronic plumbism would hardly seem justifiable. There is no record of a patient dying of chronic plumbism who did not show greater amounts of lead excretion than this patient showed.

PAIN IN SHIN BONES AND CIRCULATORY DISTURBANCE IN LEGS

To the Editor—Could you suggest a diagnosis or further studies to be carried out on the following case in order to establish a diagnosis? A woman aged 70 complains of pain in the shin bones. The trouble started about five years ago and was at first intermittent but has now progressed to the point where the pain is constant and at times very severe. It is characterized as a dull ache in both tibiae, extending from the ankles to the knees. The pain is not related in any way to exercise or physical activity. The feet and toes are cold. The greatest relief is obtained by putting the legs in hot water. Physical examination is negative. The sinus teeth and mouth are normal. The heart is normal, and the blood pressure is 154 systolic, 74 diastolic. The lungs are clear, the abdomen is normal and the liver and spleen are not enlarged. The reflexes are equal and hyperactive. There is a normal plantar reflex and a good pulse in both dorsalis pedis and posterior tibial arteries. There is moderate sclerosis of the brachial arteries. The plantar arches are normal. Roentgenograms of the legs are negative and the arteries cannot be seen. The Wassermann reaction is negative. Examination of the blood reveals hemoglobin 102 per cent (Sahl), red blood cells 4,450,000, differential 52 per cent polymorphonuclear leukocytes, 33 per cent lymphocytes, 2 per cent eosinophils, 3 per cent basophils, 4 per cent transitional. Examination of the urine is negative, basal metabolism is -8 per cent. The patient has a stable nervous system and the trouble is not imaginary. Any suggestions as to diagnosis or treatment will be appreciated. Please omit name. M.D., New York.

ANSWER—The diagnosis in this case is difficult. The coldness of the feet would suggest a circulatory disturbance, but the fact that the arteries in the feet pulsate freely would probably rule out Buerger's disease (thrombo-angiitis obliterans). The pain in the tibiae would suggest a beginning Paget's osteitis deformans, but the roentgen evidence seems to be lacking. Osteosclerosis (Albers-Schoenberg), or its opposite, acute bone atrophy, can usually be determined by roentgen examination.

The state of circulation in the feet should be determined by the rate of heat loss, the surface temperature, and the tests for capillary sufficiency. The sclerosis of the brachial arteries suggests a similar change in the arteries of the leg.

Thick woolen stockings should be worn, and diathermy should be used on both legs. Large quantities of water should be drunk daily, and a low protein diet should be enforced.

RENAL GLYCOSURIA

To the Editor—A white woman aged 48 came to me complaining of a loss of 10 pounds (4.5 kg.) during the three months preceding her visit, nervousness, fatigue and irritability. There was a history of occasional episodes of spastic colitis over a five year period, the last attack occurring in March 1935. Physical examination including fluoroscopy and proctoscopy was negative. The red blood cell count and hemoglobin were within normal limits. The Wassermann test was negative. The basal metabolic rate was plus four. The only positive finding was a two plus urinary sugar. The fasting blood sugar was 104 mg per hundred cubic centimeters of blood. A sugar tolerance test was done and found to be normal. The patient has been on a diet of 150 Gm. of carbohydrate and 80 Gm. of fat for the past two weeks and has continued to spill from one plus to two plus sugar in specimens taken two hours after meals. The urinary sugar is dextrose. Will you kindly advise me on the following: 1. Am I correct in calling this a case of renal glycosuria? 2. What is the dietetic management of renal glycosuria? 3. What other conditions might be considered in a differential diagnosis? 4. What is the prognosis as regards the appearance of diabetes mellitus in a patient with renal glycosuria? Kindly omit name and address.

M.D. New Jersey

ANSWER—1. If the blood sugar determinations made in the sugar tolerance test were reliable, this case is probably one of renal glycosuria.

2. Patients with true renal glycosuria are usually not benefited by dietary restrictions. They require no treatment.

3. Other possibilities are that the reducing substance in the urine is something other than dextrose. Fructosuria, pentosuria, galactosuria, glycuronic acid and homogentisic acid should be considered. The identification of dextrose depends on a positive fermentation test and dextrorotation in the polaroscope. The methods for identifying other reducing substances in the urine can be found in the manuals of clinical diagnosis.

4. The experience of Powelson and Wilder (Powelson, H. C., and Wilder, R. M. Innocent Glycosuria, *THE JOURNAL*, May 9, 1931, p. 1562) with eighty-two cases of renal glycosuria followed for a long period did not indicate any instance of the development of true diabetes mellitus. The prognosis in renal glycosuria is apparently entirely benign.

MAMMARY TUMOR IN MALE

To the Editor—A married man, aged 33 weighing 170 pounds (77.1 Kg.), consulted me about pain in the right breast. He states that he first noted this about two years ago when he had gained about 30 pounds (13.6 Kg.), and since then when somebody accidentally touches him, or if he brushes against something, he notices the pain. Otherwise the pain is not noticeable. The past history is essentially negative. He states that his breasts were always larger than other boys and this was called to his attention on numerous occasions. Both parents are living and well. He has two sisters and a brother apparently healthy. A thorough physical examination including urinalysis and blood examination was negative with the exception of the right breast which revealed a well padded male mamma slightly larger than the left. It is freely movable with no retraction of the nipple and no enlargement of the axillary nodes. Pressure on the nipple causes a pain, but not elsewhere. There is palpable beneath the nipple in the substance of the breast a firm circular area of induration however a similar but smaller induration nonpainful, can be palpated in the left breast. Local anodyne applications are of no avail. He is getting worried for fear the pain is due to a malignant condition. Your suggestions as to the probable cause and treatment would be greatly appreciated. Kindly omit name.

M D Illinois

ANSWER.—The first thing is to ascertain whether there is not a tumor of the testicle. Teratoma in this region may cause enlargement of the breast. If not, an exploratory operation should be done, for while it is probable that only a fibroadenoma is present—the youth of the patient being strongly in favor of a benign hyperplasia—the mortality from carcinoma of the male breast is so high that no mammary tumor which persists more than a few weeks should remain without investigation.

RENAL COLIC AND INFECTION

To the Editor—A white man aged 30 had an attack of renal colic in August 1933. He passed several stones subsequently after which cystoscopy was done. At this time the pelvis were not dilated and kidney function was excellent. The renal function and general health remained excellent until April 1935 at which time the patient suffered a single attack of colic. At this time a flat plate revealed two stones in the course of the right ureter. To date the patient has been comfortable and has passed no stone. What is the advisability and advantage of having cystoscopy done again in this case? Please omit name and address.

M D New Jersey

ANSWER.—In view of the fact that this patient has no symptoms, a policy of watchful waiting is justified as long as the urine remains free from infection.

If, however, the patient again has an attack of renal colic, the urine shows infection, and a repeated roentgen examination shows no movement of the stones, or if the pyelograms show dilatation with perhaps suspension of function in the kidney, it is advisable to pass the cystoscope again, dilate the ureter with bougies and inject sterile oil into the ureter to aid in moving the stones down the ureter.

TRAUMA AND EPIDIDYMITIS

To the Editor—In Queries and Minor Notes in THE JOURNAL, May 4, page 1659 I note your answer to the questioner from Pennsylvania. Trauma may be an exciting cause of an acute attack of nongonorrheal epididymitis in a person who gives no history of a gonorrheal infection. Would it not be well to state this answer so as to rule out strain? I can conceive of a direct trauma being able to cause a localization or recrudescence of a latent disease but so frequently "lifting" is given as a traumatic etiology that I think it well to be specific. See article by Miley B. Wesson in THE JOURNAL Dec 15 1928 page 1857.

C F N SCHRAM M D Kingsport Tenn

ANSWER.—The question of strain, such as straining at stool or heavy lifting, does play a part as an exciting cause in acute epididymitis, whether gonorrheal or nongonorrheal. This was included in the term 'trauma'.

BURNING PAIN AND BLOOD CIRCULATION IN MOUTH

To the Editor—Can you tell me the cause and remedy for burning in the mouth and throat which is relieved by removing false teeth? Both of my patients with this condition are rather nervous types. One has even had a gold plate made but to no effect. The reaction of the saliva to litmus is alkaline. Urine examinations are negative. No blood work has been done. The sets of teeth of the two patients were made by different dentists. Both sets apparently fit well and one patient has had three sets. Please omit name and address.

M D Pennsylvania

ANSWER.—Almost without exception this burning is caused by an impaired blood supply, due to the pressure of the dentures over the anterior and posterior palatine foramina. Relief should be made in the impressions before the dentures are made. It might be possible to relieve these areas on the dentures that the patients are now wearing, but ordinarily it is difficult to make sufficient relief to eliminate the burning.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY. Written examination for Group B applicants will be held in various cities throughout the country March 14. Oral examination for Group A and B applicants will be held in Kansas City, Mo. May 11-12. Applications for written examination should be filed with the secretary before Jan 15. Sec. Dr. C. Guy Lane, 416 Marlboro St. Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY. Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada Dec 7. Sec., Dr. Paul Titus, 1015 Highland Bldg. Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY. St. Louis Nov 18. Asst. Sec. Dr. Thomas D. Allen, 122 S. Michigan Ave. Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY. St. Louis Jan. Sec. Dr. Fremont A. Chandler, 180 N. Michigan Ave. Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY. Kansas City Mo., May 9. Sec. Dr. W. P. Wherry, 1500 Medical Arts Bldg. Omaha.

AMERICAN BOARD OF PEDIATRICS. St. Louis Nov 20. Sec. Dr. C. A. Aldrich, 723 Elm St. Winnetka Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY. New York Dec 30. Sec. Dr. Walter Freeman, 1726 Eye St. N. W. Washington D. C.

AMERICAN BOARD OF RADIOLOGY. Detroit Dec 12. Sec. Dr. Byrl R. Kirklin, Mayo Clinic Rochester Minn.

ARIZONA Basic Science. Tucson, Dec 17. Sec. Dr. Robert L. Nugent, Science Hall University of Arizona Tucson.

CALIFORNIA Reciprocity. Los Angeles Dec 4. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg. Sacramento.

CONNECTICUT Endorsement. Hartford, Nov 26. Sec., Dr. Thomas P. Murdock, 147 W. Main St. Meriden.

KANSAS Topexa Dec 10-11. Sec. Board of Medical Registration and Examination Dr. C. H. Ewing, 609 Broadway Larned.

KENTUCKY Louisville, Dec 3. Sec. Department of Health, Dr. A. T. McCormack, 532 W. Main St. Louisville.

MARYLAND Medical (Regular). Baltimore, Dec 10-13. Sec. Dr. John T. O'Mara, 1211 Cathedral St. Baltimore. Medical (Homeopathic). Baltimore Dec 10-11. Sec. Dr. John A. Evans, 612 W. 40th St. Baltimore.

NEBRASKA Lincoln Nov 19-20. Dir. Bureau of Examining Boards Mrs. Clark Perkins, State House Lincoln.

NORTH CAROLINA Endorsement. Raleigh Dec 9. Sec., Dr. Ben J. Lawrence, 503 Professional Bldg. Raleigh.

OHIO Columbus Dec. 3-5. Sec. State Medical Board Dr. H. M. Platter, 21 W. Broad St. Columbus.

OKLAHOMA Oklahoma City Dec 11. Sec. Dr. James D. Osborn Jr. Frederick.

TEXAS Houston Nov 18-20. Sec. Dr. T. J. Crowe, 918 Mercantile Building Dallas.

VIRGINIA Richmond Dec 11-13. Sec., Dr. J. W. Preston, 28 1/2 Franklin Rd. Roanoke.

WISCONSIN Basic Science. Milwaukee, Dec 21. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave. Milwaukee.

California July Examination at San Francisco

Dr. Charles B. Pinkham, secretary, Board of Medical Examiners, reports the written examination held at San Francisco, July 9-11, 1935. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. One hundred and twenty-eight candidates were examined, 125 of whom passed and 3 failed. The following schools were represented:

| School | PASSED | Year Grad (1935) | Per Cent |
|--|--|------------------|----------|
| College of Medical Evangelists | 826 829 831 848, 849 891 | (1935) | 81.8 |
| Stanford University School of Medicine | (1935) 779 809 822 823 827 828 83 831, 837 | (1934) | 81.3 |
| | 84 848 848 85, 853 856 856 857 858 | | |
| | 862 864 864 868 871, 873 881 882 886 889, | | |
| | 917 921 923 | | |
| University of California Medical School | 846 85 85 853, 856, 857 857 859 861 862 | (1935) | 80.9 |
| | 864 866 87 872 872 872 877 877 878 879 | | |
| | 88 881 882 887 888 889 894 894 894 898 | | |
| | 901 902 903 906 906, 908 908 914 919 933 | | |
| University of Southern California School of Medicine | 823 828 85 | (1935) | 81.2 |
| Yale University School of Medicine | | (1933) | 85.8 |
| George Washington University School of Medicine | (1934) 802 832 | (1933) | 79 |
| Loyola University School of Medicine | (1934) 841 863 (1935) 844 862 | (1935) | 78.8 |
| Northwestern University Medical School | | (1931) | 87.4 |
| Rush Medical College | | (1935) | 87.4 |
| University of Illinois College of Medicine | | (1935) | 86.7 |
| Indiana University School of Medicine | | (1934) | 84.6 |
| State University of Iowa College of Medicine | | (1933) | 82.6 |
| Tulane University of Louisiana School of Medicine | | (1934) | 86.1 |
| Johns Hopkins University School of Medicine | | (1929) | 88.4 |
| University of Maryland School of Medicine and College of Physicians and Surgeons | | (1934) 787 874 | |
| Harvard University Medical School | | (1933) | 80.4 |
| University of Minnesota Medical School | | (1935) 831 857 | |
| St. Louis University School of Medicine | | (1934) | 85.9 |
| Washington University School of Medicine | | (1935) 791 857 | |
| Creighton University School of Medicine | 846 (1935) 784 867 | (1934) | 83.2 |
| University of Oregon Medical School | | (1934) 818 854 | |
| Jefferson Medical College of Philadelphia | (1933) 826 | (1934) | 87.4 |
| Baylor University College of Medicine | | (1935) | 80.6 |
| University of Wisconsin Medical School | | (1933) | 81.7 |

| | | | |
|--|--------|------|-------------|
| Queen's University Faculty of Medicine | (1922) | 85 | 9 |
| McGill University Faculty of Medicine | (1934) | 85 | 1 |
| Hamburgische Universität Medizinische Fakultät Ham burg | (1924) | 80 | 3 |
| Universität Heidelberg Medizinische Fakultät | (1933) | 79 | 3 |
| Universität Leipzig Medizinische Fakultät | (1926) | 83 | 3 |
| University of Tomsk Faculty of Medicine Russia | (1913) | 83 | 7 |
| School | FAILED | Year | Per Cent |
| University of California Medical Department | (1904) | 56 | 4 |
| Northwestern University Medical School | (1935) | 73 | 2 |
| Universidad Central de España Facultad de Medicina Madrid | (1928) | 63 | |

* Verification of graduation in process

* Verification of graduation in process

California July Examination at Los Angeles

Dr Charles B Pinkham, secretary Board of Medical Examiners, reports the written examination held at Los Angeles, July 23-25, 1935. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. One hundred and six applicants were examined, 97 of whom passed and 9 failed. The following schools were represented:

| School | PASSED | Year | Per |
|---|---------------|-------------|------|
| College of Medical Evangelists | | Grad | Cent |
| (1935) 75 3 76 7 77 8 78 2 78 4 79 1 79 3 81 1 | | (1934) 77 1 | 84 6 |
| 82 1 82 2 83 1 83 1 83 3 83 6 84 1 84 6 84 7 84 8 | | | |
| 85 3 85 3 85 7 86 2 86 7 86 9 87 8 87 7 | | | |
| Stanford University School of Medicine | (1935) | 78 3 | |
| 78 7 82 2 82 4 87 4 | | | |
| University of California Medical School | (1935) | 87 88 7 | |
| University of Southern California School of Medicine | (1935) | 75 8, | |
| 78 1 78 1 79 4 79 8 80 6 80 7 81 8 81 8 81 8 82 1 | | | |
| 83 4 83 8 84 2 84 3 84 7 84 9 85 85 86 9 89 1 | | | |
| 89 8 | | | |
| University of Colorado School of Medicine | (1911) | 75 8 | |
| Loyola University School of Medicine | (1935) | 77 | |
| Northwestern University Medical School | (1929) 76, | (1935) | 85 3 |
| Rush Medical College | (1934) | 75 9 | |
| 78 4 (1935) 76 7 82 2 83 9 86 8 6 1 | | | |
| School of Medicine of the Division of the Biological | | | |
| Sciences | (1915) | 81 9 | |
| University of Illinois College of Medicine | (1927) | 82 4, | |
| (1935) 79 80 9 82 * 82 3 83 84 85 1 86 2 87 1 | | | |
| Indiana University School of Medicine | (1934) | 80 6 | |
| State University of Iowa College of Medicine | (1931) | 80 6 | |
| University of Louisville School of Medicine | (1934) | 82 3 | |
| University of Maryland School of Medicine and College | | | |
| of Physicians and Surgeons | (1933) | 79 3 | |
| Wayne University College of Medicine | (1935) | 85 4 | |
| Creighton University School of Medicine | (1934) 78 2 | 84 3 | |
| University of Nebraska College of Medicine | (1933) | 78 3 | |
| University of Oklahoma School of Medicine | (1934) | 81 8 | |
| University of Pennsylvania School of Medicine | (1934) | 82 4 | |
| Woman's Medical College of Pennsylvania | (1934) | 81 4 | |
| McGill University Faculty of Medicine | (1934) 82 7 | (1935) | 80 2 |
| Friedrich Wilhelms Universität Medizinische Fakultät | | | |
| Berlin | (1929) 75 2 † | 83 3 † | |
| Schlesische-Friedrich Wilhelms Universität Medizinische | | | |
| Fakultät Breslau | (1925) | 79 6 † | |
| School | FAILED | Year | Per |
| College of Medical Evangelists | | Grad | Cent |
| University of Southern California School of Medicine | (1935) 74 9 | 76 2 † | |
| American Medical Missionary College Chicago | (1935) | 77 8 † | |
| Northwestern University Medical School | (1902) | 62 2 | |
| Rush Medical College | (1935) | 71 1 | |
| Detroit College of Medicine and Surgery | (1933) | 68 3 | |
| Regia Università degli Studi di Modena Facoltà di | | | |
| Medicina e Chirurgia | (1932) | 70 6 | |
| Regia Università degli Studi di Roma Facoltà di Medi- | | | |
| cina e Chirurgia | (1926) | 62 7 † | |

* License withheld pending completion of application

† Verification of graduation in process

‡ Fell below 60 per cent in two subjects

Iowa June Examination

Mr H W Grefe, director, Division of Licensure and Registration, reports the written examination held by the Iowa State Board of Medical Examiners in Iowa City, June 4-6, 1935. The examination covered 8 subjects and included 100 questions. An average of 75 per cent was required to pass. Seventy-four candidates were examined, 73 of whom passed and 1 failed. The following schools were represented:

| School | PASSED | Year | Per |
|---|-------------|------|------|
| Northwestern University Medical School | | Grad | Cent |
| Rush Medical College | (1935) 83 5 | 86 8 | |
| University of Illinois College of Medicine | (1934) | 87 3 | |
| State University of Iowa College of Medicine | (1935) | 86 8 | |
| 75 1 * 76 5 * 77 6 * 77 8 * 77 9 * 79 * 79 1 * 79 4 * | | | |
| 79 9 * 80 5 * 80 6 * 80 8 † 81 4 * 81 6 * 81 8 * 82 5 * | | | |
| 82 5 * 82 9 * 82 9 † 83 1 * 83 3 * 83 4 * 83 5 * 83 8 * | | | |
| 83 9 * 84 1 * 84 6 * 84 6 * 84 6 * 84 9 * 84 9 * 84 9 * | | | |
| 85 1 * 85 1 * 85 1 * 85 3 * 85 4 * 85 5 * 85 6 * 85 6 * | | | |
| 85 9 * 86 1 * 86 5 * 86 5 * 86 6 * 86 6 * 86 6 * 86 8 * | | | |
| 87 3 * 87 6 * 87 8 * 87 8 * 88 1 * 88 3 * 88 4 * 88 4 * | | | |
| 88 9 * 89 3 * 89 5 * 89 6 * 89 8 * 90 6 * 92 8 * 95 * | | | |
| University of Louisville School of Medicine | (1934) | 80 1 | |

| | | |
|--|--------|------|
| Creighton University School of Medicine | (1934) | 81 1 |
| University of Nebraska College of Medicine | (1933) | 86 1 |
| University of Rochester School of Medicine | (1934) | 87 3 |
| School | FAILED | Year |
| State University of Iowa College of Medicine | Grad. | Per |
| | (1934) | 82 1 |

Nine physicians were licensed by reciprocity and 1 physician was licensed by endorsement from July 1 through August 7. The following schools were represented:

| School | LICENSED BY RECIPROCITY | Year | Reciprocity |
|--|-------------------------|----------|-------------|
| Rush Medical College | (1932) Missouri | (1933) | Michigan |
| University of Illinois College of Medicine | (1934) | (1934) | Illinois |
| Creighton University School of Medicine | (1934 2) | (1934 2) | Nebraska |
| John A. Creighton Medical College | (1930) | (1930) | Nebraska |
| University of Nebraska College of Medicine | (1934) | (1934) | Nebraska |
| Vanderbilt University School of Medicine | (1932) | (1932) | Tennessee |
| Albert Ludwigs Universität Medizinische Fakultät, Freiburg | | (1914) | Texas |

| School | LICENSED BY ENDORSEMENT | Year | Endorsement |
|---------------------------------------|-------------------------|----------|-------------|
| McGill University Faculty of Medicine | | (1928) N | B M E L |

* License withheld pending completion of internship
† This applicant has completed the medical course and will receive his M D degree in June 1936. License has not been issued.

Book Notices

Modern Home Medical Adviser Your Health and How to Preserve It. Edited by Morris Fishbein. M D. Fabrikoid. Price \$9.50. Pp 905 with 140 illustrations. New York: Doubleday Doran & Company Inc., 1934.

The idea of a family health book is not new. For fifty years such volumes have decorated the library tables and sitting room tables in many homes along with the family Bible. However the home medical adviser of the past was full of scientific and hardly understandable diagrams of the human interior. It contained innumerable peculiar prescriptions which represented the superstitions of the past. It was usually written by a compiler who based his discussions on similar books that had gone before.

The present volume in no way resembles these earlier tomes. It represents the assembled views of men whose names have been associated with progress in the fields they discuss. Their contributions have been rewritten and reedited in many instances to make statements easily understandable by any fairly intelligent reader.

The book opens with a chapter on the choice of a physician, indicating the types of medical colleges, the importance of state licensure, the significance of membership in medical organizations and the development of the specialties. There follow chapters on the family medicine chest and first aid, and on the hygiene of women by Dr Fishbein. The section on sex hygiene has been prepared by Dr Thurman B Rice, whose name is associated with the development of a similar highly successful series in *Hygiene*. Dr J P Greenhill presents a chapter on the care of the mother before and after childbirth, and this is logically followed by a chapter on the care and feeding of the child and infant hygiene by Philip P Jeans of the University of Iowa and Frederick F Tisdall of the University of Toronto. The general prevention of infectious disease and the considerations of the individual infectious diseases, again by Morris Fishbein, occupy more than 100 pages. Next come discussions of the diseases of the heart and circulation by N C Gilbert and of digestion and digestive diseases by Drs Portis. Then the book proceeds through "The Kidney Its Diseases and Disturbances," by Philip S Hench, "The Blood and Its Disturbances," by Raphael Isaacs, "Deficiency Diseases" by Russell M Wilder and D L Wilbur, and "Allergy," by W W Duke. The glands are discussed by Drs Walter Timme and Oliver P Kimball, and Dr E P Joslin has contributed a notable hundred pages on diabetes. Dr Wingate M Johnson discusses blood pressure, both high and low, and cancer is discussed by Dr Francis Carter Wood. The hazards of industry are discussed by Dr C P McCord. The care of the skin and hair and nails is fully outlined by Dr Arthur W Stillians of Northwestern University Medical School. Then come sections on the subjects of diet, posture, the care of the feet, nervous and mental disturbances, and the care of the aged. These chapters are in turn written by Solomon Strouse, Tait McKenzie, Philip Lewin, George K. Pratt and Morris Fishbein.

The book is extensively illustrated with colored plates and with 136 photographs and outline drawings. Many of these drawings are of the outline humorous type so successful in *Hygeia*. The volume is beautifully printed with a wide column and a large page. The index, which itself occupies almost sixty pages, permits the user of the volume to find readily any topic that may concern him.

In the preparation of this book, self medication, except for the slightest ailments such as are now regularly treated by every one in his own home, is completely avoided. Indeed, the dangers of self medication are emphasized throughout the book. However, the intelligent reader will gain a knowledge of how to prevent disease, of how to choose scientific medical treatment, and of how to follow intelligently his physician's instructions, thereby shortening the process of disease and particularly relieving the mind from the worry inevitably associated with unanswered questions.

Reports on Chronic Rheumatic Diseases. Being the Annual Report of the British Committee on Chronic Rheumatic Diseases Appointed by The Royal College of Physicians. Number One edited by C. W. Buckley M.D. F.R.C.P. Cloth Price 12s 6d. Pp 159 with 8 illustrations. London H. K. Lewis & Co. Ltd 1935.

The stated object of the British committee in publishing this report is to bring to the notice of those interested in chronic rheumatism recent research work from the clinic and laboratory. By way of introduction, Copeman the secretary of the committee reviews the origin and work of the British committee, and Fisher discusses the merits of the classification of "rheumatic diseases" adopted by the committee and the reasons therefor, with a review of the pathologic changes seen in the more common types of chronic arthritis. The remainder of the book comprises eleven articles on various phases of the subject. Some of these articles are listed as "original" and express the author's ideas on certain subjects without reference to the literature. Others are essays on particular subjects, with brief reviews of new and old literature. A few confine themselves to a review of current literature on a given subject. Appended is a list of titles and references to about 300 articles relating to chronic rheumatism, which appeared in American, British and continental European literature between April 1934 and March 1935.

The most valuable parts of the report, which are well worth the price of the volume, are the article by Freeman, on the present position of allergy and hypersensitiveness in chronic rheumatism and arthritis, and that by Race on biochemical investigations in chronic rheumatic diseases. In any consideration of two such poorly defined states as allergy and "rheumatism" Freeman insists we must pick our way humbly and warily yet with courage. The author has done just that and has faced the situation frankly. Freeman's paper should be required introductory reading for any one daring glibly or critically to unite the terms 'allergy' and 'rheumatism'. In Race's excellent paper are discussed the significance of alterations in the sedimentation rate of erythrocytes in blood proteins, in pigments, in compounds of sulphur, in serum calcium and in serum magnesium studies on blood groups and remarks on the chemistry of urine and synovial fluid and on estimations of the metabolic rate in rheumatic diseases. Suggestions are made for future chemical investigations particularly on blood proteins. Miller reports preliminary observations indicating that some degree of hepatic impairment, as shown by tests of hepatic function, is present in about a third of the cases of rheumatoid arthritis, osteoarthritis, fibrositis, sciatica and gouty arthritis. The role of focal sepsis is briefly considered by Willcox. Buckley reviews the nervous manifestations of vertebral rheumatism and current ideas on the cause and treatment of ankylosing spondylitis. The possible relationship of tuberculous infections to Still's disease and rheumatoid arthritis, arguments on the acceptance of 'tuberculous rheumatism' as an entity, the influence of the thyroid and parathyroid glands, and the supposed rationale of their removal from rheumatic patients, the use of histamine in the treatment of myalgia and chronic rheumatism, and trends of research in this field during 1934 are additional subjects discussed (sometimes too briefly) by Moncrieff, Copeman, Fisher, Bach and Oriel.

The report is a helpful compilation of facts and ideas and is one with which students of the subject should become familiar.

It will serve as a useful supplement to the formal "statement of opinion" concerning the basic ideas of rheumatic diseases given by the Arthritis Committee of the British Medical Association and published in the *British Medical Journal* June 17, 1933 page 1041. The report of the British Committee on Chronic Rheumatic Diseases must face the criticism, however, that as a review of current literature (admittedly) it is not complete even in its presentation of recent British researches and its comments on those studies which are discussed in some detail are not sufficiently critical. To some the publication of such a report in book form may make it more available than if it was published in a national journal of fairly wide circulation and purchasable in reprint form later (as was, for example the recent first 'Rheumatism Review' of American and English literature published for the American Committee for the Study and Control of Rheumatic Diseases in the *Annals of Internal Medicine* this spring). Others may believe the latter method preferable in making the report, in the long run more widely available and incidentally less expensive for the reader. It is to be hoped that however presented, future reports will be forthcoming. They should be of decided value to every one concerned in the care of the innumerable victims of these diseases.

Healthful Living By Harold S. Diehl M.D. Professor of Preventive Medicine and Public Health the University of Minnesota. With an introduction by Morris Fishbein M.D. Editor *Journal of the American Medical Association*. Cloth Price \$2.50. Pp 354. New York & London: Whittlesey House McGraw-Hill Book Company Inc 1935.

As the first volume in a new series to be called the Whittlesey House Health Series, under the editorship of Dr. Morris Fishbein, the McGraw-Hill Company presents a book by Dr. Harold S. Diehl. Dr. Diehl has been for some time associated with the care of student health at the University of Minnesota and has also been secretary of the American Student Health Association. He has thus an excellent background for the development of a book of this type and he adds to this a power of clear and concise expression which is unusual among medical writers. After a discussion of the possibilities for improving health and lengthening life, he discusses mental health and the normal sex life, then he answers the usual questions relative to tea, coffee, tobacco and alcohol, exercise, fatigue, rest, fresh air and diet. These considerations occupy ten chapters. There follow chapters on specific disease prevention, the common cold, the care of the eyes, ears, nose, throat and teeth, a consideration of the glands, the care of the aged and finally a chapter on the choice of a physician. These excellent discussions are supplemented by a well chosen bibliography and an adequate index. The book is reasonably priced, well printed, beautifully bound and an excellent item for recommendation by any physician to a patient who wants a book on personal hygiene.

Trattato di anestesia. Narcosi—anestesi locali regionali spinali. Da A. M. Dogliotti docente di patologia chirurgica nella R. Università di Torino. Prefazione del Prof. Ottorino Uffreduzzi. Cloth Price 75 lire. Pp 552 with 253 illustrations. Turin: Unione Tipografica Editrice Torinese 1935.

The preface is written by Professor Uffreduzzi. In the first chapter there is a historical sketch concerning general and other anesthetics. In succeeding chapters the author covers the physiology and pathology that it is well for the anesthetist to consider in his work and also the various factors that bear on the production of anesthesia from all points of view. He describes the various signs and stages of anesthesia in a novel manner. He discusses regional anesthesia and the various types of injections, emphasizes respiratory difficulties attendant on these methods and shows how artificial respiration should be carried out. He discusses postoperative pulmonary complications and the use of carbon dioxide and oxygen in their prevention and treatment, and various other complications. He shows most of the types of apparatus for administration of general anesthetics that are used throughout the world. He discusses ether, chloroform, ethyl chloride, vinethene and nitrous oxide and presents charts showing signs of anesthesia with chloroform, nitrous oxide and ethylene. He takes up cyclopropane, acetylene, tribrom-ethanol and intravenous anesthesia, especially with *n*-methyl cyclohexenylmethylmalonylurea sodium. He also

discusses preliminary medication and basal anesthesia. He elaborates his own method of peridural anesthesia and discusses in great detail spinal anesthesia and the different methods of its production. For all those who read Italian, this is a valuable book.

Asylum By William Seabrook. Cloth. Price \$2. Pp 263. New York: Harcourt Brace & Company, 1935.

The name of this author is widely known because of his contributions to anthropology, ethnology and travel. Some time ago, feeling himself under the influence of alcoholic addiction, he voluntarily entered an institution for the mentally defective and submitted himself to retention, during which time he overcame completely the craving for alcoholic liquors and obtained an insight into modern methods of caring for the mentally sick. His book reads like a novel but is accurate and should be of great value in carrying to people generally a better idea of modern methods and a better understanding of those who suffer with mental diseases. Although published but a short time ago, the book has already passed through several editions and is listed among nonfiction best sellers. Every physician will find it a welcome addition to his correlated reading in medical work. There are occasional passages of a "blue" character, which may interfere with a general recommendation of the book to younger readers.

The Ordinary Difficulties of Everyday People By John Rathbone Oliver. Cloth. Price \$2.75. Pp 296. New York & London: Alfred A. Knopf, 1935.

Dr. Oliver is a combination of priest, physician, novelist and scholar. His writings have attracted more than ordinary attention in their special field. The present book is a series of philosophical comments on babies and children, poets and dramatists, school and the home. The author discusses youth, social ambitions, medical schools and a great many of the other aspects of modern life. There are chapters on compensations, on marriage, on the dangerous age and on old age. To all his comments the author brings a ripe wisdom and a wide experience of human life seen in the various capacities in which he has lived and worked. It is a book that repays careful reading and is sure to benefit many a troubled mind.

Around a World on Fire: Exploits and Escapes of an Austrian World War Surgeon By Karl E. Kassowitz. Cloth. Price \$2. Pp 198 with illustrations by Hans V. Schrötter. Milwaukee: The Author (Gutenberg Publ. Co.), 1935.

The experiences of physicians during the World War were probably as extraordinary and varied as those of any other group. The author of this volume, who is now a physician in Milwaukee, served as a front line surgeon with the Austrian army. After being captured, he did some work in Russia, going eventually to a prison camp in Siberia. With another physician he escaped in Chinese disguise and traveled across China, finally reaching Peiping. From there he came to the United States and from there he traveled back to Austria. He has a flare for what is dramatic and he tells his story with literary simplicity. Some extraordinary drawings have been contributed by Hans V. Schrötter.

The Stomach and Duodenum By George B. Eusterman, M.D., F.A.C.P., Head of Section in Division of Medicine, The Mayo Clinic, and Donald C. Balfour, M.B., M.D., LL.D., Head of Section in Division of Surgery, The Mayo Clinic and Members of the Staff, The Mayo Clinic and the Mayo Foundation for Medical Education and Research. Cloth. Price \$10. Pp 958 with 436 illustrations. Philadelphia & London: W. B. Saunders Company, 1935.

This splendid book covers all phases of diseases of the stomach and duodenum in a complete manner. Not only have Eusterman and Balfour stated the medical and surgical sides especially well but their colleagues at the Mayo Clinic have contributed a number of complete and up-to-date chapters on the physiology, pathology and roentgenology of this most important part of the gastro-intestinal tract. The newest methods and tests both for diagnosis and for treatment are clearly stated. A good bibliography is given with each chapter. The book contains much authoritative information and it is well balanced and concise. There are a large number of illustrations, which are unusually well done.

This book should serve not only as a textbook for the student and the general practitioner but also as a reference book for the internist and the surgeon.

Celsus De Medicina Volume I With an English translation by W. G. Spencer, M.S., F.R.C.S. In two volumes. Cloth. Price \$1.50. Pp 409. Cambridge, Massachusetts: Harvard University Press, London: William Heinemann Ltd., 1935.

It is well to have in one of the fine translations made available by the Loeb Classical Library this excellent translation of the contribution of Celsus. A brief introductory note outlines the most valuable features of the work and discusses the much debated question as to whether or not Celsus was a physician or merely a translator of an old Greek work on medicine. The conclusion of Dr. W. H. S. Jones, who writes the introduction, is to the effect that Celsus must certainly have had considerable medical experience. For all purposes that would have made him a doctor in early Rome.

Réactions labyrinthiques et équilibre latéral labyrinthique. Par G. G. J. Rademaker, professeur à l'université de Leyden. Préface du Professeur Georges Guillaumin. Papier. Price 80 francs. Pp 262, with 124 illustrations. Paris: Masson & Cie, 1935.

After a preface by Georges Guillaumin and some introductory remarks by the author, in which some of the historical aspects of labyrinthine reactions are discussed, Rademaker devotes his first chapter to the reactions produced by movements in a rectilinear plane. This is followed by a chapter on the various methods and types of labyrinthine stimulation in animals and man. The illustrations, which are numerous and illuminating, include photographs of movie films showing the body movements of experiments with animals, during falling and turning. The work is supplemented by a complete bibliography. The text is most readable, the subject is presented in a well organized and clear manner, and the work as a whole is a valuable addition to the literature on labyrinthine reactions. From both a scientific and a practical standpoint it should prove of great value to all otologists and to all others who are interested in the important investigation of the vestibular mechanism and knowledge concerning it.

Berättelse från styrelsen för cancerföreningen i Stockholm för verksamhetsåret 1934. Index of Papers Published at the Radiumhemmet 1909-1934. Report on Cases Treated at the Radiumhemmet 1921-1934. Paper. Pp 64. Stockholm: H. L. Beckmans Boktryckeri, 1935.

This report is divided into three parts. The first part, which is in Swedish, covers the activities of the cancer society in Stockholm in 1934. The second part lists the papers published by Radiumhemmet in the years 1909 to 1934. The third part gives a tabular summary of the cases treated at Radiumhemmet from 1921 to 1934. The report will interest all who are concerned actively with the control and treatment of cancer.

The Story of Medicine in the Middle Ages By David Riesman, M.D., Sc.D., Professor of the History of Medicine, University of Pennsylvania. Cloth. Price \$5. Pp 402 with 80 illustrations. New York: Paul B. Hoeber Inc., 1935.

This volume traces the rise of medicine and surgery from the time of the school of Salerno through the period of Paracelsus. Special chapters concern the development of the great universities, the work of the Arabian and the Jewish physicians, the rise of surgery, the great plagues and manias, the origins of syphilis, the textbooks of the period, and the hospitals. The volume concludes with a discussion of the public's attitude toward medicine of that period. The book is handsomely printed and well illustrated. It presents a selection from the vast amount of material now available of those facts and factors which should be of greatest interest to the physician of today and also provides the philosophical comments of the author, which are never without interest.

Clinical Atlas of Blood Diseases By A. Piney, M.D., M.R.C.P., Assistant Physician, St. Mary's Hospital for Women and Children, London, and Stanley Wyard, M.D., M.R.C.P., Physician, The Cancer Hospital, London. Third edition. Cloth. Price \$4. Pp 116 with 38 illustrations. Philadelphia: P. Blakiston's Son & Co. Inc., 1935.

The classification of blood as well as of various types is becoming constantly more and more complex and difficult. Few physicians can keep abreast of the new discoveries in relationship to the types of blood as well as the variations that occur in blood diseases. This atlas provides a series of excellent illustrations, which will serve for use on the laboratory table beside the microscope.

Medicolegal

Birth Control Sale of Contraceptives Regulated—A Wisconsin statute limits to pharmacists and physicians the right to sell drugs, medicines, mixtures, preparations, instruments, and articles and devices, used or intended to be used to procure miscarriages or to prevent pregnancy. Such articles may be sold or disposed of only to married persons. To prevent the evasion of this statute, it forbids the manufacture, purchase, rental, possession or control of any slot machine or other means designed and constructed so as to contain such articles and to release them on the deposit of a coin or other thing of value. Wis Stats, 1933, section 351.235.

The defendant, the proprietor of an oil station, permitted a vending machine to be placed in the mens wash-room on his premises, adapted for the vending of the forbidden articles or of some of them, although susceptible of use for vending lawful merchandise. The machine bore signs reading "Sold only for the prevention of disease" and "Minors are prohibited to operate this machine." Representatives of the police department deposited 10 cents in the machine and it delivered an article commonly used for contraceptive purposes. The defendant was convicted in the district court and in due process the case came before the Supreme Court of Wisconsin. The defendant contended that the act was so vague and indefinite as to be unconstitutional. Many articles with innocent and lawful uses were covered by it—for instance, many drugs, medicines, instruments and devices—simply because they were susceptible of use to prevent conception or to produce abortion. The act the defendant contended, could not be read by those affected by it with any fair chance of arriving at its precise meaning.

The act is not drafted with the precision that is desirable, said the Supreme Court, but the court must give effect to its intent, when that is clear, rather than to its letter. Its intent is to be gathered from the whole statute and not from words and phrases separated from their contexts. The act covers only drugs, medicines, mixtures, preparations, instruments, articles and devices that are "used or intended or represented to be used" to procure a miscarriage or for preventing pregnancy. It is not lightly to be assumed that the legislature intended the act to cover articles having legitimate common uses, simply because they are susceptible of use for improper purposes. The limiting words in the statute, "used or intended or represented to be used," are to be construed, in the opinion of the court, to mean (1) articles solely capable of use as contraceptives or abortifacients and (2) articles appropriate for use as contraceptives and abortifacients and sold with the intent or purpose that they be so used or with the representation that they are effective for that purpose.

Applying to the case the principle enunciated in *Youngs Rubber Corporation v C I Lee & Co* 45 F (2d) 103,¹ the court concluded that it was the intent of the legislature to deal in the statute under which prosecution was brought with articles whose sole purpose, or whose intended purpose or

represented function, is to produce abortion or to prevent pregnancy and that in general it was the intention of the legislature wholly to prohibit the sale of such articles to unmarried persons or by any one except a physician or pharmacist.

Defendants contention that the notices on the vending machine on his premises, "Sold only for the prevention of disease" and "Minors are prohibited to operate this machine" were conclusive as to the purpose for which sales were made was rejected by the court. The sale of the device that was sold in this case, said the court in a public toilet, by a mechanical vending machine, was a sufficient warrant for the inference that the purpose of its sale was contraception and not merely the prevention of disease.

The judgment of conviction by the court below was affirmed—*State v Arnold* (1935), 258 N W 843.

Workmen's Compensation Acts Apoplexy and Insanity Following Minor Injury of Hand—A workman, 55 years old injured his hand slightly, in the course of his employment. He had a stroke of apoplexy within a few days thereafter and another stroke a few months later. Subsequently he became insane. A claim for compensation was filed with the workmen's compensation bureau, which the bureau rejected. The court of common pleas however, reversed the bureau's order. Thereupon the employer appealed to the supreme court of New Jersey.

The claim for compensation was based on the theory that an embolus originated in the injury of the hand, was thrown off into the blood stream, passed through a persistent congenital opening between the arterial and venous sides of the heart [patent foramen ovale], and lodged in the brain instead of in the lungs, where it normally would have lodged but for the abnormal opening. Medical testimony conceded that this was a possibility, but it showed that the workman had arteriosclerosis, with involvement of the heart and kidneys, and that clinical examination failed to disclose a patent foramen ovale. When a man is 55 years of age, said the supreme court, and shows all the symptoms of arteriosclerosis, with involvement of the heart and kidneys, it is more reasonable to accept the hypothesis that the apoplexy was the natural result of the progress of arteriosclerosis than that it was due to an embolus, thrown off from a slight wound of the hand passing to the brain because of an alleged congenital defect, which occasionally occurs in children, who do not long survive, and is rare in adults. Compensation, continued the court, is not allowable for injuries caused by the natural progress of a disease from which a workman is suffering. Accordingly, the judgment of the lower court was reversed and compensation denied—*Hahne & Co v Guenther* (N J), 178 A 58.

Accident Insurance Death from Dislodgment of Kidney Stone an Accidental Death—The defendant insurance company promised to pay to the beneficiary of an insurance policy double indemnity if the insured died from external, violent and purely accidental means and not directly or indirectly as the result of disease or physical infirmity. After a fall as he was getting out of his automobile, the insured had a bruised spot over one kidney, and thereafter he suffered 'the excruciating pain which usually accompanies the presence of a kidney stone in the ureter.' A kidney stone, according to the report, obstructed the ureter, causing hydronephritis, which was followed by pyonephritis and then by hypostatic pneumonia, which caused death. The insurer refused to pay double indemnity and the beneficiary brought suit. The trial court took the view that physical infirmity contributed to the death and directed a verdict for the insurer. The beneficiary appealed to the Supreme Court of Minnesota.

The stone that caused death measured 1.5 by 6 by 6 cm (one half by 2½ by 2½ inches) and had "certain prongs or projections" which in the opinion of the plaintiff's doctors, were likely to prevent its dislodgment from the part of the kidney in which it was being formed unless there was an abnormal abdominal pressure, such as the blow which the insured received when he fell. They regarded the stone as harmless to the health of the insured except as it might be dislodged and pass into the ureter. Before the accident the insured apparently was in the best of health and all medical witnesses agreed that if there had been no kidney stone the fall would not have killed him.

¹ In this case the United States Court of Appeals Second Circuit in construing phraseology similar to that now under consideration in federal statutes relating to the transportation of contraceptives and abortifacients in the United States mail or in interstate commerce in any manner whatever said: Taken literally this language would seem to forbid the transportation by mail or common carriage of anything adapted in the sense of being suitable or fitted for preventing conception or for any indecent or immoral purpose even though the article might also be capable of legitimate uses and the sender in good faith supposed that it would be used only legitimately. Such a construction would prevent mailing to or by a physician of any drug or mechanical device adapted for contraceptive or abortifacient uses although the physician desired to use or to prescribe it for proper medical purposes. The intention to prevent a proper medical use of drugs or other articles merely because they are capable of illegal uses is not lightly to be ascribed to Congress. Section 334 forbids also the mailing of obscene books and writings yet it has never been thought to bar from the mails medical writings sent to or by physicians for proper purposes though of a character which would render them highly indecent if sent broadcast to all classes of persons. See *United States v Chesman* 19 F 497 498 (C C E D Mo.) *United States v Clarke* 38 F 500 502 (D C E D Mo.) *United States v Smith* 45 F 476 478 (D C E D W.) *United States v Dennett* 39 F (2d) 564 568 (C C A 2). It would seem reasonable to give the word adapted a more limited meaning than that above suggested and to construe the whole phrase designed adapted or intended as requiring an intent on the part of the sender that the article mailed or shipped by common carrier be used for illegal contraception or abortion or for indecent or immoral purposes. See *Bour v United States* 229 F 960 963 (C C A 7). However we do not find it necessary to decide this question in the present case. *Youngs Rubber Corporation v C I Lee & Co* 45 F (2d) 103.

The issue of the case on appeal turned on the answers to two questions. Is death, caused by the lodgment in the ureter of a kidney stone which a fall has dislodged from the kidney, "accidental" within the meaning of the policy? If so, is such death caused by external, violent and purely accidental means, and not caused directly or indirectly by disease or physical infirmity? Although the trial court took the view that physical infirmity contributed directly or indirectly to death, the Supreme Court was more cautious. It cited *Silverstein v Metropolitan Life Insurance Company*, 254 N Y 81, 171 N E 914, in support of the postulate that "when the abnormality was so remote in its potential mischief that common speech would call it not disease or infirmity but at most a predisposing tendency, the fact that it started and was made operative by violence so that death resulted did not prevent the violence from being considered the sole cause of the death." The Supreme Court professed to have no difficulty distinguishing between the present case and cases in which the insured was suffering from chronic disease, such as diabetes or nephritis, which impairs the health and weakens the resistance so that when aggravated by violence the disease causes death. The difference, said the court, lies in that in one case the disease is merely aggravated by the violence, while in the other it is in its fatal aspects entirely set in motion by the violence. Applying this rule to the case before it, the court concluded that the jury might justly find that violence was the sole cause of death. For that reason, the Supreme Court reversed the judgment of the court below and remanded the case for a new trial—*Mair v Equitable Life Assur Soc of United States (Munn)*, 259 N Y 60.

Malpractice Operation Without Consent Implies Injury, Scope of Lawful Malpractice Defense by Medical Society—The defendant, a physician, removed several moles from the face of a minor child. The patient's mother, acting as guardian, alleged that her child had been disfigured by the treatment and sued the defendant. She alleged, among other things, that the treatment given by the defendant was given without her consent or consent of her daughter, the patient. Judgment was given against her and she appealed to the Supreme Court of Errors of Connecticut.

The instructions given to the jury by the trial court were such as might have led the jury to believe that the plaintiff was not entitled to damages unless she proved not only that the defendant treated his patient without consent but also that his patient was in fact injured by his treatment. This, said the Supreme Court of Errors, was incorrect. The removal of the moles, if done without consent, was a trespass and had the legal effect of an assault, and an assault, even without specific proof of injury from it, entitles the plaintiff to at least nominal damages. "Every human being of adult years and sound mind has a right to determine what shall be done with his own body, and a surgeon who performs an operation without his patient's consent commits an assault, for which he is liable in damages." *Schloendorff v New York Hospital*, 211 N Y 125, 105 N E 92. But the erroneous instruction given by the trial court could have had no adverse effect further than to cause the plaintiff to lose a verdict for nominal damages and costs, and errors of such limited effect do not ordinarily warrant the reversal of a judgment.

Dr Standish was called as a witness for the plaintiff. After counsel for the plaintiff had examined him and after the witness had been cross-examined, the plaintiff sought on redirect examination to show that he was not disinterested. Counsel for the plaintiff proposed to introduce evidence to show that this witness, Dr Standish, and the defendant were fellow members of the Hartford Hospital Society, that both of them practiced as specialists in the same field, that the plaintiff's witness had without compensation treated the patient on whom the defendant had operated, for several months, trying to remove the scars attributed to the defendant's treatment, and that such services were rendered gratuitously, pursuant to an agreement among the members of the hospital society to render free treatment to a patient of a fellow member if that member was sued under circumstances such as were present in this case, that the hospital society had a committee charged with the duty of determining whether, in any given case, there had been

malpractice, and that, in consideration of lowered premiums paid by each member, a blanket policy of insurance was issued to the members of the society. The trial court, however, refused the proffer of the plaintiff's counsel of evidence to prove these things. Counsel for the plaintiff asked a physician whom he had summoned as a witness whether he had not been told by telephone, by a physician on the staff of the New Britain Hospital, that he would be "run out of town" if he testified against the defendant, but the court excluded this testimony.

Counsel, said the Supreme Court of Errors, after he has called a witness and sought the benefit of his testimony, may contradict him by another witness, but he cannot directly impeach him unless it is shown to the satisfaction of the court that the testimony of his witness has taken counsel by surprise or is inconsistent with other statements made by the witness. Counsel must before he undertakes to impeach his own witness out of his own mouth, show that the witness is adverse or hostile, or show some equally potent reason, as the interests of justice under the circumstances of the case seem to the court to require. The Supreme Court of Errors, however, was unable to find anything in the record in this case suggestive of hostility on the part of the plaintiff's witness, Dr Standish, or of any unwillingness on his part to answer questions put to him, or anything else to justify an exception to the general rule regarding the impeachment of witnesses.

Counsel for the plaintiff was seeking by the questions asked of his witness, Dr Standish, and by the testimony that he proffered, to show that the medical society of which Dr Standish was a member had endeavored to use its influence to prevent the plaintiff from securing expert medical testimony in support of her claim. There can be no question, said the court, of the right of the society to investigate any claim of malpractice brought against any one of its members or to render such member any proper aid in his defense. The limits of such proper aid, however, manifestly do not include the production of testimony which is untrue or of opinions of witnesses which are not honestly entertained by them, or the prevention of the attendance of witnesses, or the suppression of any relevant evidence, or any other interference with the orderly and normal course of court procedure. Any act of such improper character by any member of the society, or participation in it by him, would render such member liable to statutory penalties and, it might be, for conspiracy at common law.

The Supreme Court of Errors found no reversible error in the rulings of the trial court—*Schmeltz v Tracy (Conn.)*, 177 A 520.

Society Proceedings

COMING MEETINGS

American Academy of Tropical Medicine St. Louis Nov 20-21 Dr Earl B McKinley 1335 H Street NW Washington D C Secretary
American Association for the Study of Neoplastic Diseases Baltimore Dec 19-21 Dr Eugene R Whitmore 2139 Wyoming Avenue NW Washington D C Secretary
American Society of Tropical Medicine, St. Louis, November 19-22 Dr Alfred C Reed 350 Post Street San Francisco Secretary
American Student Health Association New York Dec 27-28 Dr Harold S Diehl University of Minnesota Medical School, Minneapolis Secretary
Eastern Section American Laryngological Rhinological and Otolaryngological Society Newark, N J Jan 3 Dr Henry B Orton 24 Commerce St Newark N J Chairman
Medical and Surgical Association of the Southwest, El Paso, Texas, Nov 21-23 Dr W Warner Watkins, 15 East Monroe Street Phoenix, Ariz Secretary
Middle Section American Laryngological, Rhinological and Otolaryngological Society Milwaukee Jan 11 Dr William E Grove 324 East Wisconsin Avenue Milwaukee Chairman
National Society for the Prevention of Blindness, New York Dec. 5, Dr Lewis H Carris 50 West 50th Street, New York Manager Director
Puerto Rico Medical Association of Santurce Dec. 13-15 Dr Euripides Silva Ave Fernandez Juncos, Parada 19 Santurce, Secretary
Radiological Society of North America Detroit Dec. 26 Dr Donald S Childs 607 Medical Arts Building Syracuse, N Y Secretary
Society of American Bacteriologists, New York Dec. 26-28 Dr I L Baldwin College of Agriculture University of Wisconsin, Madison Wis Secretary
Southern Medical Association, St. Louis November 19-22 Mr C P Loran, Empire Building Birmingham Ala Secretary
Southern Surgical Association Hot Springs Va Dec 10-12 Dr E W Alton Ochsner 1430 Tulane Ave New Orleans Secretary
Western Surgical Association Rochester Minn., Dec. 6-8 Dr Albert H Montgomery 122 South Michigan Boulevard Chicago Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to *THE JOURNAL* in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Cancer, New York

25:1 250 (Sept.) 1935

- Malignant Tumors of Peripheral Nerves. A. P. Stout. New York—p. 1.
Studies of Fowl Tumors Induced by Carcinogenic Agents. I. Seasonal Factor Influencing Rate of Growth and Transmissibility. P. R. Peacock. Glasgow, Scotland—p. 37.
Id. II. Attempted Transmission by Cell Free Material. P. R. Peacock. Glasgow, Scotland—p. 49.
*Studies on Chemical Treatment of Tumors. II. Effect of Disturbances in Fluid Exchange on Transplanted Mouse Tumors. M. J. Shear. Boston—p. 66.
Choriocarcinoma in the Male. H. C. Fortner and S. E. Owen. Hines, Ill.—p. 89.
*Two Island Cell Adenomas of Human Pancreas Cultivated in Vitro. Margaret R. Murray and Cloyce F. Bradley. New York—p. 98.
Hyperplastic Epidermal Disease in Winter Flounder Infected with Cryptocytus Lingua (Creplin). G. M. Smith. New Haven, Conn.—p. 108.
Breeding Behavior and Tumor Incidence of an Inbred Albino Strain of Mice. J. J. Bittner. Bar Harbor, Maine—p. 113.
Glycolysis of Various Substrates by Extracts of Sarcoma and of Muscle. F. H. Scharles, M. D. Baker and W. T. Salter. Boston—p. 122.
Tumors of Digestive Tract. C. F. Geschickter. Baltimore—p. 130.

Treatment of Tumors and Effect of Disturbances in Fluid Exchange.—In experiments on fluid exchange, Shear employed a variety of substances and procedures in empirical attempt to alter the water content of tumor cells or to damage them by excessive intake of fluid or by excessive loss of fluid from the tumor. No hemorrhagic reaction was noted with histamine, but two tumors (sarcoma 180) receded and the slight retardation that occurred in the growth of the treated tumors may have been due to the treatment. The results with peptone were negative. In the mice treated with agar, one tumor receded completely and several tumors retrogressed. In the experiments with pneumococcus antibody and pneumococcus soluble specific carbohydrate, hemorrhages were observed in several of the tumors but no clear cut effect on tumor growth was obvious. In tumor-bearing mice complete withdrawal of drinking water resulted in earlier death than in non tumor-bearing control mice. Massive bleeding did not have a pronounced effect on tumor growth, although it seemed in some experiments to result in smaller tumors, this may well have been due to the general poor condition of the mice and not to a specific effect on the tumors. The various diuretics employed did not seem to influence the growth of the tumors. With acacia, recession of the tumor occurred in a few instances in a few other instances, liquefaction occurred apparently as a result of the treatment. With egg albumin and with serum albumin, a retarding influence was noted in a few instances. In one experiment with horse serum hemorrhage or striking destruction of the interior of the tumor was obtained in twelve out of seventeen mice, in some cases the tumor grew again but in three mice there was complete recession. With sublethal doses of meningococcus filtrate, hemorrhages were obtained in the tumors. Many of the mice died but in the survivors some tumors receded and grew again while others receded completely. Sodium oleate also produced hemorrhage or liquefaction in an apparently significant number of cases.

Island Cell Adenomas of Pancreas Cultivated in Vitro.—Murray and Bradley cultivated in vitro two adenomas of the islands of Langerhans from two human adults for periods of five weeks and six and one-half weeks respectively. The vitality of the explants was undiminished at the end of these periods. The two series of cultures from the two tumors differed from each other in much the same degree as the tumors differed in morphology. The behavior of the cultures from these pre-

sumably benign tumors was less irregular than the behavior of cultures of normal young and embryonic animal pancreas as reported by other workers. March 19, 1935, six cultures of one of the tumors were inserted into the axilla of a diabetic member of the staff who had volunteered to receive them. She had been maintained in normal health and activity over a period of twelve years by the injection of 20 units of insulin twice a day. Previous to the grafting the cultures had been grown for three weeks in the recipient's plasma, and the grafting procedure followed in general the technic of Stone, Owings and Gey for parathyroid transplantation through tissue culture. At the time of the last passage of each explant the medium from which the culture was cut was plated on blood agar for additional assurance that it was bacteriologically sterile. Since the transplantation the patient has been kept on a regimen of 18 units twice a day, and weekly tests of her blood sugar and urine sugar have been made. On June 12 no significant change in the level of blood or urine sugar had been registered.

American Journal of Clinical Pathology, Baltimore

5 349-454 (Sept.) 1935

- Vaccine Treatment of Acute Anterior Poliomyelitis of Monkeys. J. A. Kolmer and Anna M. Rule. Philadelphia—p. 349.
Qualitative Changes in Neutrophilic Leukocytes. R. L. Haden, Cleveland—p. 354.
*Diffuse Decidual Hyperplasia of Endometrium in Absence of Pregnancy. H. L. Reinhart. Columbus, Ohio—p. 365.
*Interpretation of Histologic Findings in Encephalitis Congenita. A. L. Amolsch. Detroit—p. 371.
Studies of Pathologic Body Fluids. Cholesterol Partition and Total Protein Content. M. Bruger. New York—p. 384.
*Pathologic Changes Resulting from Accurately Controlled Artificial Fever. F. W. Hartman and R. C. Major. Detroit—p. 392.
Value of One Hour Two-Dose Glucose Tolerance Test (Exton and Rose) in Early Diagnosis of Diabetes Mellitus. H. T. Kelly, J. T. Beardwood Jr. and K. Fowler. Philadelphia—p. 411.
The Rose Bengal Liver Function Test as Adapted to Sheard Sanford Photometer. A. S. Giorando and D. Eager, South Bend, Ind.—p. 417.
Method for Quantitative Examination of Conjunctival Fluid in Preparation for Intra Ocular Operations. F. M. Johns. New Orleans—p. 428.
Determination of Protein in Cerebrospinal Fluid. R. S. Hubbard and Helen R. Garbutt. Buffalo—p. 433.
Sensitivity of Wassermann Antigens in Relation to Rate of Dilution. A. J. Casselman, Camden, N. J.—p. 443.

Decidual Hyperplasia of Endometrium in Absence of Pregnancy.—Reinhart gives the histologic pattern and history that suggested the diagnosis of "decidua menstrualis" in a non-pregnant patient. Comparison of this case with three others in which diffuse decidual hyperplasia was present, one with chorionic villi and two without demonstrable villi giving clinical histories suggestive of early abortion, indicate a common etiology. The principal symptom of the present case was the periodically recurring, profuse, prolonged, white discharge with very little blood. Histologic examination presented little evidence of the mechanism by which the discharge was produced. However, the uterus was removed at a time during which there was clinically little discharge present. Whether this discharge was the result of the involution of the corpus luteum or of local inadequate nutrition associated with the rapid tissue growth has not been determined. If the involution of the corpus luteum is the mechanism by which this discharge is brought about, the diagnosis of "decidua menstrualis" might be competent. Histologic examination of hyperplastic decidual tissue removed in the three cases cited, during the discharge, presents a similarity to the early phase of menstruation.

Microscopic Observations in Congenital Encephalitis.—Amolsch investigated the etiologic and pathologic features of the brains of forty-six cases of incomplete cerebral development that exhibited in some degree the cellular features of encephalitis. The brains, ranging in fetal developmental age from 12 weeks to term were subjected to uniform cross-sectioning throughout the entire ventricular system. None of these infants survived longer than forty-eight hours after birth. Every brain in the series exhibited some degree of subependymal cellular activity. The degree of activity was proportional to the degree of hypodevelopment. The nature of the reaction was in no manner different in location, extent or cellular character from that seen in cases interpreted as congenital encephalitis. Subependymal infiltration of small round cells and perivascular mantles of such cells, found in the brain of the new-born, are not to be interpreted as an expression of inflam-

mation It is definitely developmental in nature This reaction is most pronounced in the prematurely born infants Between the twelfth and the twenty-eighth week of fetal development this reaction forms a prominent mass over the basal ganglion beneath the lateral ventricle The most prominent exhibit of the incomplete state of cerebral development in the term or near term infant is observed in the angle between the caudate nucleus and the thalamus and at the upper lateral angle of the lateral ventricle in sections through the anterior half of the brain Incomplete cerebral development at birth offers a distinct liability to cerebral and ventricular hemorrhage during birth and to late hypodevelopment, gliosis and possible gliomatous tumor formation in later life Congenital encephalitis by itself can exist, but such a diagnosis must depend on the presence of a true inflammatory reaction, cellular changes associated with development must be excluded from the criteria supporting such a diagnosis

Pathologic Changes Resulting from Accurately Controlled Artificial Fever—The study of Hartman and Major on the pathologic changes resulting from artificial fever therapy consist of two clinical cases coming to necropsy after fever therapy and of twenty dogs, eighteen of which were subjected to fever of various durations and degrees and two of which were used as controls, being given excessive amounts of sodium amytal, a sedative used in all but two of the other experiments and in the human cases They found that the pathologic changes in the human cases and the experimental animals were engorgement of the blood vessels, especially the capillaries, hemorrhage and degeneration The most vital changes seen were those in the brain, amounting to hemorrhagic encephalitis in some instances, those in the lung constituting hemorrhagic pneumonia and those in the adrenal characterized by degeneration in the cortex with hemorrhage Death occurring during or immediately after treatment was due to vascular collapse Although the changes described have been noted in animals receiving morphine alone as a sedative, the human patients and most of the animals received sodium amytal, a drug which in large amounts is known to produce congestion and even capillary damage, especially in the brain Since fever therapy and sodium amytal tend to produce marked dilatation and engorgement of blood vessels, the authors suggest that the combination should not be used in patients

American J Digestive Diseases and Nutrition, Chicago

2: 391-448 (Sept.) 1935

Philosophic, Clinical and Retrospective Discussion of Certain Major Problems in the Digestive Field. T R Brown, Baltimore.—p 391
Migraine Common Sense Approach. Libby Pulsifer, Rochester, N Y.—p 397

Validity of Fractional Gastric Analysis. Frances A. Hellebrandt and Elizabeth Brogdon Madison Wis.—p 402

Studies on Relation of Nonspecific Ulcerative Colitis to Bacillary Dysentery with Particular Reference to Dysentery Bacteriophage A. Winkelstein and C. Herschberger New York.—p 408

The Pancreas and General Metabolism Physiologic, Metabolic and Philosophic Concept of Nutritional Unity and Interdependence. W N Boldyreff Battle Creek Mich.—p 413

What Should Be the per Capita per Day Milk Consumption of Our Population? L Arnold Chicago.—p 416

Treatment of Food Allergy and Indigestion of Pancreatic Origin with Pancreatic Enzymes A W Oelgoetz P A Oelgoetz and Juanita Wittekind Columbus Ohio.—p 422

*Histidine in Treatment of Peptic Ulcer Preliminary Report. J T Eads Philadelphia.—p 426

Bleeding Gastric and Duodenal Ulcers D P MacGuire New York.—p 431

Histidine in Treatment of Peptic Ulcer—Eads treated thirty-five cases of peptic ulcer with intramuscular injections of a 4 per cent solution of histidine hydrochloride, averaging twenty-four injections with no local or systemic reaction Six patients, three with gastric ulcers and three with duodenal ulcers in which the average history of symptoms was two and one-half years, showed immediate clinical and roentgen evidence of cure. Symptomatic relief of distressing complaints was usually evident after the first three or four injections The gain in weight was the most marked. None of these patients were restricted as to diet or placed on medication. None of them, after a period of observation of six months or more, have shown any recurrence. Five showed some decline in the acid curve, but not to normal figures Eight patients presented definite clinical and roentgen improvement, not so rapidly as the first group, but still definite

There were six duodenal ulcers and two gastric ulcers in this group Six patients showed a gain in weight Five began to show improvement after the tenth injection, two after the fifteenth and the remaining one after the twenty third injection. Five were on no dietary restrictions, three were advised regarding elimination of tobacco, coffee, alcohol and so on, and one had alkalis at times, but not regularly The average duration of symptoms in the group was four and one half years. Nine patients showed some clinical improvement but no roentgen change The symptomatic improvement was much slower than it was in the other two groups, and not until eighteen or more injections had been given was any improvement noted. These were all duodenal ulcers with an average history of six years. There were some dietary restrictions imposed in three cases with little or no medication given. Twelve patients were unimproved after the completion of twenty four injections. Three of these were given further injections—two were given thirty injections and one thirty-six with no improvement noted. At times experiments were made with a fairly rigid dietary schedule and alkalis were given in seven cases with no appreciable change in the symptoms. Seven of this group were classified as obstructive lesions of a varying degree and were not improved at all In three of these the symptoms appeared aggravated by the injections and four showed a loss of weight. Operations were subsequently performed in three of the obstructive cases with one fatality due to pulmonary infarct. Of these twelve patients showing no immediate improvement, three subsequently appeared to show definite improvement a week or so after the completion of injections, after being placed on a strict orthodox medical regimen, when before the injections such a treatment had been of no value. This suggests the possibility of some delayed benefit. The duration of symptoms in this group was the longest. These were for the most part ulcers that are resistant to treatment and were complicated by some obstructive phenomena in seven cases

American Journal of Pathology, Boston

11: 711-894 (Sept.) 1935

Lesions of Left Auricle in Rheumatic Fever L. Gross New York.—p 711

Virus of Lymphogranuloma Inguinale. R. D Aunoy, E. von Haam and L Lichtenstein New Orleans.—p 737

Rhabdomyosarcoma of the Prostate F H Foucar Washington, D C.—p 753

Anencephalic Monster with 'Rhinodymie' and Other Anomalies. S B Broder Chicago.—p 761

*Anomalies of Circle of Willis with Resulting Encephalomalacia and Cerebral Hemorrhage O Saphir Chicago.—p 775

Experimental Gastric Erosions Following Hypothalamic Lesions in Monkeys E C Hoff and D Sheehan New Haven Conn.—p 789

Functional Cor Triloculare Bistria Report of Case with Malposition of Septum in Ventricles D Kornblum Brooklyn.—p 803

Improved Technic for Silver Impregnation of Reticulum Fibra. Helenor Campbell Wilder, Washington D C.—p 817

Anomalies of Circle of Willis—Saphir states that anomalies of the circle of Willis, with resulting interruption of the circulation between the internal carotid and vertebral arteries may form the anatomic basis of cerebral vascular disturbances. The recognition of such anomalies aids in the explanation of cerebral hemorrhage and encephalomalacia on morphologically demonstrable grounds in the absence of occluding lesions of the supplying arteries. In addition to local causes for encephalomalacia and cerebral hemorrhage the condition of the myocardium and evidence of myocardial failure in the various organs should be considered. Three brains are described which revealed anomalies of the circle of Willis involving the posterior communicating arteries, and an abnormal origin of the posterior cerebral artery in one case. Two of these brains revealed areas of encephalomalacia and cerebral hemorrhage, without the presence of occluding lesions in the supplying arteries. Whereas the posterior communicating arteries are not essential in the maintenance of the circulation of the brain under normal conditions, a free unhampered collateral anastomosis between the internal carotid and vertebral arteries is important in instances of diffuse arteriosclerosis of the arteries of the base of the brain combined with beginning myocardial failure. This conception of the origin of these brain lesions is based on morphologically demonstrable changes and does not require the assumption of theoretical functional disturbances of the circulation

American Journal of Physiology, Baltimore

113:1 250 (Sept 1) 1935

- Relation of Parathyroid Hormone to State of Calcium in Blood F C McLean B O Barnes and A B Hastings Chicago—p 141
- Total Plasma Protein in Normal and Fasting Rats W C Cutting and R D Cutter San Francisco—p 150
- Effect of Different per Cents of Protein in Diet on Bachelor and Virgin Rats J R Slonaker Stanford University Calif—p 159
- Effect of Reduced Atmospheric Pressure on Leukocyte Count O O Meyer M H SeEVERS and S R Beatty Madison Wis—p 166
- Effect of Cholecystokinin on Cholelithogenesis (Sphincter of Oddi) P Sandblom, W L Voegtlin and A C Ivy Chicago—p 175
- *Effect of Changes in Environmental Temperature on Blood Pressure and Pulse Rate in Normal Men J S Gottlieb Worcester Mass—p 181
- Acid Base Changes in Serum of Dog Associated with Hyperthermia of Dinitrophenol Administration E Muntwyler V C Meyers W H Danielson and Carla Zorn Cleveland—p 186
- Relative Significance of Electrolyte Concentration and Tissue Reaction in Water Metabolism H A Davis and L R Dragstedt Chicago—p 193
- Influence of Partial Adrenalectomy on Work Capacity of Rats D J Ingle W M Hales and G M Haslerud Minneapolis—p 200
- Specific Gravity of Blood of Normal Rabbits and Cats and Splenectomized Rabbits Before During and After Emotional Excitement L B Nice and H L Katz Columbus, Ohio—p 205
- Correlated Studies of Calcium Inorganic Phosphorus and Serum Phosphate in Normal Animals and in Animals Influenced by Irradiated Ergosterol S Freeman and C J Farmer Chicago—p 209
- Basal Metabolism and Iodine Excretion During Pregnancy Lena Enright Versa V Cole and F A Hitchcock Columbus Ohio—p 221
- Further Study of Cardiac Reflexes R S Morison Boston—p 229
- Plasma Protein Determinations in Lactating Women S C Peacock and Winifred Franz Hinman Chicago—p 235
- Influence of Ovarian Hormones Estrin and Progesterone on Menstrual Cycle of Monkey G W Corner Rochester, N Y—p 238

Effect of Environmental Temperature on Blood Pressure—In a study of the effect of an increase in the environmental temperature on the systolic and diastolic blood pressures and pulse rates of sixteen normal men, Gottlieb found that 1 When the room temperature was maintained between 23.1 and 23.9 C (73.6 and 75 F) for an observation period of three and one half hours, the mean pulse rate decreased significantly—99 beats per minute, the mean systolic blood pressure showed no change and the mean diastolic blood pressure increased significantly—87 mm of mercury 2 When the room temperature was increased from 23.6 to 33.2 C (74.5 to 91.7 F) during the period of three and one-half hours, the mean pulse rate increased 2.6 beats per minute during the first hour, then decreased significantly—58 beats per minute, the mean systolic blood pressure showed no change and the mean diastolic blood pressure increased significantly—3 mm of mercury 3 A study of the differences of the two experimental days indicated that as a result of an increase of 9.6 degrees C (17.2 degrees F) in the air temperature the mean pulse rate increased significantly, the mean systolic blood pressure showed no change and the mean diastolic blood pressure decreased significantly

Archives of Ophthalmology, Chicago

14 325 526 (Sept) 1935

- Diagnostic Value of Defects in Visual Fields and Other Ocular Disturbances Associated with Supratentorial Tumors of the Brain J H Globus and S M Silverstone New York—p 325
- Lattice Type of Corneal Dystrophy T M Shapira Chicago—p 387
- Late Traumatic Roset Cataract L Lugli, Bologna Italy—p 392
- Larocaine a New Anesthetic L L Mayer Chicago—p 408
- Genesis of Refraction of Human Eye S Ochapovsky Krasnodar U S S R. edited by B Friedman New York—p 412
- *Analysis of Fifty Five Cases of Tobacco-Alcohol Amblyopia F D Carroll New York—p 421
- Filaria Subconjunctival Report of Case J S Cregar East Orange N J and E B Burchell New York—p 435
- *Cervical Sympathectomy in Retinitis Pigmentosa Preliminary Report on Results G de Takáts and S R Gifford Chicago—p 441
- Checking Station for Tonometers A Posner New York—p 453
- Retinoscopy at a Definite Distance J D Weintraub Cincinnati—p 458
- Is Full Correction of Value in Checking Progress of Myopia? D M Rollett New York—p 464
- Provisions for Schooling of Blind and Partially Blind E M Van Cleave New York—p 473

Tobacco-Alcohol Amblyopia—Carroll studied fifty-five cases of toxic amblyopia associated with the use of tobacco and alcohol He feels that the diagnosis could be made earlier and more often if studies with the tangent screen were performed more frequently The condition should not be confused with early senile macular degeneration The amblyopia may

develop after the use of only moderate quantities of tobacco and alcohol, and these substances should be considered as only two factors that when combined with others, bring about the disease Extensive medical, neurologic, dental and otologic examinations were carried out on the patients, and the results are presented The progress of the disease was followed by numerous ophthalmic re-examinations over a period of many months and the relation of abstinence to improvement was especially noted The value of abstinence is stressed but cases are cited in which the patients improved without markedly decreasing their use of tobacco and alcohol There is great variability in the normal course of the disease, and this should be considered in attempting to evaluate the effect of any treatment

Cervical Sympathectomy in Retinitis Pigmentosa—De Takáts and Gifford performed sympathetic denervation of the eye to improve the visual acuity and visual fields of six patients suffering from retinitis pigmentosa Of eleven operations four consisted of cervicodorsal and seven of superior cervical ganglionectomies The latter, particularly if combined with a stripping of the internal carotid artery, seems to be the simplest and most constantly reliable method of obtaining complete sympathetic denervation The test of complete sympathetic denervation was the failure of cocaine to dilate the contracted pupil Not one of these patients showed an increase in visual acuity or in the visual fields One younger patient reported an improvement in night blindness None of them showed progress of the disease, but the longest period of observation was only a year and a half The only possible benefit of sympathectomy on dark adaptation and minimal light perception in these patients seems to be that which might arise from halting the progress of the disease A later report will be necessary to recommend or condemn the procedure definitely

Archives of Surgery, Chicago

31:507 676 (Oct.) 1935

- *Fascial Sarcoma and Intermuscular Myxoliposarcoma J Ewing New York—p 507
- Anal Ducts Comparative and Developmental Histology C C Tucker and C A Hellwig Wichita Kan—p 521
- Fibrosarcoma of Right Forearm with Extensive Growth into Cephalic Vein G G Davis Chicago—p 531
- *Clinical and Histologic Changes Produced in Carcinoma of Cervix by Different Amounts of Roentgen Radiation Comparison A N Arneson and F W Stewart, New York—p 542
- Longitudinal Growth of Long Bones J D Bisgard and M E Bisgard Omaha—p 568
- Clean Intestinal Anastomosis II Experimental Study E J Poth San Francisco—p 579
- Pendulous Hypertrophic Breast Comparative Values of Present Day Methods of Repair and Procedure of Choice J W Mahniak New York—p 587
- Multiple Meningiomas Report of Case in Which Three Intracranial Meningiomas Were Removed Successfully J E. Raaf and W M Craig Rochester Minn—p 601
- *Acute Abdominal Pain in Sickle Cell Anemia E. H Campbell Jr Albany N Y—p 607
- Changes Produced by Various Operations on Stomach Shown by Use of Modified Acid Test Meal F C Hill L C Henrich and C M Wilhelm, Omaha—p 622
- Fatal Cases of Septicemia Caused by Bacillus Coli Following Gastric Operations F W Hild Cleveland—p 632
- *Experimental Staphylococcal Suppurative Arthritis and Its Treatment with Bacteriophage G A L Inge and J W Toumey Jr New York—p 642
- Effect of Diet on Weight of Liver and Glycogen Concentration in Partially Hepatectomized Rats C S Stone Jr Santa Barbara Calif—p 662

Fascial Sarcoma—Ewing points out that the term fascial sarcoma should be restricted to the fibromas, fibrosarcomas, fibrochondromas or parosteal osteosarcomas originally described and designated as fascial sarcoma by Virchow It should not be employed for intermuscular myxosarcomas The intermuscular myxosarcoma, often called fascial sarcoma, is probably derived from fat lobules and presents the structure of embryonal mucous tissue or embryonal fat tissue It is rarely, if ever, of traumatic origin and is often radiosensitive The common liposarcoma of the trunk and limbs is derived from adult fat tissue and presents the structure of large granular cells, such as those seen in chronic inflammation of fat tissue The structure varies greatly with the degree of malignancy It seems to be occasionally of traumatic origin. The degree of radiosensitivity of the primary tumor is uncertain, but the recurrent

tumors are radioresistant. It appears that two types of liposarcoma may be recognized, one the myxoliposarcoma of embryonal structure and the other the granular cell liposarcoma of the adult type. Liposarcoma of both types is comparatively common in the region of the hip, knee, shoulder and trunk. It runs a characteristic clinical course, usually recurring after operation and proving fatal from infection, sepsis and metastases to the lungs. Since some are radiosensitive, it is recommended that all bulky tumors of the soft parts be submitted to treatment with high voltage radiation before surgical intervention is resorted to.

Changes Produced in Carcinoma of Cervix by Roentgen Irradiation—Arneson and Stewart call attention to the necessity of delivering a larger dose of external radiation to the parametrium if any advance is to be made in the cure of cervical carcinoma. The treatment recommended consists in increasing the target skin distance for external irradiation from 50 to 70 cm, using multiple portals (from four to six) and delivering at least 2,000 roentgens to each field within a period of about three weeks. This method delivers approximately from 3 to 3.2 threshold erythema doses to the cervix and somewhat less to the parametrium if four portals are used, and slightly more if six portals are employed. The percentage of satisfactory clinical regressions parallels the increase in the doses. The microscopic regressions tend to parallel the clinical regressions. Polypoid lesions show the greatest clinical regression with external irradiation. Crateriform lesions appear the least susceptible. The latter usually constitute a more advanced clinical type of disease. Local cure from external irradiation is exceptional with the doses used. Complete temporary epithelialization of the primary lesion is not uncommon. Despite successive biopsies showing progressive degeneration of the tumor and occasionally complete disappearance of disease in one or more specimens examined at the end of the period of external irradiation, the tumor tends almost inevitably to reappear in a histologic form that is apt to resemble closely the initial tumor. Hence restraint of growth is but a transient phenomenon. For this reason the authors have little hope that the methods described will control more than a minor percentage of tumors with parametrial extensions. It is thought, however, that the dose to the parametrium may be increased.

Acute Abdominal Pain in Sickle Cell Anemia—Campbell enumerates the abdominal symptoms and signs most commonly found in sickle cell anemia and reports six cases in which the abdominal manifestations were conspicuous. Many patients with the active form of the disease at times have attacks of acute abdominal pain, fever, mild jaundice and leukocytosis. The pain may be in the left upper quadrant, suggesting splenic infarcts, or in the epigastrium and right upper quadrant, simulating cholecystitis or hepatic tenderness from other causes or even gastric or duodenal disease. Again, there may be a cramplike pain, either generalized or localized in the epigastrium, associated with nausea, vomiting, obstipation and distention and strongly suggesting intestinal obstruction. Instances are known in which acute appendicitis has been mimicked, and on occasions acute salpingitis has been erroneously diagnosed. The symptoms and signs may vary in the same person from day to day, so that more than one abdominal condition is portrayed. The establishment of the presence of sickle cell anemia and the decision that the abdominal symptoms are or are not attributable to this disease are the two obvious steps in the diagnosis. Leukocytosis is usually present in the abdominal crises of sickle cell anemia and is often much higher than that which would be expected of the simulated disease. Jaundice due simply to uncomplicated sickle cell anemia is not obstructive, hyperbilirubinemia, hyperurobilinuria and usually an indirect van den Bergh reaction and urobilin in the highly colored stools are present. The most widely accepted theory is that pain is due to infarcts in the spleen or to the perisplenitis so frequently observed at necropsy. These could account for many of the symptoms, particularly the pain in the left upper quadrant and epigastrium and perhaps the tympanites. They do not so readily explain the pain and tenderness in the right upper quadrant and over McBurney's point or that in the lower part of the abdomen. Enlargement of the liver may in some way be responsible for the hypochondriac pain on the right side, but this is not likely. There is no specific therapy for the disease or for the abdominal

crises. General supportive measures, hygienic improvements and transfusions, if the hemoglobin concentration is very low, are customarily employed for the disease itself. For the abdominal manifestations a policy of watchful waiting with mild sedatives, heat and enemas is all that seems advisable. Patients with this disease not seldom become candidates for some form of operative therapy unconnected with the anemia. Patients with the latent form stand such procedures as well as other people, but patients in whom the disease is or has been in active phase may occasionally do very badly.

Experimental Staphylococcal Arthritis and Bacteriophage—Inge and Toumey tested the efficacy of bacteriophage therapy in infections of the joints under controlled conditions in six series of dogs (from four to sixteen). 1 Suppurative arthritis of the knee was produced and left untreated to determine the course of the disease. 2 The effect of repeated injections of bacteriophage alone and of broth alone were studied. 3 Purulent arthritis was produced in both knees with subsequent repeated injections of bacteriophage into the left knee, the right remaining as a control. 4 Bacteria suspended in broth were injected into the right knee, and into the left knee the same dose of bacteria suspended in bacteriophage was injected, no subsequent bacteriophage treatments were given. 5 Dogs were treated as in series 4, but with a more potent bacteriophage. 6 A bacteria-bacteriophage mixture incubated for varying lengths of time before the injections were made was injected into the left knee, while bacteria alone were injected into the right knee as a control. The experiments establish the following facts: 1 Acute suppurative arthritis can be produced in the dog's knee with the staphylococcus, the lesion showing a tendency to subside spontaneously and the duration of the infection varying in different dogs. 2 Repeated injections of bacteriophage alone into the knee joint of a normal dog are not without some danger of the formation of mild acute synovitis. 3 Repeated injections of broth alone into the normal knee cause no such arthritis. 4 Bacteriophage is useless as the sole means of protecting a joint against a closed suppurative arthritis. 5 The failure of bacteriophage to act in such a situation is due to complicated biologic reactions not elucidated by this series of experiments but probably in great part related to the inactivation of bacteriophage by body fluids. 6 The presence of serum "antiphage" does not exert any deleterious influence on the outcome of such experiments.

Journal of Nutrition, Philadelphia

10: 233-350 (Sept. 10) 1935

- New Toxicant Occurring Naturally in Certain Samples of Plant Foodstuffs XI Effect of Feeding Toxic and Control Foodstuffs Alternately K W Franke Brookings S D—p 233
 *Iron Requirement of Normal Human Adult G E Farrar Jr and S M Goldhamer Ann Arbor Mich—p 241
 Metabolism in Rat of Naturally Occurring Arsenic of Shrimp as Compared with Arsenic Trioxide E J Coulson Washington D C R E Remington and K M Lynch Charleston S C—p 255
 Nutritive Value of Animal Tissues in Growth, Reproduction and Lactation III Nutritive Value of Beef Heart Kidney Round and Liver After Heating and After Alcohol Extraction W H Seegers and H A Mattill Iowa City—p 271
 Some Effects of Cod Liver Oil and Wheat Germ on Retention of Iron, Nitrogen Phosphorus Calcium and Magnesium During Human Pregnancy Callie Mae Coons and R R Coons Stillwater Okla—p 289
 Food Value of Ethyl Alcohol H H Mitchell Urbana Ill—p 311
 Study of Iron Metabolism with Preschool Children Leah Ascham Experiment Ga—p 337
 Rats Milk and Stomach Contents of Suckling Rats D T Mayer Columbia Mo—p 343

Iron Requirement of Normal Adult—Farrar and Goldhamer observed a healthy man, aged 26, who carried on his usual duties as a graduate student for 316 days on a diet with an average daily iron content of 4.9 mg. During the last thirty-one days of this period the subject was in iron balance when the diet contained 5.2 mg of iron daily. The blood hemoglobin, blood iron and red blood cell levels were within normal limits. Two other male subjects were likewise in iron balance after four and five months on diets containing 7.1 and 7.8 mg of iron daily, respectively, and their blood contained normal amounts of hemoglobin and red blood cells. A young woman living for more than a month on a diet containing 9.1 mg of iron daily was in iron balance during the intermenstrual phase. The total menstrual blood loss represented 33 cc. of the sub-

ject's blood Normal urinary iron amounts to about 0.02 mg per hundred cubic centimeters of urine. These observations, together with those in the previous literature indicate that the iron requirement of the normal adult male is not more than 5 mg daily.

Medical Bull. of Veterans' Adm., Washington, D. C.

12 111 220 (Oct.) 1935

- Experiences with Collapse Therapy J. J. Beatty—p. 111
Spinal Anesthesia Ten Year Study M. Shimberg—p. 117
Regional Anesthesia G. E. Pfeiffer—p. 129
Psychoses of Presenium J. H. Baird—p. 135
Narcolepsy H. W. Baxley—p. 143
Detelectasis W. H. Watterson—p. 149
Myocardial Failure R. J. Coney—p. 154
*Food Poisoning in Hospitals and Domiciliary Institutions P. B. Matz—p. 159
Diathermy in Treatment of Pneumonia F. W. Schwarz—p. 167
Blood Sedimentation Test in Pulmonary Tuberculosis F. Shoemaker—p. 168
Postgraduate Training of Physicians of Veterans Administration L. G. Beardsley—p. 170
Identification of X-Ray Films in Court Trials H. A. Bardwell—p. 173
Pulmonary Abscess H. H. Gallatin—p. 178

Food Poisoning in Hospitals—Matz stresses the fact that insistence on personal cleanliness of the employees of the dietetic department of hospitals and domiciliary institutions is an insurance against outbreaks of food poisoning. It is essential that food handlers be instructed to scrub their hands with soap and water prior to the preparation of meals or the handling of food. As a means of preventing outbreaks all food handlers should be examined periodically to ascertain whether or not they are carriers of the bacteria that are commonly found in cases of food poisoning. Employees found to be such carriers should be promptly transferred from the dietetic department. The elimination of rodents, vermin and flies from the kitchens and dining rooms will prevent food poisoning, as they are carriers of bacteria, commonly the cause of such outbreaks. Insufficient refrigeration of cooked or uncooked foods is a frequent cause of food decomposition and outbreaks of food poisoning. Cooked or uncooked foods, as well as pastries, should not be left uncovered and at room temperature, thus inviting bacterial contamination and bacterial growth. The principal *Salmonella* group of organisms found in cases of outbreaks of food poisoning are *Salmonella aertrycke* (*Bacillus paratyphosus B*) of animal origin, *Salmonella enteritidis* of Gartner and *Salmonella cholerae-suis*. In addition the staphylococcus streptococcus and *Clostridium botulinum* are frequent bacterial contaminants of foods. All these organisms are capable of generating toxins that may contribute to the symptoms which usually accompany outbreaks of food poisoning. A review of the four outbreaks recorded by the author indicates that the principal factor responsible for the poisoning was insufficient refrigeration of various foods. There is a possibility that one outbreak was caused by staphylococci, which were found under the fingernails of food handlers.

Michigan State M. Society Journal, Grand Rapids

34 521 574 (Sept.) 1935

- Carcinoma of Uterus Its Early Diagnosis and Treatment W. D. Fullerton Cleveland—p. 521
Tuberculosis in Adolescent D. S. Brachman Detroit—p. 529
Acute Cataracts Presumably Due to Diminution of Therapy B. F. Glowacki Detroit—p. 535
*Bitterling Pregnancy Test R. G. Owen and H. E. Cope Detroit—p. 536
Recurrent Vomiting T. D. Gordon Grand Rapids—p. 537
Outbreak of Typhoid Fever Due to Carrier C. H. Benning Royal Oak—p. 541
Proper Treatment of Concomitant Convergent Strabismus L. J. Croll Detroit—p. 543
Aeroplane View of Medical Practice in Europe L. J. Gariepy Detroit—p. 546

Bitterling Pregnancy Test—Owen and Cope were unable to confirm the results of the bitterling pregnancy test reported by Kanter, Bauer and Klawans. Strongly positive results were obtained with seven out of twenty fish tested with specimens from nonpregnant women. These false positives occurred chiefly in premenstrual and postmenstrual specimens. Interval specimens were usually negative. False positive results were obtained with five out of sixteen fish tested with male urines.

New England Journal of Medicine, Boston

213: 505 550 (Sept. 12) 1935

- Physics of High Frequency Currents as Used in Medicine—Diathermy Radiotherapy and the Electric Knife E. L. Chaffee Belmont Mass—p. 505
Therapeutic Use of Short Wave Currents W. Bierman and M. Schwarzschild New York—p. 509
Diagnostic Possibilities in Soft Tissue Radiography J. R. Carty New York—p. 517
Routine Vision Testing of School Children Plea for Standardization J. J. Regan Boston—p. 519
*Arsenic in Human Tissues and Food Animals I. So-Called Normal Arsenic W. F. Boos and A. B. Werby Boston—p. 520
Trichinosis in Boston W. W. Spink and D. L. Augustine Boston—p. 527
Trichiniasis Among Jews H. Morrison Boston—p. 531
Energy Requirement in Strenuous Muscular Exercise H. T. Edwards A. Thorndike Jr. and D. B. Dill Boston—p. 532

213: 551 592 (Sept. 19) 1935

- Treatment of Compound Fracture of Skull Study of One Hundred and Eighty-Five Cases D. Munro Boston—p. 551
Lead Encephalitis Due to Triethyl Lead Report of Case K. M. Bowman and P. M. Howard Boston—p. 559
Adjustments During Four Years of Patients Handicapped by Poliomyelitis Ellen H. Barbour Lexington Mass—p. 563
Method of Repair of Femoral Hernias by Fascial Strip from Aponeurosis of External Oblique Muscle G. A. Marks Boston—p. 565
Congenital Pyloric Obstruction C. F. McGill Portsmouth N. H.—p. 567
Progress in Laryngology L. A. Schall Boston—p. 574

Arsenic in Human Tissues and in Tobacco—Boos and Werby find that all hair contains arsenic, that is to say, arsenic determinable by ordinary forensic analysis. This arsenic is being constantly excreted by the hair, which constitutes an important organ of elimination for this poison, but the expulsion of arsenic by hair is a comparatively slow process at any time. The arsenic is taken up by the roots of the hair, where it is fixed and, as the hair grows, any of the metal that has been absorbed grows out with it. They believe that the only logical answer to the increased amount of arsenic in the hair is that the food which we eat today contains more arsenic than was formerly present in food. Remington has noted that the arsenic of the body is usually attributable to food, because of (1) chemical treatment in manufacture, (2) absorption by plants from the soil, (3) presence in sea food and (4) the widespread use of arsenical sprays in America. Headden found that our virgin soils contain from two and one half to five parts per million of arsenic and the underlying marl from four to fifteen parts, and that the crops grown on such soils, and the animals fed on these crops contain arsenic. The arsenic content of American cod liver oils offers some startling information. Holmes and Remington in their examination of twenty samples, comprising six geographic types, found very high amounts of arsenic. The average arsenic content of the oils is calculated to the trioxide and was found from 18 to 44 parts per million. The examination of human bone in poisoning cases showed that, when the individual lived only a few hours, the amount in the bone was quite small, whereas the bone of patients who had lived several days showed a substantial quantity of arsenic. A study of the bones of food animals, purchased at a market, showed quite high figures, particularly the bones of beef cattle. Two popular pipe tobaccos and two well known cigaret tobaccos were examined and it was found that tobacco (pipe) A contained 133 tobacco (pipe) B 95, tobacco (cigaret) C 11 and tobacco (cigaret) D 9 parts of arsenic per million.

Philippine Journal of Science, Manila

57 1 148 (May) 1935 Partial Index

- Notes on Philippine Mosquitoes II. Uranotaenia Group F. E. Baisas Manila—p. 63

Psychoanalytic Quarterly, Albany, N. Y.

4 371 536 (July) 1935

- Quantitative Dream Studies Methodological Attempt at Quantitative Evaluation of Psychoanalytic Material F. Alexander and G. W. Wilson Chicago—p. 371
Psychoanalytic Study of Significance of Self Mutilations K. A. Menninger Topeka Kan—p. 408
Primal Scene Play and Destiny G. H. Graber Stuttgart Germany—p. 467
Psychogenesis of Organic Symptoms Note L. J. Saul Chicago—p. 476
Lactation in a Virgin W. Briel and E. W. Kulka, New York—p. 484

Public Health Reports, Washington, D C

50 1211 1238 (Sept 6) 1935

- Further Studies on Production of Dibenzanthracene Tumors in Pure Strain and Stock Mice H B Andervont—p 1211
 Acute Response of Guinea Pigs to Vapors of Some New Commercial Organic Compounds VIII Butanone F A Patty H H Schrenk and W P Yant.—p 1217

Review of Gastroenterology, New York

2 187 278 (Sept.) 1935

- The Gallbladder Problem M E Rehfuess Philadelphia—p 187
 *Study of Effects of Long Continued Basic and Acid Diet J C Doane, Philadelphia—p 194
 Tuberculous Ulcer of Stomach Report of Case with Necropsy Findings D M Grayzel New Haven Conn.—p 204
 Gastrointestinal Factors in Angina Pectoris J B Wolfe Philadelphia and Anna Samuelson New York—p 208
 Choline and Gastrointestinal Tract B Jablons and E Bader, New York—p 217
 Two Diabetic Cases Study in Social Background Dorothy E Flitcroft New York—p 222
 Public Health Nursing in the Health Triangle. Alma C Haupt New York—p 231

Effects of Long Continued Basic and Acid Diet—Over a period of approximately six weeks Doane studied the effect of basic diets on the acid-base regulatory mechanism, gastric acidity and chemical change of patients with arthritis hyperacidity and gastric ulcer. With diets predominatingly basic to a high degree, urine pH rose with maximal effects in some cases after the third week. The plasma carbon dioxide combining power and the blood pH resisted any change except to a minor degree. Gastric acidity was reduced in one patient but little or not at all in the other patients. Clinical improvement was particularly noted in one patient with arthritis characterized by lessened joint pain and beneficial effect on constipation and other intestinal symptoms. The effect of diets high in excess acid ash were studied on patients with achlorhydria and achylia including a group of five patients with pernicious anemia. In one patient with arthritis and achlorhydria there was a definite return of free hydrochloric acid. No definite change was noted in other cases of achlorhydria or achylia with pernicious anemia. Though consistently acid urines were obtained on this diet no constant change in blood pH was noted. An occasional lowering of the plasma carbon dioxide combining power was noted with no change in the blood pH , an indication of moderate compensated acidosis. The use of foods high in excess acid ash and iron is recommended for cases of hypochromic anemia with achlorhydria. A control group of patients receiving alternating basic and acid meals was observed. Though basic ash tended to exceed acid ash in these patients, little change in urine, blood or gastric reaction could be observed. These observations substantiated the thought that consistently high basic or acid diets for prolonged periods are necessary before demonstrable changes are to be expected. The separation of the ingestion of basic and acid foods from meal to meal has no scientific basis to support it as a therapeutic measure dependent on restoration and maintenance of the acid base equilibrium of the body.

Rhode Island Medical Journal, Providence

18 129 146 (Sept.) 1935

- Study of Nasal Infections J N Fishbein and E J Staff Providence.—p 129

South Carolina Medical Assn Journal, Greenville

31 145 166 (Aug.) 1935

- The Pediatrician Looks at the Tonsil R M Pollitzer Greenville—p 145
 Differential Diagnosis of Bright's Disease J A Bradley Florence.—p 151

Southwestern Medicine, Phoenix, Ariz

19 301 330 (Sept.) 1935

- Calcium Metabolism and Its Role in Healing of Diseased and Injured Tissues J W Flinn Prescott Ariz.—p 301
 The Juvenile Osteochondrodystrophies E W Johns Albuquerque N M.—p 306
 Interpretation of Blood Cholesterol Determinations R Davison Tucson Ariz.—p 311
 *Unusual Allergic Property of Autolyzed and Decomposed Proteins O H Brown Phoenix Ariz.—p 314

Unusual Allergic Property of Autolyzed and Decomposed Proteins—Brown states that autolyzed, fermented or decomposed proteins are more prone to act as allergens than

are fresh, unchanged proteins or normally digested proteins. Fresh foods may undergo spoiling in the alimentary canal before they have had a chance to undergo normal peristalsis. It would seem that in certain cases a mild intestinal stimulant taken with food may prevent allergic reactions by stimulating peristalsis, mixing food and alimentary canal secretions, allowing normal digestion and inhibiting bacterial putrefaction. Green fruits and vegetables as ordinarily obtained have had hours of exposure to temperatures that promote chemical change. Canned fruits and vegetables are probably generally taken with more or less dispatch from the picking to the cannery, where little time is supposedly lost in getting them into the can. This may be an argument for canned over fresh fruits and vegetables—unless they really are fresh. The long time that cereals are kept before they are consumed may have something to do toward promoting sensitizations to them.

Tennessee State Medical Assn Journal, Nashville

28: 361-402 (Sept.) 1935

- The Failing Heart C B Laughlin Greeneville.—p 361
 Brucella Infection (Undulant Fever Abortus Fever Malta Fever) with a Survey of Cases Occurring in Memphis and Shelby County—1934 W R Blue Memphis—p 365
 Ocular Tuberculosis—Tuberculin R J Warner Nashville—p 376
 Version Its Indications and Advantages G W Stone Knoxville.—p 382
 Renal Dwarfism P C Elliott Nashville—p 386
 Urologic Problems in Children of Interest to the General Practitioner G R Livermore Memphis—p 391

Texas State Journal of Medicine, Fort Worth

31 307 364 (Sept.) 1935

- Cancer As We Comprehend It A C Broders Rochester, Minn.—p 312
 Early Diagnosis of Cancer of Cervix and Body of Uterus. T A Pressly San Antonio—p 316
 Surgery in Carcinoma of Uterus Cervix and Body A L McMerrey Houston—p 318
 X Rays and Radium in Treatment of Carcinoma of Cervix and Fundus R H Mullen Dallas—p 321
 Cancer of Uterus from the Pathologist's Point of View J L Gelfink Dallas—p 324
 Modern Refinements in Cataract Extraction R K Daily Houston—p 330
 Periummon Phytozoar in the United States F Y Durrance, Houston—p 336
 Uterine Hemorrhage Its Pathology and Clinical Significance. B F Stout and D A Todd San Antonio—p 340
 *Use of Sclerosing Solution in Cure of Chronic Sinuses M W Sherwood, Temple—p 347

Sclerosing Solution in Treatment of Sinuses—Sherwood states that in 1933 Cutler and Zollinger called his attention to the use of sclerosing solution in the treatment of cysts and fistulas. During his work in the empyema service in the government hospitals during the World War he used 20 per cent bismuth and cottonseed oil in empyema cavities and branchial fistulas to outline the cavities and the fistulas. He found that in practically every instance of chronic empyema the bacterial count was rapidly lowered by these injections, even more so than with the use of standardized surgical solution of chlorinated soda. He also found that a number of branchial fistulas healed rapidly in some instances and slowly in others from the bismuth and cottonseed oil injections. Since then he has tried this in other sinuses and fistulas about the body with surprisingly good results. Two of the cases that he reports, in which the repeated injections of bismuth had failed, led to the trial of the modified Carnoy's solution, as suggested by Cutler and Zollinger. Since then he has cured several patients and is trying this treatment in other cases. Sufficient time has not elapsed to justify presenting the end results.

West Virginia Medical Journal, Charleston

31: 437-484 (Oct.) 1935

- Our Changing Times M Fishbein Chicago—p 437
 Evolution of Otolaryngology as a Medical Specialty J E Brown Sr., Columbus Ohio—p 448
 Anesthetic Hazards in Patients with Heart Disease D C Ashton, Beckley—p 458
 Diagnosis and Treatment of Carcinoma of Rectum. A E Weinstein Steubenville Ohio—p 461
 Presacral Neurectomy for Certain Vesical Conditions. O H Fulcher Welch—p 465

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

32: 163-240 (July-Sept.) 1935

- Contribution to Epidemiology of Acute Poliomyelitis H. Wennerberg—p. 163
Neurologic Complications of Varicella: Clinical and Epidemiologic Study E. A. Underwood—p. 177
Analysis of Over Four Thousand Cases of Educational Deafness Studied During the Past Twenty Five Years M. Yearsley—p. 196

British Journal of Physical Medicine, London

10: 57-72 (Aug.) 1935

- Rheumatoid Arthritis: Its Etiology and Treatment by Diathermy C. A. Robinson—p. 58
Restoration of Skin Function by Octozone Therapy Sheila Macpherson—p. 63

British Medical Journal, London

2: 439-484 (Sept. 7) 1935

- Injuries to Semilunar Cartilages C. A. Pannett—p. 439
Addiction to Endocrine Gland Extracts S. W. Patterson—p. 442
*Essential Purpura Haemorrhagica B. Myers—p. 445
High Blood Pressure Note J. Hartsilver—p. 449
Scarlet Fever: Attempted Immunization in Public School L. R. Lempiere—p. 450
Chronic Amebiasis and Chronic Appendicitis W. Wilkinson—p. 452

Essential Hemorrhagic Purpura—Myers points out that in essential hemorrhagic purpura the spleen is not enlarged clinically or as seen at operation or after examination by the pathologist. There may be cases in which the spleen is enlarged temporarily. The presence of thrombocytopenia, increased bleeding time, from twenty to thirty minutes or even ninety minutes or more in rare cases and a positive capillary resistance test are valuable aids in the diagnosis of essential hemorrhagic purpura. The blood coagulation is practically normal, in marked contrast with hemophilia. Acute, chronic and intermittent forms of essential hemorrhagic purpura are described. The disease should always be looked on as serious. A case that may not appear to endanger the life of the individual may terminate with tragic suddenness. The author has treated five typical cases of essential hemorrhagic purpura, all of which have been cured by splenectomy. As a temporary measure in severe bleeding from hemorrhagic purpura blood transfusion is distinctly valuable, but the good effects are likely to last only for from ten to fourteen days. Neither drugs nor thromboplastin serum are of any real value. Tying the splenic vein has been practiced by some, but, if the causative agent should prove to be a toxic substance present in the spleen, splenectomy is preferable. The usual practice is not to do a splenectomy if the red cells are below 2 million per cubic millimeter and only then after a blood transfusion.

2: 485-526 (Sept. 14) 1935

- Hospital Problems J. Barrett—p. 485
Fractures of Neck of Femur E. W. H. Groves—p. 491
Radiographic Diagnosis in Diseases of Lungs J. G. Edwards—p. 493
The Child Guidance Clinic H. Sutton—p. 495
*Wire Extension in Treatment of Mandibular Fractures R. Brooke—p. 498
Laryngeal Granuloma Following Intratracheal Intubation R. B. Gould—p. 499

Wire Extension in Treatment of Mandibular Fractures—To overcome the eventuality of a displaced position of the lower and upper jaws in mandibular fractures when reduction is impossible because of local edema and sepsis Brooke has applied the principles in use in the treatment of fractures of the long bones. A Kirschner's wire is passed transversely through the symphysis of the mandible and vertical weight extension is applied by means of pulleys attached to a Balkan frame. The head is held down by webbing straps to the bed. It is found that with this form of treatment the patient experiences great relief from pain and is able to open the mouth much more freely almost at once. Liquid food is given at first, followed later by soft solids. The extension is left on until the local condition in the mouth has improved to such a degree that it is possible to fit a dental splint of the usual pattern. Not only is there great relief from pain but the position of the fractured fragments is greatly improved and alignment is restored.

Indian Medical Gazette, Calcutta

70: 481-540 (Sept.) 1935

- Preliminary Report on Epidemic Dropsy Outbreak in Parulia R. N. Chopra and R. N. Chaudhuri—p. 481
Ocular Complications of Epidemic Dropsy E. O. Kirwan—p. 485
Pathology of Epidemic Dropsy M. N. De and K. D. Chatterjee—p. 489
Cutaneous Manifestations of Epidemic Dropsy Part I: Clinical Study R. N. Chopra and R. N. Chaudhuri—p. 493
Id. Part II: Histopathologic Study R. N. Chopra, R. N. Chaudhuri and D. Panja—p. 496
Observations on Epidemic Dropsy Cases Admitted into the Tropical Diseases Hospital from 1922 to 1933 R. N. Chopra and S. N. Bhattacharya—p. 498
Incidence of Cerebrospinal Fever in Borstal Institution and Central Jail Lahore During 1934 with Note on Use of Antimeningococcus Prophylactic Vaccine M. Jacob—p. 502
Short Account of Ten Cases of Eclampsia Treated by Intravenous Injections of Magnesium Sulphate M. M. Nolan—p. 503
Estimation of Minute Quantities of Atabrine in the Blood R. N. Chopra and A. C. Roy—p. 504
Unusual Identification of Explosive N. J. Vazifdar—p. 506

Journal of Pathology and Bacteriology, Edinburgh

41: 221-372 (Sept.) 1935

- Pulmonary Artery Thrombosis with Ayerza's Syndrome Case G. L. Montgomery—p. 221
Experimental Production of Sarcoma in Rats and Mice by Colloidal Aqueous Solution of 1,2,5,6-Dibenzanthracene E. Boyland and H. Burrows—p. 231
*Pathogenic Diphtheroid Bacillus from Fatal Case of Meningitis H. J. Gibson—p. 239
Late Relapses and Apparently Spontaneous Cure of Untreated Relapses in Experimental Trypanosoma Brucei Infections Treated by Chemotherapeutic Agents C. H. Brownning and R. Gulbransen—p. 253
Relation of Oligocytes and Astrocytes in Cerebral Tumors Eugenia R. A. Cooper—p. 259
*Liver Changes in Exophthalmic Goiter G. R. Cameron and W. A. E. Karunaratne—p. 267
Liver Regeneration and Biliary Obstruction G. R. Cameron—p. 283
Mixed Tumors of Palate: Report of Four Cases L. J. Davis—p. 289
Suprarenal in Cholesterol Fed Rabbits W. W. Kay and R. Whitehead—p. 293
Staining of Fat with Sudan IV W. W. Kay and R. Whitehead—p. 303
Involution of Permanent Cortex of Rabbit Suprarenal by Fatty Change R. Whitehead—p. 305
Mitochondrial Changes in Autoplastic Liver Transplants E. S. Duthie—p. 311
Histologic Changes in Organs of Rats Injected with Estrone Alone or Simultaneously with Estrone and Testicular Hormone V. Korenchevsky and M. Dennison—p. 323
*Change in Basophil Cells of Pituitary Gland Common to Conditions Which Exhibit Syndrome Attributed to Basophil Adenoma A. C. Crooke—p. 339
Lympho-Epithelioma of Thymus T. T. Wu—p. 351

Diphtheroid Bacillus from Fatal Case of Meningitis—Gibson describes a fatal case of meningitis due to an organism resembling that (*Corynebacterium parvulum*) described by Schultz and his co-workers. The lesions produced appear to have resulted from invasion by a nontoxicogenic type of diphtheroid bacillus. A study has been made of its morphologic, cultural and biochemical characters and of its pathogenicity. It is highly virulent for rabbits, guinea-pigs, rats and mice and its effect is not neutralized by the antitoxins of *Corynebacterium diphtheriae* or *Corynebacterium ovis*. Efforts to demonstrate an exotoxin have failed and indirect evidence has been presented suggesting that the pathogenic effects are not due to toxic action.

Liver Changes in Exophthalmic Goiter—Cameron and Karunaratne attempt to show by grouping their thirty cases that a certain proportion of fatal exophthalmic goiter cases (about two out of three) display changes of the liver independently of passive venous congestion. They find it possible to distinguish between cases in which passive venous congestion, usually the result of cardiac failure is primarily responsible for the pathologic alterations and those in which the changes are independent of stasis. The latter however, may be complicated by venous congestion. In their thirty cases, ten showed various grades of nutmeg liver, of the remaining twenty, six presented some evidence of stasis also. Fatty change has been an almost constant finding (twenty-six cases), and they attach little significance to it. When it is associated with definite necrosis, they regard the resulting condition as evidence of a severe toxemia and in all probability the basis of the more chronic changes, which they have called atrophy and cirrhosis. They consider that the cases with chronic changes of atrophy,

fibrosis and regeneration form a group in which the frequency of occurrence and the constant pathologic picture must be related causally to the complex of exophthalmic goiter. They recognize three types of change in the liver associated with exophthalmic goiter: (1) cases with acute damage (marked fatty change and/or acute liver necrosis), (2) cases with evidence of progressive damage (various stages of cirrhosis), and (3) arrested cases (nodule formation, atrophy).

Hyaline Change in Basophil Cells of Pituitary—Crooke discusses a hyaline change in the basophil cells of the pituitary gland that does not appear to be an expression of cell degeneration in the ordinary sense but is probably an expression of altered physiologic activity. It was found in slight amount in a few basophil cells of the anterior lobe in only nine out of some 350 pituitary glands from various conditions in which the syndrome attributed to basophil adenoma was absent. Its presence in examples of the different conditions in which it was thus found was inconstant and exceptional. It was found in large amount in many basophil cells in the acini of the anterior lobe in all twelve available examples of the syndrome attributed to basophil adenoma, whether this was associated with a basophil adenoma, a neoplasm of the thymus or a neoplasm or hyperplasia of the adrenal cortex. Analysis shows that this conspicuous amount of hyaline change was the only abnormality common to all twelve examples of the syndrome, and it is concluded that it is the abnormality of fundamental significance.

Lancet, London

2 539 592 (Sept 7) 1935

Chronic Constrictive Pericarditis (Pick's Disease) Treated by Pericardial Resection P D White—p 539

*Observations on Anemia in Chronic Rheumatic Diseases D H Collins—p 548

Simple Ulcer of Large Bowel R A Kerr—p 550

Observations on Chorea Environmental Factor G F Walker—p 553

Anemia in Chronic Rheumatic Diseases—Collins has observed twelve patients with chronic rheumatism and a severe or moderate anemia, who were given massive doses of iron and observed for periods up to twenty-one days, seven totally failed to respond and only two showed any marked improvement. Anemia, due to a diminished hemoglobin content of the blood with a relatively insignificant fall in the red cell count, is common among patients having chronic rheumatic conditions. The more severe degrees of anemia are seen almost entirely in cases of atrophic (rheumatoid or 'infective') arthritis. Deficient gastric secretion is not a constant factor in the production of anemia in these cases. Anemia of equal severity is encountered in cases with normal fractional test meal curves, as in cases with deficient acid secretion. There is no specific anemia accompanying the chronic rheumatic conditions. The anemia is a simple hypochromic one secondary to the disease process.

2: 593 646 (Sept 14) 1935

Perforation of Esophagus by Swallowed Foreign Bodies J E G McGibbon with radiologic notes by J H Mather—p 593

Chronic Constrictive Pericarditis (Pick's Disease) Treated by Pericardial Resection P D White—p 597

Treatment of Obesity J H Anderson—p 604

Observations on Biliary Drainage. T Hunt—p 608

Agranulocytic Angina Case B J Boulton—p 610

*Right-Sided Eventration of Diaphragm Notes on Case F G Nicholas and A M Nussbrecher—p 611

*Acetylsalicylic Acid (Aspirin) Poisoning S C Dyke—p 613

Papilledema Caused by Cervical Cord Tumor D McAlpine—p 614

Right-Sided Eventration of Diaphragm—Nicholas and Nussbrecher report a case of right-sided eventration of the diaphragm in the differential diagnosis of which paralysis of the diaphragm, eventration, hernia and absence of the right half of the diaphragm was considered. The negative history and the roentgenographic and clinical observations ruled out the first, and the roentgenogram showing an unbroken dome of the right side of the diaphragm eliminated the third and fourth possibilities. Therefore the diagnosis of right-sided eventration was the only other possibility and it was concluded that it was of congenital origin. The authors warn against indiscriminate needling of the chest in obscure cases, because there is great danger of perforating a viscus unless eventra-

tion or hernia of the diaphragm has been eliminated. The condition gives rise to hardly any symptoms, and the likelihood of serious disability in the future appears remote.

Acetylsalicylic Acid Poisoning—Dyke describes a case of poisoning by acetylsalicylic acid in which the clinical manifestations pointed to a profound disturbance of metabolism and to toxemia with a heavy incidence on the higher nervous centers. In the early stages the extreme hyperpnea was a marked feature. If the hyperpnea had been due to actual liberation of acid radicals from the ingested compound, it might have been supposed that the urine would be strongly acid, but the urinary pH was found to range from 5.8 to 6.4. Evidence of the widespread nature of the toxemia was afforded by the urine, which showed (in addition to acetone) bile salts, albumin and granular casts, which made it evident that both the liver and the kidneys were damaged severely. Albumin was present at first in large amount and on the fifth day was still present in traces, bile salts remained present in fair amount throughout the period of observation. The temperature ranged from normal to 101 F during the first four days. No physical signs indicative of inflammation that might account for the pyrexia could be found. The obvious indications for treatment were to correct the dehydration, combat the acidosis and support the liver against further damage. To this end dextrose-containing fluids were pushed in every possible way. The beneficial effect of lumbar puncture was striking, on both occasions on which it was performed it was followed by a sudden and definite improvement in the general condition. The very strong reaction with ferric chloride given on both occasions by the cerebrospinal fluid would indicate the presence in it of large amounts of the drug, and it is reasonable to suppose that benefit was due to removal from contact with the central nervous system of fluid saturated with the noxa. The beneficial effect of drainage of the cerebrospinal fluid in the present case is in conformance with general experience in barbiturate poisoning, in which also the noxa is taken up in large amount by the fluid.

South African Medical Journal, Cape Town

9 549 584 (Aug 24) 1935

Heart Pain E E Wood—p 551

Effect of Compulsory Segregation of Lepers in Basutoland. P D Strachan—p 554

Eclampsia I Incidence and Etiology A I Goldberg—p 556

Id II Eye Changes During Pregnancy with Especial Reference to Eclampsia J S du Toit—p 559

Id III Treatment of Eclampsia. E C Crichton—p 560

Id IV Notes on Eclampsia A S Wells—p 562

Japanese Journal of Gastroenterology, Kyoto

7 57 114 (July) 1935

Existence of Substances Promoting Liver Function in Blood and Urine

Report II Urine N Mizuta and T Matsuura—p 57

Quantitative Changes in Enzymes in Liver and in Various Tissues in Case of Impaired Renal Functions. S Murata—p 69

Significance of Liver for Metabolism of Lactic Acid I Ohashi—p 88

Studies on Metabolism of Inorganic Salts and Water in Hepatic Disturbances Report III Metabolism of Inorganic Salts Perfusion

Experiment of Extirpated Liver H Shigemitsu—p 104

Id Report IV Metabolism of Water H Shigemitsu—p 111

Journal of Oriental Medicine, Dairen, South Manchuria

23 9 20 (Aug) 1935

Origin of Parietal Branches of Aorta in Chinese. K Miyashita—p 9

Biochemical Investigation on Blood Serum After Irradiation with Artificial Light V Colloid Reaction in Blood Serum After Irradiation with Artificial Light M Murayama—p 11

Prophylactic Inhalation Against Scarlet Fever in Adults. G Ishiyama—p 12

Studies on Scarlet Fever Toxin III Purification of Scarlet Fever Toxin and Anatoxin Toxin Production of Scarlet Fever Streptococcus in Semisynthetic Mediums S Nagata—p 13

Effect of Ethereal Oil of Allium Scorodoprasum on Blood Picture. T Miyamoto—p 14

Relationship Between Digestive Absorption and Diet of Unpolished Rice A Abe U Takei O Ueno T Miyamoto and F Etô—p 15

Comparative Studies of Arteriosclerosis Caused by Test Feedings of Two Kinds of Thyroid Gland Substances Kan Jin Nan—p 16

Influence of Blood Transfusion on Function of Reticular Endothelial System M Okamoto—p 17

Effect of Formaldehyde on Serum Protein A Abiko—p 18

Effect of Formaldehyde on Egg Albumin A Abiko—p 19

Effect of Formaldehyde on Toxicity of Histamine, Peptone and Ammonium Salts A Abiko—p 20

Lyon Chirurgical

32 513 639 (Sept Oct.) 1935

- *Cystic Disease and Its Treatment by Estrogenic Substance E Dahl Iversen—p 513
- Complications of Adrenalectomies Arkannikowa—p 547
- Evolution of Sacral Methods in Operation for Rectal Cancer F Mandl—p 566

Treatment of Cystic Mastitis by Estrogenic Substance—Dahl Iversen states that the characteristic sign of cystic mastopathy is the appearance of cysts of the galactophore canals and lobules, all the new growths are irregular, and the pericanalicular and periacinous connective tissues proliferate considerably and become the site of a round cell infiltration. A number of theories have been advanced to explain these changes, among them that the primary factor is a dystrophy or senile regression of hormone secretion. The author observed the effects of ovarian hormones on the breasts of noncastrated rabbits and of infant and adult female guinea-pigs. Both estrogenic substance and lutein were used in the injections. Several results were common to the two substances. The hormones caused only a physiologic hyperplasia when administered in large quantities. The glandular system dilated uniformly and to a greater degree after the administration of lutein. The lumens were filled with a homogeneous eosinophile secretion. The epithelium kept its normal aspect and neither atrophied nor proliferated toward the lumen. Neither the pericanalicular nor the periacinous connective tissues proliferated. Dahl Iversen concludes as a result of these observations on fifty-four animals and thirty-three controls that no changes comparable to cystic mastopathy result from the administration of estrogenic substance or lutein. There is incontestable evidence, however, that estrogenic substance often has a favorable subjective as well as objective effect in human cystic mastopathy. The action on the diseased breast, therefore, seems to differ from that in the normal animal.

Schweizerische medizinische Wochenschrift, Basel

65 937-956 (Sept 28) 1935 Partial Index

- Surgery and Radiations in Treatment of Cancers H Hartmann—p 937
- Physical Therapy at Swiss Lakes P M Besse—p 942
- Experimental Studies on Biologic Action of So-Called Earth Rays E Jenny A Ochler and H Stauffer—p 947
- New Alkaloid of Ergot. E Rothlin—p 947
- *Comparison Between Micromethod and Macromethod of Sedimentation of Erythrocytes O Merkelbach—p 949

Sedimentation of Erythrocytes—Merkelbach points out that the question is often asked whether a micromethod gives just as reliable results as the macromethod in the determination of the sedimentation speed of the erythrocytes. The micromethod has the advantage of making a venous puncture unnecessary. The author made comparative tests with the Westergren method and the micromethod of Langer. On the basis of observations on 256 patients, the author reaches the conclusion that the micromethod of Langer cannot be the method of choice for the determination of the sedimentation speed of erythrocytes, for its results differ too greatly from those obtained with the Westergren method. The author considers a greater uniformity advisable in the determination of the sedimentation speed of erythrocytes and for this reason advises adoption of the Westergren method as the standard method.

Polichinico, Rome

42 1943 1986 (Oct 7) 1935 Practical Section

- *Cycle of Development of Oxyuris in Intestine of Man G Penso—p 1943
- Cyst of Mesentery Case. G Muzzarelli—p 1950

Life Cycle of Oxyuris in Man—Penso calls attention to the importance of the life cycle of Oxyuris, which passes the adult and coupling phases of its life in the lumen of the intestine. The females, after coupling, perforate the intestine and pass from the lumen to the submucous membrane of the intestinal walls. There they lay eggs, the larvae of which, after development, perforate the intestinal wall and pass from the submucous membrane to the lumen of the intestine for repetition of the same cycle. The biologic cycle of Oxyuris lasts twenty days. The author proves that there is no auto-infestation by Oxyuris. The persistence of the infestation and the difficulties

of the treatment are due to the duration of the biologic cycle, on the one hand, and to the fact that anthelmintics kill the parasites in the lumen of the intestine but cannot act on those lodged in the submucous membrane of the intestine, on the other. The author believes that good results might be secured by administering anthelmintic drugs for three consecutive days, at intervals of twenty days. However, because of the possibility that different groups of Oxyuris might have their cycles between the intervals it would be preferable to find a drug, perhaps an antimonial preparation, which, given parenterally, would have a parasitic action on the parasites lodged both in the lumen of the intestine and in the intestinal walls.

Prensa Médica Argentina, Buenos Aires

22 1753-1798 (Sept 11) 1935

- Indications of Rectal and Vaginal Touch in Obstetrics O Jurgens—p 1753
- *New Maneuver for Abdominal Examination G A Mortola—p 1760
- Rare Vertebral Congenital Abnormality Vertebral Telescopage Roentgen and Clinical Study J R Abdala—p 1765
- Anatomoclinical Forms of Pulmonary Syphilis in Adults D Vifoli—p 1770

New Maneuver for Abdominal Examination—Mortola describes a maneuver for abdominal examination that consists in slipping the parietal layer of the peritoneum over the visceral layer by the following technic. The patient is in the dorsal decubitus with the abdominal muscles relaxed. The physician takes between the thumbs and index fingers of both hands a large fold of the anterior abdominal wall at the lower right and left quadrants to discover any cutaneous hyperesthesia and then exercises traction on the cutaneous folds. When the parietal layer slips over the visceral layer in the pathologic zone an intense pain is produced. The positive results are of value in the diagnosis of chronic conditions of the abdomen, especially in chronic appendicitis. In these cases it coexists with a positive McBurney sign. The maneuver gives also positive results in acute appendicitis and in tuberculous peritonitis without ascites. The fact that the reaction is positive in many cases after appendectomy and becomes negative when the peritoneal inflammation subsides proves that the reaction is not appendicular but peritoneal. The intensity of the reaction is related to the peritoneal inflammatory process. In all cases in which the maneuver provoked pain in one or both sides of the abdominal surface, unilateral or bilateral lesions of the peritoneum were found at operation. The author performed the maneuver in about 130 cases, in twenty-seven of which operation was performed.

Archiv für klinische Chirurgie, Berlin

182 459 648 (Aug 26) 1935 Partial Index

- *Substitutes for Blood Konrich—p 459
- Experimental Studies on Behavior of Cerebral Pressure in Fat Embolism Frey—p 581
- *Is Severing of Connecting Bridge of Healthy Horseshoe Kidney a Justifiable Intervention? R Chwalla—p 590
- Experiences with Physiologic Tendon Transplantation on Feet in Poliomyelitis F Mommsen—p 599

Substitutes for Blood—Konrich points out that in severe acute loss of blood the best treatment is blood transfusion. However blood transfusion involves a number of factors, such as suitable donors, tests and instruments the smooth collaboration of which may be impossible in rural regions or in certain emergencies. It would be desirable to find a suitable substitute for blood, which could be kept in readiness like other injection fluids. The author made tests on 360 rabbits, employing simple bleeding as well as the so-called washout experiment. He made comparative tests with physiologic solution of sodium chloride, a dry and a fluid preparation which, in their composition, correspond to the blood salts, and Tyrodes solution and serum. It was found that the quantity of blood the loss of which is fatal varies greatly, namely, between 1.57 and 4.63 per cent of the body weight. The isotonic solution of sodium chloride was found to be inferior to all other fluids that were tried. The solutions of the blood salts were more favorable, but even their efficacy was considerably inferior to that of serum. The efficacy of all solutions could be noticeably increased by adding to them rabbit erythrocytes removed from the serum. Death from loss of blood is not primarily due to heart failure but to failure of the respiration. The inadequate filling of the vascular system

is not the cause of death, at least not the chief cause. Death is caused not so much by a deficiency of erythrocytes as by a deficiency in serum.

Severing the Connecting Bridge of Horseshoe Kidney—Chwalla describes two cases of horseshoe kidney in which he performed dissection of the isthmus more than ten years ago. In these two cases all symptoms of the horseshoe kidney were absent ten and fourteen years after the operation. He thinks that this proves the suitability of the intervention. His two patients were women.

Deutsche medizinische Wochenschrift, Leipzig

61 1503 1542 (Sept. 20) 1935 Partial Index

- Focal Infection H. A. Gins—p. 1503
- *Clinical Studies on Action of Histidine Therapy in Gastrointestinal Ulcers E. E. Bauke—p. 1510
- New Short Term Application of Short Waves in Medical Practice W. Huneke—p. 1514
- Treatment of Pruritus G. Schafer—p. 1517

Histidine Therapy in Gastrointestinal Ulcer—Bauke says that, on the basis of observations in forty-six cases, he is able to corroborate the favorable results that others obtained with histidine in the treatment of gastro-intestinal ulcers. He emphasizes that the selection of the cases is highly important because histidine monohydrochloride produces the best results in new gastro-intestinal ulcers, whereas it produces as a rule only symptomatic effects in the chronic relapsing forms. The dosage must be individualized. The number of injections varies between eighteen and twenty-five. The administration of histidine in tablet form is much less effective than the parenteral administration, and the combination of oral and parenteral medication increases the action only slightly. Cure is indicated by disappearance of the subjective symptoms, of the traces of occult bleeding and of the roentgenologic signs of niche formation and by the increase in weight. The incidence of roentgenologically demonstrable cicatrization is higher after treatment with histidine monohydrochloride than after the formerly customary therapeutic methods. The average increase in weight is from 4 to 7 Kg. The gastric secretion and motility are not influenced by the histidine treatment. The author recommends the therapy for use on a larger material.

61:1543 1582 (Sept. 27) 1935

- *Significance of Intravital Examination of Bone Marrow for Clinico-hematologic Diagnosis N. Henning—p. 1543
- Special Forms of Gastrogenic Anemia K. Wotzka—p. 1548
- Essential Hypochromic Anemia K. Jensen—p. 1550
- *Comparison of Thrombocyte Counts According to Fonio and Jürgens F. Gerloff—p. 1557

Intravital Examination of Bone Marrow—Henning, in collaboration with Korth, devised a new method for the withdrawal of bone marrow, a diagnostic sternal irrigation. Following anesthetization of the skin and of the periosteum, the cannula attached to a record syringe containing 0.5 cc. of the irrigation fluid, is pushed vertically into the sternum. After trying different types of trocars the authors found that a beveled hollow needle is more effective for the perforation of the bone. After the medullary cavity has been reached, irrigation is begun. The plunger of the syringe is pressed downward, which proves easy if the needle is in the correct position. As the result of the increased pressure in the medullary space, the patient feels a pain. The fluid is forced out and this is immediately followed by aspiration. A fluid having the appearance of leukemic blood appears in the syringe. The cannula is removed and the site of puncture is covered by a sterile plaster. Preparations are made as in the case of blood smears. The authors used in each case May-Grunwald, Giemsa and peroxidase stains. The advantages of this method are that the cannula is simpler because it works without a mandrin, there is no time lost in changing the mandrin and attaching the point, the hollow needle penetrates the bone readily, the readiness with which the irrigation fluid enters indicates the correct position of the instrument, the irrigation tears off a sufficient mass of cells so that the puncture fluid appears in the syringe immediately following the aspiration, and, since the irrigating fluid contains anticoagulating substances (finally a solution of sodium citrate was used), it is unnecessary to be hasty. The author emphasizes that this method is not only more simple but also more rapid than the method of Arinkin. After describing the cell morphology of the normal bone marrow, he reports the

aspects of the bone marrow in the various blood diseases. He performed approximately 200 punctures and only once failed to obtain marrow. He hopes that the intravital examination of the bone marrow will soon acquire a place beside the cytologic examination of the blood. The systematic comparison between the site of blood formation and the peripheral blood will be a great help to pathologic physiology, diagnosis, therapy and prognosis.

Thrombocyte Counts—Gerloff points out that the literature reports more than fifty different methods for the determination of the number of thrombocytes. At present the method of Fonio is most widely used. However, this method does not reveal the correct number of thrombocytes. The author's comparative tests with Fonio's method and the one described by Jürgens disclosed that the values obtained with these methods stand in a ratio of about 1:276, the method of Jürgens giving the higher numbers. He found that the lower numbers detected with the method of Fonio are due to the fact that a large percentage of thrombocytes are destroyed. He shows that the method of Jürgens is a simple and exact method in which the destructive influences are limited to a minimum.

Deutsche Zeitschrift für Chirurgie, Berlin

245: 333-436 (Aug. 28) 1935 Partial Index

- Esophageal Peptic Ulcer W. Roessler—p. 333
- *Use of So Called Universal Donor in Blood Transfusion E. Hesse—p. 371
- Intra Abdominal Displacement of Testes and Malignant Degeneration E. Heimicke—p. 383
- *Experiments on Function of Greater Omentum H. Ueda and W. Mabuchi—p. 390
- Significance of Determination of Rest Nitrogen for Clinic of Acute Pancreatic Disturbances F. Bernhard—p. 398

Universal Donor in Blood Transfusion—Hesse says that until recently it was generally asserted that persons in blood group O are universal donors. A number of authors even suggested that in time of war only blood of group O should be used, so as to make the determination of blood groups unnecessary. The author asserts that recently there has been an increase in the number of cases in which hemolysis followed the transfusion of blood from a universal donor into a patient with another blood group. He found forty-six cases reported in the literature, twenty of which were fatal. He emphasizes that the transfusion of large amounts of blood (more than 200 cc.) may lead to 'retrogressive' agglutination and hemolysis particularly if the titer of the donor's serum is too high compared to the erythrocytes of the recipient. Investigations were made on the titers of 104 universal donors. In more than 42 per cent the titer exceeded 1:32 with the erythrocytes of group A, and in more than 32 per cent it exceeded 1:32 with the erythrocytes of group B. The author says that such a titer already involves danger of 'retrogressive' agglutination. In fourteen cases the titer was 1:128 and in three cases 1:256. The transfusion of blood from a universal donor with a titer of 1:16 causes no symptoms. However, in cases in which the titer was high or of moderate height, signs of hemolytic shock appeared. In the case of transfusion of blood of the same group the clinical observations disclosed no deviations from the normal, whereas the transfusion of blood from a universal donor produced considerable increases in the pulse frequency (up to forty beats). This indicates that the nervous system is extremely sensitive toward discrepancies in the blood groups. The transfusion of blood from universal donors is especially dangerous if the recipient belongs to group A, for fifteen of twenty-two cases of hemolytic shock were of this group. The author reaches the conclusion that there are no universal donors in the strict sense of the term and that transfusions should be made only within the same blood group. If in case of emergency a universal donor has to be used, not more than 200 cc. should be given and even then the transfusion is permissible only if the erythrocyte count of the recipient has not gone below two million and the titer of the donor's serum with the erythrocytes of the recipient does not exceed 1:16. Of course, if it is a question of life and death and only a universal donor is available, the lesser of two evils should be chosen and transfusion tried.

Function of Greater Omentum—To obtain information about the function of the greater omentum, Ueda and Mabuchi studied the effect of its extirpation on the organism of animals.

First they made histologic studies to determine the changes in the abdominal organs following extirpation of the omentum. Quite early they found degenerative changes of different degrees in the liver, spleen, kidney, mesenteric lymph nodes and stomach. Later they observed enlargement and proliferation of the histiocytes in the liver, spleen and mesenteric lymph nodes which they consider vicarious manifestations of the reticulo-endothelial system. They describe serologic studies in which they observed that rabbits without omentum have a higher mortality following the injection of bacterial toxins than normal rabbits. Other studies were concerned with the effects of the extirpation of the greater omentum on the iron metabolism of the various organs and on the blood. The authors gained the impression that the omentum is a sort of protective apparatus against toxic substances and exerts a regulating influence on the iron metabolism. The second part of the report is concerned with experiments on the function of the greater omentum in the metabolic processes. It was observed that in rabbits the removal of the greater omentum influences the metabolism of the carbohydrates, of the protein bodies and of the fat and lipid substances. The metabolic changes that develop following removal of the spleen differ in their pathogenesis from those produced by the total extirpation of the greater omentum. The omental extirpation causes a certain fluctuation in the liver glycogen. The weight decreases gradually and usually fluctuates in proportion to the glycogen content of the liver.

Klinische Wochenschrift, Berlin

14: 1345-1376 (Sept. 21) 1935 Partial Index

Studies on Hormones in Cushing's Disease A Jores—p. 1348
Traumatic Origin of Inflammatory Diseases of Nerves P Matzdorff—p. 1351

Human Milk as Hemostatic A Sole—p. 1354
Sodium Chloride Therapy in Addison's Disease S Siwe—p. 1359
Iodine Metabolism in Persons with Goiter L Scheffer and L von Megay—p. 1360

Human Milk as Hemostatic—Sole gives a summary report of the hemostatic action of human milk which he discovered in 1931. Human milk surpasses all other hemostatics in vitro as well as in the patient. However, colostrum is ineffective and the hemostatic action develops completely between the fourteenth and the thirtieth day of lactation, but after that it remains practically the same throughout the period of lactation. Only the milk of entirely healthy women (without febrile diseases) should be used. Human milk was found to accelerate the coagulability of animal bloods. The principle in human milk which effects the acceleration of the coagulation adheres to the suspended fat particles and can be separated from the milk by centrifugation. This principle is not soluble in alcohol, ether or acetone. The author describes a method for the preparation of a powder, which contains chiefly the coagulating principle and from which aqueous suspensions can be prepared. He discusses the properties, the nature and the purpose of the coagulating principle in human milk. Human milk has a hemostatic effect only when applied locally whereas enteral or parenteral (intramuscular) administration has no effect on the coagulation of the blood. The author applies the milk by means of iodoform tampons that have been saturated with it. The practical results of the local application of human milk are demonstrated on the basis of the case histories of hemophilic patients (operations and injuries). In such cases and in thrombopenic hemorrhages it produced favorable results.

14: 1377-1416 (Sept. 28) 1935 Partial Index

*Behavior of Diastolic Venous Pulse Wave in Tachycardia B Misske—p. 1381

Influence of Ultraviolet Irradiations on Carbohydrate Metabolism A Marchionni and C Hövelborn—p. 1387

*Modification of Antigen (Horse Serum) by Ultraviolet Irradiation P Kállós and Liselotte Kállós-Deffner—p. 1392

New Pancreatic Substitution Preparation with Greater Lipatic Action L. Vogel and P. Lacerenz—p. 1393

Diastolic Venous Pulse Wave in Tachycardia—Misske shows that in the venous pulse curve there appears in addition to the a wave, indicative of an auricular contraction, and the v wave, as a manifestation of the filling of the right auricle during the ventricular contraction, a third elevation (d) which Wenckebach designated as the systolic-diastolic marginal wave,

or simply marginal wave, because it marks the boundary between the evacuation and the filling of the ventricle. The author explains the development of this third wave and shows that it is of especial diagnostic value. He made investigations which convinced him that the behavior of the d wave in tachycardia is determined by the beat frequency but that the changes or deviations in the d wave are not always the same in cases of equal pulse frequencies without it being possible to find a definite reason for this. Up to a pulse rate of 106 the d wave shows no great changes, for these appear only in case of higher frequencies. They can be classified into three groups. In the first group there may be considerable flattening up to complete disappearance. In the second group d is indicated only in the lower course of the systolic declivity, or it is indicated by a break-off and to a certain extent it appears as the prolongation of the systolic slope. In both groups d is immediately followed by the auricular a wave. In the third group d is prematurely interrupted by the subsequent a wave, or its peak or its ascending branch blends wavelike with the subsequent a wave. That in a case of identical pulse frequencies the deviations of the d wave may differ was observed in two cases with frequencies of 131. In one of these it was indicated as a break-off at the foot of the systolic slope, whereas in the other it appeared as a shallow wave, and in a case with a frequency of 129 it was elevated and blended with the subsequent a wave. The author describes several characteristic venous pulse curves in tachycardia. One illustration depicts the curve of the venous pulse in exophthalmic goiter. Another outlines the venous pulse in tachycardia caused by endocarditis and in which the diastolic wave was missing. A third shows blending of the diastolic wave with the subsequent presystolic wave in a case of exophthalmic goiter (caused by iodine) with a pulse frequency of 140, a prolonged transmission time (PQ 0.22 second) and a basal metabolic rate of 83.3 per cent, and a fourth shows the venous pulse curve of the same patient when the pulse frequency was 120, the PQ 0.21 second and the basal metabolic rate 50 per cent. That the deviations of the diastolic wave are caused entirely by the accelerated heart action is proved by the observation that it becomes more and more shallow with increasing cardiac frequency and is only indicated or disappears entirely in frequencies of 150 and more.

Modification of Horse Serum by Ultraviolet Irradiation—Kallós and Kállós-Deffner point out that studies by Pick and by Landsteiner disclosed that relatively slight changes in the chemical structure of antigens produce considerable changes in their biologic properties. They describe their own studies conducted to determine what effect irradiations with ultraviolet rays have on the immunobiologic properties of a protein antigen. They found that intensive ultraviolet irradiation lasting at least twenty minutes is capable of counteracting the shock producing action of horse serum, while the neutralization capacity for specific antibodies is retained.

Zeitschrift für Tuberkulose, Leipzig

73: 321-456 (Sept.) 1935

Annual Report of Tuberculosis Welfare Station in Jena J E Kayser Petersen—p. 321

*Significance of Early and Regular Examinations for Pathogenesis and Course of Cases of Tuberculosis in Families of Patients with Open Tuberculosis Y P Liu—p. 334

Aspects of Tuberculosis in Rural Districts R Hess—p. 349

Protective Confinement of Asocial and Antisocial Tuberculous Patients A Rössler—p. 358

Tuberculosis Contacts—On the basis of 1,000 cases that were under observation in the welfare station for tuberculous patients in Jena, Liu demonstrates 1. The importance of early examination of the persons who are in contact with a patient who has open tuberculosis. Tabular reports indicate that, if these examinations are made early, 0.72 per cent of these persons are found to have an infectious tuberculosis, whereas, if these examinations are postponed their number amounts to 19.4 per cent. 2. The importance of regular examinations. Comparative tables indicate that, in case of regular after examinations, 2 per cent contract an infectious tuberculosis and 3 per cent of these terminate fatally. However, if the examinations are not made regularly, 16 per cent are found to develop infectious tuberculosis and 9 per cent of these end in death.

Zentralblatt für Gynäkologie, Leipzig

59: 2289 2336 (Sept. 28) 1935 Partial Index

Relations Between Cohabitation and Pregnancy in Young Girls and Physiologic Follicle Cycle Indicated Thereby F von Mikulicz Radecki and Eva Kausch—p 2290

Tubal Deformities and Tubal Sterilization B Ottow—p 2302

*Experiences with Chemical Diagnosis of Pregnancy According to Kapeller Adler (Demonstration of Histidine in Urine) K Stern—p 2305

Diagnosis of Pregnancy by Demonstration of Histidine in Urine—Stern stresses the comparatively small number of erroneous results (5.6 per cent) in the urines of nonpregnant women, but he concedes that the test gives from 15 to 20 per cent of negative results during the early period of pregnancy. From this he concludes that the positive reactions are more convincing than the negative reactions. In the more advanced stages of pregnancy, during which, to be sure, the laboratory methods of diagnosis are much less important, the reaction has a reliability of 94 per cent. But in spite of the fact that the chemical diagnosis of pregnancy by means of the demonstration of histidinuria does not attain the same degree of correctness as the Aschheim-Zondek reaction, the author does not want to reject it. He thinks that it should be used as a preliminary test because of its simplicity, inexpensiveness and rapidity, the positive outcome in connection with the clinical test making the existence of a pregnancy highly probable, whereas the negative test could be controlled by an Aschheim-Zondek test.

Hospitaltidende, Copenhagen

78: 889 916 (Aug. 27) 1935

*Further Experiences with Treatment of Hematemesis and Melena with Food A Rischel—p 889

Is Creatinine Clearance Expression of Filtration Through Glomeruli? (Studies on Elimination of Sugar and Urea) P Iversen and T Bjerring—p 903

Retroposition of Colon and Common Ileocolic Mesentery with Torsion Case K M Andersen—p 911

Treatment of Hematemesis and Melena with Food—Rischel says that, in 220 of Meulengracht's 256 cases of hematemesis and melena in which food was used for the treatment, the hemorrhage is ascribed to ulcerations or erosions in the intestinal tract. The mortality was about 1 per cent. Among the 206 patients in whom treatment was given up to 1935, 112 had hematemesis, ninety-four of whom had melena, and ninety-four had melena, among 192 patients, 144 were men. There were values of pathologic secretion in about 28 per cent of the cases with positive roentgenograms and in about 6 per cent of those with negative pictures. Definite roentgenologic signs of gastric or duodenal ulcer were present in about 30 per cent and doubtful signs in about 33 per cent. In a number of the remaining 37 per cent with negative roentgen results there had been constant dyspepsia of more than a year's duration directly before the hemorrhage. History of dyspeptic disorders of more than ten years standing occurred as often in the cases with negative roentgen results as in those with a positive picture, suggesting the possibility of chronic ulcer in spite of the negative results. The author says that, in addition to the more rapid restitution and blood regeneration in the patients treated according to Meulengracht than in those treated with inanition and to the reduced length of time of rest in bed, greater frequency of defecation and less tendency to constipation were noted, 175 patients were discharged without dyspepsia after an exclusive purée diet. Perforation after hemorrhage occurred in only two cases, one being a case of peptic jejunal ulcer. Blood transfusion is advised in cases of a threatening anemic condition.

78: 917 944 (Sept. 3) 1935

*Profuse Renal Hemorrhage with Especial Regard to Cause and Treatment of Obscure Renal Hemorrhages O Mikkelsen—p 917
Clinical Observations on Effect of Intravenous Injections of a 25 per cent Solution of Pyridine Betacarboxylic Acid Diethylamide T Dalsgaard Nielsen—p 933

78: 945 972 (Sept. 10) 1935

*Profuse Renal Hemorrhage with Especial Regard to Cause and Treatment of Obscure Renal Hemorrhages O Mikkelsen—p 945
Umbilical Endometriosis Case E Tølbjall—p 963

Renal Hemorrhage—Mikkelsen mentions trauma, cystic kidney, floating kidney and hydronephrosis as conditions that may lead to vague renal hemorrhage and reviews the causes of profuse, continued or intermittent hematuria with or without

pain and without other symptoms, or the so called essential hematuria, classifying them on the basis of the literature as (1) histologically demonstrable changes in parenchyma, calices, papilli and pelvis, and (2) without histologic changes, disturbances of innervation or blood supply, or hemorrhagic diathesis. The largest reported number of cases of nephrectomy in obscure hematuria show nephritic changes as the cause of the bleeding. Only five cases of hypernephroma are reported. The author says that immediate nephrectomy is indicated in cases of fulminant hemorrhage if the bleeding is assuredly unilateral. In other cases the treatment is partly symptomatic, partly directed to the assumed underlying cause. Treatment is symptomatic in the rare cases of obscure bilateral hemorrhage. Expectant treatment is advised in unilateral hematuria, if the bleeding does not stop spontaneously, symptomatic treatment should be given, possibly medical treatment, as the hemorrhage often depends on focal nephritis. On recurrence, instillation of silver nitrate in the pelvis may be tried. Protein therapy is sometimes effective. The effect of roentgen treatment is doubtful. Usually only the milder hemorrhages are affected by bloodless treatment. With continued or recurring hematuria decapsulation should be considered, which is effective in most cases of nephritic hemorrhages. If hematuria recurs in spite of decapsulation, nephrectomy is indicated, provided the hemorrhage is surely unilateral.

78: 973 1000 (Sept. 17) 1935

*Retroperitoneal Hematomas C C Fleischer Hansen—p 973

*Treatment of Anuria with Intravenous Infusion of Hypertonic Sodium Sulphate Solution J E. Holst—p 989

Acute Delirium K Hermann—p 994

Retroperitoneal Hematomas—Fleischer Hansen reports a case of partially calcified perirenal hematoma in which the intumescence, originated after trauma endured for twenty five years without special symptoms. Renal function and urine were normal and the pyelogram showed slight changes. Treatment of a traumatic hematoma as such, he says, is usually not indicated, but the true hematoma without other simultaneous abdominal lesions may become so large that extraperitoneal excision is called for. Complicated organic lesions immediately after the trauma and possible infection of the hematoma somewhat later call for surgical treatment. Operation may be indicated later, often after years, because of cyst formation, pseudohydronephrosis, calcification, deficient resorption or other complications. The "spontaneous" nontraumatic hematomas are found in the kidney region even more often than the traumatic, and, while not common, are well known. In the reported case of unilateral adrenal hemorrhage the patient was admitted eight days after sudden onset of violent pain in the left renal region with subsequent daily attacks of less intense pain. Operation was contraindicated by the patient's extreme exhaustion. Necropsy revealed an intumescence the size of a man's head, consisting of coagulated blood, in which was found the normal left kidney. Remnants of the left adrenal appeared to be in the upper pole of the hematoma. Cirrhosis of the liver and arteriosclerosis of the coronary artery were found. The hematoma is thought to have originated at the time of the first grave attack. A diagnosis of perirenal hemorrhage is rarely made, the cases being generally regarded as renal tumor, perirenal abscess or ileus. Treatment should consist of lumbar incision, drainage of the hematoma and possibly nephrectomy. All graver cases have been fatal when treated conservatively. The reported mortality is about 60 per cent. Better prognosis depends on diagnosis.

Treatment of Anuria with Sodium Sulphate Solution—Holst states that, while the anuria in the two reported cases followed an attack of kidney colic and might perhaps be described as a "reflective anuria," there was considerable impairment of the kidney function with hypostenuria and, especially in the second case, renal insufficiency is believed to have existed for a longer period. Treatment with sodium sulphate resulted in rapid improvement.

CORRECTION

Escherichia Instead of Endamoeba—In the Current Medical Literature in THE JOURNAL, October 26 page 1381, throughout the title and abstract of the article by Gehm and Huebalekian, the word Endamoeba should read Escherichia.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 105, No 21

CHICAGO, ILLINOIS

NOVEMBER 23, 1935

SIGNIFICANCE OF PAIN AND VOMIT- ING IN CHOLELITHIASIS

ROBERT ZOLLINGER, M D
BOSTON

The susceptibility of the gallbladder and extrahepatic ducts to overdistention or inflammation from cholelithiasis makes these structures a common source of referred visceral pain. The utilization of the biliary passages in animals in the study of visceral pain has brought forth information of great value but is limited, as are all experiments involving pain in animals, because of the great barrier of speech. I have mechanically distended these passages in conscious patients at the time of operation in an effort to make observations on the important mechanism of referred visceral pain and determine whether a difference existed in the radiation and type of pain with distention of the gallbladder as compared to the common duct.

Why should patients with cholelithiasis have pain in the epigastrium, right upper quadrant or left upper quadrant, or pain referred to the back? Of the various theories proposed to explain the mechanism of referred visceral pain, two of the better known and widely accepted are those proposed by Mackenzie¹ and more recently by Morley.² A review of these theories is given in preparation for an analysis of our experimental observations to determine which theory more satisfactorily explains the mechanism of pain arising from the gallbladder or extrahepatic ducts.

According to the widely known and accepted theory of Mackenzie, pain impulses arising from the gallbladder or common duct travel to the celiac ganglion and over the right splanchnic nerves into the cord, as shown in figure 1. The Mackenzie school does not recognize true visceral pain as such but believes that these impulses set up an irritable focus in that segment of the cord into which they enter, furthermore, that the pain arises from the ordinary sensory somatic impulses entering the segment of the cord already sensitized by the sympathetic impulses. According to this theory visceral disease can express itself as pain only by secondarily involving the somatic pathways either in the dorsal root ganglion or in the spinal cord. Mackenzie believed that a viscerosensory mechanism (A-Z, fig 1) accounts for the referred pain found in the epigastrium, the right upper quadrant or the back. Likewise an overflow of afferent impulses from the organ involved

would produce muscular spasm over a visceromotor mechanism (B-Z, fig 1). The surface of the peritoneum was supposed to be insensitive, but the subperitoneal layer supplied by the cerebrospinal nerves is quite sensitive. Figure 1 shows the cerebrospinal nerves ending in the subperitoneal layer. The location of the pain according to this theory should remain stationary, regardless of the size or location of the gallbladder, since the peritoneum is not involved in the mechanism.

Figure 2 demonstrates the pathways for pain in the back in cases of cholelithiasis, according to the views of Mackenzie. It has been repeatedly proved in animals that the right splanchnic nerves carry the impulses of pain from the gallbladder and major bile ducts.³ It is anatomically known that the right splanchnic nerves usually communicate with the posterior roots of the fifth to the twelfth intercostal nerves, and that the latter supply the segments of the skin in which the painful areas in gallbladder disease are commonly referred. Pain in the back is usually located in the interscapular or infrascapular region on the right side. A careful analysis will often show a similar location of pain when the patient complains of pain in the shoulder. Relatively few have discomfort in the third or fourth cervical segment, as noted following the stimulation of the phrenic nerve.

The theory of Morley is explained in figure 3. He agrees with Ryle,⁴ Hurst⁵ and others that a true visceral pain does exist and that it is usually the result of abnormal tension on the sympathetic afferent nerve endings in the muscular walls of the hollow viscera. Morley believes that visceral pain is in no sense referred to superficial structures of the abdominal wall and is a deep-seated central pain, not accurately localized. The early epigastric symptoms of appendicitis are an example of such a pain. Likewise, vaguely localized epigastric distress might be expected as an early symptom of distention of any part of the digestive tube supplied by the celiac ganglion, including the gallbladder. The pain of large bowel distention and the like is similarly referred to a lower level because of the sympathetic nerve supply. Impulses traveling over the splanchnic nerve (Z) enter the cord and are recognized by the higher centers as pain, but they do not enter into the mechanism of referred pain to the back or right upper quadrant.

Morley believes that (1) referred pain does not occur unless the cerebrospinal nerves are stimulated, (2) the peritoneum supplied by the cerebrospinal nerves is highly sensitive, and (3) the cerebrospinal nerves extend to the peritoneum (fig 3) instead of to the sub-

From the Surgical Clinic of the Peter Bent Brigham Hospital.
Because of lack of space this article is abbreviated in THE JOURNAL.
The complete article appears in the author's reprints.
Read before the Section on Surgery General and Abdominal at the
Eighty Sixth Annual Session of the American Medical Association
Atlantic City N J June 14 1935
¹ Mackenzie James Symptoms and Their Interpretation London
Shaw & Sons 1920
² Morley John Abdominal Pain New York, William Wood & Co
1931

³ Schragar V L and Ivy A C. Symptoms Produced by Distention of the Gallbladder and Biliary Ducts Surg Gynec. & Obst. 47: 113 (July) 1928
⁴ Ryle J A Study of Pain, Brit. M J 1 537 (March 31) 1928
⁵ Hurst A F The Sensibility of the Alimentary Canal London 1911

peritoneal layer as shown in figure 1 Capps⁷ found that the pain elicited by stimulation of the parietal peritoneum is localized with considerable accuracy by the patient, the error being less than 1 inch (2.5 cm). The pain of cholelithiasis in the right upper quadrant would indicate that the underlying peritoneum has been stimulated according to the theory of Morley. He has empha-

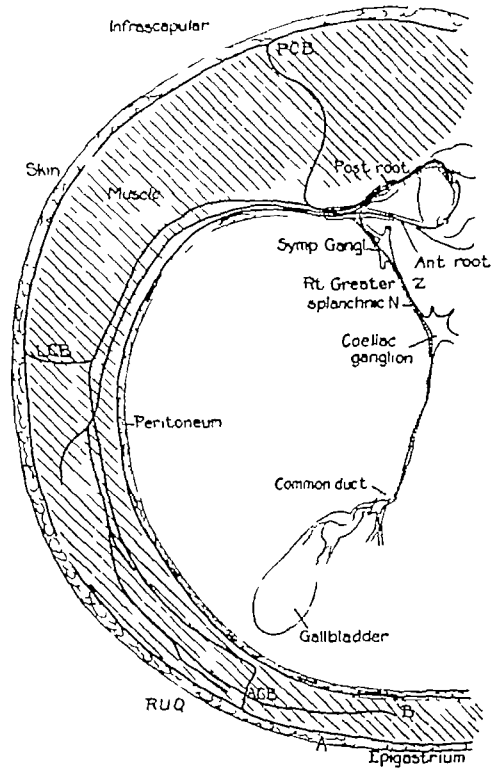


Fig. 1—Explanation of the theory of Mackenzie. The gallbladder is not in contact with the parietal peritoneum. The cerebrospinal nerves end in the subperitoneal tissue. A Z, viscerosensory reflex; B Z, visceromotor reflex; P C B, posterior cutaneous branch; L C B, lateral cutaneous branch; A C B, anterior cutaneous branch.

sized the change in position of the pain and tenderness as an acute gallbladder descends with an increase in size. He proposes a peritoneocutaneous radiation (A, fig. 3) all within the cerebrospinal nerves to explain referred pain, likewise, a peritoneomuscular reflex (B, fig. 3) to explain muscle spasm and rigidity. Ryle⁸ has emphasized that referred pain does not often occur from distention alone but is usually accompanied by inflammation. In practically every case of cholelithiasis there is an accompanying chronic cholecystitis which would be an adequate stimulus for the pain or tenderness in the right upper quadrant.

The explanation of Morley for the pain in the back in cases of cholelithiasis is shown in figure 4. The dotted lines represent sensory innervation by the sympathetic nerves to the visceral peritoneum. The heavy lines represent the surfaces of the peritoneum, which he believes are supplied by the cerebrospinal nerves. These sensitive nerves extend a short distance up the mesenteries and into the gastrohepatic ligament about the major bile ducts. He believes from his observations on the production of pain in patients under local anesthesia that the cerebrospinal nerves extend a greater distance into the mesenteries than was previously maintained. The inflammation about the extrahepatic ducts themselves stimulates the somatic nerves in the gastrohepatic ligament and so gives rise to localized pain in the back,

just as in the right upper quadrant. He calls attention to the frequent observation that during an operation for gallstones, following a recent attack of gallstone colic, evidence of inflammatory congestion and edema is usually found involving the gallbladder wall and adjacent bile ducts. The exact anatomic relation of the cerebrospinal nerves to the gastrohepatic ligament is not known. However, since the sensory supply of the margins of the diaphragm, both the pleural and peritoneal surfaces, arises from the lower six intercostal nerves, it is reasonable to assume that branches may extend into the adjacent tissues. In the great majority of cases the pain in the back is referred to the region supplied by one or more of the lower six thoracic nerves.

The anatomic arrangement and accessibility of the gallbladder and common duct permit the easy utilization of these structures in animals for the study of the mechanism of referred visceral pain. Schrager and Ivy⁹ have reported observations on the mechanical distention of the gallbladder or biliary passages in dogs. Their studies were undertaken primarily to give experimental evidence to the clinical observations that patients with gallstone colic have an associated inspiratory distress. They found that distention of the gallbladder caused distress, inhibition of respiration, and salivation denoting nausea in approximately 40 per cent of the dogs. Vomiting occurred only once, and then when food was in the stomach. Distention of the biliary duct caused more striking symptoms than distention of the gallbladder. Salivation or nausea always, and vomiting frequently, occurred if the pressure was above 100 mm. of mercury.

Ogilvie¹⁰ in England distended the gallbladder in a series of patients following cholecystostomy. Of course, in these patients the gallbladder was attached to the anterior wall. He found that nausea was present in four of the six cases, but no vomiting. The patients all complained of a distress resembling indigestion. The pain was roughly localized to the region of the gallbladder in four cases, to the xiphoid process in one and to the left hypochondrium in another. He concluded that accurate localization of the pain in gallbladder disease was an indication of involvement of the parietal peritoneum by an infectious process, and in the absence of infection the pain due to obstruction of the cystic duct may be vaguely localized to the upper part of the abdomen.

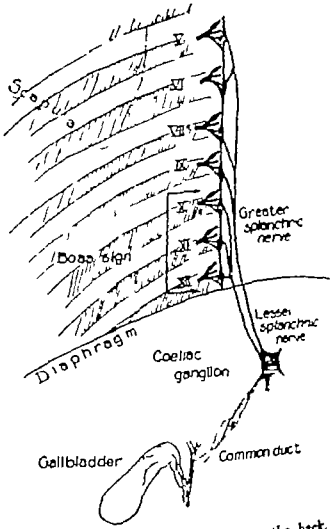


Fig. 2—Pathways for pain in the back according to theory of Mackenzie.

Our experimental observations corroborate his results.¹¹ We have made observations on nine women,

7 Capps, J. A., and Coleman, G. H. A Clinical Study of Pain. New York: Macmillan Company, 1932.

10 Ogilvie, W. H. Some Notes on the Surgical Aspects of Gallstone Disease. *Guy's Hosp. Rep.* 75: 78-97 (Jan.) 1925.
11 Zollinger, Robert. Observations Following Distention of the Gallbladder and Common Duct in Man. *Proc. Soc. Exper. Biol. & Med.* 30: 1260-1261 (June) 1933.

operated on for gallbladder disease. The complaints varied from chronic indigestion to typical as well as bizarre radiation of the pain. Chronic cholecystitis and cholelithiasis were found in every case at operation.

In seven patients the gallbladder was exposed and the stones were removed after a short gas-oxygen anesthesia. A sterile rubber balloon, carried on a sterile

cult 6 Distention of the gallbladder, producing contact with the parietal peritoneum, gave localized pain. This was markedly relieved by infiltration of the overlying abdominal wall with procaine hydrochloride. 7 Two patients did not complain of discomfort regardless of the amount of distention of the gallbladder. Our observations further indicated that 1 Mechanical distention of the common duct produced severe epigastric distress. The pain was more severe than that in distention of the gallbladder in the same patient. 2 Dis-

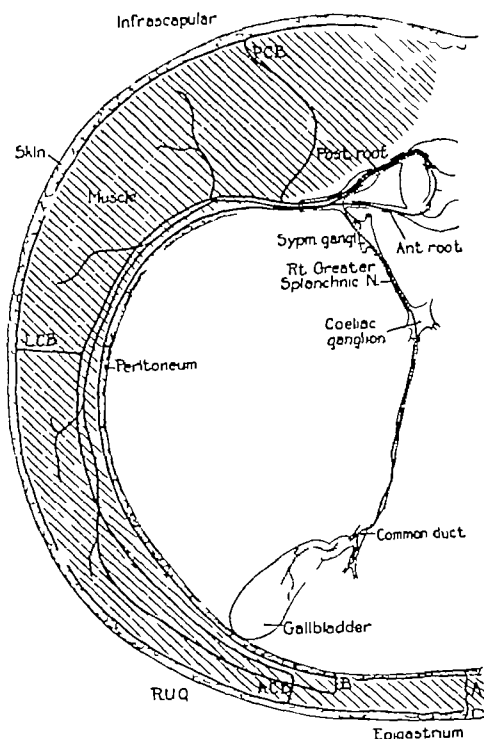


Fig 3—The theory of Morley. The gallbladder is in contact with the parietal peritoneum. The cerebrospinal nerves end in the peritoneal layer. A peritoneocutaneous radiation. B peritoneomuscular reflex. P C B posterior cutaneous branch. L C B lateral cutaneous branch. A C B anterior cutaneous branch.

hollow metal tube, was inserted into the gallbladder (fig 5). The tube was connected to a glass jar through which the balloon could be inflated and the amount of pressure recorded. The fundus of the gallbladder was then sealed around the rod by several silk sutures and replaced in the abdomen away from the abdominal wall. The edges of the wound were held in approximation and all gauze and retractors removed from its margins to avoid additional painful stimuli. Distention was carried out after the patient had recovered sufficiently from the short anesthesia to answer questions intelligently. In two patients the observations were made following exposure of the gallbladder under local infiltration anesthesia of the right upper quadrant. The common duct was distended in three of the nine patients by the same method and the resultant signs and symptoms were similarly recorded. The pressure applied varied between 50 mm and 150 mm of mercury.

Our observations indicated that 1 Mechanical distention of the gallbladder usually gave rise to deep epigastric discomfort, more severe but similar to the attacks of indigestion in gallbladder disease (fig 6). 2 The discomfort was not referred to the gallbladder region. 3 Distention of the gallbladder did not cause vomiting. 4 It was found impossible to reproduce the usual referred pain in the back, the infrascapular region or the right upper quadrant. 5 Objectively and subjectively the patients had respiratory difficulty when the gallbladder was distended, especially inspiratory diffi-

TABLE 1—Observations in Nine Women Who Came to Operation

| Distention of the Gallbladder | |
|-------------------------------|--|
| 1 | Deep epigastric discomfort (indigestion) |
| 2 | Absence of pain in gallbladder region |
| 3 | Absence of vomiting |
| 4 | Absence of referred pain |
| 5 | Inspiratory difficulty |
| 6 | Contact with parietal peritoneum gives right upper quadrant pain |
| 7 | Absence of pain in two patients |
| Distention of the Common Duct | |
| 1 | Severe epigastric distress |
| 2 | Vomiting |
| 3 | Absence of referred pain |
| 4 | Inspiratory distress |

ty of the common duct produced vomiting in two of the three cases. 3 There was no evidence of referred pain to the right upper quadrant or to the back. 4 Inspiratory distress was present.

I have attempted to explain our observations according to the commonly accepted theories of referred visceral pain previously reviewed. Contrary to the Mackenzie theory, I believe that a true visceral pain exists. This was represented in our experiments by the consistent finding of epigastric discomfort similar to the attacks of indigestion noted by the patients previous to operation. Two of our patients had a tendency to refer their epigastric discomfort to the left upper quadrant, as they did previous to operation. Sheldon¹² has recently reported observations on a patient who complained of precordial pain. He¹³ stated that the pain was usually in the epigastrium and only several times was it referred to the precordium. The pain was never referred to the back. The pain in the left upper quadrant may represent atypical localization of the vaguely localized visceral epigastric pain. The mechanism was intact for the reproduction of referred pain in either

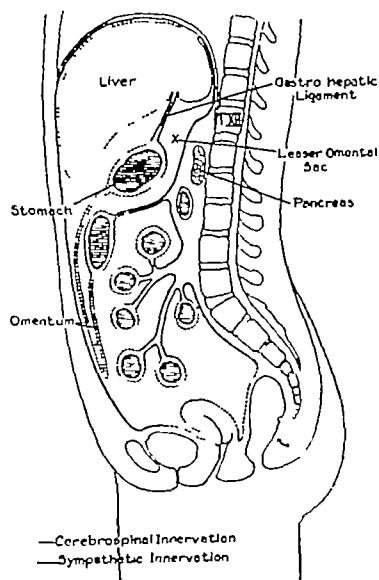


Fig 4—Possible pathways for pain in the back according to theory of Morley. Solid lines represent innervation by cerebrospinal nerves. The visceral peritoneum supplied by sympathetic innervation is represented by dotted lines.

12 Sheldon L. B. A Clinical Study of Biliary Secretion in a Case Presenting a Completely Obstructed Common Duct, *J A M A* 104: 913-916 (March 16) 1935.

13 Sheldon L. B. Personal communication to the author.

the right upper quadrant or the back, according to the theory of Mackenzie. Although the mechanical distention was an adequate stimulus for visceral pain to reach the cord by the usual route, referred pain did not result despite the fact that the majority of these patients previous to operation had pain in the back or right upper quadrant. According to the theory of Mackenzie, a previous irritable focus must have existed in the cord in several of these patients with referred pain up to the time of operation, and it is reasonable to assume that the mechanism should have been repeated following distention of these organs.

The relief obtained by infiltration of the overlying skin with procaine hydrochloride might be interpreted to favor the theory of Mackenzie. Some infer that by this method afferent somatic impulses failed to reach the irritable focus of the cord, and referred pain was

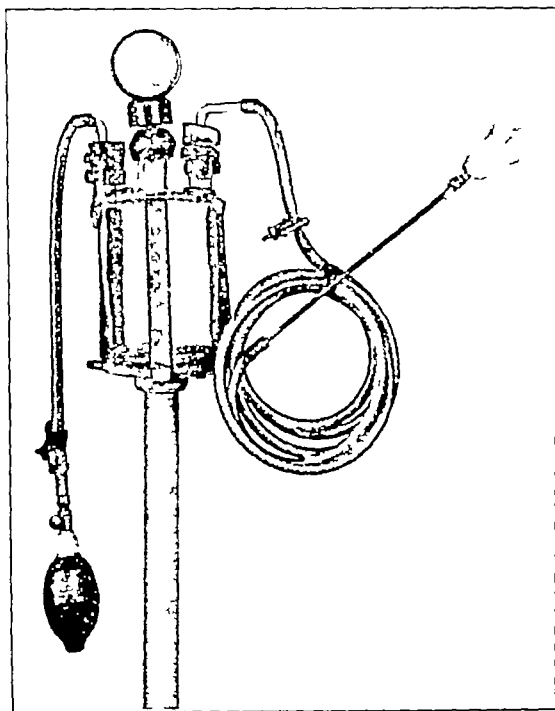


Fig 5—Apparatus used in the experimental studies

not recognized. Weiss and Davis¹⁴ believe that, since pain referred from intra-abdominal disease is obliterated or relieved by infiltration of the skin over the painful point, some weight is given to the Mackenzie theory. However, Morley believes that it is just as much in favor of his peritoneocutaneous radiation, since pain in the shoulder tip referred over the phrenic nerve can likewise be alleviated by anesthetizing the painful area. The latter pain rises from stimulation of the dome of the diaphragm, travels over the phrenic nerve and is referred usually to the fourth cervical segment, all within the somatic cerebrospinal nerves.

Since referred pain could not be reproduced by mechanical distention either in our cases or in those of Oglvie, weight is given to the argument that referred pain and tenderness are more likely to result from inflammatory lesions. The common association of cholecystitis with cholelithiasis would adequately account for the frequency of referred pain in this dis-

ease. The pain in the right upper quadrant is usually localized over the region of the gallbladder, and it is suggested that the peritoneum may enter into the mechanism of this pain. The peritoneocutaneous radiation of Morley could be used to explain this mechanism (fig 3). Since Sheehan has offered anatomic evidence in favor of afferent somatic nerves branching in the gastrohepatic ligament, I believe that these branches may come from any of the lower six thoracic nerves that supply the adjacent peritoneal margins of the diaphragm. In other words, the pain in the back in gall bladder disease is the result of direct inflammation of the cerebrospinal nerves over a mechanism similar to that in which pain is localized over the right upper quadrant.

The pathway explaining inspiratory distress is not entirely clear. It has been proved by Ivy³ that, in dogs, distention of the gallbladder or common duct produced fixation of the diaphragm. This was partially relieved by section of the right splanchnic nerve and partially relieved by section of the vagus nerve. Section of the vagus seemed to be more efficacious than section of the splanchnic, and it was necessary to cut both nerves to abolish this reflex entirely. The fixation of the diaphragm may be of cortical origin as a protective mechanism against pain.

Two of the patients had no discomfort regardless of the amount of distention of the gallbladder. Ivy recorded a similar observation in some of his experiments on dogs. The experimental observations agree with the clinical that the gallbladder in some patients can be markedly distended with stones without symptoms or with only slight discomfort. It has been shown that gallstones are discovered in about 10 per cent of the women operated on for other conditions who have never had symptoms suggestive of cholelithiasis.¹⁵

The absence of vomiting following distention of the gallbladder and the presence of this symptom when the common duct was distended is in accord with the observation on animals. Previous experimental work has shown that afferent emetic impulses from the peritoneal cavity travel with equal facility through the vagal and the sympathetic trunks.¹⁶ Perhaps, as Ivy suggests, a difference of threshold exists between the gallbladder and the biliary passages, the nerves of the gallbladder being more difficult to excite.

CLINICAL STUDY

An effort has been made during the past two years to test the clinical significance of our experimental observations. Patients were specifically questioned in regard to vomiting, shortness of breath, and the location and radiation of their initial pain. The 153 surgical cases of cholelithiasis in the Peter Bent Brigham Hospital during this period were divided into five separate groups, according to the probable location of the offending stones (table 2).

The first group consisted of forty-three cases of chronic cholecystitis and cholelithiasis with a negative history for jaundice. A second group included twenty-two cases of chronic cholecystitis and cholelithiasis with history of jaundice in which either the common duct was not explored or no common duct stone was found at exploration. However, the history of jaundice implied that the common duct had at some time been

¹⁴ Weiss, Soma and Davis, David. Afferent Impulses from Skin in Mechanism of Visceral Pain. *Am. J. M. Sc.* 176:517 (Oct.) 1928.

¹⁵ Truesdell, E. D. Incidental Gallstones in Women. *Ann. Surg.* 98:362-368 (Sept.) 1933.
¹⁶ Walton, F. E., Moore, R. M. and Graham, E. A. The Nerve Pathways in the Vomiting of Peritonitis. *Arch. Surg.* 22:8-9 (May) 1931.

obstructed. A stone was found impacted in the ampulla of the gallbladder or in the cystic duct in twenty-three cases of chronic cholecystitis and cholelithiasis. The fourth group included thirty cases of acute or acute and chronic cholecystitis with cholelithiasis. The ampulla of the gallbladder or the cystic duct was obstructed by a calculus in many of these cases. The fifth group comprised thirty-five patients from whom a common duct calculus was removed at operation. In

TABLE 2—Cholecystitis and Cholelithiasis

| | Chronic Without Jaundice | Chronic With Jaundice | Acute | Chronic with Impacted Stone in Ampulla or Cystic Duct | Common Duct Stone |
|---------------------------------|--------------------------------|-----------------------------|--------|---|-------------------------|
| 1933 and 1934 | | | | | |
| Number of cases | 43 | 22 | 30 | 23 | 35 |
| Vomiting | 44 1% | 68 1% | 73 3% | 57 0% | 91 0% |
| Jaundice | 0 | 100 0% | 20 0% | 30 4% | 88 5% |
| Colic | 97 5% | 100 0% | 100 0% | 91 3% | 94 3% |
| Chills | 4 0% | 9 0% | 16 0% | 4 3% | 31 4% |
| Inspiratory distress | 25 5% | 31 5% | 26 6% | 8 7% | 22 5% |
| Pain in right upper quadrant | 6 1% | 68 1% | 53 8% | 69 6% | 51 4% |
| Epigastrium | 30 2% | 22 7% | 40 0% | 21 7% | 45 7% |
| Pain referred to back | 65 1% | 54 5% | 40 0% | 82 6% | 51 5% |
| Pain in left upper quadrant | 10 2% | 4 5% | 0 | 4 3% | 0 |

all but the first group, therefore, there was evidence of past or present obstruction of the cystic or common duct.

A comparison was made of the incidence of vomiting, jaundice, colic, inspiratory distress and the location and radiation of the initial pain and like conditions in the various groups.

The presence of vomiting when the common duct was distended suggested that this symptom might be of value in making a diagnosis of a calculus located outside the gallbladder, especially in the common duct. Involuntary vomiting, and not induced vomiting, was included if it occurred at any time in the present or past illness. Table 2 demonstrates the high incidence of vomiting in those cases in which a stone was lodged or passed through the cystic or common duct. Vomiting occurred in only 44 per cent of the forty-three patients with chronic cholecystitis who gave no history of jaundice and in whom the stone was not found in the ampulla or the cystic or common duct. Obviously it could not be determined in what number of cases a stone might have been lodged in the cystic duct accounting for the history of vomiting. This finding agrees with the views of those who believe that patients with cholelithiasis may have nausea and induced vomiting, but involuntary vomiting indicates that a stone is located outside the gallbladder in the bile ducts. A higher incidence of involuntary vomiting was found in the cases of chronic cholecystitis in which there was a history of jaundice. Apparently in many of these cases a common duct stone had been passed or may have been overlooked at the time of operation. Vomiting occurred in 73.3 per cent of the cases of acute cholecystitis. In a large number of these cases a stone was found impacted in the ampulla of the gallbladder or in the cystic duct, which would account easily for this symptom, as shown in the next group. Involuntary vomiting occurred in 87 per cent of the cases in which a stone was found impacted in the ampulla of the gallbladder or in the cystic duct at the time of operation. The highest incidence, 91 per cent, was found in the cases of common duct stone. Our experimental observations which showed that vomiting followed distention of the

common duct, seems to coincide rather closely with the clinical observations that distention of the bile ducts, by a calculus, produced a high incidence of involuntary vomiting as compared to calculi in the gallbladder. The clinical analysis of patients with cholelithiasis has been convincing enough to make us suspicious of a calculus in the cystic or common duct in cases in which there is pronounced involuntary vomiting. Furthermore, we believe that, when vomiting has been a prominent symptom, exploration of the common duct might be considered regardless of the history of jaundice or size of the common duct, unless at operation a calculus was found impacted in the ampulla or cystic duct.

It has been taught generally that a diagnosis of common duct stone is made when biliary colic is accompanied by the classic triad jaundice, chills and fever. We found that jaundice had occurred at some time in 44.4 per cent of 153 cases. The first group of chronic cholecystitis was selected with a negative history for jaundice and the second for a positive history for jaundice. It occurred in 20 per cent of cases of acute cholecystitis and in 30.4 per cent of the group in which a stone was found impacted in the ampulla or cystic duct. The highest incidence of jaundice, 88.5 per cent, occurred in those cases in which a common duct stone was found at operation. It has been previously emphasized by Clute¹⁷ that jaundice was absent in 39 per cent of his cases of common duct stone. However, in a much larger series of cases reviewed in our hospital we found the incidence of jaundice to remain in the neighborhood of 90 per cent.

Attacks of biliary colic were recorded in a high percentage of all our cases. Perhaps a few of the patients did not actually have a typical colicky type of pain. It is significant to note that not all the patients with common duct stones gave a history of colic. Macdonald¹⁸ has recently emphasized the low incidence of colic in cases of common duct stone. He quotes Wilkie of Edinburgh as believing that patients have colic only when a calculus passes the muscular cystic duct, but no

TABLE 3—Observations in Three Hundred Cases of Cholelithiasis

| | Cholecystitis and Cholelithiasis | | Common Duct Stone* |
|----------------------|-------------------------------------|--------|--------------------------|
| | Chronic* | Acute* | |
| Involuntary vomiting | 27% | 85% | 89% |
| Jaundice | 0 | 11% | 90% |
| Colic | 60% | 80% | 90% |
| Chills and fever | 0 | 12% | 15% |

* One hundred cases.

pain in the common duct, owing to the fact that there is insufficient muscular development in the wall of the common duct to produce contraction. We believe that patients with common duct stone generally do have colicky pain, and it might be explained by overdistention of this fibro-elastic tube.

There was a low incidence of chills and fever associated with cases of chronic cholecystitis, despite the fact that a moderate number gave a past history of jaundice. Chills were present in 16.6 per cent of the cases of acute cholecystitis and 31.4 per cent of the cases of proved common duct stone. Although chills

17 Clute H M Common Duct Stones J A M A 95 1568 1971 (Nov. 22) 1930

18 Macdonald J G The Histology of the Biliary Ducts and Its Correlation with the Symptomatology of Common Duct Stone Surg Gynec & Obst 60 775 780 (April) 1935

have been associated in the classic triad indicating common duct stone, it was found in less than one third of the cases

Respiratory embarrassment may accompany any type of colicky pain, but I am convinced of its importance in the diagnosis of biliary colic. Schragar and Ivy⁹ and Crile¹⁰ have emphasized the clinical value of this symptom in the differential diagnosis of diseases of the gallbladder and biliary ducts from other disorders of the upper portion of the abdomen. That this symptom has not been looked for is evidenced by the fact that it was not mentioned in a review of 300 cases of cholelithiasis at the onset of this study. Respiratory distress was mentioned in about one fourth of our recent cases.

Pain occurred as the initial complaint in the right upper quadrant in about two thirds of all the cases. The high incidence of epigastric discomfort occurred in the acute cases and the cases of common duct stone. I believe that epigastric distress as the initial symptom indicates dilatation of the ducts, and these percentages tend to confirm that belief. It is interesting to note that the incidence of pain in the back, or referred to the back, is practically the same as that occurring in the right upper quadrant. This might be interpreted to mean that patients having sufficient inflammation of the gallbladder to stimulate the parietal peritoneum anteri-

TABLE 4—Indications for Exploration of Common Duct

- 1 History or presence of jaundice
- 2 Cholangitis associated with cholelithiasis
- 3 Recurrent symptoms after cholecystectomy
- 4 Frequent attacks of gallstone colic
- 5 Pronounced involuntary vomiting
- 6 Suggestion of stone by palpation
- 7 Dilated or thickened common duct
- 8 Contracted thickened gallbladder
- 9 Dilated cystic duct
- 10 Thickening of head of pancreas
- 11 Many small stones in gallbladder and cystic duct

orly would also have an inflammatory process extending down the cystic duct to the common duct. The somatic nerve supplying the gastrohepatic ligament about the common duct would then refer the pain to the back according to the theory of Morley. The pain was present, or radiated to the left upper quadrant, in 16.2 per cent of the first group of patients who had not been jaundiced, and in a few of the others. The experimental and clinical manifestations of pain of the left upper quadrant were interpreted as an atypical localization of true visceral pain.

Table 3 is a compound of a study of 300 cases of cholelithiasis that were studied at the beginning of our experimental observations. They are included here to support the smaller series reported, covering the past two years. Involuntary vomiting occurred in some 29 per cent of the chronic cases of cholecystitis and jumped rapidly to 85 per cent in the 100 acute cases and to 89 per cent in cases of common duct stone. The incidence of jaundice was similar to the smaller group reported. Colic occurred in an increasing proportion in the acute group and common duct stone group. This incidence of colic is probably more reliable than the higher incidence reported in the past two years. Chills and fever were present in only 15 per cent, as compared to 31 per cent of our recent cases.

The clinical analysis appeared convincing enough to make us suspicious of a calculus in the cystic or common duct in cases in which there was pronounced involuntary vomiting. I believe that this symptom should

be added to the list of commonly accepted indications for drainage of the common duct, as shown in table 4. The first five indications would be obtained from the history, including the history or presence of jaundice, symptoms of cholangitis associated with cholelithiasis, recurrent symptoms after previous surgery on the biliary tract, frequent attacks of gallstone colic, and pronounced involuntary vomiting.

At operation the common duct should be explored if there is a suspicion of a stone by palpation, dilatation or thickening of the common duct, contracted, thickened or nonfunctioning gallbladder, dilated cystic duct that would permit stones to pass into the common duct, thickening of the head of the pancreas suggesting a chronic pancreatitis, perhaps the result of a calculus in the common duct, or many small stones in the gallbladder and cystic duct, which might easily pass into the common duct.

I believe that, by keeping in mind the various indications more common ducts have been explored and that this has been partially responsible for the finding of a high incidence of common duct stones. The common duct was explored in fifty-nine cases, or 38.3 per cent of the 153 cases. The common duct was usually opened after the method of Cheever.²⁰ A common duct stone was found in 59.3 per cent of the ducts explored or in 22.8 per cent of the 153 patients operated on during 1933 and 1934. According to the autopsy statistics compiled by Crump,²¹ a stone is located outside the gallbladder in more than 20 per cent of cases of cholelithiasis. The finding of a similar number of common duct stones at operation should improve the general end result following operations for cholelithiasis.

CONCLUSION

I believe that our experimental observations indicate that a true visceral pain exists.

Our inability to reproduce referred pain to the back adds weight to the argument that referred visceral pain is usually the result of inflammation, probably over a peritoneocutaneous radiation instead of a viscerocutaneous reflex.

Experimentally and clinically, inspiratory distress commonly accompanies distention of the gallbladder or extrahepatic ducts.

The experimental finding of vomiting following distention of the common duct, but not the gallbladder, has been confirmed by a clinical analysis. Furthermore, I believe that involuntary vomiting should be added to the list of commonly accepted indications for exploration of the common duct.

A common duct stone was found in 22.8 per cent of the patients operated on for cholelithiasis in the Peter Bent Brigham Hospital during the years 1933 and 1934.

25 Shattuck Street

20 Cheever, David. Instrumental Dilatation of Papilla of Vater and Dislodgment of Calculi by Retrograde Irrigation. Contribution to Surgery of Bile Passages. Arch. Surg. 18: 1069-1077 (April) 1929.
21 Crump, Curtis. The Incidence of Gallstones and Gallbladder Disease. Surg. Gynec. & Obst. 53: 447-455 (Oct.) 1931.

Irritability and Lack of Stamina—Hess repeatedly pointed out the frequency among children of cases in which no specific symptom of scurvy can be seen but in which irritability, lack of stamina, and retardation of growth can be cured by the simple addition of more antiscorbutic food to the dietary. The interpretation of such a case is that the previous food, while furnishing enough vitamin C to prevent scurvy, had not been rich enough in this vitamin for the best interests of normal nutrition—Sherman, H. C. Food and Health, New York. Macmillan Company, 1934.

TRANSFUSION FOR JAUNDICED
PATIENTSE. STARR JUDD, M.D., ALBERT M. SNELL, M.D.
AND

M. TISCHER HOERNER, M.D.

Fellow in Surgery the Mayo Foundation
ROCHESTER, MINN

Gallstones are supposed to have been removed from the gallbladder of a living patient by Fabricius¹ in 1618, but Petit,² who published his discussions on biliary obstruction and its surgical treatment a century later, is often considered to be the founder of surgery of the gallbladder. Great improvements were made in the technic by Bobbs,³ who sponsored cholecystotomy and also by Langenbuch,⁴ who in 1882 performed the first cholecystectomy on a human being. However little mention was made of the hemorrhagic tendency of jaundiced patients until Smith⁵ called attention to it in 1891. Since that time an enormous amount of information has accumulated and as a result present methods of treatment have a more rational basis. Nevertheless the problems associated with jaundice have not all been settled, as is shown by the numerous theories concerning the factors involved.

The early investigators believed that the excess of bile pigment circulating in the blood stream was responsible for the hemorrhagic tendency. Morawitz and Bierich⁶ observed that when one part of oxbile was added to from ten to fifteen parts of dog's blood in vitro the mixture composed of bile and blood was incapable of coagulation. Since a 10 per cent concentration of bile never occurs in jaundiced patients and since anticoagulant effects were not obtained with lower concentrations, this observation could not be of clinical importance. King and Stewart⁷ then offered a different explanation, they suggested that the calcium combined with the bile pigment and rendered it less toxic. Later, King, Bigelow and Pearce⁸ concluded that, when the calcium and bile pigment combined, less calcium was available and that this caused interference with the mechanism for coagulation.

Other investigators were equally certain that the bile acids played the most important part in the process because of their ability to inhibit the coagulability of the blood in vitro. Morawitz and Bierich⁶ felt that there was not a sufficient concentration of bile acids in the blood of patients to inhibit clotting. Hoppe⁹ used 30 liters of urine of jaundiced patients before obtaining a positive test for bile acids, but later experiments

have not substantiated his results. Malkoff¹⁰ demonstrated both clinically and experimentally that early in the course of the disease bile acids are present in the urine of patients who have obstructive jaundice but that they tend to decrease in concentration if the jaundice persists. Foster, Hooper and Whipple¹¹ and Wangenstein¹² made similar observations. Wangenstein¹² also reported that not only did excretion of the bile acids diminish but the synthesis of bile salts was interfered with. The recent work of Brakefield and Schmidt¹³ and of Snell, Greene and Rowntree¹⁴ agreed with these results. Therefore it appears safe to assume that neither the bile pigments nor the bile acids per se are responsible for the bleeding of patients who have obstructive jaundice.

Wright¹⁵ was probably the first to suggest the use of calcium in cases of hemophilia and internal bleeding, and Mayo Robson¹⁶ the first to propose its use to stop the bleeding in cases of obstructive jaundice. Boggs¹⁷ found a decrease in the coagulation time after the administration of calcium to rabbits both orally and intravenously. Rey¹⁸ observed a similar phenomenon in dogs. Lee and Vincent¹⁹ found that the addition of calcium chloride to the blood of jaundiced patients in vitro shortened the coagulation time. According to Schmerz and Wischo,²⁰ the intravenous injection of calcium lactate into normal persons shortened the coagulation time. Walters²¹ has emphasized the use of calcium chloride as a preventive of hemorrhage in cases of obstructive jaundice. Kirk and King²² and Emerson²³ reported a moderate reduction in the total calcium content of the serum in cases of jaundice but found a greater reduction in the ultrafiltrable or diffusible fraction. Buchbinder and Kern²⁴ noted a reduction in the calcium content of the serum in three cases of jaundice. Favorable results were obtained with parathyroid extract by Cantarow, Dodek and Gordon²⁵ in the treatment of jaundiced patients who showed a tendency to bleed. In the opinion of these investigators

10 Malkoff G. Zur Pathologie des Ikterus. Ueber die Ausscheidung der Gallensäuren durch den Harn die Bauchwassersucht und einige andere Erscheinungen der Gallenretention abstr. Jahresb. u. d. Fortsch. d. Tierchem. 27: 781-785 1897.

11 Foster M. G. Hooper C. W. and Whipple G. H. The Metabolism of Bile Acids. II. Normal Fluctuations in Healthy Bile Fistula Dogs. J. Biol. Chem. 38: 367-377 (June) 1919. III. Administration by Stomach of Bile Acids, Taurine and Cholic Acid to Show the Influence upon Bile Acid Elimination. Ibid. pp. 379-392. V. Control of Bile Ingestion and Food Factors. Ibid. 41: 420. VI. Origin of Taurocholic Acid. Ibid. pp. 421-433.

12 Wangenstein O. H. The Hemorrhagic Diathesis of Obstructive Jaundice and Its Treatment. Ann. Surg. 88: 845-865 (Nov.) 1928.

13 Brakefield J. L. and Schmidt C. L. A. Studies on the Synthesis and Elimination of Certain Bile Components in Obstructive Jaundice. J. Biol. Chem. 87: 523-545 (Feb.) 1926.

14 Snell A. M., Greene C. H. and Rowntree L. G. Diseases of the Liver. VII. Further Studies in Experimental Obstructive Jaundice. Arch. Int. Med. 40: 471-487 (Oct.) 1927.

15 Wright A. E. Upon a New Symplic and Upon the Possibility of Increasing the Coagulability of the Blood in the Vessels in Cases of Hemophilia and Aneurysm and Internal Hemorrhage. Brit. M. J. 2: 1306-1308 1891.

16 Robson A. W. M. The Surgery of the Gall Bladder and Bile Ducts with Brief Notes of Seventy Eight Cases. Brit. M. J. 1: 901-904 (April 28) 1894.

17 Boggs T. R. Ueber Beeinflussung der Berinnungszeit des Blutes im lebenden Organismus. Deutsches Arch. f. klin. Med. 70: 539-550 (March) 1904.

18 Rey J. G. Ueber die Ausscheidung und Resorption des Kalkes. Arch. f. exper. Path. u. Pharmacol. 35: 295-305 1895.

19 Lee R. I. and Vincent Beth. The Relation of Calcium to the Delayed Coagulation of Blood in Obstructive Jaundice. Arch. Int. Med. 16: 59-66 (July) 1915.

20 Schmerz Hermann and Wischo Fritz. Untersuchungen über die blutgerinnungsbefördernde Wirkung der Gelatine bzw. der Calciumsalze. Mitt. a. d. Grenzgeb. d. Med. u. Chir. 30: 90-115 1918.

21 Walters W. M. Preoperative Preparation of Patients with Obstructive Jaundice. Surg. Gynec. & Obst. 33: 651-656 (Dec.) 1921.

22 Kirk P. L. and King C. G. Calcium Distribution in Blood. J. Lab. & Clin. Med. 11: 928-935 (July) 1926.

23 Emerson W. C. The Distribution of Calcium in Jaundiced and Acoholic Dogs. J. Lab. & Clin. Med. 14: 122-130 (Nov.) 1928.

24 Buchbinder W. C. and Kern Ruth. Experimental Obstructive Jaundice. I. Growth Factor in Defective Calcification. Arch. Int. Med. 40: 900-910 (Dec.) 1927.

25 Cantarow Abraham, Dodek S. M. and Gordon Burgess. Calcium Studies in Jaundice with Special Reference to the Effect of Parathyroid Extract on the Distribution of Calcium. Arch. Int. Med. 40: 129-139 (Aug.) 1927.

From the Division of Medicine the Mayo Clinic (Drs. Judd and Snell) and the Mayo Foundation (Dr. Hoerner).

Read before the Section on Surgery General and Abdominal at the Eighty-Sixth Annual Session of the American Medical Association Atlantic City, N. J. June 14, 1935.

1 Fabricius quoted by Carr J. L. and Foote, F. S. Progressive Obstructive Jaundice. Changes in Certain Elements of the Blood and Their Relation to Coagulation. Arch. Surg. 29: 277-296 (Aug.) 1934.

2 Petit J. L. Remarques sur les tumeurs formées par la bile retenue dans la vesicule du fiel et qu'on a souvent prises pour des abcès au foie. Mem. Acad. roy. de chir. 1: 155-187 1743.

3 Bobbs J. S. Case of Lithotomy of the Gallbladder. Tr. Indiana M. Soc. 18: 68-73 1868.

4 Langenbuch Carl. Einiges über Operationen am Gallensystem. Berl. klin. Wchnschr. 21: 809-811 (Dec. 22) 826-829 (Dec. 29) 1884.

5 Smith G. J. Abdominal Surgery. ed. 4 Philadelphia P. Blakiston's Sons & Co., 1891. p. 610.

6 Morawitz P. and Bierich R. Ueber die Pathogenese der cholanischen Blutungen. Arch. f. exper. Path. u. Pharmacol. 56: 115-129 1907.

7 King J. H. and Stewart H. A. Effect of the Injection of Bile on the Circulation. J. Exper. Med. 11: 673-685 (Sept.) 1909.

8 King J. H., Bigelow J. E. and Pearce Louise. Experimental Obstructive Jaundice. J. Exper. Med. 14: 159-178 (Aug.) 1911.

9 Hoppe Felix. Ueber die Anwesenheit von Gallensäuren im menschlichen Harn und die Bildung des Gallenfarbstoffes. Virchows Arch. f. path. Anat. 24: 113 1862.

the hormone acted as a mobilizer of calcium, which in turn increased the coagulability of the blood and was instrumental in diminishing the permeability of the capillary walls. King, Bigelow and Pearce⁸ found changes of osteoporosis in the bones of patients who had obstructive jaundice. However, Halverson, Mohler and Bergeim²⁰ expressed the belief that reduction of the serum calcium content in jaundiced patients is more apparent than real. In addition, Hammarsten²⁷ showed that the interaction of thrombin and fibrinogen to form fibrin does not require the presence of calcium. Vines²⁸ and Stuber and Focke²⁹ had similar experiences. Snell, Greene and Rowntree³⁰ found no change in the serum calcium content either in cases of experimental obstructive or in other forms of jaundice. Later, Snell and Greene³¹ concluded that there was no correlation between either the total or the diffusible content of calcium of the serum on the one hand and, on the other, either the serum bilirubin or the delay in the coagulation time of the blood in the presence of jaundice. From this discussion it appears that there may be some disturbance of the blood calcium in cases of obstructive jaundice but that its relationship to hemorrhage is rather indirect and at present unknown.

Fonio³² has administered an extract containing lipoids and blood platelets, which has yielded results in the treatment of jaundiced patients who were bleeding. However, except rarely there is no evidence of a quantitative deficiency of blood platelets either in obstructive jaundice or in hepatic necrosis associated with severe hemorrhagic tendencies. On the other hand, it is possible that there is a qualitative alteration.

Irradiation of the spleen appeared to lower the clotting time of normal blood and led Stephan³³ to employ that plan to stop bleeding. Tichy³⁴ suggested irradiating the liver. Foster and Whipple³⁵ expressed the belief that the value of this treatment is attributable to an increase in the blood fibrin content.

Many experiments and clinical observations have demonstrated that the liver has an important function to perform in association with coagulation of the blood. Bohr³⁶ ligated the celiac and mesenteric arteries and observed that specimens of blood taken four hours later would not clot for two hours. Doyon,³⁷ Doyon, Morel and Billet³⁸ and Doyon, Morel and Kareff³⁹ had simi-

lar experiences after injecting atropine into the mesenteric vein of the dog and after administration of overdoses of chloroform. Kerr, Hurwitz and Whipple⁴⁰ produced necrosis of the liver in dogs by the subcutaneous injection of phosphorus and found that the blood of the animals would not clot. Doyon and Kareff⁴¹ also excised the livers from dogs and observed that the blood failed to clot. Thus it would seem that there might be something present in the liver which is essential for the clotting of blood.

The bleeding which occurs in cases of jaundice may be attributable to a lack of fibrinogen, as has been suggested. Foster and Whipple³⁵ stated that the liver is the main potential source of fibrinogen in the body. They showed that although the clotting time does not vary profoundly with a change in the blood fibrinogen content, low values for fibrinogen may be responsible for the clots being too weak to act efficiently. Colbeck⁴² also found low values for fibrinogen in some cases of obstructive jaundice, and expressed the belief that in these instances the liver was incapable of responding in a normal manner to a demand for a raised blood fibrinogen content. On the other hand, Williamson, Heck and Mann⁴³ stated that the liver is not necessary for the regeneration of fibrinogen. Linton⁴⁴ observed that in cases of obstructive jaundice there was no deficiency of blood fibrin. In contradistinction to this, Moss⁴⁵ and Snell⁴⁶ found that there is really an increase in the amount of fibrinogen relative to the extent of the change in the liver, and they concluded that the hemorrhagic tendency of jaundiced patients is not associated with a deficiency of fibrinogen in the plasma.

Some investigators have expressed the belief that the damaged liver of a jaundiced patient produces an excess of an anticoagulant substance that prevents the blood from clotting. Howell⁴⁷ expressed the opinion that such a material is responsible for the fluidity of the blood and that an excess may be the cause of hemorrhage in cases of hemophilia and jaundice. Doyon and his co-workers⁴⁸ injected atropine, oxbile and bile acids into the mesenteric veins and common bile ducts of animals and produced incoagulability of the blood, but they failed to obtain the same result after systemic injection. Their experiments seemed to substantiate the theory that the damaged liver produces an anticoagulant substance. Boggs⁴⁹ also observed that injection of thymus and liver extract from dogs often results in incoagulability of the blood. In addition, Denny and Minot⁴⁰ noted that stasis of the blood in the liver

26 Halverson, J. O., Mohler, H. K. and Bergeim, Olaf. Calcium in the Blood in Tuberculosis. *J. A. M. A.* 68: 1309-1311 (May 5) 1917.

27 Hammarsten quoted by Lowenstein, Wilfried and Politzer, Georg. Zur Wirkung der Kalksalze auf die Blutgerinnung bei oraler und intravenöser Zufuhr. *Klin. Wchnschr.* 3: 2042-2045, 1924.

28 Vines, H. W. C. The Coagulation of the Blood. I. The Role of Calcium. *J. Physiol.* 55: 86-99 (May 24) 1921.

29 Stuber, Bernhard and Focke, Fritz. Untersuchungen zur Lehre von der Blutgerinnung. Ueber die Entbehrlichkeit des Kalkes für den Gerinnungsprozess. *Biochem. Ztschr.* 154: 77-81, 1924.

30 Snell, A. M., Greene, C. H. and Rowntree, L. G. Diseases of the Liver. II. A Comparative Study of Certain Tests for Hepatic Function in Experimental Obstructive Jaundice. *Arch. Int. Med.* 36: 273-291 (Aug.) 1925.

31 Snell, A. M. and Greene, C. H. The Calcium in the Serum in Jaundice. *Am. J. Physiol.* 92: 630-638 (April) 1930.

32 Fonio, A. Ueber die Wirkung der intravenösen und der subkutanen Injektion von Koagulen. Kocher, Fonio am Tiersuch mit einigen therapeutischen Erfahrungen. *Mitt. a. d. Grenzgeb. d. Med. u. Chir.* 27: 642-678, 1914.

33 Stephan, Richard. Retikulo-endothelialer Zellapparat und Blutgerinnung. *München med. Wchnschr.* 67: 309-312 (March 17) 1920.

34 Tichy, Hans. Durch Reizbestrahlung der Leber beschleunigte Blutgerinnung. *Centralbl. f. Chir.* 47: 1389-1390, 1920.

35 Foster, D. P. and Whipple, G. H. Blood Fibrin Studies. IV. Fibrin Values Influenced by Cell Injury, Inflammation, Intoxication, Liver Injury and the Eck Fistula. Notes Concerning the Origin of Fibrinogen in the Body. *Am. J. Physiol.* 58: 407-431 (Jan.) 1922.

36 Bohr, C. Ueber die Respiration nach Injektion von Pepton und Blutgefässen und über die Bedeutung einzelner Organe für die Gerinnung des Blutes. *Centralbl. f. Physiol.* 2: 261-264, 1888.

37 Doyon, M. Incoagulabilité du sang provoquée par le chloroforme. *role du foie.* *Compt. rend. Soc. de biol.* 58: 30-31 (Jan.) 1905.

38 Doyon, M., Morel, A. and Billet, J. Alterations du foie provoquées par le chloroforme. *Compt. rend. Soc. de biol.* 58: 108-109 (Jan. 21) 1905.

39 Doyon, M., Morel, A. and Kareff, N. Teneur en fibrinogène du sang rendu incoagulable par l'atropine. *Compt. rend. Soc. de biol.* 58: 428 (March 4) 1905.

40 Kerr, W. J., Hurwitz, S. H. and Whipple, G. H. Regeneration of Blood Serum Proteins. III. Liver Injury Alone. Liver Injury and Plasma Depletion. The Eck Fistula Combined with Plasma Depletion. *Am. J. Physiol.* 47: 379-392 (Dec. 1) 1918.

41 Doyon, M. and Kareff, N. Effect de l'ablation du foie sur la coagulabilité du sang. *Compt. rend. Soc. de biol.* 56: 612-613 (April 16) 1904.

42 Colbeck, J. C. Hemorrhage in Jaundiced Patients. *Guy's Hosp. Gaz.* 46: 138-144 (April 16) 157-165 (April 30) 1932.

43 Williamson, C. S., Heck, F. J. and Mann, F. C. A Study of Fibrinogen Following Removal of the Liver. *Am. J. Physiol.* 59: 457-467 (April) 1922.

44 Linton, R. R. The Relation of the Blood Fibrin to the Hemorrhagic Diathesis of Obstructive Jaundice. *Ann. Surg.* 96: 394-405 (Sept.) 1932.

45 Moss, Walter. Experimental Obstructive Jaundice. Its Effect on Fibrinogen and Coagulation of the Blood. *Arch. Surg.* 26: 119 (Jan.) 1933.

46 Snell, A. M. Unpublished data.

47 Howell, W. H. The Purification of Heparin and Its Presence in Blood. *Am. J. Physiol.* 71: 553-562 (Feb.) 1925. Purification of Heparin and Its Chemical and Physiological Reactions. *Bull. Johns Hopkins Hosp.* 42: 199-206 (April) 1928.

48 Doyon, Morel and Kareff. Doyon, M. and Gautier, C. Action de la bile sur la coagulabilité du sang par l'intermédiaire du foie. *Compt. rend. Soc. de biol.* 61: 428-429 (March 13) 1909. Action de la bile sur la coagulation du sang. expériences sur le lapin. *ibid.* 66: 593-594 (April 3) 1909. Action de l'atropine injectée par le canal cholédoque sur la coagulabilité du sang. *ibid.* 64: 127-128 (Jan. 25) 1908.

49 Denny, G. P. and Minot, G. R. The Origin of Antithrombin. *Am. J. Physiol.* 35: 233-247, 1914.

caused an increase in the antithrombin content of the blood. However present methods of estimating the concentration of heparin-like substances in the blood are subject to so many errors that the results are not reliable.

According to Carr and Foote¹ the bleeding of jaundiced patients is attributable to seepage through an inefficient clot, although the blood clots as rapidly as normally. They expressed the belief that the clot which is formed is influenced by the collection of intermediate products of protein metabolism, such as cysteine and related forms of mercaptan, so as to produce a non-retractile friable jelly instead of a strong occluding mesh. They employed brombenzene experimentally in the treatment of the bleeding associated with jaundice and had good results. However, the clinical application of this work has yet to be proved.

The fact that hemorrhage with jaundice still occurs, although present methods of treatment have reduced its incidence, shows that further search must be made before it will be possible to eradicate this serious complication completely. The recent work of Snell and Adams⁵⁰ has directed attention to several new factors and it is on these phases of the problem that the present paper is based.

THE CLINICAL OCCURRENCE OF THE TENDENCY TO HEMORRHAGE

There is no close relationship between the tendency to bleed and the duration of obstructive jaundice, but in a general way the hemorrhagic tendency is enhanced as the period of obstruction is prolonged. When the obstruction is caused by a malignant process, the liability to hemorrhage is also magnified because of the more extensive hepatic damage that occurs under these conditions. Likewise, the depth of the bilirubinemia does not seem to be an invariable controlling factor in the bleeding, but certainly more severe bleeding is seen in deeply jaundiced patients. Long continued intermittent obstruction also appears to produce a hemorrhagic tendency that is almost certainly the result of progressively increasing damage to the liver. It should also be mentioned that bleeding attributable to hepatic disease has been known to take place in the absence of clinical jaundice. Linton⁵¹ reported observing a hemorrhagic tendency in patients with biliary fistula who did not have jaundice. Judd⁵² also encountered this situation several times. In addition Walters⁵³ noticed similar phenomena in a case of carcinoma of the liver. However, the tendency to bleed is associated more frequently with severe damage to the parenchyma of the liver, such as is present with acute yellow atrophy or the degenerative changes which occur secondary to biliary obstruction, than with any other type of lesion. These observations suggest that the degree of injury to the hepatic parenchyma may be the most important factor in the production of hemorrhage in cases of hepatic disease. Further credence is also given to such an opinion, for there appears to be no tendency to bleed in cases of hemolytic jaundice, and according to Wangersteen⁵² the incidence of spontaneous hemorrhage in cases of catarrhal jaundice is exceedingly low. In both of these conditions the amount of hepatic injury is comparatively slight.

Almost every one is familiar with the beneficial effects of the transfusion of blood, which are reflected in the decrease in the coagulation time of the blood and in the general improvement of the jaundiced patient. However, the reason for these changes has always been obscure. The method of transfusion employed most frequently at present involves the use of sodium citrate as an anticoagulant. Because sodium citrate in itself has been shown to lower the coagulation time, it might be argued that the improvement that follows the administration of citrated blood is attributable to the sodium citrate. However, this cannot possibly be true, for numerous investigators have found that equally good, or even better, results can be obtained by utilizing whole blood. For several months we adhered to the plan of using whole blood in transfusions in order to obtain comparative data on a large series of jaundiced patients. For a while we thought that there was less tendency to bleed than there had been when we used citrated blood, but further experience seemed to indicate that the transfusion of citrated blood is of as much value as is the transfusion of whole blood. The best method of preventing hemorrhage is to give one or more transfusions of blood before operation, in some cases the transfusion of blood should be carried out both before and after surgical correction of the condition.

It should be mentioned at this point that hepatic insufficiency and renal insufficiency are two other surgical complications that must be kept in mind when jaundiced patients are being treated. Since an injured liver can utilize carbohydrates more readily than it can utilize any other nutrient substance, large quantities of a 10 per cent solution of dextrose should be given intravenously both preoperatively and postoperatively. This measure should be further supplemented by a high carbohydrate diet. The increased intake of fluid, just described, serves a double purpose in the presence of jaundice for it may also improve elimination through the damaged kidney. Some, if not all, of these therapeutic measures should be continued throughout convalescence. Under such a plan of treatment the mortality was only 4.3 per cent following operations performed on jaundiced patients at the clinic in the past year.

The risk of operations on the biliary tract is materially increased if the procedure is undertaken after the development of an obstruction of the biliary tract and of an associated infection in the liver and pancreas. The patients operated on in 1934 illustrate this point very well. In 617 consecutive cases, cholecystectomy or cholecystostomy was performed for acute or chronic disease confined to the gallbladder with the extremely low mortality of 0.97 per cent. This figure may be contrasted with the mortality of 2.65 per cent for 867 consecutive cases in which complicating factors necessitated operating on the common or hepatic ducts. One hundred and seventeen patients in the latter group were jaundiced at the time operation was undertaken.

The operative risk in cases of jaundice deserves further elaboration. In all, 207 jaundiced patients were operated on at the clinic in 1934, with a mortality of 4.3 per cent. Failure to recover was attributable for the most part to hepatic insufficiency or hemorrhage. The variety of measures advocated for the control of the hemorrhagic tendency in the jaundiced patient is in itself evidence of the lack of specificity of any of these measures. Relief from the underlying condition is the first consideration. When possible, operative

⁵⁰ Snell A. M. and Adams Mildred. Unpublished data.
⁵¹ Linton R. R. The Relation of Calcium to the Hemorrhagic Tendency in Obstructive Jaundice. *Ann Surg* 93: 707-721 (March) 1931.
⁵² The Sedimentation Rate of Blood as an Index of the Hemorrhagic Tendency in Obstructive Jaundice. *Ann Surg* 91: 694-704 (May) 1930.
⁵³ Judd E. S. Unpublished data.
⁵⁴ Walters. *Waltman Discussion Proc Staff Meet. Mayo Clin* 7: 695-696 (Nov. 30) 1932.

measures to relieve biliary obstruction should be instituted as promptly as possible after preoperative preparation. Often cycles of bleeding can be observed, especially if a determination of the coagulation time is made daily or on alternate days. It is well to take advantage of this natural variation in choosing the time for a necessary surgical procedure.

Each of the patients in this series who died had a rather marked degree of jaundice and the serum bilirubin value was more than 5 mg per hundred cubic centimeters. In two cases the concentration of serum bilirubin was more than 10 mg per hundred cubic centimeters and in three it was more than 20 mg. There is no known method by which it is possible to determine conclusively whether the liver will resume its excretory function if biliary obstruction is relieved surgically. Consequently, the surgeon is often misled in regard to the risk involved when operative measures are undertaken. In our experience the level for serum bilirubin gives the most information concerning the degree of parenchymal injury. Although patients who have moderate icterus cannot be insured against hepatic insufficiency, and some of those who have marked bilirubinemia may have a comparatively smooth convalescence, in general the higher the value for serum bilirubin the greater the likelihood that serious hepatic injury is present.

It has been observed by several clinicians that deeply jaundiced patients often remain in fairly good condition before operation but that, after surgical relief of the obstruction, intense toxemia develops and is rapidly fatal. The true nature of this condition is difficult to explain. McIndoe and Counseller⁵⁴ have described the marked degree of dilatation of the biliary passages that occurs in cases of complete obstruction, as well as the associated parenchymal lesions. They also suggested that there is a reduction in the portal flow of blood, which may be partly responsible for the hepatic cellular atrophy that is seen in these cases. Consequently, when the obstruction is relieved the pressure in the common bile duct decreases and presumably the stasis of the portal circulation is relieved. Increased blood flow through the liver may wash out into the systemic circulation toxic substances resulting from previous hepatic damage, which are injurious to the kidneys and the capillary walls. Although this explanation of "chole-mia" or "hepatic insufficiency" is theoretical, it deserves consideration for, except in a few cases, the condition cannot be satisfactorily explained on an anatomic basis alone. Crile⁵⁵ and Reid⁵⁶ have gone so far as to recommend gradual decompression of the biliary system in such cases.

EFFECT OF REDUCTION IN THE OXYGEN CONTENT OF THE ARTERIAL BLOOD

One cannot help being impressed with the fact that from both a clinical and an experimental standpoint the liver is somehow concerned with the maintenance of the "internal environment" and, when it fails in this respect, a vicious circle is developed, which is instrumental in producing further disintegration of the hepatic parenchyma as well as changes in the physiologic constants of the living organism. Since the liver is intimately associated with the production of certain

of the constituents of the blood, it is natural to search for changes that might throw some light on the problem from this source.

While working on the problem of pernicious anemia, Rich⁵⁷ noted that there was atrophy of the cells around the central veins of the hepatic lobules, presumably the result of an oxygen deficiency. Both Rich⁵⁷ and MacCallum⁵⁸ found this same type of atrophy in certain types of chronic passive congestion of the liver. Later, Rich and Resnik⁵⁹ reported that atrophy of the cells in the central portion of the hepatic lobule developed if animals were kept in an atmosphere deficient in oxygen. Campbell⁶⁰ and Rosin⁶¹ substantiated this work. These observations made it appear of interest to determine the relationship of oxygen deficiency to other hepatic lesions and its influence on the associated hemorrhagic tendency.

The question naturally arises as to whether anoxemia is ever found in patients with clinical hepatic disease and, if so, what its cause may be and what can be done to correct it. Its occurrence and characteristics have recently been studied by one of us,⁶² and in this work it was found that anoxemia of the anoxic variety was a fairly constant accompaniment of advanced parenchymal hepatic disease. In a study of nine patients who had obstructive jaundice, it was found that the oxygen capacity of the blood ranged from 9 to 20 volumes per cent and that the arterial oxygen saturation was between 79.8 and 95 per cent. Although proof was lacking, there was some evidence to show that the degree of oxygen unsaturation of the arterial blood in general reflected the condition of the patient. When the oxygen saturation of a patient who had hepatic disease was normal, or nearly so, the patient's general state was usually better than average. On the other hand, most of the very low values of oxygen saturation were found in patients who were showing definite signs of hepatic insufficiency. Finally, it was also shown in a few cases that the percentage of oxygen saturation of the arterial blood returned to a normal level as the hepatic lesion regressed. These facts may be of considerable clinical importance in the treatment of hepatic insufficiency with hemorrhage.

Study of the blood of patients whose livers have been damaged reveals that the anoxemia is usually of the anoxic type, as shown by the low percentage of oxygenation of the arterial blood, and that possibly this is attributable to some change in the pulmonary alveoli causing deficient oxygenation of the reduced hemoglobin. This appears to be the proper explanation, since inhalation of oxygen materially increases the oxygen saturation of the arterial blood. Nevertheless, even on repeated examination, constant changes could not be demonstrated in the lungs to which the anoxemia could be attributed, but it is possible that considerable influence might be exerted by minute changes in the alveolar walls, similar to those observed by Rühl⁶³ in experimental animals after shock due to histamine.

- 57 Rich, A. R. The Pathogenesis of the Forms of Jaundice, *Bull. Johns Hopkins Hosp.* 47: 338-377 (Dec.) 1930.
- 58 MacCallum, A. B. quoted by Rich⁵⁷.
- 59 Rich, A. R. and Resnik, W. H. On the Mechanism of Jaundice Following Pulmonary Infarction in Patients with Heart Failure, *abstr. Bull. Johns Hopkins Hosp.* 38: 75-76, 1926.
- 60 Campbell, J. A. Concerning the Problem of Mount Everest, *Lancet* 21: 84-86 (July 14) 1928.
- 61 Rosin, A. Morphologische Organveränderungen beim Leben unter Luftverdünnung. II. Mitteilung. *Beitr. z. path. Anat. u. z. allg. Path.* 80: 622-639 (Oct. 5) 1928.
- 62 Snell, A. M. and Macleay, Elizabeth. The Effects of Chronic Disease of the Liver on the Composition and Physicochemical Properties of Blood. Changes in the Serum Proteins. Reduction in the Oxygen Saturation of the Arterial Blood. *Ann. Int. Med.* to be published.
- 63 Rühl, Arthur. Ueber Störungen des Sauerstoffdurchtritts in der Lunge. *Arch. f. exper. Path. u. Pharmacol.* 158: 282-303, 1930.

54 Counseller, V. S. and McIndoe, A. H. Dilatation of the Bile Ducts (Hydrohepatosis). *Surg. Gynec. & Obst.* 43: 729-740 (Dec.) 1926.

55 Crile, G. W. The Technic of Gallbladder Surgery in the Presence of Jaundice. *Surg. Gynec. & Obst.* 33: 469-471 (Nov.) 1921.

56 Reid, M. R. Drainage of the Common Bile Duct. A Note on a Method of Regulating the External Drainage of Bile. *Ann. Surg.* 78: 620-622 (Nov.) 1923.

In one case the observation that a transfusion of blood appeared to relieve the anoxemia led to further investigation of the problem. In another instance, repeated transfusion not only increased the hemoglobin content and thus the oxygen capacity of the blood but also improved the percentage of oxygenation of arterial blood. These cases are included in the accompanying table.

Of course these beneficial effects may be ascribable to an improvement in the circulation, but they raise the question of whether the hemoglobin produced by a

Apparent Effect of Transfusion on the Percentage of Oxygen Saturation of Arterial Blood

| Pa- tient | Date | Ca- pacity | Oxygen | | | | Carbon Di- oxide Vol- umes per Cent Arte- rial | Comment |
|--------------|--------------------|----------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------|--|---|
| | | | Arterial | | Venous | | | |
| | | | Satura- tion per Cent | Con- tent per Cent | Satura- tion per Cent | Con- tent per Cent | | |
| 1 | 9/21/34 9/27/34 | 11.40 14.80 | 9.40 13.30 | 82.4 89.8 | 7.20 12.40 | 63.1 83.7 | Studies on admission 49 hours after trans- fusion | |
| 2 | 4/21/35 4/27/35 | 5.40 7.89 | 4.43 7.40 | 82.0 93.7 | 1.90 | 3.1 | 41.8 46.2 | Studies on admission 24 hours after trans- fusion |
| | 5/ 3/35 | 8.03 | 8.15 | 94.4 | 5.00 | 57.5 | 43.5 | 29 hours after sec- ond transfusion |
| | 5/ 8/35 | 10.50 | 9.60 | 91.4 | | | 43.9 | 144 hours after last transfusion |
| 3 | 5/18/35 5/14/35 | 8.00 5.89 | 8.56 5.33 | 91.2 93.6 | 1.53 2.79 | 32.5 49.0 | 52.0 54.0 | Studies on admission 18 hours after trans- fusion |

diseased liver is abnormal. It is known that the liver is intimately associated with the production of hemoglobin, as has been shown by Whipple.⁶⁴ Macrocytic anemia has also been demonstrated repeatedly in cases of hepatic disease and this would lead one to believe that the injured liver is not capable of functioning normally in respect to the production of hemoglobin. This defect is chiefly quantitative, so far as is known, for in man hemoglobin is supposed to be of constant composition.

Investigation of the properties of hemoglobin is difficult, but it is possible to approach the problem by

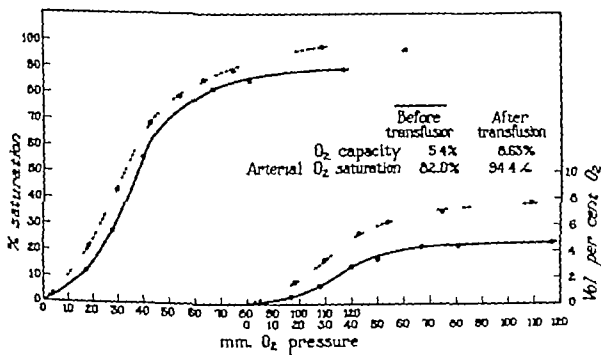


Chart 1—Oxygen dissociation curves (before and after transfusion) for blood taken from patients with severely damaged livers

two methods (1) spectrophotometric study and (2) study of the dissociation curves. In these cases spectrophotometry revealed no abnormalities, such as the presence of methemoglobin or sulphemoglobin, to explain the observed anoxemia. Up to the present, the dissociation curves of blood of patients with severely damaged livers have shown only a slight variation from the

normal curves for oxyhemoglobin established by Barcroft,⁶⁵ except when there is associated anemia (charts 1 and 2).

In cases complicated by anemia the dissociation curve is somewhat displaced to the right, and in the higher levels of oxygen tension the hemoglobin is not completely saturated, after one or more transfusions the curves have a more nearly normal contour, and because of this fact, and the increased oxygen capacity, the

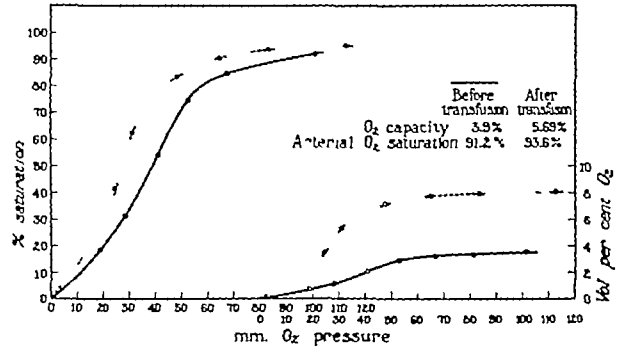


Chart 2—Oxygen dissociation curves (before and after transfusion) for blood taken from patients with severely damaged livers

blood is theoretically capable of transporting and delivering more oxygen than before. These dissociation curves have been studied under standard conditions of carbon dioxide tension (40 mm) and temperature. They suggest but do not prove that hemoglobin is at least changed by admixture with that of normal blood. In other words, the effect of transfusion on a very anemic patient who has hepatic disease is to improve the blood both quantitatively and qualitatively as a vehicle for the transportation of oxygen, the actual amount of oxygen for delivery to the tissues being thus increased. These changes may be attributable to alterations in the carbon dioxide, electrolyte or protein content of the blood, or to changes in its pH , rather than to changes in the hemoglobin itself, this matter is still under consideration. The importance of these last mentioned factors does not detract from the clinical value of transfusions to patients who have hepatic lesions, for the anoxic and anemic patient apparently receives more benefit from transfusion than can be attributed to the amount of hemoglobin transferred. In these instances, repeated transfusions and inhalation of oxygen are indicated since they relieve the anoxemia, whether it is of the anoxic or of the anemic variety, and thus protect the hepatic parenchyma from the effect of prolonged low oxygen tensions.

Although it is difficult to determine definitely the true cause of anoxemia in cases in which the phenomenon appears, it is quite likely that it has some effect on the progress of the hepatic lesion. It already has been mentioned that reduced oxygen saturation of the arterial blood, produced experimentally, leads to atrophy of the central portion of the hepatic lobule. It may also render the hepatic tissue more vulnerable to influences that could otherwise have been withstood.

COMMENT AND SUMMARY

Several points in this work deserve additional discussion. Anoxemia is not present in every jaundiced patient, but if jaundice exists the degree of unsaturation appears to have some relationship to the general

⁶⁴ Whipple, G. H. Anemia, Liver Function and Hemoglobin Production, Proc. California Acad. Med. 80:102, 1932-1933.

⁶⁵ Barcroft, Joseph. The Respiratory Function of the Blood. Part I. Lessons from High Altitudes. Cambridge University Press, 1925. Part II. Hemoglobin, 1928.

condition of the patient. It is also possible that anoxemia, when associated with hepatic disease, may have a deleterious effect on the progress of the hepatic lesion itself. Consequently, if the anoxemia persists, the liver is likely to be extensively injured and as a result the tendency to bleed will be materially increased.

In order to treat the condition intelligently, it should be borne in mind that the anoxemia may be of two types: (1) anoxic anoxia, which can be corrected by placing the patient in oxygen, and (2) anemic anoxia, which will respond to the transfusion of blood. In the latter instance there is not only an absolute anemia, as is shown by the decrease in the amount of hemoglobin present, but also a relative anoxia, because the ability of the hemoglobin to carry oxygen is diminished in certain cases. It can easily be realized that under the latter circumstances, which appear to exist only in the anemic patient, administration of oxygen alone cannot relieve the situation. On the other hand, marked benefit, for which a theoretical basis has been demonstrated, is apparently derived even from the comparatively small amount of blood given in the transfusion.

Without reference to the mechanism whereby anoxemia is produced in cases of hepatic disease, it is apparent that transfusion has a favorable influence on it in at least three ways: 1. More hemoglobin is supplied, thus increasing the oxygen capacity of the blood. It should be remembered that erythrocytosis is one of the physiologic responses to anoxemia, and that because of a deficient production of hemoglobin this cannot readily occur in the presence of advanced hepatic damage. 2. There is a better saturation of the arterial blood with oxygen after transfusion. This may be the result of an improvement in the general circulation or some change in the character of the blood as a physicochemical system. 3. The functional capacity of hemoglobin may be increased by transfusion. This can be shown by a consideration of the dissociation curves, as is expressed graphically in the accompanying charts. As pointed out, this may involve factors other than the hemoglobin itself: the p_{H} and carbon dioxide content of the blood may be of importance in this respect.

The low mortality among our jaundiced patients in the past year reflects the value of the clinical application of these principles. We feel that the lowered mortality is attributable to the adequate preoperative preparation, the selection of the opportune time for surgical treatment, and the postoperative care as previously outlined. In any case, transfusions of blood have been shown to be of both theoretical and practical value in the control of anoxemia and of the tendency to bleed that is associated with advanced hepatic disease.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. ZOLLINGER AND DR. JUDD,
SNELL AND HOERNER

DR. F. K. BOLAND, Atlanta, Ga. Dr. Zollinger's inability to reproduce referred pain to the back from gallbladder lesions adds weight to the argument that referred visceral pain usually is the result of inflammation. Mere distention of a viscus does not cause referred pain to any other part. It is stated that inspiratory distress commonly accompanies distention of the gallbladder or extrahepatic ducts. Does inspiratory distress then aid in the differential diagnosis of lesions of the biliary tract from other diseases of the upper part of the abdomen, such as peptic ulcer and pancreatitis? Is inspiratory distress due to back pressure from the biliary tract into the liver which in turn affects the diaphragm? Obstruction of the common duct is productive of more pronounced symptoms than obstruction of other parts of the biliary tract. Vomiting is more apt

to follow distention of the common bile duct than distention of the gallbladder. The recommendation that involuntary retching be added to the other indications for exploration of the common duct brings to mind the seriousness of surgery of the common duct. Cholecystostomy and cholecystectomy may give but little trouble, but one should not attempt operations on the common duct without unusual training and experience. In considering pain in the upper part of the abdomen, with or without vomiting, I think of several patients who suffered from violent attacks diagnosed as angina, when thorough study revealed gallstones, and of one patient whose disease was angina and who was operated on for cholecystitis. The radiation of pain accounts for mistakes in diagnosing these conditions, the mechanism of the radiation being explained by the innervation of the heart and the gallbladder through their mutual complicated connection with the vagus and the autonomic system. Dr. Judd and his co-workers have given what appears to be a reasonable explanation as to how transfusion increases the coagulability of the blood in jaundiced patients. There is no hemostatic agent as effective for hemorrhage as transfused blood. Dextrose is helpful in these cases, because a damaged liver can utilize carbohydrates more rapidly than it can any other nutrient substance. I should like to inquire whether it is better to give pure oxygen or to combine oxygen with 5 or 10 per cent carbon dioxide in order to stimulate deeper inspirations. The fact that oxygen increases the coagulability of the blood emphasizes the importance of giving special attention to maintaining a flat abdomen in these patients, because 90 per cent of the gas accumulating in the intestine is eliminated through the blood and lungs and not through the bowel. Therefore I should think that the less the lungs are crowded with this gas the more oxygen they can absorb.

DR. W. J. MERLE SCOTT, Rochester, N. Y. The explanation by Drs. Judd, Snell and Hoerner of the continuation of bleeding in a patient who has been jaundiced with obstruction over a period of time sounds logical. The height of the jaundice is not the cause of bleeding. I recently operated on a baby with an icterus index of 320, and there wasn't the least tendency in that baby to bleed, from either the muscle or the bed of the spleen. There is one point in regard to damage to liver parenchyma in connection with the explanation that Dr. Judd and his co-authors have given which I have used. After releasing tension on the bile ducts in an obstructive jaundice one has a condition similar to the well known one in the kidneys. Under such circumstances there are hemorrhages in the kidney parenchyma and temporarily, until the circulation of the kidney readjusts itself, there is serious difficulty in that circulation. So I think that also in sudden release of pressure in obstructive jaundice one finds the same type of effect with damage to the circulation of the liver. In two cases with long standing jaundice and very long bleeding time after multiple transfusions and with all the common conservative methods of trying to prepare the patient for operation, it was absolutely impossible to reduce the bleeding time and it was felt that the operative risk was very great. Efforts to perform a cholecystostomy under local anesthesia were successful. A water-tight tube was put in and then the gallbladder was gradually decompressed against water pressure. These patients went through that procedure very well, and it was feasible then to do the larger operation without any difficulty and without bleeding. I think that in the few cases with such extreme jaundice, when there are severe risks from the standpoint of bleeding postoperatively, this method is worth while.

DR. E. S. JUDD, Rochester, Minn. At the clinic, we administered oxygen subcutaneously in several cases, but we found that it was absorbed so rapidly that we were unable to determine that it accomplished anything worth while. We have not tried injection of oxygen in the treatment of jaundiced patients. The sudden relief of pressure in the biliary system is an important consideration. Allowing all the bile to escape at once is unfortunate. When there is deep jaundice and evidence of great pressure in the biliary tract, it is best to perform cholecystostomy and to release the pressure gradually, as Dr. Scott advises. We have followed this plan in a number of cases and feel that it accomplished a great deal.

BLOOD SUGAR CONCENTRATION AND
THE EXTERNAL SECRETION OF
THE PANCREATIC GLANDB P BABKIN, MD, DSc, FRSC.
MONTREAL

The relations between external and internal secretions of the pancreatic gland are far from being clearly understood, although some of the data seem to point to a certain connection between them.¹ The data concerning the activity of the acinous tissue of the pancreas during diabetes are very contradictory. Labbe, Nepveux and Adlersberg² and Gavrila and Parascivisco³ reported a diminution of the enzymatic power of the pancreatic juice activated by intraduodenal introduction of ether in human diabetes. Katsch and von Friedrich⁴ found lower tryptic values in one out of five cases of diabetes. Jones, Castle, Mulholland and Barley⁵ state that in sixty-eight cases of diabetes approximately half the patients showed a diminution in the digestive power of the pancreatic juice. The poor state of nutrition of some of these patients might have played some part in this phenomenon. According to Deusch and Drost,⁶ clinical manifestations of the impaired exocrine function of the pancreas in cases of diabetes mellitus are extremely rare. They may be observed if the diabetes is complicated by pancreatitis, cancer, cysts and the like. In no case of diabetes that they investigated did they find any diminution in the concentration of enzymes in the pancreatic juice.

In experimental animals the results obtained from investigation of the influence of hyperglycemia and hypoglycemia on the pancreatic secretion are likewise conflicting. Savitsch and I,⁷ using dogs with a permanent pancreatic fistula, established that, when a solution of hydrochloric acid to which cane sugar had been added was introduced into the stomach, it stimulated a flow of pancreatic juice having a higher concentration of trypsinogen than the juice obtained when acid alone was introduced. In a series of studies La Barre and Destree⁸ and La Barre,⁹ by means of a method of cross-circulation whereby it was possible to supply blood from one dog (the donor) to the head only of another dog (the recipient), demonstrated that hyperglycemia in the donor increases and hypoglycemia

(insulin, decamethylene diguanidine) diminishes the volume of the pancreatic secretion and the total output of enzymes in the recipient. In order that hyperglycemia might exert a positive effect on the pancreatic secretion, the presence of the thalamic region was essential. On the other hand, Gayet and Guillaumie¹⁰ could observe no increase of the pancreatic secretion when the brain centers were subjected to the influence of hyperglycemic blood.

Collazo and Dobreff¹¹ reported a small but definite increase of pancreatic secretion in the dog after administration of insulin. Deusch and Drost⁶ observed an analogous effect when insulin was administered in man. According to Okada¹² and his co-workers, hypoglycemia stimulates and hyperglycemia inhibits the pancreatic secretion, acting through the vagal centers. On the other hand, Lambert and Hermann,¹³ Penau and Simonnet,¹⁴ Chiray, Lebon and Gozlan,¹⁵ and Fonseca and Carvalho¹⁶ deny the secretagogue effect of insulin on the pancreas. La Barre and Destree⁸ noted a marked inhibition of the pancreatic secretion in dogs after administration of insulin.

This unsatisfactory state of affairs induced us to reinvestigate experimentally some aspects of the complicated problem of the pancreatic function during disturbances of carbohydrate metabolism.

RESULTS

During the last few years we have become interested in the effect of the blood sugar concentration on the secretory activity of the digestive glands, and especially on the output of enzymes from the pancreas in hyperglycemia and hypoglycemia. Experiments were performed on dogs and cats, but chiefly on rabbits. The last-mentioned animal offers great advantages for this type of experiment, since its pancreatic gland secretes continuously and spontaneously.¹⁷ Different anesthetics were used, amytal or pentobarbital sodium being preferred as having the least effect on the blood sugar concentration. In some experiments the spinal cord was cut below the medulla after brief ether anesthetization. The pancreatic duct was cannulated, the adrenals were removed or left intact, according to the requirements of the particular experiment. The concentration of only one of the three principal enzymes of the pancreatic juice was determined, since these enzymes are secreted in parallel concentration by the pancreatic gland in the dog,¹⁸ in man¹⁹ and in the rabbit.²⁰

The chief results obtained by us are as follows.

Miss C O Hebb established that in the rabbit there is a close parallelism between the degree of glycemia and the concentration of enzymes in the pancreatic juice. The rise or fall of the blood sugar concentration, in spite of the fact that the secretion of pancreatic juice remains very often constant in volume, is accom-

From the Department of Physiology McGill University.
Read before the Section on Gastro-Enterology and Proctology at the Eighty-Sixth Annual Session of the American Medical Association Atlantic City N J June 14, 1935.

- 1 Freud J and Saadi Nazim. *Compt rend Soc de biol* 95: 571 (July 23) 1926. Zunz E and La Barre, Jean. *ibid* 95: 1435 (May 21) 99: 335 (June 29) 1928. Coelho E and Oliveira J C. *ibid* 98: 477 (Feb 17) 1928. Boldyreff W N. *Am J Physiol* 85: 353 (June) 1928. A thorough discussion of this problem will be found in La Barre, Jean. *Diabète et insulinnémie*. Paris: Masson & Cie 1933. Papers by Soula and his co-workers should also be consulted. Soula C, Rouzard J, Bugnard L and Basset, A. *Compt rend Soc de biol* 110: 27 (May 13) 346 (June 10) 1932. Soula C, Goebel Bugnard and Bouisset. *ibid* 111: 282 (Oct 21) 1932. 1242 1335 1932. Soula C. *ibid* 112: 770 (March 3) 1933. Bugnard and Soula C. *Compt rend Acad d sc* 194: 2330 (June 27) 1932. *Bull Acad de méd* 107: 1047 (July 26) 1932.
- 2 Labbe, M, Nepveux F, and Adlersberg L. *Arch d mal de l'app digestif* 35: 871 (Nov.) 1925.
- 3 Gavrila I and Parascivisco M. *Compt rend Soc de biol* 95: 761 (Sept. 21) 1926.
- 4 Katsch G and von Friedrich L. *Klin Wchnschr* 1: 112 (Jan. 15) 1922.
- 5 Jones, C M, Castle W B, Mulholland, H B and Barley Francis. *Pancreatic and Hepatic Activity in Diabetes Mellitus*. *Arch Int. Med* 35: 315 (March) 1925.
- 6 Deusch G and Drost, E. *Klin Wchnschr* 6: 2180 (Nov 12) 1922.
- 7 Babkin B P and Savitsch W W. *J russe de physiol* 3: 143 1921.
- 8 La Barre, Jean, and Destree P. *Compt rend Soc de biol* 95: 1237 1240 (May 4) 1928. 99: 337 (June 29) 1056 (Oct 5) 1874 (Dec. 21) 1928, 101: 147 (May 17) 1929.
- 9 La Barre, Jean. *Am J Physiol* 94: 17 (July) 1930.

- 10 Gayet R. and Guillaumie M. *Compt rend. Soc de biol* 103: 1220 (May 1) 1930. 105: 373 (Nov 14) 1930.
- 11 Collazo J A. and Dobreff Minko. *Biochem Ztschr* 105: 352 1925.

- 12 Okada S. *Nagoya J M Sc* 7: 91 (Dec.) 1933.
- 13 Lambert M and Hermann H. *Compt rend Soc de biol* 92: 43 (Jan 16) 1925.
- 14 Penau H and Simonnet, H. *Bull Soc chim. biol* 7: 17 1925.
- 15 Chiray M, Lebon J and Gozlan, W. *Bull et mém Soc. méd d. Hop de Paris* 40: 1524 (Dec 4) 1646 (Dec. 18) 1925. 50: 329 (Feb. 26) 1926.
- 16 Fonseca F and de Carvalho A. *Compt rend. Soc. de biol* 95: 1252 (Nov 26) 1926.
- 17 Baxter S G. *Am J Physiol* 96: 343 349 (Feb.) 1931.
- 18 Babkin B P. *Tr. Mil. M Acad., St Petersburg* 9: 93 1904. *Die aussere Sekretion der Verdauungsdrüsen*, ed 2 Berlin Julius Springer 1928. P 469. Savitsch W W. *Zentralbl f d ges Physiol u. Path. d Stoffwechsels* 1909 No 1. La Barre and Destree.
- 19 Wohlgemuth J. *Berl. klin Wchnschr* 1907 No. 2.
- 20 Baxter S G. *Am J Dig Dis & Nutrition* 2: 108 (April) 1935.

panied by a rise or fall of the enzymatic activity of the juice. This is evident from several types of experiments. If the blood sugar level is kept constant during the experiment, there is no fall in the concentration of enzymes, e. g., in the case of urethane (ethyl carbamate) anesthesia, if the usual postoperative hyperglycemia gradually diminishes, there is also a slow fall in the enzyme concentration, if the fall of the blood sugar concentration is arrested and it goes up (owing to struggling of the animal, administration of ether and the like), the enzymatic activity of the pancreatic juice remains on the same level or increases.

That it is the concentration of dextrose in the blood that regulates the output of pancreatic enzymes was shown by Miss Hebb in experiments in which dextrose (usually 5 cc of 20 per cent dextrose solution) was administered intravenously. Without a single exception

fact, in many experiments the enzymatic activity of the pancreatic juice was diminished after injection of these substances.

We subjected to thorough analysis the fact of the increased output of enzymes by the pancreas under the influence of dextrose.

The possible excitation of the adrenal secretion by an excess of dextrose in the blood and consequent stimulation of the pancreatic secretion was excluded in the experiments on doubly adrenalectomized animals carried out by Dr. Baxter²¹ and Miss Hebb.

Next comes the problem of the passage of dextrose through the acinous cells and the possibly favorable effect thereby produced on the enzymatic activity of the pancreatic juice. The majority of the experimental and clinical investigators are inclined to think that neither after the introduction of a large amount of dextrose into the blood of experimental animals nor in cases of severe diabetes does dextrose appear in the saliva. But, as far as we could ascertain, nothing was known concerning the behavior of the pancreatic gland under similar circumstances.

Miss Hebb clearly demonstrated that the pancreatic acini are much more readily permeable to dextrose than are the secretory cells of the salivary glands. She determined the reducing substances by the Hagedorn-Jensen method before and after yeast fermentation of the protein-free filtrate of pancreatic juice obtained from rabbits, dogs and cats under anesthetics. Dextrose was recovered from the pancreatic juice of rabbits in amounts of from 10 to 50 mg per hundred cubic centimeters, when the blood sugar concentration varied between 200 and 300 mg. Intravenous injection of dextrose greatly raised the previous values. When, after dextrose administration, the hyperglycemia was 385 mg per hundred cubic centimeters and over, the concentration of dextrose in the pancreatic juice rose to 100 mg and higher. Analogous relations were found in the case of the pancreatic juice of dogs and cats secreting under the influence of secretin. When the concentration of the blood sugar was moderate, the pancreatic juice contained sometimes traces, sometimes as much as a few milligrams per hundred cubic centimeters of sugar. These values rose greatly (i. e., as high as 70 or 80 mg per hundred cubic centimeters) after the intravenous administration of dextrose. The permeability of the pancreatic cells to dextrose was not impaired by atropinization of the animal.

The first step in the analysis of the effect of the blood sugar concentration on the pancreatic secretion was to find out how the increased concentration of dextrose in the pancreatic juice may affect its enzymatic function. It was thought that the increase of the digestive power of the pancreatic juice during hyperglycemia might possibly be due to the favorable action of dextrose, present in the pancreatic juice, on its enzymatic functions. This hypothesis was disproved with regard to the lipolytic and the tryptic activity of the pancreatic juice. The addition of dextrose in various amounts (0.1 cc of 0.05, 0.1 or 0.2 per cent solutions) to the pancreatic juice did not produce any beneficial effect on the action of lipase or trypsin. No experiments were performed with amylase, but Clark and Edwards²² reported that the amylolytic activity of malt diastase was not affected by weak concentrations of dextrose and was inhibited by stronger concentrations.

TABLE 1—Experiment Showing That Concentration of Dextrose Regulates Output of Pancreatic Enzymes*

| Time | Volume of Pancreatic Secretion, Cc | Corrected Lipase Unit† | Total Output of Lipase per Hour | Blood Sugar, Mg per Cent | Comment |
|-----------------------|------------------------------------|------------------------|---------------------------------|--------------------------|---|
| 11 00 a.m. 11 30 a.m. | 0.4 | | | | |
| 11 30 a.m. 12 00 noon | 0.3 | | | 298 | |
| 12 00 noon 12 30 p.m. | 0.5 | 810 | 8 100 | 233 | |
| 12 30 p.m. 1 00 p.m. | 0.4 | | | | |
| 1 00 p.m. 1 15 p.m. | 0.2 | 570 | 5 700 | | |
| 1 15 p.m. 1 45 p.m. | 0.25 | 300 | 3,000 | 143 | 1 15 p.m. 5 cc of 3.3% NaCl solution (isotonic with 20% dextrose solution) injected intravenously |
| 1 45 p.m. 2 15 p.m. | 0.35 | | | | |
| 2 15 p.m. 2 45 p.m. | 0.4 | 315 | 3 150 | 131 | |
| 2 45 p.m. 3 15 p.m. | 0.3 | | | | |
| 3 15 p.m. 3 45 p.m. | 0.3 | | | | |
| 3 45 p.m. 4 15 p.m. | 0.2 | 700 | 7 500 | 266 | 3 45 p.m. 5 cc of 20% dextrose solution injected intravenously |
| 4 15 p.m. 4 45 p.m. | 0.25 | | | | |

* September 21. Rabbit 21 Kg. fasting thirty-six hours. The spinal cord cut below the medulla during brief ether anesthesia. Artificial respiration.

† In this and the following table, corrected lipase units means the lipolytic power of the pancreatic juice when the dilution factor is taken into consideration. This is calculated according to the formula: $\frac{\text{volume for 1 hour}}{1 \text{ cc.}} \times \text{lipase units in 0.1 cc.}$

the rise in the blood sugar level increased the concentration of enzymes in the pancreatic juice (table 1). In many experiments this occurred when there was no change whatever in the rate of secretion of the juice. From this it would seem that under certain circumstances dextrose may increase the output of organic material and enzymes from the glandular cells without affecting greatly the rate of secretion of the fluid parts of the juice.

The effect of dextrose on the secretory function of the pancreatic gland was found to be specific. Since the intravenous introduction of concentrated solutions of dextrose may change the osmotic pressure of the body and tissue fluids, it was thought that it might also affect in some way the secretory function of the pancreas. However, control experiments with intravenous administration of isosmotic solutions of sodium chloride, sodium bicarbonate and cane sugar did not produce any effect comparable to the effect of dextrose on the function of the acinous cells. As a matter of

The conclusion to be drawn from these experiments is that the increased enzymatic activity of the pancreatic juice in hyperglycemic animals does not depend on the presence of dextrose in the secretion. Therefore the changes in the enzyme concentration of the pancreatic juice after administration of dextrose are due to some processes occurring in the body, probably in the pancreas itself. Since the parasympathetic nervous system, as is well known,²³ regulates the output of enzymes from the pancreatic gland, the effect of atropine was tested. After the administration of atropine the concentration of enzymes usually fell slightly. The injection of massive doses of dextrose together with atropinization did not increase the concentration of enzymes in the pancreatic juice and even failed to prevent its customary fall (table 2). The latter fact is further evidence that the presence of dextrose in the juice, the passage of which substance through the acinous cells is not prevented by atropine, does not increase its enzymatic activity. Therefore it seems justifiable to conclude that dextrose stimulates that function of the acinous cells of the pancreas which is concerned with supplying enzymes to the juice, and that it acts through the medium of the parasympathetic nervous system. Since this effect was observed in animals with the vagi cut, it appears to be mainly of a peripheral nature. However, special experiments are needed to determine whether the central nervous system participates in this phenomenon or not.

The effect of hypoglycemia was studied in our laboratory some time ago by Dr. S. G. Baxter.²¹ After the work of Miss Hebb, his data now appear in a somewhat different light. Dr. Baxter established that the hypoglycemic state of the blood provoked by insulin diminishes the discharge of enzymes by the pancreatic gland in the rabbit. Usually the volume of the pancreatic secretion during hypoglycemia also decreased, but in some experiments this decrease was very insignificant or entirely absent. Nevertheless in all cases the tryptic power of the juice gradually diminished with the fall of the blood sugar concentration. To avoid the increased output of epinephrine during hypoglycemia,²⁴ in most of Baxter's experiments the adrenals were removed or their veins were tied. The effect of hypoglycemia on the discharge of pancreatic enzymes depends on the integrity of the vagi. If both vagi were sectioned, there was an absence of any significant fall in the enzymatic power of the pancreatic juice during insulin hypoglycemia. The volume of the secretion, however, was very often diminished.

Intravenous administration of dextrose in massive doses to hypoglycemic animals with the vagi intact as well as after section of the vagi, restored the flow of the pancreatic juice if it was inhibited and greatly increased the concentration of enzymes in the pancreatic juice. Moreover, the beneficial effect of dextrose did not depend on the integrity of the sympathetic nerve supply to the pancreatic gland because it was observed in vagotomized and splanchnicotomized animals.

COMMENT

These investigations firmly establish certain facts concerning the interrelations between the blood sugar concentration and the exocrine activity of the pan-

creatic gland. In the present unsatisfactory state of our knowledge of the intimate processes taking place in a secreting gland, however, the interpretation of these data is very difficult.

The first fact which must be taken into consideration is that the blood sugar concentration affects separately the "secretory" and "trophic" functions (so designated by R. Heidenham) of the pancreas. It is the latter function (i.e., the discharge of organic material and enzymes by the glandular cells) that is always stimulated by the excess of dextrose in the blood. The changes in the volume of the secretion are not so constant. Our experiments showed that hyperglycemia influences the "trophic" function of the pancreas always, and its secretory function sometimes, by direct action on the gland itself. In the case of the "trophic" function it acts presumably through the endings of the parasympathetic nerve. However, the possibility of the influence of the central nervous system cannot be

TABLE 2—Experiment Showing that Massive Doses of Dextrose After Administration of Atropine Did Not Increase Concentration of Enzymes in Pancreatic Juice *

| Time | Volume of Pancreatic Secretion, Cc. | Corrected Lipase Units | Total Output of Lipase per Hour | Blood Sugar Mg per Cent | Comment |
|-----------------------|-------------------------------------|------------------------|---------------------------------|-------------------------|---|
| 11 30 a.m. 12 00 noon | 0.3 | 704 | 7 040 | | |
| 12 00 noon 12 30 p.m. | 0.3 | 002 | 0 020 | 2.0 | |
| 12 30 p.m. 1 00 p.m. | 0.2 | 475 | 4 750 | 370 | 12 30 p.m. struggling 1 mg. of atropine sulphate intravenously |
| 1 00 p.m. 1 30 p.m. | 0.3 | | | | |
| 1 30 p.m. 2 00 p.m. | 0.2 | 430 | 4 300 | 380 | 1 30 p.m. 1 mg. of atropine sulphate and 10 cc. of 20% solution of dextrose intravenously |
| 2 00 p.m. 2 30 p.m. | 0.3 | | | | |
| 2 30 p.m. 3 00 p.m. | 0.2 | 430 | 4 300 | +38.0 | |
| 3 00 p.m. 3 30 p.m. | 0.3 | | | | |
| 3 30 p.m. 4 00 p.m. | 0.3 | 430 | 4 300 | +38.0 | 3 30 p.m. 5 cc. of 20% solution of dextrose intravenously |
| 4 00 p.m. 4 30 p.m. | 0.2 | | | | |
| 4 30 p.m. 4 45 p.m. | 0.2 | 264 | 2 640 | | 4 30 p.m. right vagus nerve stimulated in the neck for 15 min. no effect on the heart |

* December 7. Rabbit 2.4 Kg. fasting forty eight hours. pentobarbital sodium. artificial respiration.

excluded. On the other hand, hypoglycemia exerts its effect through the central nervous system. The inhibitory impulses to the acinous cells are discharged along the vagus nerves. From their nature, they may be called "trophic-inhibitory" or "negative-trophic" impulses.

All these facts are indicative of a relationship between the blood sugar level and some metabolic processes taking place in the secretory cells during their activity. There are already indications that the carbohydrates play an extremely important part in the processes of secretion. Anrep and Cannan²⁵ found that stimulation of the chorda tympani or pilocarpine administration increases the consumption of blood sugar by the submaxillary gland of a dog. Hober and Ferrari²⁶ found that the metabolism of the active submaxillary gland is analogous to that of working muscle. The secretory work depends on carbohydrates and on an organic phosphoric compound present in the glandular tissue and is to a certain degree independent

²³ Babkin B. P. Die äussere Sekretion der Verdauungsdrüsen 1928 p. 44.

²⁴ Lunz and La Barre.¹

²⁵ Anrep G. V. and Cannan R. K. J. Physiol. 56: 248 (May) 1922. 57: 1 (Dec.) 1922.

²⁶ Hober, R. and Ferrari R. A. In Wechnsch. 12: 433 (March 18) 1933.

of oxygen supply. During stimulation of the chorda tympani the concentration of lactic acid and of phosphoric acid in the blood of the glandular vein greatly increases. Still, Bennett and Scott²⁷ showed that in a dog the secretion of the pancreatic juice activated by highly purified secretin is accompanied by an increased consumption of oxygen. The average respiratory quotient of the resting pancreas is 0.79. During the secretory activity of the gland the average respiratory quotient (extra respiratory quotient) was found to be 1.05. The concentration of lactic acid in the venous blood collected from an active pancreas was increased. All this suggests that the carbohydrate metabolism is increased during the secretory activity of the organ. Undoubtedly further work is necessary in order that the part played by the secretory nerves in the metabolism of a secretory gland may be understood.

What is the explanation of the variety of results obtained in different cases of diabetes mellitus in human beings in relation to the pancreatic secretion? The discrepancy in the determination of the volume of the pancreatic secretion and the enzyme concentration is undoubtedly due in some degree to the unsatisfactory methods employed in obtaining the pancreatic juice from human subjects. Another cause may be the different state of the acinous cells in various cases of diabetes. It is legitimate to suppose that the degree of hyperglycemia in a given case of diabetes will determine the amount of zymogen granules stored in the pancreatic cells and hence the concentration of enzymes in the juice.

SUMMARY

The existence of a close relationship between the blood sugar level and the secretory processes of the pancreatic gland has been established. Hyperglycemia always increases the output of enzymes from the acinous cells and in certain cases increases the volume of the secretion. The effect of hyperglycemia is chiefly peripheral, the parasympathetic nervous system presumably participating in this. Hypoglycemia produced by the administration of insulin lowers the concentration of enzymes in the pancreatic juice. After section of the vagus nerves this effect disappears.

ABSTRACT OF DISCUSSION

DR A. H. AARON, Buffalo. I have repeatedly determined the lipase and amylase concentration in the B fraction of the duodenal contents in a single individual with achlorhydria. Feeling that these results are as near standardized as can be obtained by usual intubation, I repeated Dr Babkin's experiment as nearly as possible in this individual. Hyperglycemia was produced and maintained during the drainage of the B fraction by repeated intravenous injections of dextrose. At no time during this experiment did the concentration of ferments increase in the duodenal contents. Determinations for amylase were performed according to Ivy's modification of Willstätter's method, and lipase was determined by the method of Cherry and Crandall.

DR B. P. BABKIN, Montreal. The methods of collection of pancreatic juice in man are unsatisfactory. What one gets from a duodenum is three or four juices, and besides that one gets fifteen enzymes and activators, so, really, I think that the clinicians will have to find better methods to get the pancreatic juice less contaminated with other secretions, in which it will be possible to determine with a reasonable accuracy the relative concentration of the three principal enzymes.

ANESTHESIA FOR THYROCARDIAC PATIENTS

L. F. SISE, M.D.
BOSTON

A thyrocardiac patient is one having thyroid toxicity and significant heart disease. For the purposes of making a study of the end results, significant heart disease has been taken to be (1) auricular fibrillation or flutter, or (2) congestive heart failure.¹ Many most serious cases of heart disease, however, which might appear to be quite dangerous for the administration of an anesthetic, do not fall within this group. For this reason it has seemed best in studying the effect of anesthesia to include in this group not only the aforementioned heart conditions but also cases of coronary disease, angina pectoris, and the two most serious valvular lesions, mitral stenosis and aortic regurgitation. The question of diagnosis will not be considered. All diagnoses have been made by the medical department of the Lahey Clinic. No doubtful diagnoses have been considered, but when a definite diagnosis was made by the medical department this diagnosis has been taken as final.

Our early operations were done with local anesthesia. After a comparatively small series of cases this was gradually replaced by nitrous oxide, and a considerable series of cases was done with this gas. In 1924, following the introduction of ethylene, a change was made to this drug, and the resulting series of cases is by far the largest. Following the work of Waters with cyclopropane we made still another change and now do these toxic heart cases largely under cyclopropane.

In the course of this considerable series of cases under these various anesthetics it is only natural that certain opinions and conclusions should have been formed concerning the value and limitations of these various anesthetics.

Local anesthesia is favored by many and has considerable value in lack of toxicity and in that it does not itself place an appreciable load on the heart. We have found, however, that with these cases in actual practice it has certain definite drawbacks. 1 These toxic patients are nervous and excitable and often react very poorly to the conscious state during operation. We believe that on this account we have seen venous congestion very definitely increase during operative procedures. Of course, preliminary medication helps considerably, but its effect varies so much between different individuals that its results are uncertain and not to be depended on. 2 Anesthesia is inadequate in many cases. The points where it is apt to be inadequate are during elevation of the lateral lobes and during extraction of extensions below the clavicle. Of course a cervical plexus block will take care of most of these points quite well, but the administration of the block itself is too much of an ordeal for these patients to endure. For these two reasons we have found it necessary to augment local anesthesia with a gas anesthetic in the majority of instances. 3 Under local anesthesia the surgeon is more restricted. He does not have the freedom for rapid manipulation and wide exposure that he has under a general anesthetic. For these three

From the Lahey Clinic.
Read before the Section on Miscellaneous Topics, Session on Anesthesia, at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.
1. Lahey, F. H., and Hurxthal, L. M. Postoperative End Results in Three Hundred Thyrocardiacs. *Am. J. Surg.* 24: 225-231 (May) 1934.

27. Still, E. U., Bennett, A. L., and Scott, V. B. *Am. J. Physiol.* 106: 509 (Dec.) 1933.

reasons we believe that in these cases local anesthesia is inferior to certain forms of general anesthesia. It was abandoned quite early in our work with these cases, so that our total experience with it has been comparatively small.

Nitrous oxide is of value in that it does not of itself have appreciable toxic action or place an increased load on the heart. It is, however, inevitably accompanied by at least some degree of anoxemia. This anoxemia increases the load on the heart and at the same time, by decreasing the oxygen supply to the heart muscle, renders the heart less able to carry even the same load. The situation is still further complicated by the fact that these thyrotoxic individuals require more than the normal amount of oxygen and are often somewhat resistant to anesthesia. In addition, nitrous oxide is a comparatively weak anesthetic and does not satisfactorily suppress certain reflex effects. It often happens that considerable manipulation of the trachea is necessary in the course of the operation and that this may produce a strong reflex tendency to cough and laryngeal spasm. If these effects do take place, the resulting anoxemia may be much worse than if a deeper degree of anesthesia had been maintained in the first place. The anesthetist is thus in a quandary as to which of the two courses open to him is the less bad—the light anesthesia, which may at any moment result in spasm and deep anoxemia, or the deeper anesthesia, which carries anoxemia from the start. The situation is bad enough in patients with normal hearts, though here the anesthetist of reasonable skill and experience has sufficient warning of trouble to enable him to bring the patient safely through. But when, as occasionally happens in these cases, the myocardium is seriously damaged and incapacitated, this warning may be reduced practically to zero.

The inevitable tragedy that results has occurred twice in my own experience. These two cases have been reported elsewhere in detail,² but the second case has such value as a warning to others that it is worth mentioning again here. After approximately 2,000 thyroid cases under nitrous oxide, this second fatality occurred just eight days after the first one. With the first case thus fresh in mind, I was naturally particularly cautious and alert. Yet, with everything apparently going smoothly and safely, cessation of heart action occurred with an abruptness that appeared absolute.

Our series of thyroid operations under nitrous oxide has been comparatively large and in many respects has been reasonably satisfactory. Nevertheless, in these toxic heart cases, both from theoretical considerations and from practical experience, nitrous oxide appears to be fraught with danger. For this reason and because it has often been extolled as one of the safest anesthetics, I should like to give as my emphatic opinion that in these cases it is a dangerous anesthetic.

It must further be said, however, that the danger lies not in the nitrous oxide itself but in the anoxemia that accompanies it. If one uses preliminary medication or an adjuvant in sufficient amount to avoid this anoxemia, this particular danger is removed. Toxicity or depression may be added, but these appear to be lesser evils than anoxemia. I believe that in cases of damaged myocardium the latter should be avoided absolutely.

Ethylene has for these cases two important advantages over nitrous oxide. It can be used with a considerably larger amount of oxygen and it suppresses much more satisfactorily the reflex effects. The great advantage of these two points will be evident from the discussion of nitrous oxide. Its toxic action appears to be minimum. Our series under ethylene is the largest of any anesthetic and does not include any case in which death appeared to be the direct result of the anesthetic. A small amount of anoxemia frequently accompanies it. This is not enough to be dangerous to the normal heart but should be avoided with the damaged organ. For this purpose sufficient oxygen may be added to overcome the anoxemia, and the desired depth of anesthesia maintained by the addition of a small amount of ether. Of late we have often used cyclopropane as the adjuvant. Either combination makes a very satisfactory anesthetic for these cases. I am unable now to say which is the better.

Cyclopropane appears desirable for these cases because of the unusually large amount of oxygen that can be used with it. Experimental evidence indicates toxic action on the heart in the higher concentrations. Whether in the lower concentrations used in anesthesia this action is of sufficient degree to be of moment or whether it is even present at all is not now apparent. Whatever the reason, certainly there is a marked difference in the immediate postoperative recovery of patients in whom different depths of anesthesia have been given. Those who have been given a minimal degree of anesthesia have had surprisingly few after-effects, while those cases in which a considerable depth has been accomplished often show considerable depression. Reflex effects are controlled quite well even by light degrees of anesthesia.

Not only is the complete avoidance of anoxemia under cyclopropane of advantage but it is even possible that the more than normal percentage of oxygen under this anesthesia may be of further additional value in itself. This possibility is indicated by the work of Barach,³ who showed that in heart failure, especially of the nonrheumatic type, the employment of 50 per cent oxygen enables many patients to regain their compensation when other measures have failed. This indicates the possibility that abnormally high oxygen during anesthesia may aid the damaged myocardium to handle the strain.

Regardless of the particular drug used for anesthesia, a few general conclusions are justified.

1. Anoxemia is to be avoided especially in those cases presenting a damaged myocardium. This has already been sufficiently discussed but needs to be stressed.

2. Obstruction to respiration is to be avoided. Not only does this tend to the production of anoxemia but the labored breathing which it engenders is just so much extra exertion to the patient and a bother to the surgeon in his work. An efficient airway should be used as a routine. In cases in which compression of the trachea is shown by x-rays it is advisable to use intratracheal anesthesia. Cyclopropane is an excellent anesthetic for the insertion of the tube, but in the really bad risk cases it is better to avoid the considerable depth necessary for this procedure by using local anesthesia of the larynx. This may easily be obtained by spraying 10 per cent cocaine through an airway under light gas anesthesia.

2. Sise, L. F. Anesthesia for Thyroid Surgery. *Anesth. & Analg.* 4: 287-298 (Oct.) 1925.

3. Barach, A. L. The Treatment of Heart Failure by Continuous Oxygen Therapy. *Anesth. & Analg.* 14: 79-88 (March-April) 1935.
Barach, A. L. and Levy, R. L. Oxygen in the Treatment of Acute Coronary Occlusions. *J. A. M. A.* 103: 1690-1693 (Dec. 1) 1934.

3 Rather liberal premedication should be used to lessen nervousness and excitement

4 The stimulating effect of carbon dioxide should be avoided This we have done satisfactorily by means of the carbon dioxide absorption technic In a few

TABLE 1—Ages of Patients *

| Age | Patients |
|----------|----------|
| 33 to 39 | 10 |
| 40 to 49 | 24 |
| 50 to 59 | 40 |
| 60 to 69 | 23 |
| 70 to 71 | 3 |
| | 100 |

* Approximately two thirds are 50 years or over

TABLE 2—Sex

| Female | 74 |
|--------|-----|
| Male | 26 |
| | 100 |

TABLE 3—Type of Goiter (All Thyrotoxic)

| | |
|---------------------------|-----|
| Primary hyperthyroidism | 50 |
| Adenomatous goiter | 38 |
| Recurrent hyperthyroidism | 0 |
| Adenoma | 2 |
| | 100 |

TABLE 4—Classification as to Risk

| Grade* | Cases |
|--------|-------|
| 1 | 2 |
| 2 | 35 |
| 3 | 62 |
| 4 | 1 |
| | 100 |

* Grade 1 is a good risk, grade 2 a fair risk, grade 3 dangerous and grade 4 a probable fatality Almost two thirds are classed as dangerous risks

cases in which the soda lime had become exhausted and had been replaced during the operation by fresh soda lime, the beneficial effects of this procedure have been most strikingly demonstrated

5 The depth of anesthesia should be nicely adjusted so that, while reflex effects are controlled, the dangers of anoxemia and the depressing or toxic effects of more than minimal depth are avoided

So important are these points that I believe the proper conduct of the anesthesia in these respects is much more important than any niceties in the choice of the particular anesthetic agent

STATISTICS

In order to make certain facts about these cases more clear and definite I have analyzed and tabulated the last 100 cases In most respects the tables are self explanatory, but they can be clarified by comment in some instances The risks are graded from 1 to 4, 1 being a good risk, 2 a fair risk, 3 a dangerous risk, and 4 a probable fatality These risks are all graded by the anesthetist and are recorded on the chart before operation When one notes from the tables that almost two thirds of these cases were graded as dangerous and that just about two thirds of the patients were 50 years of age or over, and when one notes the various

heart conditions and realizes that, in addition, all these patients were suffering from thyroid toxicity, a fairly clear idea is had that this group as a whole was a decidedly dangerous risk The serious condition of this group is also indicated in table 5, in which it is seen that multiple stage operations were thought necessary in all but thirteen cases

COMPLICATIONS AND DEATHS

In considering the complications and deaths, one encounters the usual difficulty in determining how much is due to the anesthetic and how much has nothing whatever to do with it

One is struck at once by the fact that every one of these patients had auricular fibrillation and that every patient having a complication had, in addition, congestive heart failure Such cases are particularly prone to the occurrence of emboli Emboli appear to account for complication 3, temporary hemiplegia, and death 2, sudden death Complication 1, excessively high pulse rate during anesthesia, was probably due to toxicity and the initial heart condition Whether any other anesthetic would have proved better is impossible to

TABLE 5—Type of Operation *

| | |
|------------------------------------|-----|
| Hemithyroidectomy | 25 |
| Subtotal thyroidectomy | 7 |
| Ligation of superior poles | 1 |
| Excision | 1 |
| Skin flap (incomplete operation) | 1 |
| Muscles cut (incomplete operation) | 1 |
| Total ablation | 1 |
| | 100 |

* In only thirteen instances was a complete operation in one stage thought safe

TABLE 6—Kind of Anesthetic

| | |
|------------------------------|-----|
| Ethylene | 66 |
| Cyclopropane | 13 |
| Ethylene-ether | 9 |
| Ethylene-cyclopropane | 6 |
| Nitrous oxide-ether | 1 |
| Tribrom ethanol-cyclopropane | 1 |
| | 100 |

TABLE 7—Pathologic Condition of the Heart *

| | |
|--|-----|
| Auricular fibrillation | 61 |
| Congestive failure | 25 |
| Mitral stenosis | 9 |
| Coronary sclerosis | 3 |
| Coronary occlusion | 3 |
| Angina pectoris | 1 |
| Auricular flutter | 1 |
| Aortic regurgitation | 1 |
| | 107 |
| Auricular fibrillation and congestive failure | 28 |
| Auricular fibrillation and mitral stenosis | 4 |
| Auricular fibrillation and coronary sclerosis | 1 |
| Auricular fibrillation and aortic regurgitation | 1 |
| Mitral stenosis and congestive failure | 1 |
| | 35 |
| Mitral stenosis and auricular fibrillation and congestive failure 1 case | 2 |
| | 37 |
| | 100 |

* Thirty six patients had more than one

say Complication 2, spontaneous pneumothorax, was unusual One cannot help wondering whether the respiratory obstruction during operation, with probable labored breathing, did not have some causal relationship Against this view is the large number of cases presenting similar obstruction but without this compli

cation, which we had in this clinic before our free use of intratracheal anesthesia. No relation to the anesthetic was indicated in complications 4 and 5.

The relation of the anesthetic to the two deaths from thyroid storm must remain an unsolved problem. Thyroid storm is often caused by or accompanied by pneumonia and appears to be related in some way to liver failure, as suggested by Dr. Lahey. Both of these were present in death 1. In this case ethylene-ether was used, though but a small amount of ether was given. In the other case, ethylene was used. This drug is not one that is generally believed to have any tendency to the production of either pneumonia or liver failure. In fact, the causes entering into the production of postoperative pneumonia are still obscure in many respects. On the whole it seems probable that the cause of postoperative thyroid storm lies in the preoperative condition of the patient, the amount of surgery done, and the conduct of the anesthesia, rather than in the particular anesthetic agent used.

The operative mortality of 3 per cent here recorded is not far from that of 4.25 per cent reported by Lahey and Hurxthal in reviewing 300 of these cases in 1933.

COMPLICATIONS

CASE 1—A woman, aged 53, severely toxic, whose heart was greatly enlarged, had auricular fibrillation and congestive heart failure. On coming to the operating room the pulse became very rapid. She was given cyclopropane, and the pulse rose still further to 200. The operation, therefore, was limited to ligation of the superior thyroid poles. As it was felt that apprehension played a prominent part in the rapid pulse at this operation, at the next stage she was given tribrom-ethanol in her room before coming to the operating suite, and this was followed by cyclopropane for the operative procedure. Nevertheless the pulse rose just the same, in fact reaching this time a high of 215. It was felt best, therefore, by the time the muscles had been cut to conclude the operation. She recovered without further complication.

CASE 2—A man, aged 45, very toxic, with auricular fibrillation and congestive failure, had marked tracheal obstruction during operation. (Use of the intratracheal method would have been preferable.) Ethylene-cyclopropane anesthesia was administered. At two and three-quarters hours after the operation there was sudden dyspnea and cyanosis. Diagnosis was made of spontaneous pneumothorax, and 1,100 cc. of air was withdrawn. Next day 900 cc. more was withdrawn and the patient thereafter made an uninterrupted recovery. This patient eventually made a most remarkable improvement over his pre-operative condition.

CASE 3—A woman, aged 49, with auricular fibrillation and congestive failure, on the second day had a sudden hemiplegia. This was considered at the time to be embolic in nature. Recovery was rapid and complete.

CASE 4—A woman, aged 49, mildly toxic with auricular fibrillation and congestive heart failure, in early convalescence developed hydrothorax. This was felt to be due to the giving of too large an amount of intravenous fluids. These were stopped and she made a prompt recovery.

CASE 5—A man aged 39 with auricular fibrillation and congestive failure, during convalescence had an acute attack of dyspnea and palpitation from which he recovered spontaneously.

DEATHS

CASE 1—A man, aged 67, was operated on in two stages, each under ethylene-ether. At the first stage he had auricular fibrillation and congestive failure but made an uneventful convalescence. At the second stage he still had fibrillation but had recovered from the failure. This operation was much more severe than the first stage, as he had an intrathoracic extension on the left the size of a small grapefruit, which descended into the chest and crossed over the trachea to the right side, and which was extricated from the chest only with considerable difficulty. He did well for two days but then had thyroid

storm, cyanosis, jaundice and bronchopneumonia, and died. Just which of these complications was primary and which secondary is not clear, but the postmortem examination, which was allowed for the chest only, gave bronchopneumonia as the only cause of death.

CASE 2—A woman aged 39, had auricular fibrillation. She had an uneventful operation and convalescence till the fifth day, when she was given 21 grains (1.4 Gm.) of quinidine to control the fibrillation and died very suddenly. Cerebral embolism was thought to be the probable cause of death.

CASE 3—A man aged 67, had auricular fibrillation and congestive failure and a very large intrathoracic goiter. His condition was very critical, but operation appeared to be only hope. He died in two days of thyroid storm.

SUMMARY

The ordinary definition of a thyrocardiac condition is enlarged to include coronary disease, angina, mitral stenosis and aortic regurgitation.

Local anesthesia is inferior to the gases because (1) these patients are unusually nervous, (2) anesthesia is inadequate (unless block is used), and (3) the surgeon is restricted.

Of the gases, nitrous oxide is dangerous on account of anoxemia, unless much premedication or an adjuvant is used. The best anesthetics are ethylene, cyclopropane, ethylene-cyclopropane or ethylene-ether. A nice choice between these is less important than the proper conduct of anesthesia. This should include (1) avoidance of anoxemia, (2) avoidance of obstruction, (3) liberal premedication, (4) minimal rebreathing, and (5) nicely adjusted depth of anesthesia.

In our last 100 cases there were five complications and three deaths.

605 Commonwealth Avenue

ABSTRACT OF DISCUSSION

DR. ANSEL M. CAINE, New Orleans. New Orleans and its surgical territory have few toxic goiters when compared to Boston and the Middle West. We do have them, however, and nearly every toxic thyroid is a cardiac case if of any standing. I agree with Dr. Sise in his conclusions regarding oxygenation. I think we should take it even further than is done in his discussion, that is, treat the case preoperatively and postoperatively with oxygen. Barach has used it to great advantage. The pulse rate and heart action are greatly improved. Oxygen is not discontinued even on the way to the surgery and is commenced again before the patient is returned to bed. Barach again emphasizes this at the oxygen therapy exhibit. Cyclopropane permits oxygen therapy during anesthesia. Too much cannot be said of the importance of an open airway. The surest way to secure this is with an endotracheal tube. Spraying the throat with a 10 per cent solution of cocaine to abolish reflexes is not without danger, unless the patient's tolerance to cocaine is known. No one with whom I have talked here seems to have had trouble. My fifth patient (not thyrocardiac) went into convulsions. These were promptly relieved by intravenous injections of amytal, the temperature, which had reached 103 F., returned to normal in two hours. I saw a death some years ago from swabbing the throat with a 20 per cent solution of cocaine to abolish reflexes for local tonsillectomy. The temperature rose to 108 F. plus. The same week another death took place in Selma, Ala., under similar circumstances. Therefore, the danger is real and not fancied. Premedication, to avoid suspicion on the part of the patient as to the contemplated time of the operation, can be accomplished by giving capsules for 'treatment' at a routine time for several days ahead then duplicating the capsules but changing the contents on the day of operation. The hypodermic injection is given after the patient is asleep from the capsules.

DR. MILTON J. RAISEBECK, New York. I heartily endorse Dr. Sise's paper. The factors that hamper the heart are, first and foremost, lack of oxygen. In following cases to the operat-

ing room I have come to the opinion that this problem of lack of oxygen cannot be solved in many cases with nitrous oxide except in the hands of an exceptionally skilful anesthetist. Our knowledge of cyclopropane is limited, it may have some action on the heart, but the large amount of oxygen one is able to give with it and the fact that relaxation is secured apparently with light dosage would appear to give it an advantage over other anesthetic agents, although ethylene has been the one with which I have had the most experience. The second source of danger for the heart is the production of spasm or any violent muscular effort. The type of heart that cannot stand mechanical stress is chiefly the older arteriosclerotic heart, one with a history of anginal pain or coronary disease. The anesthetic that produces rapid and easy relaxation would thus have an advantage. The third factor that may increase the cardiac burden is a rise in blood pressure, but I do not feel that this is as important as the others. I have observed a rise in blood pressure during operation to quite a considerable height without affecting the heart adversely. Of course a rise in blood pressure may be associated with lack of oxygen and then the effect is certainly harmful. The problem is up to the anesthetist, and it depends on his skill rather than on the qualities of the agent itself. The bad risks that I have observed all showed auricular fibrillation and/or congestive failure. In my experience fibrillation is an added risk but not a great one, whereas congestive failure is a serious factor. If the patient has to go to operation with moisture at the lung bases and with enlargement of the liver, or with edema anywhere, he is a very bad risk. There is one hint that may be useful. Incipient failure may be detected in the absence of physical signs by determining the circulation time. If decholin is injected in the vein at the elbow, the patient will report a bitter taste normally within eighteen seconds. Gluside can be used in a similar way and is somewhat cheaper. If the circulation time, as revealed by this test, is markedly slow even without objective evidence of heart failure, the patient is going to be more than usually sensitive to the lack of oxygen, mechanical stress or any of the other hazards of anesthesia and will therefore demand special attention.

DR S C WIGGIN, Boston. I agree with everything that Dr Sise has said about nitrous oxide in thyrocardiac and thyroid cases in general. I am glad that Dr Sise modified the first statement that nitrous oxide is dangerous in thyrocardiac patients with the statement that it can be used if sufficient premedication and an adjuvant are administered. At the Faulkner Hospital we have had about 150 thyroid patients in the past two years, including more recently a small percentage of thyrocardiac patients with cardiac deficiency. I have limited the use of morphine in these cases because I find that they do not need the total dose, the larger doses which the hyperthyroid or the tumors of the thyroid need. In the operating room, instead of starting with gas-oxygen, I oxygenate the patient first with plenty of oxygen and then I am able to put him to sleep with a low concentration of nitrous oxide. The surgeon thoroughly infiltrates the thyroid region with 1 per cent solution of procaine hydrochloride, which enables me to use a very light concentration of nitrous oxide and oxygen, probably more than a deep sleep. In cases of auricular fibrillation I have noticed the blood pressure come down from a high level. One patient started with a pressure of 190, in the course of about twenty minutes it was down to 120 and her pulse, starting at 120, came down to 80 and the clinical course ran level to the end of the operation. If nitrous oxide is used discreetly in these cases, it is of value.

Eugenics—Sir Francis Galton, the founder of the science, was also the founder of the first modern eugenics society "The Eugenics Education Society of Great Britain." In the leadership of this society, Sir Francis Galton was succeeded by Major Leonard Darwin. By 1912 the scientific advance of eugenics in many different countries seemed to warrant an international congress. Accordingly, the first International Congress of Eugenics duly assembled in London in July 1912—Laughlin, H. H. Historical Background of the Third International Congress of Eugenics. A Decade of Progress in Eugenics, Baltimore, Williams & Wilkins Company, 1934.

FACTORS CAUSING BRONCHIECTASIS

THEIR CLINICAL APPLICATION TO DIAGNOSIS AND TREATMENT

W P WARNER, M.B., F.R.C.P (C.)
TORONTO, ONT

Bronchiectasis may be defined as a condition in which the bronchial tubes are dilated beyond their normal size. The pathologic process present practically always produces symptoms, the commonest being chronic cough and sputum. Most cases of bronchiectasis were diagnosed "chronic bronchitis" until 1922, when Sicard and Forestier¹ discovered the usefulness of iodized oil, which was radiopaque and could readily be injected into the bronchial tree without danger, and bronchial dilatation could be diagnosed with certainty. It is since then that our knowledge of this disease has progressed markedly. Recent studies have shown more clearly the pathologic process involved in bronchiectasis. This work will be reviewed and the interpretation of signs and symptoms on this pathologic basis will be discussed, as well as the rationale of treatment.

ETIOLOGY OF ACQUIRED BRONCHIECTASIS

In a recent survey of 110 cases of bronchiectasis, which have been thoroughly studied and followed for varying periods of time up to eight years, it was found that the bronchiectasis began with a known illness in 59 per cent pneumonia, 30 per cent, lung abscess, 12 per cent, influenza, 5 per cent, whooping cough, 4 per cent, "acute bronchitis," 3 per cent, measles, 2 per cent, bronchogenic carcinoma, 2 per cent, foreign body, 1 per cent. In 41 per cent of the cases the onset was insidious, there being no history of any acute respiratory infection immediately preceding the onset of bronchiectasis. However, the frequency of an acute respiratory disease preceding the bronchiectasis and the character of the general and local symptoms during the course of the disease strongly suggest infection as the important etiologic factor.

The next question is What tissue in the lung is primarily affected by this infection? The hypothesis of Andral² and Stokes³ was that the primary cause of bronchiectasis is a weakening of the bronchial wall with subsequent dilatation. Later, Corrigan⁴ and Hamilton⁵ were the first to advance the theory that in bronchiectasis the primary fault is in the parenchyma of the lung, the bronchi dilating secondarily to fibrosis in the parenchyma and to pleural adhesions.

Recent work has done much to determine which of these theories is correct. Warner and Graham⁶ have demonstrated from observations on bronchiectatic lobes at operation and after removal (lobectomy) that bronchiectasis may occur without either fibrosis of the lung or pleural adhesions being present. Further evidence in support of this fact was obtained by the same investigators when they observed lobar atelectatic bronchiectasis appear in such a short time that the more chronic process of fibrosis could not account for it. Having

From the Department of Medicine University of Toronto and the Toronto General Hospital.

Read before the Section on Practice of Medicine at the Eighty-Sixth Annual Session of the American Medical Association Atlantic City N. J. June 12, 1935.

1 Sicard J A and Forestier J Bull et mém Soc méd d. hôp de Paris 46: 463 (March 17) 1922.

2 Andral G Clinique médicale Paris 2 22 1824.

3 Stokes W Treatise on the Diagnosis and Treatment of Diseases of the Chest Dublin 1837.

4 Corrigan D J Dublin M J 13 270 1838.

5 Hamilton D J Practitioner London 22 426 1879.

6 Warner, W P and Graham, Duncan Lobar Atelectasis as a Cause of Triangular Roentgen Shadows in Bronchiectasis, Arch. Int. Med. 52 888 (Dec.) 1933.

excluded fibrosis of the lung and pleural adhesions as necessary factors in the production of bronchiectasis, they turned to a consideration of a possible weakening of the bronchial wall. From the examination of surgically removed bronchiectatic lobes, Robinson⁷ has shown that the most marked and consistent pathologic finding is chronic inflammation of the bronchial wall, often with complete destruction of the muscle and elastic tissue. Greey⁸ made a bacteriologic study of the same material and found a variety of organisms present. He concluded that no specific organism produces the infection which causes damage to the bronchial wall. It is my opinion, therefore, that the initial fault in bronchiectasis is damage and subsequent weakening of the bronchial wall, probably caused by a nonspecific infection.

Forces Causing Physiologic Bronchial Dilatation—Given a weakened bronchial wall with loss of elastic and muscle tissue as the primary fault in bronchiectasis, there must be some mechanical reason for the bronchus to become dilated. There have been many explanations offered for this bronchial dilatation, but I believe that there is a simple and adequate explanation.

Physiologic bronchial dilatation has been described by Macklin⁹ and others. By bronchoscopic examination and by roentgen examination with iodized oil in the bronchial tree it may be seen that a normal bronchus becomes dilated during inspiration and narrowed on expiration. This physiologic dilatation on inspiration is brought about by forces that are the chief cause of permanent or pathologic dilatation occurring in bronchiectasis. These forces are, first, the direct pull of the expanding thorax on the bronchi, transmitted through the parenchyma, second, the difference in pressure between that in the lumen of the bronchus and that outside its wall occurring on inspiration. On expiration the bronchus becomes narrowed, owing to its elastic tissue, which becomes effective with the cessation of the forces causing dilatation.

The forces causing physiologic dilatation acting on a bronchus which has lost much of its elastic and muscle tissue, such as occurs in bronchiectasis, will cause a greater dilatation than normal on inspiration, since there is not the elasticity to overcome. The bronchus will not return to its normal expiratory size with the cessation of the dilating forces, since its power of contraction is diminished on account of the loss of elastic and muscle tissue in its wall. Therefore the forces causing physiologic dilatation, if applied to a weakened bronchus, as found in bronchiectasis, will cause permanent or pathologic dilatation.

Added Factors Occurring in Bronchiectasis That Help to Cause Pathologic Bronchial Dilatation—Besides the forces of physiologic dilatation there are certain added factors in bronchiectasis that help to cause pathologic dilatation. These factors are atelectasis of the parenchyma, fibrosis of the parenchyma, and central bronchial obstruction. They increase the normal dilating force and may be of considerable significance in determining whether permanent dilatation (bronchiectasis) will occur or not.

1. *Atelectasis* Atelectasis of the parenchyma of the lung, which in my experience is of fairly common occurrence in bronchiectasis, increases the forces caus-

ing permanent bronchial dilatation in several ways. The pull of the expanding thorax on the bronchi will not be lessened by the intervening, inflated elastic parenchyma but will be transmitted directly to the bronchus through the solid atelectatic lung. There will result a greater pull on the bronchus. Also, with atelectasis, there will be a greater than normal pressure difference between that in the lumen of the bronchus and that outside its wall on inspiration. The increased intrapleural pressure found in atelectasis must be an index of increased pull on the bronchus and a greater pressure difference.

The normal telescoping movements of the bronchi and the passage of air through their lumens into and from the parenchyma on respiration are important factors in draining the bronchi of secretion. Atelectasis of the parenchyma, by interfering with the free passage of air along the bronchi and also with bronchial movement, causes a stagnation of secretion in the lumens. This secretion present in bronchiectasis has been given as one of the causes of the dilatation of the bronchi by its own weight or pressure, but this effect must be extremely slight. However, the infected material in the lumen of the bronchus must favor further infection of the wall of the bronchus, thus promoting increased weakening of the bronchial wall.

It is conceivable that a bronchus weakened by infection, such as occurs in bronchiectasis, might have the power to withstand some dilating force and not become permanently or pathologically dilated. However, if the bronchus is persistently subjected to the forces causing physiologic dilatation, and particularly if these forces are augmented by those which accrue as a result of atelectasis, permanent dilatation will result.

2. *Fibrosis of the Parenchyma* This is considered by many to be the chief cause of bronchiectasis. I believe that fibrosis and pleural adhesions when found in bronchiectasis are only supplementary factors increasing the physiologic dilating forces. They are rarely, if ever, the primary cause of the trouble in bronchiectasis. Fibrosis of the parenchyma will increase the dilating force in much the same way as atelectasis. There will be an increased direct pull on the bronchus as the force of the expanding thorax is transmitted directly through the solid lung. Also, as the parenchyma will be incapable of changing its air content on respiration, there will be very little flow of air along the bronchi, with subsequent stagnation of secretion and further damage to the all important bronchial wall.

3. *Central Bronchial Obstruction* This condition, in my experience, rarely occurs in bronchiectasis. However, a new growth or foreign body causing central obstruction is found in a definite percentage of cases. When this central bronchial obstruction is partial, it may produce a ball valve action. That is, on inspiration the lumen of the bronchus will widen at the site of the obstruction and allow air to pass distal to it. On expiration, the lumen of the bronchus will narrow and the central obstruction will either be increased or be made complete as the edge of the obstruction approaches the bronchial wall opposite to it. Thus, air will be partially or completely trapped in the bronchus distal to the obstruction. The slightly positive pressure present in the normal bronchi on expiration will be dissipated through the trachea into the atmosphere, whereas the positive pressure in the obstructed bronchus cannot be so readily equalized. Also, the return of the bronchus to its normal expiratory narrowed lumen, chiefly by elastic recoil, will be hindered by the entrapped air.

7 Robinson W. L. *Brit. J. Surg.* 21:302 (Oct.) 1933

8 Greey P. H. *The Bacteriology of Bronchiectasis* *J. Infect. Dis.*

1:203 (March) 1932

9 Macklin C. C. *The Dynamic Bronchial Tree*, *Am. Rev. Tuberc.*

25:393 (March) 1932

These factors will aid in the production of permanent or pathologic dilatation. Central bronchial obstruction has its greatest effect in causing bronchial dilatation during coughing, and especially if there is also peripheral bronchial obstruction or parenchymal fibrosis. Coughing without central bronchial obstruction increases the dilating force only because of the forced inspiration that precedes the closing of the glottis. The forces causing physiologic dilatation are greater with this forced inspiration than on quiet breathing. There appears to be no reason why that part of the coughing act during which the glottis is closed, or during which expiration is taking place, should cause dilatation unless there is central bronchial obstruction. The marked bronchial movements caused by coughing will also tend to cause permanent dilatation, because the bronchus with its decreased elasticity is further weakened by excessive movements. Also, as in atelectasis and fibrosis, the central bronchial obstruction interferes with proper drainage of secretion from the affected bronchus, with resulting damage to the bronchial wall.

CONGENITAL BRONCHIECTASIS

I have discussed the causes of permanent bronchial dilatation in acquired bronchiectasis. In practically all



Fig 1—Lobar atelectatic bronchiectasis. A plain roentgenogram showing triangular basal shadow in costodiaphragmatic area which is diagnostic of bronchiectasis. B after the injection of iodized oil into the bronchial tree showing the main bronchus to the right lower lobe communicating with dilated bronchi which are seen only in the area of the shadows.

cases of bronchiectasis, infection of the bronchial wall with destruction of its elastic and muscle coats is the primary fault and the bronchus subsequently becomes dilated, as a result of the factors considered. However, from time to time, reports appear of cases of congenital bronchiectasis supposedly the result of congenital or growth defects.

Congenital bronchiectasis should be diagnosed, either pathologically or clinically, with a great deal of hesitation. Henke and Lubarsch¹⁰ sum up the evidence by which congenital bronchiectasis may be diagnosed pathologically by stating that it is extremely difficult to be sure that bronchiectasis is congenital unless it is found in a fetus or new-born baby. Many of the cases diagnosed clinically as congenital I believe are acquired. Recently, I¹¹ described a series of cases of massive one-sided bronchiectasis showing many common characteristics. Cases similar to these have been described as congenital in origin, but they may be adequately

explained as acquired bronchiectasis, the permanent bronchial dilatation occurring because of factors already outlined. In this particular group of cases the added factor is, I believe, massive atelectasis of the parenchyma of one lung, and I have termed them "massive atelectatic bronchiectasis." The known etiologic factors causing acquired bronchiectasis may explain the origin of practically all cases of bronchiectasis. It seems unnecessary to postulate as a cause of bronchiectasis congenital defects, which usually cannot be proved either clinically or pathologically.

SYMPTOMS

The most common local symptoms of bronchiectasis are a chronic cough and sputum. There are certain characteristics about these symptoms that are almost diagnostic of bronchiectasis. Since this disease is a primary infection of the bronchus with marked destruction of its wall, one would expect that the cough reflex could not be elicited from it. The secretions in the diseased bronchi do not cause the cough reflex unless they leave these bronchi either by overflowing or by changes in posture, causing them to spill over into normal bronchi capable of causing a cough.

The character of the sputum is also significant. Formerly the classic picture of bronchiectatic sputum was about 1 pint of foul-smelling sputum, which separated into three layers on standing. This type of sputum is exceedingly rare. The average amount in our cases has been 4 ounces a day and only 20 per cent of our bronchiectatic patients have foul smelling sputum. However, there is one characteristic which is extremely suggestive of bronchiectasis and that is that the sputum is "chunky." This characteristic is explained by the fact that the diseased bronchus has lost to a great extent its normal movements which tend to flatten out excess secretion along the wall of the bronchus. The secretion tends to stagnate and the slight bronchial movements and small passage of air along the dilated bronchi allow the formation of this chunky sputum. Blood spitting is exceedingly common in bronchiectasis and occurred in 45 per cent of our cases. The infection in the bronchial wall after it has caused destruction may become so attenuated that no excess secretion is formed and "dry" bronchiectasis results. These cases without a cough or sputum are very uncommon and occurred in only 2 per cent of our series. The classic local symptoms of bronchiectasis, then, are a cough and sputum influenced by posture and the sputum moderate in amount, often accompanied by blood spitting and usually not foul smelling but practically always chunky.

The general or systemic symptoms are dependent chiefly on the condition of the parenchyma of the lung. A typical history of bronchiectasis is found in the patient in the twenties or thirties who consults a physician regarding a cough and chunky yellow sputum influenced by posture, which he has had since childhood following an attack of pneumonia or whooping cough. He has enjoyed excellent health and with the possible exception of one or two attacks of pneumonia is not bothered by anything but this constant cough and sputum. There is infection in the patient's bronchi but he has been fortunate in that the parenchyma of the lung has escaped to a large extent the infection permanently present in the walls and lumens of the bronchi. On the other hand, there is the patient who has chronic ill health due to spread of infection from bronchi to parenchyma, with resulting chronic low grade pneumonia. Acute pneumonia occurs frequently

¹⁰ Henke, Friedrich and Lubarsch, Otto, editors. *Handbuch der speziellen pathologischen Anatomie und Histologie*. Berlin: Julius Springer, 3, 1, 1928.

¹¹ Warner, W. P. *Quart J Med* 3: 401 (July) 1934.

in the bronchiectatic lung 52 per cent of our cases presented at least one attack and 27 per cent more than one attack after the onset of bronchiectasis. Bronchiectatic patients may also be greatly incapacitated because of repeated massive hemorrhages or be social outcasts due to fetid sputum.

SIGNS

Since the essential pathologic change in bronchiectasis is infection damaging the bronchial wall, one would expect the common physical signs to be dependent on this rather than on any parenchymal change. Dilated bronchi with excess, almost stagnant, secretion produce medium crackling râles which are by far the commonest physical sign in bronchiectasis. These râles are usually heard in the lower lobes, since bronchiectasis usually attacks these lobes; in only 2 per cent of our cases was it entirely located in the upper lobes. The parenchyma may be affected by chronic bronchopneumonia with resulting fibrosis, so that the physical signs of consolidation and fibrosis are present. Also the parenchyma may become atelectatic. Lobar atelectasis occurred in 16 per cent of our series and in about half of these the atelectatic bronchiectatic lobe could be diagnosed clinically as an area exhibiting impaired resonance, bronchial breath sounds and medium crackling râles, situated posteriorly along the spine and extending out in a triangular shape to the base of the lung. The common physical sign in bronchiectasis is the medium crackling râles persisting at one or both lower lobes.

ROENTGEN EXAMINATION

In bronchiectasis plain roentgen examination of the chest is usually negative or some thickening of the descending bronchial trunks may be observed. This is in keeping with the etiologic conception that bronchiectasis is a primary bronchial disease. So often is the roentgen report negative that its chief value lies in helping to rule out such conditions as tuberculosis as a cause of the patient's symptoms. When certain secondary changes, such as chronic bronchopneumonia and fibrosis, occur in the parenchyma, roentgen evidence becomes of value. If lobar atelectasis occurs in bronchiectasis, a triangular basal shadow (fig 1) is observed, which is diagnostic of this disease. These triangular basal shadows occurred in 16 per cent of our cases. They are the best diagnostic criteria found in plain roentgenograms of the chest in patients having bronchiectasis. These shadows were first described by Comby¹² and have been studied by Singer and Graham,¹³ Rist, Jacob and Trocme,¹⁴ Sargent and Bordet,¹⁵ Wallgren,¹⁶ and others. They have been considered due either to fibrosis of the bronchiectatic lung or to atelectasis of the parenchyma about the dilated bronchi. Graham and I⁹ found that these shadows have always represented a shrunken lobe containing bronchiectatic bronchi. We found that the bronchiectatic lobe was shrunken and took the shape that caused a triangular shadow on the x-ray film because of atelectasis of the parenchyma, not because of fibrosis. This atelectasis was due to inflammatory swelling of the walls of the peripheral bronchioles causing occlusion of their lumens with resulting deflation of the lung. The other plain x-ray picture that is diagnostic of bronchiectasis is seen in massive atelectatic bronchiectasis (fig 2). The thin whorl-like shadows present from apex to base, with mediastinum shifted to the affected side, are diagnostic of this unusual type of bronchiectasis.

Roentgen examination after injection into the bronchial tree of a radiopaque oil is the important diagnostic procedure to prove or disprove the presence of bronchiectasis. This simple procedure, almost devoid of danger, has been discussed elsewhere¹⁷ and will not be considered further here.

PROGNOSIS

It is obvious that the prognosis in bronchiectasis depends on the extension of the infection into the parenchyma of the lung or to other parts of the bronchial tree, or on the occurrence of massive pulmonary hemorrhage. So typical are the symptoms of bronchiectasis that I believe that the onset may in most cases be accurately determined from the history. By this means the duration of the disease, up to the time of writing in our series of bronchiectasis cases is estimated at ten years, the longest forty-two years. Patients may have bronchiectasis almost all their lives and die of some other disease. On the other hand, 23 per cent of our patients are dead after having the disease for an average of nine years; the shortest



Fig. 2.—Massive atelectatic bronchiectasis. A plain roentgenogram showing whorl-like shadows evenly distributed which are characteristic of this type of bronchiectasis. B saccular dilatations visualized after the injection of iodized oil.

duration in these fatal cases was three months. It is evident, therefore, that the prognosis varies tremendously with the individual case, from one with disease rapidly progressing to a fatal termination to one with practically no progression or disability.

TREATMENT

It is not within the scope of this paper to go into details regarding treatment. Some points arising as a result of this etiologic conception will be considered. It appears logical that if the physiologic dilating forces or any of the added factors causing bronchial dilatation could be held in abeyance during the time that the infection is acute and active in the bronchial wall, permanent dilatation might not occur. Artificial pneumothorax, for instance, by decreasing the dilating forces in acute bronchiectasis, might protect the bronchus until the infection subsides in its wall and it is able to withstand such dilating forces without becoming permanently dilated. In chronic bronchiectasis when permanent or pathologic dilatation has occurred, little can be expected from collapse therapy. When central bronchial obstruction can be removed this should be done,

¹² Comby J. Bull. Soc. de pédiat. de Paris 23: 385 1925.

¹³ Singer J. J. and Graham E. A. J. Missouri M. A. 19: 390 (Sept.) 1922.

¹⁴ Rist E., Jacob P. and Trocme P. Ann. de med. 21: 144 (Feb.) 1927.

¹⁵ Sargent Emile and Bordet F. Bull. et mém. Soc. méd. d. hop. de Paris 61: 742 (June 2) 1927.

¹⁶ Wallgren Axel. Beitr. z. Klin. d. Tuberk. 69: 641 1928.

¹⁷ Warner W. P. Canad. M. A. J. 27: 583 (Dec.) 1932.

thus eliminating a factor causing increased dilating force and impaired bronchial drainage

When bronchiectasis has become established, with secondary changes in the parenchyma, medical treatment consists of draining the dilated bronchi. This can be accomplished most satisfactorily by adequate postural drainage. Bronchoscopic drainage is of use chiefly as a means of improving postural drainage by removing some central bronchial obstruction, such as a foreign body, growth or granulation tissue.

Surgical treatment has made tremendous advances in recent years. When permanent or pathologic dilatation has taken place, surgical removal of the diseased lung is the only method of "cure," as the bronchi never return to their normal size by other forms of treatment. However, with such a high operative mortality still present in lobectomy, the patient must have considerable disability before operation is advised.

CONCLUSIONS

1 The primary fault in bronchiectasis is a non-specific infection of the bronchial wall causing destruction, particularly of the muscle and elastic tissues present.

2 The weakened bronchus then becomes permanently dilated, owing to the forces causing physiologic bronchial dilatation.

3 There are certain added factors: atelectasis of the parenchyma, fibrosis of the parenchyma, and central bronchial obstruction, which increase this physiologic dilating force and tend to produce permanent or pathologic dilatation.

4 The conception of bronchiectasis as a primary disease of the bronchus secondarily affecting the parenchyma alters the interpretation of signs and symptoms and the application of therapy.

100 College Street

ABSTRACT OF DISCUSSION

DR. DAVID T. SMITH, Durham, N. C. I have been studying bronchiectasis for the last ten years and agree with Dr. Warner's statement that the primary fault in bronchiectasis is an infection of the bronchial wall with destruction of the elastic and muscular coats. I am particularly interested in the types of infection that can destroy the elastic tissue and muscle in the bronchial wall. The tubercle bacillus can and occasionally does destroy the bronchial wall and produces the iodized oil picture of bronchiectasis. Staphylococci necrotize pulmonary tissue and can probably destroy elastic tissue and muscle in the bronchi. The fusospirochetal group of organisms that ulcerate the tonsils, necrotize the lung and destroy bone can undoubtedly destroy the elastic and muscular coats of the bronchi. Chevalier Jackson has seen this occurring in the bronchi of man through the bronchoscope and I have produced the iodized oil and pathologic picture of bronchiectasis in rabbits with the fusospirochetal organisms. In 1930 I reported a series of sixty cases of bronchiectasis in which the lesion was demonstrated by the injection of iodized oil. Forty-nine of the sixty cases showed fusiform bacilli and spirochetes in the sputum. These cases were under observation for many months and had repeated sputum studies. In a general hospital, where the patients cannot have repeated examinations for such long periods, one would not expect to find as high a percentage of fusospirochetal organisms. As a check on my own enthusiasm for these organisms I collected the results of the sputum studies on the cases of bronchiectasis seen in the Duke Hospital during the last four years, the examinations being made by the regular house staff and routine laboratory. The bronchiectasis was diagnosed in thirty cases by injections of iodized oil and in two at necropsy. Spirochetes and fusiform bacilli were found in the sputum in eighteen cases. Staphylococcus aureus was found in eight cases and various types of other organisms in six cases.

When fusiform bacilli and spirochetes are present in the sputum, I believe that the postural drainage treatment should be supplemented by injections of neoarsphenamine. If there is no evidence of improvement with this treatment within a month, bronchoscopy should be tried and, if this also fails, surgery is indicated.

DR. HAROLD BRUNN, San Francisco. A study of cases of bronchiectasis at the University of California Hospital Thoracic Clinic substantiates in the main the thesis promulgated by Dr. Warner in his paper. There can be no doubt in reading the history of the cases that we have had, especially severe ones, that infection early in life is the distinguishing feature. However, I still feel that infection is not the only factor involved. There are certain cases of congenital bronchiectasis which I believe are present and brought to the attention of the physician only when infection supervenes. The only method by which this point can be evaluated is by a more careful roentgen study of children in early life, especially those whose deliveries have been difficult and in whom atelectasis occurs. However, at the present time roentgenograms of small children are very difficult to interpret and iodized oil studies are practically impossible. The rabbit as an animal for experimentation is a poor choice, as it is frequently subject to bronchiectasis. I am fully in accord with Dr. Warner as to the physiology involved in the formation of the sacculations in regard both to the atelectatic lung and to the dilating force of inspiration. Experimental work along these lines was carried out in our laboratory by Drs. Prinzmetal and Brill. Dr. Prinzmetal has since then continued this work at the Barnes Hospital, Washington University, a report of which appeared last year in the *Journal of Allergy*.

CLINICAL STUDY UNDER CONTROLLED CONDITIONS OF 1,083 CHILDREN WITH HOOKWORM

A. E. KELLER, M.D.

J. T. GOOGE, M.D., C.P.H.

H. B. COTTRELL, M.D., C.P.H.

D. G. MILLER, JR., M.D.

AND

R. H. HARVEY, M.D.

NASHVILLE, TENN.

A recent investigation¹ of the hookworm problem in Mississippi revealed that there had occurred a marked decrease in both incidence and intensity of hookworm infestation since 1914. No recent clinical studies of hookworm have been made to determine its effects on the health of school children under these conditions of lowered prevalence and intensity of infestation. Since methods are now available by which with a fair degree of accuracy the physical condition of the patient can be studied in relation to the hookworm burden, the present report deals with such a study among rural school children in George County, located in south eastern Mississippi.

This particular area was studied because it was known that 40.8 per cent of 1,618 white persons were found in that county to have hookworm during the recent state-wide study in Mississippi. Since it has been established that the highest incidence and intensity of infestation of hookworm is found in the school age group, from 5 to 18 years inclusive, and as the most severe symptoms of hookworm disease are found in

Drs. Miller and Harvey were students in the fourth-year medical class at the time this work was done.

From the Department of Preventive Medicine and Public Health of Vanderbilt University School of Medicine, in cooperation with the State Department of Health of Mississippi, and aided by a grant from the International Health Division and Division of Medical Sciences of the Rockefeller Foundation.

1 Keller, A. E., Leathers, W. S. and Ricks, H. C. An investigation of the incidence and intensity of infestation of hookworm in Mississippi. *Am. J. Hyg.* 19: 629-656 (May) 1934.

this group of the population, the present study concerning the clinical manifestations was confined to individuals of this age period

The plan of study was projected so that there would be for each child studied a medical and dietary history and a complete physical and blood examination. The hemoglobin determinations were made by the Sahl

TABLE 1—Intensity of Hookworm Infestation*

| Intensity of Infestation Eggs per Cc of Feces | Approximate Number of Hookworms | Clinical Classifi- cation | Num- ber of Spec- imens | Average Num- ber of Hook- worms | Per Cent Posi- tive |
|---|---------------------------------------|---------------------------------|----------------------------------|---|------------------------------|
| Salt flotation and egg count negative | None | Negative | 222 | | 20.5 |
| Salt flotation positive egg count negative. | | | | | |
| 0 to 699 | 0 to 24 | Very light | 220 | | 20.9 |
| 700 to 1,299 | 25 to 50 | Very light | 159 | 15 | 17.5 |
| 1,300 to 2,599 | 51 to 100 | Light | 169 | 39 | 15.6 |
| 2,600 to 12,599 | 101 to 500 | Light | 90 | 77 | 8.3 |
| 12,600 to 25,099 | 501 to 1,000 | Moderate | 161 | 194 | 14.9 |
| 25,100 and over | 1,001 and over | Heavy | 13 | 657 | 1.2 |
| | | Very heavy | 13 | 1,710 | 1.2 |
| Total.. | | | 1,083 | | 100.0 |

* One thousand and eighty three specimens of feces examined by both the salt flotation and Stoll dilution egg-counting technique

method with hemoglobinometers standardized against a solution the hemoglobin content of which had been determined gasometrically. An examination of the blood by the thick drop method for malaria parasites was also included, to rule out a condition that might complicate or produce symptoms and signs similar to those of hookworm disease. Individuals in whom plasmodia were found in the blood and also those showing parasitic infestations other than hookworm were excluded from this series of cases. A specimen of feces was obtained from each individual and each specimen was examined by both the salt flotation and Stoll dilution egg-counting techniques. A total of 1,083 school children were studied according to the plan outlined. This represents approximately 59 per cent of the children of school age in the county.

In order to obtain a control series, all children whose specimen of feces contained no hookworm eggs as determined by examination with both the salt flotation and egg-count methods were placed in one group. These children all lived in the same families and under similar environmental and dietary conditions as those who were found to have hookworm. Of the 1,083 specimens of feces examined 222, or 20.5 per cent, were negative by both the salt flotation method and the egg count. This group is considered as a control series.

Of the 1,083 specimens there were 861, or 79.5 per cent, positive on salt flotation and 635, or 58.6 per cent, positive on egg count. This difference of 19.9 per cent more specimens found positive by the salt flotation method than by egg count is accounted for by the greater efficiency of the salt flotation technic in detecting hookworm eggs in specimens of feces containing only a small number of ova. Practically all individuals who are found to have hookworm under these conditions have very light infestations.

The intensity of infestation of the specimens found positive on egg count is shown in table 1.

If an intensity of infestation of 2,600 or more eggs per cubic centimeter of feces, or 100 or more hookworms, is taken as the level at which clinical symptoms may be expected to be present table 1 shows that only 187, or 17.3 per cent, of the specimens examined showed infestations which were probably the cause of

symptoms. If the group of specimens designated "salt flotation positive, egg count negative" are considered as very light infestations, it is seen that 62.2 per cent of all the specimens showed very light or light infestations and 20.5 per cent were negative. In the tables that are to follow, the approximate number of hookworms will be shown rather than the number of eggs per cubic centimeter of feces. The group of cases that were positive on salt flotation but negative on egg count are also included with the very light group.

HISTORIES

The symptoms of hookworm as shown by the history records of 1,083 children have been analyzed according to the intensity of infestation. There were no significant differences found in the different intensity groups for such symptoms as anorexia, digestive disturbances, abdominal pain and discomfort, disturbed sleep and restlessness. Approximately as many children complained of these symptoms in the control group as in the groups showing variations in intensity of infestation. There was, however, a definite correlation between the intensity of infestation and such symptoms as fatigue, weakness, dyspnea and edema. This analysis is shown in table 2.

In analyzing table 2 it is found that in the negative or control series the percentage of persons complaining of fatigue, weakness, dyspnea and ground itch was lower than in any of the hookworm infested groups. There is rather marked variation in the light intensity groups and it is only when an infestation of 100 worms or more is reached that there is decided increase in the percentage of individuals complaining of these symptoms. Not only were there larger numbers of children with moderate and heavy infestations complaining of fatigue, weakness and dyspnea but it should be stated that the degree of fatigue, weakness, dyspnea and edema was more marked in these children with moderate and heavy infestations than in those of the lower intensity groups.

A history of ground itch has always been considered a cardinal symptom of hookworm disease and in this series of cases children giving a history of ground itch

TABLE 2—The Correlation of Symptoms with Intensity of Hookworm Infestation

| Approximate Number of Hookworms | Number Examined | Fatigue | | Weakness | | Dyspnea | | Edema | | Ground Itch | |
|---------------------------------------|--------------------|---------|----------|----------|----------|---------|----------|--------|----------|-------------|----------|
| | | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent |
| Negative | 222 | 31 | 14.0 | 31 | 14.0 | 33 | 12.6 | 12 | 5.4 | 76 | 34.2 |
| 0 to 24 | 415 | 96 | 23.1 | 94 | 22.7 | 56 | 13.5 | 16 | 3.9 | 242 | 58.3 |
| 25 to 50 | 169 | 61 | 36.3 | 44 | 26.0 | 39 | 23.0 | 13 | 7.7 | 100 | 61.1 |
| 51 to 100 | 90 | 19 | 21.1 | 23 | 24.4 | 19 | 21.1 | 3 | 3.3 | 60 | 75.0 |
| 101 to 500 | 161 | 50 | 31.0 | 49 | 30.4 | 43 | 26.7 | 10 | 10.0 | 132 | 82.0 |
| 501 to 1,000 | 13 | 8 | 61.5 | 8 | 61.5 | 7 | 53.8 | 4 | 30.7 | 11 | 84.6 |
| 1,001 and over | 13 | 9 | 69.2 | 8 | 61.5 | 7 | 53.8 | 2 | 15.3 | 8 | 61.5 |

were studied with reference to the significance of this symptom. The data show that 34.5 per cent of the negative or control group and well over half of those with hookworm gave a history of ground itch. Moreover, conditions conforming to the clinical manifestations of ground itch were found not infrequently in children during the examination.

PHYSICAL EXAMINATION

The results of the physical examinations are shown in table 3. In order to evaluate the effect which foci of infection may produce and obscure the conditions

produced by hookworm infestation, an analysis of those individuals in whom diseased teeth and tonsils were found on physical examination is included. Only those tonsils which the observer was reasonably sure were diseased are included in this analysis.

One of the most striking observations on physical examination was the large percentage of children in each group who were underweight. Only those children who were either 10 per cent above or 10 per cent below the weight for their heights were considered overweight or underweight as determined by the standards of the American Child Health Association. Table 3 shows that from 56.6 to 71.5 per cent of the children examined were underweight, from 24.5 to 37.8 per cent were normal weight, and from 0.7 to 5.7 per cent were overweight. It was found that for all intensity groups the average underweight was 17.7 per cent and there was a variation between the different groups of from 16.3 to 20.0 per cent. However, there was only a slight variation in the degree of underweight in the various intensity groups as compared with the control series.

The figures for weights show that in the moderate and heavy infestations there is some increase in the percentage of children who were underweight. Table 3 shows also that the percentage of children underweight

number in the control group with this condition was about the same as in the groups showing hookworms. The data show that diseased teeth and tonsils were equally distributed throughout all groups examined and these conditions should be considered as probable factors influential in causing the malnutrition and anemia found.

BLOOD EXAMINATION

In making the blood counts the red and white cell pipets containing the diluted blood were placed in a mechanical device (rotor) in order to obtain more uniform dispersion of the cells in the diluting fluid. This method has been described by Bryan and Garrey. The precautions regarding fresh diluting fluid for the red blood cell counts were observed as suggested in their paper. The method used for hemoglobin determination has already been described. In making the differential leukocyte counts, slide smears were stained with Wright's blood stain. Two hundred leukocytes in each specimen were counted.

The results of the examination of the blood are given in table 4, which has been arranged to show the average results in both the control group and the different intensity levels of those infested with hookworm.

A discussion of the data concerning the blood examination is based on the normal values of the constitu-

TABLE 3—Correlation of Results of Physical Examination with Intensity of Hookworm Infestation

| Approximate Number of Hookworms | Number Examined | Normal Weight | | Overweight | | Underweight | | Average per cent Underweight | Poor Nutritional Condition | | Pallor of Skin and Mucous Membranes | | Diseased Teeth | | Diseased Tonsils | |
|---------------------------------|-----------------|---------------|----------|------------|----------|-------------|----------|------------------------------|----------------------------|----------|-------------------------------------|----------|----------------|----------|------------------|----------|
| | | Number | Per Cent | Number | Per Cent | Number | Per Cent | | Number | Per Cent | Number | Per Cent | Number | Per Cent | Number | Per Cent |
| Negative | 222 | 76 | 34.4 | 7 | 3.1 | 138 | 62.5 | 16.6 | 38 | 17.0 | 92 | 41.4 | 104 | 47.0 | 55 | 24.8 |
| 0 to 24 | 415 | 156 | 37.6 | 20 | 4.8 | 242 | 58.3 | 18.0 | 80 | 20.5 | 163 | 39.3 | 183 | 44.1 | 103 | 24.8 |
| 25 to 50 | 169 | 61 | 36.1 | 6 | 3.6 | 102 | 60.3 | 17.4 | 41 | 24.3 | 79 | 46.7 | 82 | 48.5 | 42 | 24.9 |
| 51 to 100 | 90 | 33 | 36.7 | 2 | 2.2 | 55 | 61.1 | 17.0 | 21 | 23.3 | 33 | 42.2 | 50 | 55.5 | 24 | 26.7 |
| 101 to 500 | 101 | 45 | 21.8 | 1 | 0.7 | 115 | 71.5 | 16.3 | 51 | 31.7 | 86 | 33.4 | 76 | 47.2 | 30 | 18.6 |
| 501 to 1,000 | 13 | 5 | 38.3 | 0 | 0.0 | 8 | 63.7 | 18.0 | 6 | 46.0 | 9 | 70.0 | 6 | 46.0 | 4 | 30.7 |
| 1,001 and over | 13 | 3 | 23.1 | 0 | 0.0 | 9 | 71.5 | 20.0 | 7 | 53.8 | 11 | 84.6 | 8 | 61.5 | 5 | 40.0 |

is essentially the same in the negative group as in the groups showing light and moderate hookworm infestations. Obviously there were factors operating other than hookworm to bring about this condition in both the infested and the noninfested groups. Although it is not possible to compare the data concerning the heights of the children examined in this series with the heights of a comparable group of normal children, the impression was gained that for the study as a whole a majority were undersized generally.

The clinical observations of the skin and mucous membranes showed in general that the percentage of individuals with anemia increased with the intensity of hookworm infestation. Of the individuals who were in the negative or control group, 41.4 per cent were recorded as having clinically some degree of pallor of the skin and mucous membranes.

Physical examinations revealed that the percentage of children with poor nutritional status is slightly higher in the group with light hookworm infestation than in the control group, and it is definitely higher in the groups with moderate and heavy infestations.

The percentage of children with diseased teeth in the different groups showed no significant variation. From 42.9 to 61.5 per cent of the children in each group in this series had diseased teeth. Practically the same figures were obtained in regard to diseased tonsils. From 18 to 40 per cent of all the children in each group were recorded as having diseased tonsils. The percentage of children with diseased tonsils in the different intensity groups did not vary much and the

ents of the blood of children in corresponding age groups as are under consideration in this study. The average red blood cell count and hemoglobin estimation² for normal children 5 years of age is stated to be 4,500,000 red blood cells per cubic millimeter and 85 per cent hemoglobin, 100 per cent being used as equivalent to 16 Gm. For normal children 10 years of age the average is 5,000,000 red blood cells and 90 per cent hemoglobin. For both age periods 8,000 white blood cells per cubic millimeter is the normal average. If these figures for the hemoglobin should be translated into grams per hundred cubic centimeters to correspond with the method of determination used in this series of observations, the average normal of 5 years would be 13.6 Gm and for 10 years would be 14.4 Gm per hundred cubic centimeters of blood.

There was a secondary anemia in all groups with hookworms as well as in the control series. However, there was very little difference in the negative group as compared with those having light infestations. There was no appreciable decrease in the red blood cell counts and hemoglobin until an infestation of 100 hookworms or more is reached, in which groups there was a greater decrease in hemoglobin. Those children having the heaviest worm burdens were on the average more anemic than those having either no hookworm or light infestations.

² Bryan W. R., and Garrey W. E. A Mechanical Device That Produces Uniform Dispersion of Blood Cells in the Diluting Pipet. *J. A. M. A.* 103: 1059-1060 (Oct. 6) 1934.
³ Holt L. E., and Howland John. *Holt's Diseases of Infancy and Childhood*, ed. 10. Revised by L. E. Holt Jr. and Rustin McIntosh. New York: D. Appleton & Co. 1935. p. 529.

In individual cases, anemias as severe as those found in the children with moderate and heavy hookworm infestations were also found in children having light infestations. In the control group, 18 per cent had anemias as severe as those found with moderate and heavy infestations. Therefore it is apparent that hookworm infestation alone does not account for the anemia, as the same degree of secondary anemia was found in a significant number in each of the groups

TABLE 4—Results of Blood Examination *

| Approximate Number of Hookworms | Number Examined | Red Blood Cells Millions per Cu Mm | Hemoglobin Grams per 100 Cc | White Blood Cells Thousands per Cu Mm | Per Cent Eosinophils | Per Cent with Normal Number of Eosinophils |
|---------------------------------|-----------------|------------------------------------|-----------------------------|---------------------------------------|----------------------|--|
| Negative | 222 | 3.445 | 10.1 | 7.70 | 9.6 | 36.0 |
| 0 to 24 | 415 | 3.428 | 9.8 | 8.35 | 12.0 | 16.5 |
| 25 to 50 | 169 | 3.308 | 9.0 | 8.23 | 11.9 | 13.0 |
| 51 to 100 | 90 | 3.575 | 9.6 | 9.15 | 14.2 | 11.1 |
| 101 to 500 | 161 | 3.148 | 9.3 | 7.96 | 13.2 | 4.8 |
| 501 to 1,000 | 13 | 3.190 | 7.6 | 7.54 | 17.9 | 8.0 |
| 1,001 and over | 13 | 2.857 | 6.5 | 8.32 | 13.8 | 15.0 |

* Average red and white blood cell counts, hemoglobin determination and eosinophil count according to intensity of hookworm infestation

The average leukocyte count was found to be within the limits given by Holt and Howland³ (1933). There was no relationship between the intensity of infestation and the leukocyte count. In each group there were a few counts above 10,000 cells per cubic millimeter, one of these being 18,700. There were only seventeen counts below 5,000, the lowest being 2,750.

The differential leukocyte counts revealed normal distribution of the cells except for the eosinophils. Table 4 shows that in the control group an average of 9.6 per cent of the white cells counted were eosinophils. Only 3.6 per cent of the counts in the negative group contained less than 5 per cent, which is considered the upper limit of normal. This abnormally high eosinophil count in a large number of individuals without intestinal parasites may be explained in part by the fact that this investigation was carried on during the season most favorable for the transmission of hookworm. Under these conditions it would be possible to find an increase in the eosinophil resulting from migration of hookworm larvae even though examination of the feces revealed no hookworm eggs. Similar instances have been reported in which this occurred during the period of migration following massive infection with hookworm larvae.⁴

In the infested groups no relationship between the worm burden and the percentage of eosinophils could be determined. In each group there was an increase in the eosinophils, the average varying from 11.9 to 17.9 per cent. In from 4.3 to 17 per cent of the blood specimens obtained from children known to have hookworm, the number of eosinophils was within normal limits. The smallest number of normal eosinophil counts was found in the group showing from 100 to 500 worms. These data indicate that while in a majority of individuals with hookworm there is usually found an increase in the eosinophils, there also may be no increase in these cells.

DIETS

The data relative to the diets of the individuals studied in this series were obtained by questioning the parents and recording on special forms the information

relative to the amounts of the usual types of food ordinarily consumed, such as milk, cereals, meat and eggs, fruits and vegetables. Information concerning the use of accessory foods, such as cod liver oil, orange and tomato juice, and yeast also was obtained. Notation was made as to whether none or very small amounts of these substances were eaten or whether moderate to large amounts were included in the usual diet. Data relative to dietary habits are difficult to obtain, but we believe that the dietary data obtained in this study is representative of the area under consideration.

Table 5 contains these data which have been prepared so as to show the relative amounts of these substances usually consumed. The figure 1 under each heading indicates that either none or very small amounts of the particular food were eaten and the figure 2 represents either moderate or large amounts. Figure 1 represents inadequate amounts and figure 2 adequate amounts of the various foods. The figures in the columns represent the percentage of persons in each group. In order to conform to the procedure used in reporting the other observations the dietary data will be given according to the various intensities of infestation.

Table 5 shows that on the whole the amounts of the different foods consumed by all groups were inadequate except vegetables. Inquiry as to the kind of vegetables eaten indicated that most of the vegetables consisted of dried beans and peas. Only small amounts of green leafy vegetables were eaten. It was also found that the term meat was used to indicate salted fat pork with a very small amount of lean pork in it. This was the usual type of meat used, though small amounts of eggs, beef, chicken and fish were eaten. The constituents of the diet also were on the whole lacking in animal protein and hematopoietic substances. It can be said that the diets were not only inadequate in amount but also very poorly balanced.

One of the striking features concerning the diet was the extremely small number of children who had

TABLE 5—Dietary Data Showing Relative Amounts of Different Foods Used in 1,083 School Children Examined for Hookworm According to Intensity of Infestation

| Approximate Number of Hookworms | Number Examined | Milk | | Cereals | | Meat and Eggs | | Vegetables | | Fruits | | Additional Vitamins | |
|---------------------------------|-----------------|------|----|---------|----|---------------|----|------------|----|--------|----|---------------------|---|
| | | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| | | % | % | % | % | % | % | % | % | % | % | % | % |
| Negative | 222 | 33 | 67 | 40 | 60 | 38 | 62 | 10 | 90 | 37 | 63 | 98 | 2 |
| 0 to 24 | 415 | 41 | 59 | 47 | 53 | 37 | 63 | 13 | 87 | 45 | 55 | 99 | 1 |
| 25 to 50 | 169 | 40 | 60 | 54 | 46 | 44 | 56 | 10 | 90 | 54 | 46 | 100 | 0 |
| 51 to 100 | 90 | 45 | 55 | 58 | 42 | 49 | 51 | 14 | 86 | 63 | 37 | 100 | 0 |
| 101 to 500 | 161 | 52 | 48 | 80 | 20 | 49 | 51 | 13 | 87 | 68 | 32 | 97 | 3 |
| 501 to 1,000 | 13 | 77 | 23 | 83 | 17 | 50 | 50 | 7 | 93 | 12 | 88 | 100 | 0 |
| 1,001 and over | 13 | 71 | 29 | 86 | 14 | 50 | 50 | 21 | 79 | 53 | 47 | 100 | 0 |

1 indicates that none or only small amounts of the food were eaten
2 indicates that moderate to large amounts of the food were eaten
% indicates percentage of persons in each group

received additional food substances in the form of vitamins. From 98 to 100 per cent of all children had received none of these foods. It would seem reasonable to state that the lack of adequate amounts of food together with the poor balance of the diet and lack of additional vitamins was responsible in a great measure for the large percentage of children shown to be underweight and undersize. It is therefore reasonable to assume that the unsatisfactory dietary conditions may be considered an important accessory factor in causing the secondary anemia associated with hookworm infestation.

⁴ Ashford B. K. Payne, G. C. and Payne Florence K. Acute Uncinariasis from Massive Infestation and Its Complications. J. A. M. A. 101: 843-847 (Sept. 9) 1933

Table 5 shows that with the increase in the intensity of infestation the diet became more inadequate in substance except vegetables (dried beans and peas). This was probably due to the economic condition in certain parts of the county under study, because the records show that those communities in which the highest incidence and the greatest number of heavy infestations were found were the poorest and had the largest number of families on the direct federal relief rolls. It should be stated, however, that the diet in those communities in which the economic conditions were better, while somewhat improved, were not satisfactory. It would appear that dietary insufficiencies were possibly almost or fully as important in bringing about the abnormal blood conditions noted as any other factors. Although hookworm infestation is conducive to increasing the anemia, it should be noted that the same dietary faults and the same degree of malnutrition were found in the groups without hookworm as in the groups with hookworm.

COMMENT

This study shows that there is a correlation between the physical condition of children infested with hookworm and the worm burden. This relationship is not striking, however, until the intensity of infestation reaches a level of moderate to heavy infestation (100 or more hookworms). In these intensity groups as compared with the negative or control group and those with light infestations there were more children complaining of symptoms such as fatigue, weakness, dyspnea and edema. The degree of these symptoms was also more marked in these children. They were also more anemic as compared with those who either had no hookworm or had light infestations.

Certain conditions were found to essentially the same extent in all groups, including the control series. The observations relative to secondary anemia, poor dietary conditions, malnutrition, underweight, diseased teeth and tonsils were especially striking. In the presence of these conditions the clinical manifestations produced by hookworm infestation are likely to be more marked than if complicating factors were not present. It seems likely, especially in the light and very light cases, that factors other than hookworm were in part at least responsible for bringing about the physical condition of the children examined.

It has been shown by workers in Puerto Rico⁵ that where satisfactory diets containing iron can be provided the effects of hookworm infestation can be decreased without removing the hookworms. In considering the measures that are necessary to improve the physical conditions of children living under such conditions it is necessary to reduce the environmental hazards, such as improper excreta disposal, and to eradicate the hookworms present. The removal of foci of infection, with provision of satisfactory diets and the use of iron following treatment, especially in the heavy infestations, are necessary procedures if the normal health level of children in these areas is to be maintained.

SUMMARY

1 In a series of 1,083 children it was found as a result of the examination of a specimen of feces for hookworm eggs that 222, or 20.5 per cent, were negative and that 79.5 per cent were infested. Of those

infested 674, or 62.2 per cent, had very light or light infestations and 187, or 17.3 per cent, had moderate and heavy worm burdens.

2 As regards the symptoms of which these children complained, no significant differences were noted in either group for such disturbances as dyspnea, weakness and fatigue, and edema until an infestation level of approximately 100 or more hookworms was reached. Not only did a larger percentage of children complain of these symptoms when the intensity of infestation reached this level but also the degree of dyspnea, weakness and fatigue, and edema was increased.

3 For all groups studied, from 56.6 to 71.5 per cent were underweight as determined by accepted standards. There was only slight variation in the degree of underweight in the infested groups as compared with the controls.

4 The data relative to anemia and malnutrition as determined by physical examination indicate no striking differences between the negative or control group and the very light and light infestations. Those individuals showing the heaviest worm burdens had the greatest degree of anemia and malnutrition. Anemia was noted, however, in 41.4 per cent of the 222 children in the control series.

5 Diseased tonsils and teeth were present to almost the same extent in both the control group and in each group with hookworm.

6 The red blood cell counts and hemoglobin determinations show a secondary anemia in all groups, the degree of anemia being greatest in those children with infestations of 100 or more hookworms. It was found that 18 per cent of the control series and from 22 to 27 per cent of those with very light and light infestations had the same degree of anemia as those with moderate and heavy worm burdens.

7 No significant deviations from the normal leukocyte counts were found.

8 An increase in number of eosinophils was found in all groups, the control group averaging 9.6 per cent. The average eosinophil count for those known to have hookworm varied from 11.9 to 17.9 per cent.

9 In the groups with hookworm, from 4.3 to 17 per cent had eosinophil counts less than 5 per cent. No relationship between the percentage of eosinophils and the number of hookworms could be determined.

10 Data relative to the dietary habits of the children studied showed that on the whole the diets were not only inadequate in amount but also poorly balanced and lacking in hematopoietic substances. The main components of the diet consisted of cereals, dried beans, peas and meat, which was salted fat pork. Only small amounts of animal protein, milk and eggs were consumed. Only a small number of children in the entire group received additional accessory food substances such as cod liver oil, orange or tomato juice.

CONCLUSIONS

The conclusions drawn from this study are based on conditions as they exist at the present time in George County, Mississippi. It is apparent that there is a high incidence of hookworm in the county studied, but a majority of infested children have very light or light worm burdens. It would seem that the other conditions such as anemia, malnutrition, probable foci of infection and poor diets should be given attention in any evaluation of the effects of hookworm infestation in the population studied, as these conditions were frequent in both control and infested groups.

⁵ Rhoads, C. P., Castle, W. B., Payne, G. C. and Lawson, H. A. Observations on the Etiology and Treatment of Anemia Associated with Hookworm Infestation in Puerto Rico. *Medicine* 13: 317-375 (Sept.) 1934.

In the early days of hookworm control in this country it was necessary to institute extensive treatment campaigns on account of the severity of the disease. It is reasonable to state that hookworm control now should be considered as part of a well balanced public health program. The removal of the hookworm alone will bring about only partial and temporary improvement in the health of children. Attention should not be focused on hookworm infestation alone to the exclusion of other conditions that may be as important as hookworm in producing ill health.

THE USE OF UNSATURATED FATTY ACIDS IN THE TREATMENT OF ECZEMA

(ATOPIC DERMATITIS, NEURODERMATITIS)

SAMUEL J. TAUB, M.D.

AND

SAMUEL J. ZAKON, M.D.
CHICAGO

About two years ago, Hansen¹ conceived the idea of investigating the possible clinical bearing of a discovery made in 1929 by Burr regarding the requirement for unsaturated fatty acids in animal nutrition. Burr found that rats placed on completely fat free diets, but adequate in all other respects, soon developed a definite syndrome characterized in the early stages by scaliness of the skin and in the later stages by cessation of growth, necrosis of the tail and pathologic alterations in the kidneys. When, however, he added fats to the diet of these experimental animals, they again began to grow and the skin scaliness disappeared entirely.

Hansen found that the iodine absorption value of the blood serum of eczematous babies is low and that it increases with clinical improvement. He could produce an increase in the serum iodine by feeding these babies linseed oil and he also reported a number of clinical cures by feeding linseed oil.

Cornbleet,² working independently, reported on the treatment of eczema (atopic eczema, neurodermatitis), in adults with maize oil. The essential substances of these unsaturated fatty acids are apparently linoleic, linolic and possibly arachidonic acids.

Utilizing the preliminary observations of these workers, a number of pharmaceutical houses are exploiting these unsaturated fatty acids to the medical profession with claims that are entirely unwarranted. These unsaturated fatty acids are now sold at an exorbitant price, with exaggerated claims for the treatment and cure of such conditions as eczema, alopecia, asthma and other allergic conditions.

In our clinical experience with linseed oil, covering a period of eight months, we have used a purified linseed oil as advised by Hansen, in doses of from one-half ounce to 1 ounce (15 to 30 cc) three times a day. Our series comprises only eight patients with eczema (atopic dermatitis, neurodermatitis). These patients are the only ones of a larger number who carried out this treatment faithfully. Our results with these eight patients were universally poor. Two of these patients, while taking the linseed oil, developed crops of oily cysts and furunculosis. Another patient

had a severe asthmatic attack after taking the linseed oil. The asthma developed the first day the oil was taken and skin tests with powdered linseed and cottonseed were strongly positive. No allergic tests were made on any of these patients and we did not include the patient who developed asthma in this series. One of the distributors of a linseed oil specifically states in its advertisement to doctors that asthma is benefited while under this treatment. In a previous article, one of us³ cited the relatively large incidence of cottonseed as a cause of asthma, hyperesthetic rhinitis and associated allergic disturbances. Botanically related seeds such as linseed, kapok seed, peas and beans may also produce an allergic disturbance in a patient sensitive to cottonseed. Therefore the danger of promiscuously prescribing a linseed oil product for an eczema patient is apparent.

In none of these patients could we see any improvement in the clinical appearance of the eczema. In view of these results we have discontinued the use of the unsaturated fatty acids in the treatment of atopic eczema and we conclude that the promiscuous use of linseed oil as advocated by the distributors of this product is entirely unjustified and not without danger if used for a patient who may be cottonseed or linseed sensitive.

185 North Wabash Avenue.

HERNIA REDUCED EN MASSE

LOUIS H. NASON, M.D.

AND

CHARLES G. MIXTER, M.D.
BOSTON

An unusual and dangerous complication of hernias is reduction *en masse*. This condition nearly always creates an emergency, since false reduction almost inevitably causes strangulation of the hernial contents. The gravity of such a situation makes it necessary to consider the possibility of hernia reduced *en masse* whenever certain characteristic clinical features are present.

This condition was recognized as early as 1702, when Saviard¹ first noted its occurrence. Conner and Howitt² in 1908 collected five instances in 1,618 cases of strangulated hernia at the St. Thomas and St. Bartholomew hospitals. Pearse³ in 1931 published a statistical study based on 193 cases collected from the literature. Force and taxis appear to be the precipitating factors in 93 per cent of the cases. It occurs more commonly in males than in females, usually on the right side, and in inguinal rather than in femoral hernias. Pearse found only 12 per cent of the cases in femoral hernias.

The following case reports serve to illustrate the typical history and physical observations in patients with hernia reduced *en masse*. Three of the five cases occurred in a group of 632 hernias of all types, of which seventy-three were strangulated or incarcerated. It is noteworthy that in none of these cases was undue force or taxis a prominent feature in the history.

REPORT OF CASES

CASE 1.—D. F., a man aged 50, entered the hospital complaining of generalized abdominal cramps beginning suddenly

1 Hansen P. E. Study of Iodine Number of Serum Fatty Acids in Infantile Eczema. *Proc. Soc. Exper. Biol. & Med.* 30: 1198 (June) 1933.

2 Cornbleet Theodore. Use of Maize Oil in the Treatment of Eczema. *Arch. Dermat. & Syph.* 31: 224 (Feb.) 1935.

3 Taub S. J. Cottonseed Allergy. *J. A. M. A.* 103: 334 (Aug. 4) 1934.

From the Surgical Service of the Beth Israel Hospital.

1 Saviard. *Observations de chirurgie.* Paris 1702.

2 Conner E. M. and Howitt A. B. *Ann. Surg.* 47: 573 1908.

3 Pearse H. E. Jr. *Surg. Gynec. & Obst.* 53: 822 (Dec.) 1931.

six hours before entrance. The pain gradually shifted to the right lower quadrant of the abdomen and was followed by nausea and vomiting. At the onset he noticed a tender bulge in the right inguinal region, but this soon disappeared spontaneously. Seven years previously he had had a bilateral inguinal herniorrhaphy and appendectomy.

Examination revealed a distended abdomen with waves of peristalsis traveling from left to right. There was no evidence of a recurrence of either inguinal hernia. However, over the right saphenous opening there was a distinct defect, which allowed the admission of the examining finger to a depth of about $1\frac{1}{2}$ inches. Only a feeble impulse could be felt on coughing, but no distinct mass was palpable.

Under spinal anesthesia a right lower rectus incision was made. Dilated bowel presented. This bowel led to a right femoral hernia, the sac and unreduced contents of which protruded into the abdominal cavity. The neck of the sac was incised, and an incarcerated loop of ileum dark and discolored was liberated. The circulation of the loop returned satisfactorily. The sac was inverted into the abdominal cavity and removed after ligation of the neck. The convalescence was uneventful and the patient was discharged on the fourteenth postoperative day.

CASE 2—B S, a man aged 48 entered the hospital complaining of abdominal pain and vomiting of two days' duration. He had had bilateral inguinal hernias for the past fifteen years, which had always been reducible. Six days before admission he developed cramplike pain in the left lower quadrant of the abdomen and in the region of the hernia, which had become incarcerated. He reduced the hernia and the symptoms subsided but recurred two days before admission. He began to vomit with increasing frequency and severity. He became obstipated, and enemas produced neither feces nor flatus. The right hernia was always reducible. The left hernia had not reappeared since the previous "reduction" six days previously.

The patient was dehydrated, and the abdomen was markedly distended and tympanic. On the right side there was a reducible, nontender inguinal hernia but on the left side the examining finger could be inserted through the external inguinal ring into a definite defect. No hernial mass could be palpated. The temperature by rectum was 100.4°F , the pulse rate 130.

Under spinal anesthesia, a left lower paramedian incision was made. The small bowel was found markedly dilated. This was traced down to the left internal inguinal ring where a distinct bulge into the peritoneal cavity was noted. This consisted of a hernial sac with incarcerated and strangulated small bowel, the whole entirely out of the inguinal canal and occupying a retroperitoneal position. The neck of the sac was incised and the bowel liberated. It was deeply discolored but appeared viable. The sac was dealt with by inverting it and amputating it after transfixion at the neck. The immediate convalescence was stormy, the patient developing evidences of paralytic ileus. This was successfully treated, and the convalescence proceeded uneventfully.

CASE 3—J F, a man aged 65, entered with a history of having had bilateral inguinal hernias for ten years. Three days before admission the left hernia protruded to the size of a large plum. He experienced some difficulty with it and therefore resorted to a warm bath, in which it apparently became reduced. Two hours later he began to experience generalized abdominal cramps, with nausea, and three hours after the "reduction" he vomited. The vomiting and the cramps continued to the time of entry.

The abdomen was markedly distended, and waves of peristalsis could be seen traveling over the upper half. The right inguinal region contained an easily reducible hernia. In the left inguinal region the external ring was dilated and easily admitted the examining finger. There appeared to be a definite defect in the floor of the canal, with only a weak impulse on coughing. The temperature was 100°F rectally, and the pulse rate 120.

Under general anesthesia a left rectus incision was made. The small bowel was definitely distended, the distended portion being traced down to the left internal inguinal ring. This ring appeared displaced directly into the abdominal cavity by

a large sac containing small bowel. The bowel could not be liberated by gentle traction. Therefore the ring was incised at its upper aspect, and about 9 inches of dusky, cyanotic ileum delivered. Its surface was almost completely covered by ecchymotic hemorrhages. There were definite constriction rings present at both efferent and afferent loops. After ten minutes the circulation appeared to have returned satisfactorily. A Witzel type of enterostomy was performed, the catheter emerging through a stab wound.

Shortly after operation the patient manifested a moderate degree of shock. This was successfully combated with intravenous infusion of saline and dextrose solutions. However the blood pressure again dropped and the temperature rose to a terminal height of 105.8°F . The patient lapsed into coma and died twenty-four hours after operation.

His death appeared to be due to gangrene of a supposedly viable loop of ileum, or to a gas bacillus infection.

CASE 4—E W, a man, aged 59, was referred to Dr C G Mixter complaining of vomiting of five days' duration. Since the onset of the vomiting his abdomen became distended and he had no bowel movement. For the past seven years he had been aware of a moderate sized right inguinal hernia. Three days before the onset of the vomiting, the hernia became incarcerated. However, it was reduced without undue difficulty and there had been no pain in this region since.

The abdomen was markedly distended and tympanic throughout. The right external inguinal ring was dilated, and a definite defect could be felt in the floor of the canal. When the patient coughed a slight impulse was felt, and a vague mass appeared to descend and strike the tip of the examining finger. The pulse rate was 90. The temperature was 98.4°F rectally.

Several enemas were given with no results. Therefore, under ether anesthesia the abdomen was opened through a 6 inch right paramedian incision. The loops of small intestine were greatly distended and injected. Exploration of the right internal inguinal ring revealed a tumor mass the size of an orange. The tumor was composed of a hernial sac with a neck three-fourths inch in diameter and containing bowel, the whole having been reduced *en bloc*. The neck of the sac was incised, permitting reduction of the strangulated loop. The bowel was cyanotic and showed two pressure rings. It was viable, however. The usual herniorrhaphy incision was then made, and a routine herniorrhaphy was then carried out.

The convalescence was rather stormy and marked by persistent distention with some vomiting. On the fifth postoperative day the patient died suddenly from what was thought to be a massive pulmonary embolus.

CASE 5—B M L, a physician, aged 44, was referred to Dr C G Mixter complaining of generalized abdominal cramps and nausea of forty-eight hours' duration. He had had bilateral inguinal hernia for many years. Eighteen years previously bilateral herniorrhaphy was performed with recurrence on the right side. During the past four years he had worn a tight fitting truss. The hernia had become scrotal shortly after its recurrence but had always been reducible. Forty-eight hours before admission to the hospital, the hernia slipped down. He reduced it without any undue force, and thereafter the truss was able to retain it. Shortly afterward he began to feel nauseated and vomited. The nausea and the vomiting persisted, and the abdomen became distended. He began to experience cramplike pain about the umbilicus.

The abdomen was distended and tender over the lower half. The right inguinal region showed a distinct defect, with a slight impulse transmitted on coughing. Just above the usual site of the internal inguinal ring was a deep tender mass.

Operation through a herniorrhaphy incision revealed a large hernial sac displaced upward in a preperitoneal position and containing a loop of gangrenous small bowel. The intestine was resected and the hernia repaired. The convalescence was uneventful, except for a transient attack of biliary colic.

COMMENT

A hernia reduced *en masse* consists in a displacement of the sac and its contents into an anomalous position. Despite the apparent reduction, the relation of the sac to its contents remains undisturbed. The common pos-

tion that the sac assumes is the space between the peritoneal and the muscle layers of the abdominal wall ordinarily defined as the properitoneal space. Certain conditions must obtain before such a situation can occur. The neck of the sac must be sufficiently wide to allow the entrance of bowel or omentum and yet narrow enough to imprison and retain incarcerated contents. The sac itself must be sufficiently mobile within the hernial canal to permit it to be forced upward and inward. Likewise sufficient mobility of the neck of the sac, together with the parietal peritoneum immediately surrounding the hernial ring, is necessary to provide room behind the peritoneum for the "reduced" hernia. The structures surrounding the neck of the sac must be fairly well separated from the internal ring. The degree of mobility of the neck of the sac determines to a large extent the position which the falsely reduced mass will occupy. The neck may be fixed, but the peritoneum just within the peritoneal cavity and anterior to the ring may be so lax as to form a properitoneal pouch. Under such circumstances the "reduced" mass will occupy a properitoneal position and may then be palpable as a tumor in the abdominal wall. Similar laxity posterior to the ring may act to produce a retroperitoneal displacement of the sac. If considerable pressure and taxis are applied, rupture of the sac may occur and the incarcerated contents may come to lie extraperitoneally. Commonly the neck of the sac moves directly inward with the reduced sac and is therefore found projecting into the abdominal cavity. If omentum is adherent to the sac, the entire sac may be pulled inward when the patient lies down, since the omentum in sliding back tends to invert the sac.

Obviously, only a fairly large well developed hernia could provide these conditions. The wide indefinite ring of the direct inguinal type of hernia should not provide suitable circumstances for reduction *en masse*. Nevertheless this has been observed. The hernia whose contents have become permanently incarcerated is unlikely to be reduced *en masse*. In this case the sac is usually too firmly adherent. However, even here the possibility is not too remote. It is the moderate sized well established freely movable hernia lying in a canal whose walls are lax and distensible that is the most common type in which this accident occurs.

In the femoral hernia, reduction *en masse* is extremely rare, since the slitlike opening of the saphenous space with its firm fascia and sharp semilunar upper edge prevents the pushing of the sac and its contents inward beyond it. It is for the same reason that incarceration in femoral hernias is common. Despite this peculiar anatomic arrangement, actual reduction *en masse* with strangulation of bowel has been observed (case 1).

When reduction *en masse* occurs, it is usually possible to elicit the following story. The patient has invariably been aware of a hernia which had previously been reducible and on this occasion the hernia had apparently been reduced. Yet the pain, cramps and vomiting had continued or had appeared for the first time. The reduction need not necessarily have been accomplished with any undue force although the false reduction usually does occur as a result of an over-strenuous attempt at reduction by pressure or taxis, either by the patient by his friends or even by his physician. An ill fitting truss may provide the means for bringing about this accident. In a small percentage of cases the reduction occurs spontaneously and may take place several days or even weeks before the symptoms of intestinal obstruction have supervened.

On examination there may be noted the objective evidence of intestinal obstruction. Superficially the local examination may reveal nothing remarkable, but with careful palpation of the hernial canal through the ring there is to be detected a definite defect with only a feeble impulse on coughing. This finding is characteristic, and when it exists in any individual giving a history of a previous hernia a reduction *en masse* should be considered. In a properitoneal reduction, a mass may be felt in the abdominal wall above or medial to the usual site of the "reduced" hernia. Rectal examination usually fails to disclose anything of significance.

The treatment is immediate operation. The abdominal approach to the hernia is recommended as the most advisable since it is always necessary to incise the neck of the sac in order to liberate the bowel or omentum. The approach provides the most direct method of reaching and dealing with the various hernial orifices. In the event that resection of bowel is necessary, the advantages of doing so through a laparotomy incision are obvious. A lower rectus incision retracting the muscle medially should be the incision of choice. The inguinal, femoral and umbilical rings should be palpated first, and no attempt to pull forcibly the bowel or omentum out of the sac should be made. Time will be saved and trauma avoided if the neck of the sac is immediately cut and the contents are gently reduced back into the abdominal cavity. When the sac has been emptied and appropriate disposition made of its contents, it can be dealt with by inverting it into the abdominal cavity, and then amputating it after transfixion at the neck. If the patient's condition is good it may be advisable to repair the hernial canal through a separate incision. This procedure can be carried out with dispatch if the sac has been eliminated from within through the abdominal incision.

SUMMARY

Five cases of hernia reduced *en masse* were seen. Although this is considered a rare accident, three of the five cases occurred in a group of seventy-three incarcerated or strangulated hernias. It is shown to occur in the well established hernia with the sac lying loosely in the hernial canal. The hernial sac and its contents can be displaced properitoneally, retroperitoneally, or directly into the abdominal cavity. Forceful attempts at reduction may or may not be a factor in its production.

Patients are seen because of intestinal obstruction, and examination reveals a definite defect at the usual site of the hernia, with no apparent hernial sac. In the properitoneal false reduction a tumor mass may be felt in the abdominal wall above and medial to the site of the internal inguinal ring. The abdominal approach to the hernia is recommended as the most expedient.

330 Brookline Avenue.

Born Calcium Poor—To be normal and healthy the full-grown human body must be richer in calcium than in any other mineral element. Yet every human being is born calcium poor.

Why are we born calcium-poor? It is a handicap which nature accepts (or imposes) in order to diminish the casualties of delivery. Once the danger of the event of birth is safely past it is presumably to the advantage of the young organism to recover from the handicap of its low-calcium condition of body as rapidly as possible. Hence the extreme importance of liberal calcium intake for the growing child—Sherman H. C. Food and Health, New York, Macmillan Company, 1934.

Clinical Notes, Suggestions and New Instruments

CAYO POWER INSTRUMENTS

E. P. CAYO M.D. SAN ANTONIO TEXAS

These instruments are intended to cover the entire field of bone surgery and to do it in such a manner that, from the standpoint of antiseptis, they need cause no more anxiety than would ordinary hand instruments.

There is a set of these instruments, consisting of two cross cut saws (or reciprocators), an automatic chisel and a drill, or rotator, also several attachments and many tips, such as saw blades, drills and chisel blades. These instruments are

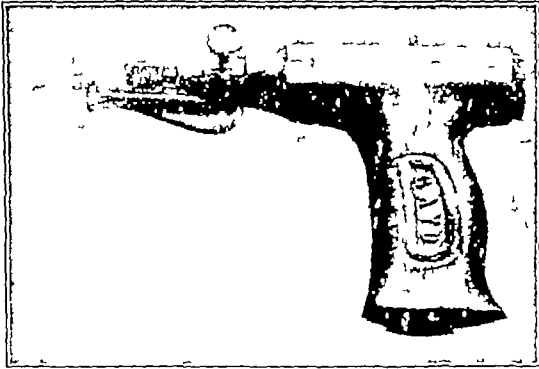


Fig 1—Reciprocator (saw gun) equipped for amputations or bone splicing

driven through a flexible shaft and by means of a Universal Motor permanently housed in a carrying case.

With these instruments any kind of saving imaginable can be done, and done without danger, because the hand can be closed on the teeth of the saw when it is going at full speed and yet with no danger to the hand. That is why ribs may be severed without injuring the pleura, or bone flaps made in the

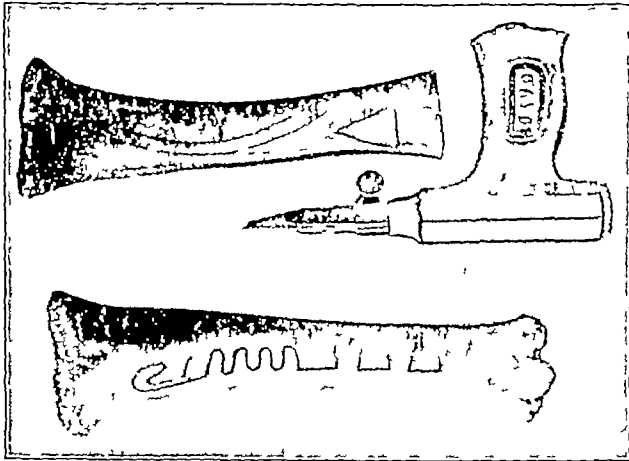


Fig 2—Reciprocator equipped for stab sawing that is for starting to saw directly into the bone for the making of bone grafts curved or otherwise laminectomies and so on

skull without injuring the dura. Bone grafts may be cut, curved or otherwise. Laminectomies can be done with ease in a very short time. The instruments are particularly adapted for amputations and bone steppings. Saw blades, varying from slender keyhole saws to the stout bevel pointed stab saw, come with the instruments.

Stab sawing is a method of sawing that enables one to cut right down squarely into the bone to make grafts curved or otherwise, to do laminectomies, and to remove odd-shaped pieces of bone and the like. To do it well, however, requires considerable practice.

The automatic chisel consists of an attachment that converts the reciprocator into an automatic chisel. The attachment takes gouge and chisel blades of varied size and shape. With this instrument very delicate or very rapid work can be done.

The rotator (drill gun) is devised to operate any kind of bone cutting instrument requiring a rotary motion, such as drills, burrs, trephines and circular saws. It is built on the order of the reciprocator and is often referred to as a drill gun. Probably its most interesting feature is a gage that

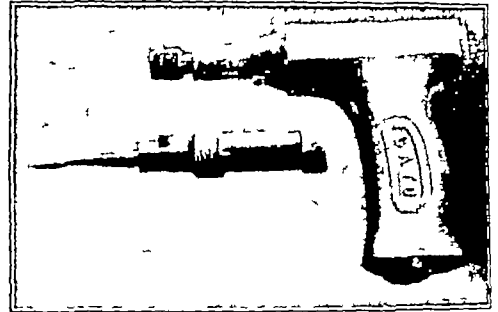


Fig 3—Reciprocator with chisel attachment.

only controls depth of perforation but also fixes the drill point to the exact location on the bone where perforation is desired.

The flexible shaft, although very small and flexible, will still the powerful motor without breaking. It can be instantly connected to or disconnected from any of its instruments.

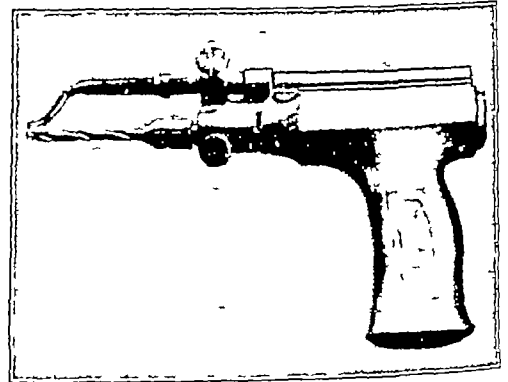


Fig 4—Rotator (drill gun) equipped with drill gage.

These instruments are built of chromium-plated bronze and stainless steel. They can be repeatedly sterilized without injury. They come in a carrying case 8 by 8 by 16 inches. The weight all told is about 25 pounds.

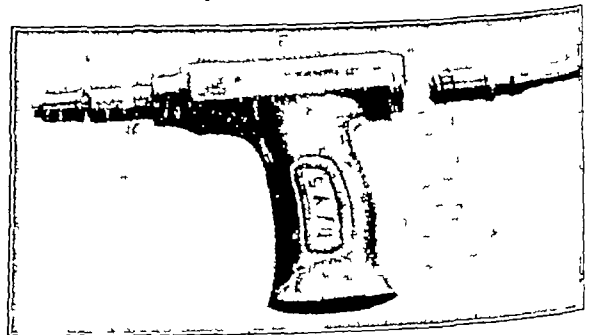


Fig 5—Instantaneous shaft connection.

It is sincerely hoped that these inventions and adaptation by their simplicity and versatility, their freedom from physical danger to both patient and operator, and last, but not least, their freedom from danger of field contamination will make the use of power instruments in bone surgery as popular as they should be.

Santa Rosa Hospital.

Therapeutics

THE THERAPEUTICS OF THE COOK COUNTY HOSPITAL

EDITED BY BERNARD FANTUS, MD
CHICAGO

NOTE.—In their elaboration, these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics, Dr Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. The articles will be continued from time to time in these columns. When completed, the series will be published in book form.—Ed

THE THERAPY OF JAW FRACTURES AND OF FACE INJURIES

OUTLINE BY DR. J E SCHAEFFER AND DR. M B SKINNER

Fractures of the jaw are either traumatic or pathologic. External blows, gunshot wounds, automobile accidents, falls, and extraction of teeth are the most common traumatic causes. The most common pathologic conditions that predispose to fracture are carcinoma, sarcoma, cysts, osteomyelitis, tuberculosis and syphilis. Pathologic fractures are relatively rare.

DIAGNOSIS

As fractures of the jaw are many times overlooked and loss of function or deformity often results from failure to recognize them, a thorough examination of the jaws should be made and roentgenograms taken whenever a patient presents himself with a history of trauma and pain or swelling about the face.

One should look for

- 1 Local trauma
- 2 Abnormal mobility
- 3 Partial or complete loss of function
- 4 Crepitus
- 5 Deformity
- 6 Loss of occlusion in some part of the arch.
- 7 X-ray evidence

A fracture of the maxilla is more difficult to diagnose than that of the mandible. It may not be possible to obtain roentgenograms showing clear detail.

Differentiation Between a Fracture and Dislocation

—In a dislocation the patient is unable to close the jaws and cannot bring any of the teeth into occlusion. In a fracture some of the teeth may be in occlusion or can be brought into occlusion by manipulation of the fragments.

TREATMENT

General Principles —In most cases the earlier the reduction is made the better, for the sooner the fragments are brought into position and immobilized the sooner the repair can begin. If, however, the patient is so severely injured that his life is in danger, it is better to delay treatment of the jaw until he is on the way to recovery, even as long as three or four weeks. If there is a marked swelling of the floor of the mouth or if the tissues on the lingual surface or tongue are badly injured, immediate fixation may embarrass respiration or favor infection.

After the jaws have been fixed, the patient should be instructed to cleanse his mouth thoroughly after each feeding. This is best accomplished by the use of a "baby sized" tooth brush and a dentifrice followed

by rinsing the mouth with some good antiseptic, e. g., the Antiseptic Solution of the National Formulary. The patient has to subsist, of course, on a liquid diet. It is never necessary to extract a tooth in order that the patient may take nourishment. Even when there is a full complement of teeth there is enough space between the teeth to draw liquid through.

As practically all fractures of the jaw, when teeth are present, are compound, they are susceptible to infection. Some advocate establishing immediate drainage of all fractures by an incision just below the fracture line. A more conservative plan is to take care of the infection when it develops. When it does occur fomentations are applied, and, when localization takes place an incision is made to the bone and drainage instituted.

The Barton bandage, commonly applied either as a temporary or as a permanent means of treating a jaw fracture, is inefficient when there is any displacement. In most cases it tends to produce more displacement and causes more discomfort than no treatment.

Reduction and retention require recognition of the following special types of injury.

Fracture of the arch

- Complete transverse fracture of the maxilla
- Fracture of the arch in the edentulous
- Fracture back of the last molar tooth
- Fracture through the neck of the condyle.
- Extensive fracture of the maxilla
- Lacerations about the face and mouth.

FRACTURE OF ARCH

When there are a considerable number of teeth present in both arches, the reduction and fixation of a fracture is greatly simplified, as the opposing arch may be utilized to fix the jaw in its proper relation by the use of intermaxillary wires. The methods commonly used are (a) the first Gilmer, (b) the second Gilmer, (c) the loop method and (d) the Hammond splint.

(a) In the first Gilmer method (fig 1) a No 24 gage brass wire, which is very pliable and does not stretch, is used. The wire is cut into lengths of about 15 cm each, the ends being cut on a slant, which makes it easier to pass them through the interproximal spaces. The wire is then passed, from the lingual surface, through the interproximal spaces on each side of the tooth to be utilized for fixation. With a blunt instrument the loop of the wire on the lingual surface is held well down on the neck of the tooth and the two ends are grasped with a large needle holder and the wire is twisted tightly about the tooth. It is important that the wire should be down on the neck of the tooth to prevent it from slipping. A sufficient number of teeth are wired on either side of the line of fracture, and the corresponding teeth of the opposing jaw are wired in the same way. The mandible is then fixed to the upper jaw by twisting the wires of one to those of the other. By crisscrossing the upper and lower wires, a more stable fixation may be obtained.

There is one disadvantage in this method. In order to open the mouth the wires have to be cut, and if union has not taken place it is then necessary to rewire the jaws.

(b) In the second Gilmer method (fig 2) a heavy arch wire, 14 gage, is adapted to the buccal and labial surfaces of the teeth of both arches. These are attached by threading a No 24 gage brass wire between and around the teeth. Care should be taken that the wire is well down on the neck of the teeth and that a suffi-

cient number of teeth are wired to hold the arch wire rigid. Intermaxillary wires are then placed around the arch wires and the jaws are brought into occlusion by twisting them up tightly. This method is advantageous in that the mouth may be opened and inspected at any time and fixation again be established by merely replacing the intermaxillary wires. It is a much more

stable method, which makes it very useful in cases of delayed union.

Another adaptation of the Gilmer arch bar is very useful in handling fractures difficult to reduce, such as those in which there has been a delay in treatment. A modification of the arch bar is made by either

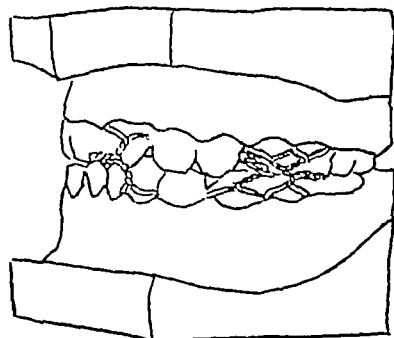


Fig 1—First Gilmer method

bending a series of loops or soldering a series of lugs to both the upper and lower arch bars (figs 3 and 4). These lugs are directed away from the occlusal line of the teeth. Elastic bands are then placed over the lugs and distributed in such a manner as to bring traction in the right direction for the reduction of the displaced fragments. The constant and even pull soon brings the fragments into their proper alignment with little or no discomfort to the patient.

(c) The loop method (fig 5) is one in which a strand of No 24 gage wire is twisted in the middle to form a loop large enough for another wire of the same size to pass through. The ends of this wire are then passed between the two teeth to be ligated from the buccal to the lingual side. One wire is brought around and passed through the interproximal space on the distal side of one tooth, the other is passed through on the mesial side of the adjacent tooth. One strand is passed through the eyelet and the two ends are then twisted, the wires being pulled tightly against the teeth. The same teeth in the opposing arch are wired in a like manner. The number of teeth wired depends

on the kind and location of the fracture. Intermaxillary wires are now passed through the eyelets and the teeth brought into occlusion and the wires twisted tight.

This method is not as stable as the second Gilmer method nor does it meet the variety of uses. Its one ad-

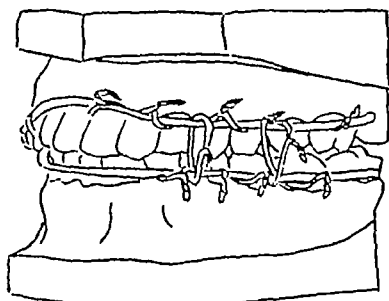


Fig 2—Second Gilmer method

vantage is that it is easily and quickly applied and the jaws may be opened and inspected and fixation again obtained by merely placing on new intermaxillary wires.

Bringing the teeth into occlusion is not always as simple as just merely tightening the intermaxillary wires. In many cases some manipulation is necessary. This is strictly a mechanical problem and depends on

the amount of displacement and the direction of the line of fracture. The amount of displacement will depend on the direction, application and degree of force producing the fracture plus muscular pull. In a general way one might say that the short fragment is displaced upward and the long fragment has a tendency to be displaced in a downward direction.

(d) The Hammond splint (fig 6) furnishes another satisfactory method of handling single fracture of the mandible when there are sound teeth in both fragments. This splint consists of two arch wires, No 14 gage, one shaped to the teeth on the buccal surface and the other on the lingual surface. These are wired together with No 24 gage brass wires by passing them through the interproximal spaces and around the teeth. The small wires are passed over one arch wire and under the other and then twisted tight. This method allows the patient full movement of his jaw and saves him the inconvenience of having his jaws immobilized for several weeks.

COMPLETE TRANSVERSE FRACTURE OF MAXILLA

A complete transverse fracture of the maxilla requires fixation outside the mouth. The jaws are wired together by the second Gilmer method. A skull

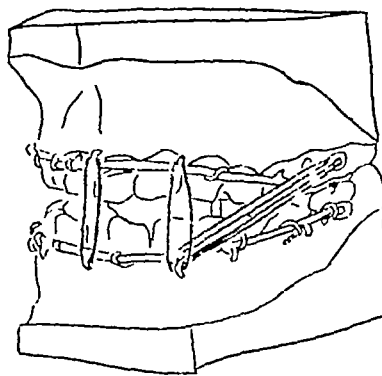


Fig 3—Adaptation of second Gilmer method for delayed reduction

cap of plaster or the crown part of a woman's felt hat is adjusted to the head and both jaws are then immobilized by a piece of rubber dam with a slight tension on it, encircling the mandible and attached to the skull cap. When there is considerable displacement of the maxilla it is often necessary to reduce it by rubber band traction.

If this is the case, it is sometimes unavoidable to delay the fixation of both jaws until the teeth are brought into proper occlusion, as these may act as a wedge and prevent the traction from bringing the jaws into proper relation. Immobilizing the mandible to the maxilla is not always possible, as the fracture through the nasal fossae may obstruct breathing. In these cases the maxillae and facial bones are supported by a Kingsley splint (fig 7). This is constructed to cover the upper teeth with metal arms extending outside the mouth and backward in line with the occlusal plane (fig 7A). This permits using the top of the skull as a fulcrum in order to seat the fractured bones somewhere near their normal relationship. After the maxillary bones have been seated, pressure is applied to the mandible externally in order to establish normal occlusion (fig 7B).

FRACTURES OF THE ARCH IN THE EDENTULOUS

With slight displacement, not great enough to cause nonunion or deformity, the only treatment necessary is to advise a soft diet and rest. These cases as a rule get along well and, when union has taken place, any change in the relationship of the two arches may be corrected by the proper construction of artificial den-

tures If the displacement is extensive, it may be reduced by direct or circumferential wiring

In the direct wiring method an incision is made along the lower border of the mandible The line of fracture is exposed and all soft tissue removed from between the ends of the bone Two holes are drilled in each fragment, one above and one below the mandibular canal Two silver wires, 20 and 22 gage, are placed through the holes as follows The first wire is inserted through the upper opening in the short fragment to the lower hole in the long fragment and then the other wire is placed in the other holes The fragments are adjusted and the wires tightened to hold the fragments in their proper position Care should be taken that the ends of the wires do not stick out into the soft tissue to cause undue irritation The wound is sutured and the patient should be kept under close observation the first week to detect onset of infection promptly If no infection occurs, the wires are left in permanently If, on the other hand, infection occurs, it may be necessary to remove the wires for complete healing to take place, but this should not be done early, as it is possible for union to occur in the presence of a low grade infection

When the circumferential wiring method is used, an incision is made as before and two wires are passed up into the mouth close to the bone on the buccal and lingual surface, one wire on each side of the line of fracture The ends of the wires are passed through holes in a lead or vulcanite plate, which has previously been fitted to the ridge, and tightened up The wound is then sutured This method is not as stable as the direct

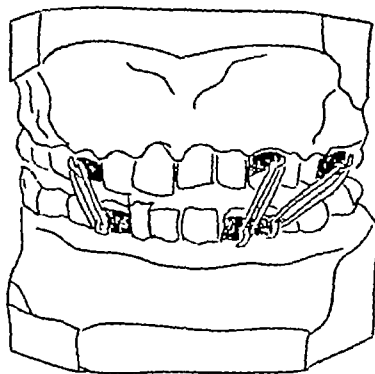


Fig 4—Angle bands with hooks and rubber bands for delayed reduction

wiring but it saves the necessity of drilling into the bone and thus lessens the danger of infection

Fractures in which there has been a considerable loss of bone may require some type of dental splint As each case is an individual problem and the construction of the splint requires the technical skill of a dentist, a detailed discussion is not advisable here It is necessary to treat many of these by means of a bone graft

FRACTURE BACK OF LAST MOLAR TOOTH

Fracture of the jaw back of the last molar tooth is very difficult to handle If the fracture line is in a downward and backward direction there will be an upward and lateral displacement of the short fragment caused by the action of the temporal, masseter and internal pterygoid muscles When this occurs there is a marked deformity of the jaw with a loss of the normal angle of the mandible Many methods have been devised to treat this type of fracture, but none have proved entirely satisfactory One method was to place a modeling compound or gutta percha mold in this area and then wire the jaws together This, however, makes it very difficult to keep the mouth clean in this area and tends to infection It generally causes a

pressure necrosis of the soft tissue Another method is to make a splint with a pin fixed in the ramus and force the posterior fragment into position by means of a jackscrew Similar to this is the use of a head cast with a rod extending downward to the back of the neck The angle of the jaw is exposed, a hole drilled through the bone, and a wire passed through and fastened to the rod of the plaster cast

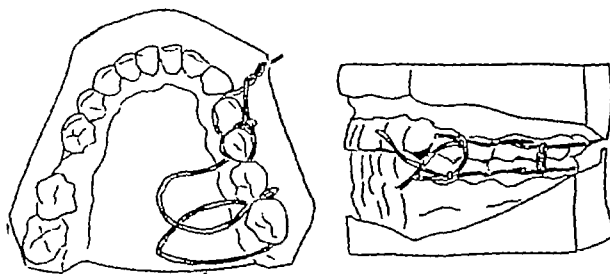


Fig 5—Loop method

A method which was introduced by the Oral Surgery Department at the Cook County Hospital, and one which seems most satisfactory, is as follows Arch wires are made as in the second Gilmer method, except that a prolongation of the unannealed wire is extended back past the line of fracture The end of this extension wire is forked to fit over the bone on the short fragment It is then bent in such a way that, when the jaws are brought into occlusion and fixed, the short fragment will be held down in position In the last two years about forty cases have been treated this way with good results None have shown any injury to the bone where the wire has rested against it It is relatively simple to apply and the risk of infection caused by drilling into the bone is eliminated

FRACTURE THROUGH NECK OF CONDYLE

In fracture through the neck of the condyle the general surgeon usually suggests an open reduction or the removal of the condyle Both of these are contraindicated because of the danger of such an operation The facial nerve lies just external to this region and unless the greatest care and skill are used it is apt to be injured, thus causing paralysis to that side of the face Another great danger in this type of operation is the fact that the internal maxillary artery lies below the neck of the condyle, and if it is severed or injured it is difficult to control the hemorrhage Wiring the teeth into occlusion usually establishes a satisfactory relationship of the long and short fragments

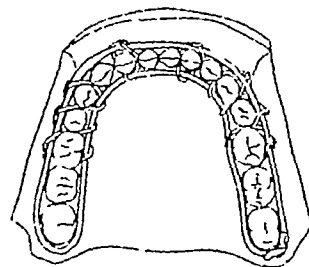


Fig 6—Hammond splint modified

Fractures treated this way have united with satisfactory function, ankylosis of the temporomandibular joint has not occurred

EXTENSIVE FRACTURE OF MAXILLA

Extensive fractures of the maxilla, involving the other facial bones, fall chiefly into two classes according to the character of the predominant displacement "If a severe force, such as a kick of a horse, is applied from in front in an upward and backward direction,

COUNCIL ON PHYSICAL THERAPY

JOUR. A. M. A.
Nov. 23, 1933

the maxilla may be driven in toward the base of the cranium with considerable comminution and impaction, or if, as is most commonly the case, the malar bone will be to the prominence of the cheek, the maxillary antrum, but at more or less driven into the maxillary antrum, but at the same time there may be extensive radiating frac-

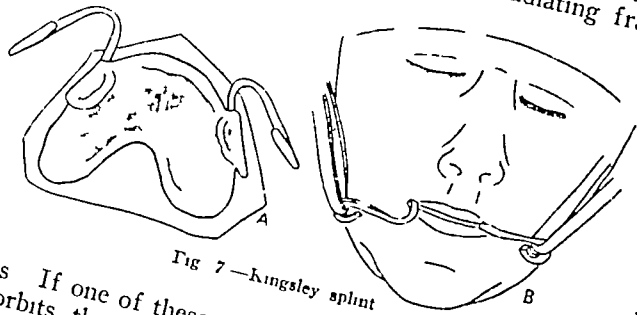


Fig. 7—Kingsley splint

tures If one of these is a transverse fracture through the orbits, the whole bony framework of the face may sag down, supported only by the soft tissue" (Blair) The general principles of treatment of such injuries are as follows If depressed fractures of the maxilla or nasal bones are present, these must be elevated back into position, lacerations of the soft tissue are cleaned and sutured so as to have the injured tissue brought back as near as possible to the normal position All scars are allowed to heal for at least six months, as an ugly scar tends to become less unsightly If after six months one believes that the scar can be improved, it is carefully resected for cosmetic appearance

Fractures of the malar bone, when this bone is driven into the maxillary sinus, show a marked depression on the injured side of the face Often the patient will complain of difficulty in closing his jaws, as the coronoid process of the mandible is impinged on by the depression of the zygomatic arch These cases are treated by making an incision in the buccal sulcus and exposing the fractured maxilla The malar bone is then elevated into position through the maxillary sinus and held in place by packing the sinus with gauze

LACERATIONS

Lacerations about the face and the mouth frequently accompany fractures of the jaw When the laceration extends from the external surface through to the mouth, treatment should be as follows The wound is thoroughly cleansed with green soap and water then irrigated with sterile water, and the surrounding tissue swabbed with alcohol The mucous membrane is sutured from the inside of the mouth with black silk, so that the stitches may later be easily removed Lacerations in the oral cavity heal more quickly if the raw surfaces are loosely approximated than if left to heal by themselves The deep tissues are then sutured with 0000 catgut Then the skin surfaces are brought together with horsehair

When the laceration extends through the lip it is important that the vermilion borders be sutured together in a straight line, otherwise an ugly scar will result

In cases in which there has been considerable loss of tissue, it is best to bring the tissues as near to their normal relation as possible, with the idea of a plastic correction later, though at times a plastic operation may with advantage be undertaken immediately, as was done in a patient who had three fourths of his upper

lip and the floor of his nose bitten off Both alae of the nose were pulled laterally, which caused much deformity In this case a piece of the mucous membrane of the mouth was brought up and sutured in to form the part of the missing floor of the nose The edges of the remaining portion of the lip were then straightened with a scalpel and sutured together A Logan face bow was applied to keep tension off the sutures The wound has healed well, leaving the mouth less than one-third its normal size This, however, was easily corrected by V incisions at the corners of the mouth

In lacerations of the lips, an infra orbital injection for the upper, and a mental injection of 2 per cent procaine solution for the lower, will often save the patient much pain and make it much easier for the operator to work

When patients present lacerations which have street dirt in them, a prophylactic dose of 1,500 units of tetanus antitoxin is always given

NOTE—To improvise a cheek retractor, bend the handle of a spoon Set the bowl of the spoon against the patient's cheek and retract the cheek by pulling on the handle and attach the handle to the back of the neck with adhesive tape Such an improvised retractor makes it possible to do some of this work without assistance

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS
HOWARD A. CARTER Secretary

LIEBEL-FLARSHEIM (SW2-C) SHORT WAVE GENERATOR ACCEPTABLE

Manufacturer The Liebel-Flarsheim Company, Cincinnati. This unit is recommended by the manufacturer for medical diathermy and for minor electrosurgery It is well constructed. The wavelength is about 25 meters It is equipped with two 125-watt vacuum tubes and operates from a 60 cycle alternating current. The power input is about 550 watts. Since there is no acceptable method for measuring the output of diathermy machines, this value is not stated. Its shipping weight is about 150 pounds.

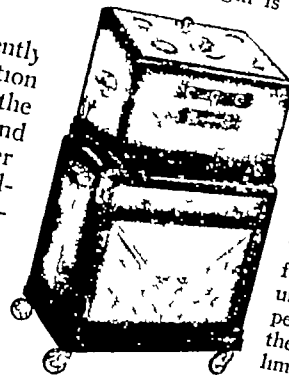


Fig. 1—Liebel Flarsheim generator (SW2 C) Short Wave Gen

Either pad electrodes or a coil for electromagnetic induction may be used. The unit is cooled by a motor-driven forced draft fan. Operating this unit under full load indicated that the temperature rise of the transformer and the cabinet was within the temperature limits considered safe by the Council. At the request of the Council, the Liebel-Flarsheim Company submitted data concerning the tissue heating effect in the human thigh. The firm reported that four turns of the induction cable two turns being above and two below the point of insertion of the inductive Thermocouples were applied to the thigh and deep-lying tissue (quadriceps extensor) After twenty five minutes' treatment, the machine being operated at the patient's tolerance the temperature rise, with the coil technique was observed to be more than that obtained with conventional diathermy—the criterion for investigating short wave machines which the Council has adopted In a clinic acceptable to the Council, the firm's report was confirmed

Burns may be produced by this machine, but with the observance of ordinary care, they may be avoided, their likelihood to occur is much less than with the use of conventional diathermy.

The machine was used by the Council's investigator in a clinic for several months, and he reported that it gave satisfactory service.

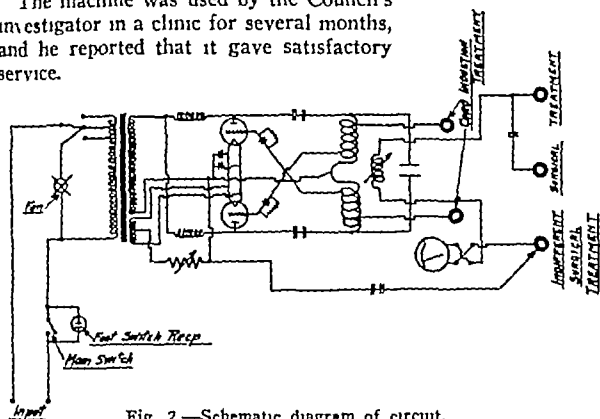


Fig 2—Schematic diagram of circuit.

In view of the foregoing report, the Council on Physical Therapy voted to include the Liebel-Flarsheim (SW2-C) Short Wave Generator in its list of accepted apparatus.

McINTOSH UNIVERSAL DIATHERMY UNIT ACCEPTABLE

Manufacturer McIntosh Electrical Corporation, Chicago

The manufacturer recommends this unit for medical and surgical diathermy. It is a cabinet model. The main line switch is mounted on the panel. The binding posts for the treatment cords are mounted on the front of the panel, and a four-gap spark gap covered by a metal screen is mounted on top. It has a four point "voltage selector switch" (rheostat) and a typical milliamperemeter, protected by fuses, with two scales, 0 to 1,000 and 0 to 4,000. There is a spiral coil mounted on a rotating rod in such a manner that the frequency in kilocycles is said to be altered from approximately 750 to 2,200. The unit weighs about 100 pounds.

At the request of the Council, the manufacturer submitted data containing a report of tests of the unit for power input and output, and for its spark gap and transformer temperature rise. The results recorded in the data were in agreement with the observations of the Council's investigator, and in conformity with the standards for diathermy machines previously established by the Council.

The Council's investigator reported that, from a clinical standpoint the machine is a satisfactory device for ordinary

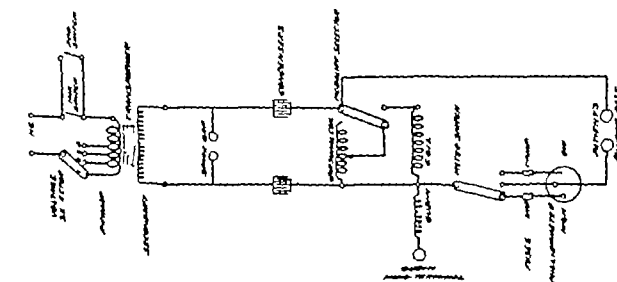


Fig 2—Schematic diagram of circuit.

local medical diathermy and for electrodesiccation and electrocoagulation.

In view of the foregoing report, the Council voted to include the McIntosh Universal Diathermy Unit in its list of accepted apparatus.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
PAUL NICHOLAS LEECH Secretary

GLUTAMIC ACID

A brand of glutamic acid was presented to the Council for consideration as an agent to be used in the treatment of myasthenia gravis and muscular dystrophy (progressive or pseudohypertrophic) and as generally interchangeable with aminoacetic acid N R.

The Council considered the relative therapeutic value of aminoacetic and glutamic acids, and, in the light of this whether or not the latter is a nonessential product. The usefulness of certain amino acids in the treatment of these myopathies has been largely demonstrated with aminoacetic acid. Tripoli and his associates¹ are the only workers who have used glutamic acid for this purpose. They claim that it cost less than half as much as aminoacetic acid, they believe that it is a slightly superior creatine former and even less toxic (in animals) than the relatively harmless aminoacetic acid. Further studies by these workers² suggest that its efficacy is equal to that of aminoacetic acid.

Brand, Thomas, Milhorat and Technor,³ however have shown that there is no increase in creatinine demonstrated by patients with progressive muscular dystrophy when glutamic acid is administered. The Council has been informed that Shorr and Richardson in an article to be published will report confirmation of this finding. There appear to be no adequately controlled observations indicating that glutamic acid is of therapeutic value in muscle disease. Commercial prices at present do not indicate that this is a cheaper agent. The Council doubts the advisability of administering from 20 to 30 Gm daily of this fairly strong organic acid, being of the opinion that it would be irritating to the stomach.

As a result of its consideration, the Council decided that there is not available sufficient confirmed, controlled evidence of the usefulness and harmlessness of glutamic acid to warrant acceptance at this time for inclusion in New and Nonofficial Remedies. A statement of the Council's consideration was sent the manufacturer of the submitted brand on receipt of which the firm agreed to close active promotion of its brand. In the interest, however of those who desire to know the Council's attitude on glutamic acid, publication of the foregoing statement was authorized.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH Secretary

CONCENTRATED SOLUTION LIVER EXTRACT PARENTERAL-LEDERLE—A sterile, aqueous solution, containing the nitrogenous nonprotein fraction G of Cohn et al obtained from fresh mammalian liver, preserved with 0.5 per cent of phenol. Each cubic centimeter contains antianemic substance obtained from 100 Gm of liver.

Actions and Uses—Concentrated solution liver extract parenteral-Lederle is proposed for intramuscular injection in the treatment of pernicious anemia and sprue.

Dosage—To insure optimum dosage for cases of pernicious anemia in relapse it is advisable to make an injection of 1 cc. each day for three or four successive days. In a series of cases

¹ Tripoli, C. J. and Beard, H. H. Muscular Dystrophy and Atrophy. Arch. Int. Med. 53: 435 (March) 1934.

² Tripoli, C. J., McCord, W. M. and Beard, H. H. Muscular Dystrophy. Muscular Atrophy. Myasthenia Gravis and Strabismus. J. A. M. A. 103: 1595 (Nov. 24) 1934.

³ Brand, E., Harris, M. M., Sandberg, M. and Ringer, A. T. Studies in Origin of Creatine. Am. J. Physiol. 90: 296 (Oct.) 1929. Milhorat, A. T., Technor, Fritz, and Thomas, Karl. Significance of Creatine in Progressive Muscular Dystrophy and Treatment of This Disease with Glycine. Proc. Soc. Exper. Biol. & Med. 20: 609 (Feb.) 1932.

in which remissions have been thus initiated by the use of concentrated solution liver extract parenteral-Lederle there is evidence that injections of 1 cc every two weeks provide sufficient active material to complete the remission and maintain a satisfactory blood picture. In complicated cases and those with extensive neurologic involvement, the optimum dosage may be much larger and must be determined for each patient.

Manufactured by the Lederle Laboratories Inc., Pearl River N. Y.
Vials Concentrated Solution Liver Extract Parenteral-Lederle 1 cc

Concentrated solution liver extract parenteral-Lederle is prepared as follows: A mixture of finely ground liver and water is acidified to the isoelectric point pH 5.054. After partial coagulation of the liver proteins is effected by heating to 75-85°C the pulp is separated by filtration centrifugation or pressing and the aqueous filtrate is concentrated in vacuo to the consistency of a thin syrup. By careful fractional precipitation with large volumes of alcohol at low temperatures (4°C) much inactive material (proteins) is precipitated and subsequently discarded. The alcoholic filtrate is concentrated in vacuo and sufficient alcohol added to precipitate the active material (fraction G) of Cohn et al. (Proceedings of the American Society of Biological Chemistry *J. Biol. Chem.* 74:1619 [July] 1927). The washed precipitate generally known as Cohn's fraction G, commonly obtained as a hygroscopic brownish powder in addition to the active antianemic factor, contains much inert matter. In order to obtain a concentrate of the active factor as free as possible from inert substances the solution containing the fraction G of Cohn is treated with a special activated carbon. Subsequently the material is concentrated in vacuo so that each cubic centimeter represents material obtained from 100 Gm of liver. The solution is then sterilized and 0.5 per cent of phenol added as a preservative.

FERRIC CHLORIDE—For description see the U. S. Pharmacopeia and Useful Drugs under *Ferri Chloridum*.

Saf-T-Top 5% Ferric Chloride in 50% Glycerine Solution. A solution of ferric chloride 5 per cent in glycerin 50 per cent marketed in ampules having a capillary opening and containing 2 and 15 cc. This form is intended for use as a neutralizing agent of the toxicodendrol of poison ivy and poison sumac. It is applied externally.

Prepared by Robert A. Bernhard, Rochester N. Y.

NOVOCAIN (See New and Nonofficial Remedies, 1935, p. 63, and THE JOURNAL, June 22, 1935, p. 2256).

The following dosage forms have been accepted:

Sterile Ampules Novocain Crystals for Spinal Anesthesia 500 mg
Sterile Ampules Novocain Crystals for Local Anesthesia 500 mg

ISOPROPYL ALCOHOL—Propan-2-ol— $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ —obtained by the reduction of acetone or, as a product in the petroleum industry, by the absorption of olefin gases containing propylene in sulphuric acid, and hydrolyzing the resulting sulphuric acid esters.

Actions, Uses and Dosage—Isopropyl alcohol, because it is a solvent for creosote, is used in the removal of that substance from the skin as a prophylactic agent against creosote burns. Isopropyl alcohol has been recommended for the disinfection of the skin and of hypodermic syringes and needles. As it is said not to affect the potency of solutions of insulin, it has been employed as a disinfecting agent in connection with the administration of this agent. Until further data are available isopropyl alcohol should not be relied on to destroy such spore-bearing organisms as *Clostridium tetani*, *Clostridium Welchii* or *Bacillus anthracis*. It is not potable and should not be given by mouth.

Isopropyl alcohol is a clear colorless volatile liquid having a characteristic odor and a slightly bitter taste miscible with water in all proportions, also miscible with chloroform and ether. It is insoluble in salt solutions and may be recovered from aqueous mixtures by salting out with sodium chloride, sodium hydroxide, etc. Specific gravity at 25°C from 0.780 to 0.790. Refractive index at 20°C from 1.3770 to 1.3780. Isopropyl alcohol is volatilized at low temperatures and boils at from 81 to 83°C. It does not affect blue or red litmus paper previously moistened with water when diluted with an equal volume of water.

Shake 20 cc. of isopropyl alcohol in a glass stoppered cylinder with 1 cc. of a freshly prepared solution of ammonio silver nitrate and allow to stand in diffused daylight for six hours; the mixture does not become more than faintly opalescent or acquire more than a faint brownish tint (aldehyde). To 5 cc. of isopropyl alcohol add 2 cc. of normal sodium hydroxide solution and 5 drops of a 1 per cent aqueous solution of sodium nitroprusside mix thoroughly; finally make slightly acid with acetic acid; no purplish red color (aldehyde).

Evaporate 100 cc. of isopropyl alcohol in a platinum dish on a water bath and dry at 100°C; the residue does not exceed 0.01 per cent.

Saf-T-Top Isopropyl Alcohol 98%. Isopropyl alcohol 98 per cent marketed in ampules having a capillary opening and containing 2 and 15 cc. This dosage form is intended solely for the removal of creosote from the skin.

Prepared by Robert A. Bernhard, Rochester N. Y.

MERCUROCHROME (See New and Nonofficial Remedies 1935 p. 309).

The following dosage forms have been accepted:

Saf-T-Top Mercurochrome Solution (See New and Nonofficial Remedies, 1935 p. 312). Also marketed in ampules with a capillary opening, containing 15 cc. of the aqueous 2 per cent solution.

Prepared by Robert A. Bernhard, Rochester N. Y.

Saf-T-Top Mercurochrome 2 per cent in 25 per cent Glycerine. A solution of mercurochrome H. W. & D. 2 per cent in a solution of 25 per cent glycerin marketed in ampules with a capillary opening containing 2 and 15 cc.

Prepared by Robert A. Bernhard, Rochester N. Y.

RABIES VACCINE (See New and Nonofficial Remedies, 1935, p. 380).

Lee Laboratories, Columbus, Ohio

Rabies Vaccine Semple Method (Lee)—An antirabic vaccine prepared according to the general method of David Semple (phenol killed). The fixed virus of rabies is injected subdurally into normal rabbits. These rabbits show definite symptoms of rabic paralysis in from six to seven days. At the time of complete paralysis they are bled to death and the brain is removed aseptically. Necropsy shows the rabbits to be normal, and sterility tests are made on the brain tissue to insure freedom from bacterial contamination. Sterile brains are then emulsified in 1 per cent of phenol by shaking with pyrex glass beads. The emulsion is passed through a 100 mesh sieve, and the whole made to a 16 per cent emulsion, and heated at 37.5°C for twenty-four hours in the incubator in order to kill the virus. After removal from the incubator it is made to an 8 per cent emulsion by adding an equal volume of physiologic solution of sodium chloride. The finished product is an 8 per cent brain emulsion containing 0.5 per cent of phenol and 0.85 per cent of sodium chloride.

The finished product is tested for absence of living virus by injection into rabbits. Injections are also made into guinea pigs and mice to check against contamination with tetanus bacilli.

Rabies vaccine Semple method (Lee) is marketed in packages containing seven and fourteen 1 cc. vials respectively. All the doses are of the same potency, one dose (1 cc.) is to be given daily over a period of fourteen days.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS

RAYMOND HERTWIG Secretary

NOT ACCEPTABLE

- (a) LOEB'S GENUINE GLUTEN BREAD (FRESH)
(b) LOEB'S GENUINE GLUTEN BREAD SLICED AND TOASTED

Manufacturer—Loeb Dietetic Food Company, New York.

Description—(a) Gluten bread prepared from gluten flour, water, shortening, yeast and salt. The gluten flour contains on a water-free basis not less than 71 per cent nitrogen, not more than 56 per cent nitrogen-free extract (protein factor 57) and not more than 44 per cent starch as determined by the diastase method. (b) Toasted slices of the gluten bread.

Analysis (submitted by the manufacturer)—

| | per cent |
|--|----------|
| (a) | |
| Moisture | 24.9 |
| Ash | 2.5 |
| Fat (ether extraction method) | 5.1 |
| Protein (N X 5.7) | 35.8 |
| Crude fiber | 0.4 |
| Carbohydrates other than crude fiber (by difference) | 31.3 |
| (b) | |
| Moisture | 7.6 |
| Ash | 5.7 |
| Fat (ether extraction method) | 6.4 |
| Protein (N X 5.7) | 43.8 |
| Crude fiber | 0.4 |
| Carbohydrates other than crude fiber (by difference) | 36.1 |

Calories—(a) 31 per gram 88 per ounce
(b) 38 per gram 108 per ounce

Claims of Manufacturer—The package labels bear the claims "For Use in Restricted Diet under Directions of a Physician."

Two slices of Loeb's Genuine Gluten Bread contain less carbohydrates than a single slice of ordinary white bread. A booklet "Diabetes and the Restricted Diet" states that "this booklet [contains] a list of delicious recipes, all of which marked with an asterisk are suitable for the reducing diet. White bread, cakes and candies should be entirely discarded, and in their place Loeb's Sliced and Toasted Gluten Bread, and other starch-free and starch reduced foods should be consumed."

Uselessness as a Special Purpose Food—Loeb's Genuine Gluten Bread and Loeb's Genuine Gluten Bread Sliced and Toasted are manufactured specially for use in diets restricted in dextrose formers. To be eligible for acceptance, such type of bread and toast shall contain dextrose formers yielding dextrose in an amount not greater than 33 Gm per hundred cubic centimeters (the dextrose equivalence being computed as the carbohydrate, plus 58 per cent of protein, plus 10 per cent of the fat content of the food). Dextrose formers of these breads on the other hand yield many times 33 Gm of dextrose per hundred cubic centimeters.

There is authoritative evidence that commercially prepared special diabetic foods are of limited usefulness to the diabetic patient and that the availability of insulin makes them no longer necessary. Artificial substitutes for ordinary foods are not to be favored. It is much better for the diabetic patient to learn how to plan his diet with foods in common use and readily available. The diet should be exactly prescribed in carbohydrate, protein and fat and total calories.

The designation of a food as a 'diabetic food' merely because it is low in carbohydrates is now unwarranted and misleading and gives the erroneous impression either that the food taken in unrestricted quantities in diabetes is harmless or that it has remedial action. Except for the necessity of restricting foods to avoid overstepping the food tolerance, there are no special diabetic nutritional requirements. The exploitation of starch-free or low carbohydrate foods containing an excess of protein for use by diabetic patients is unwarranted. Protein may be tolerated almost as poorly, if not quite as poorly, as starch in diabetes.

These gluten breads have no specific reducing properties and are no more useful than ordinary white bread in special reducing diets. The caloric content is similar to that of usual bread. The fact that the starch content may be somewhat less than that of usual bread does not specifically qualify the products for a reducing diet.

Because Loeb's Genuine Gluten Bread and Loeb's Genuine Gluten Bread Sliced and Toasted are adjudged without usefulness or special adaptability for inclusion in diets for obesity or diets restricted in dextrose formers, they will not be listed among the accepted foods of the Committee on Foods.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.



RAYMOND HERTWIG Secretary

HULBURT'S BRAND CALIFORNIA ORANGE JUICE (SWEETENED)

Manufacturer—Hulburt's Fruit Products, Inc., New York.

Description—Canned pasteurized California Valencia orange juice with added sucrose retaining in high degree the natural vitamin C content.

Manufacture—Ripe standard grade Valencia oranges are washed, graded (inferior or defective fruit is removed) halved by machine and reamed by hand. The juice is screened to remove coarse pulp and rag, pasteurized in pipes at 82 C., and sealed in enamel lined cans. The equipment is monel metal or glass lined.

Sucrose is added in varying quantities to produce standard uniform sweetness.

| <i>Analysis</i> (submitted by manufacturer) — | per cent |
|---|----------|
| Moisture | 86.7 |
| Total solids | 13.3 |
| Ash | 0.4 |
| Fat (ether extract) | 0.5 |
| Protein (N \times 6.25) | 0.9 |
| Reducing sugars as invert sugar | 5.1 |
| Sucrose | 5.3 |
| Crude fiber | 0.03 |
| Carbohydrates (by difference) | 10.5 |
| Titratable acidity as citric acid | 1.0 |

Calories—0.5 per gram 14 per ounce

Vitamin—Chemical assay for cevitamic (ascorbic) acid shows the product to approximate fresh orange juice in vitamin C content.

Claims of Manufacturer—This canned orange juice retains in high degree the nutritional values of the natural fruit juice and is intended for all the dietary and table uses of orange juice.

TREESWEET BRAND CALIFORNIA LEMON JUICE

Manufacturer—TreeSweet Products Co. Los Angeles

Description—Canned California lemon juice largely retaining the natural nutritional values.

Manufacture—Juice is expressed from selected, tree ripened fruit processed and canned as described for TreeSweet Pure California Orange Juice (THE JOURNAL, June 15, 1935, p 2187)

| <i>Analysis</i> (submitted by manufacturer) — | per cent |
|--|----------|
| Moisture | 89.7 |
| Total solids | 10.3 |
| Ash | 0.4 |
| Fat (ether extract) | 0.6 |
| Protein (N \times 6.25) | 0.4 |
| Reducing sugar as invert sugar | 1.8 |
| Crude fiber | 0.01 |
| Carbohydrates other than crude fiber (by difference) | 2.1 |
| Volatile acid as acetic | 0.7 |
| Fixed acid as citric | 6.0 |
| pH | 2.3 |

Calories—0.16 per gram 4.6 per ounce

Vitamin—Rich source of vitamin C

Claims of Manufacturer—No added sugar or preservative. The process used enables retention in high degree of natural food values.

HORMEL BRAND CHICKEN BROTH WITH RICE

Manufacturer—George A. Hormel & Co., Austin, Minn.

Description—Chicken broth with rice, salt and sugar and flavored with water extract of carrots, celery, onions and peppers.

Manufacture—The carrots are peeled by machine, pared by hand diced and washed. The celery is freed of root and leaves, and the separate stalks are cleaned by hand. The onions are peeled and chopped. The birds are singed and the pin feathers removed. The birds are inspected by government inspectors, the feet and heads are sawed off, the viscera are removed and the birds are washed and sawed into pieces. Hearts and gizzards are retained for the broth.

The birds with a definite quantity of carrots, celery, onions and peppers in muslin sacks are placed in the required amount of water, seasoned with salt and boiled under pressure for two hours at 230 F. The fat is skimmed off. The broth is screened and a given quantity filled into cans with definite amounts of rice and skimmed fat. The cans are sealed and processed.

| <i>Analysis</i> (submitted by manufacturer) — | per cent |
|---|----------|
| Moisture | 93.9 |
| Total solids | 6.1 |
| Ash | 1.2 |
| Fat (ether extract) | 1.7 |
| Protein (N \times 6.25) | 2.1 |
| Crude fiber | trace |
| Carbohydrates (by difference) | 1.1 |

Calories—0.3 per gram 9 per ounce

JOHNSON'S BESTOVALL BRAND TOMATO JUICE

Distributor—H. A. Johnson Company, Boston and New York.

Packer—American Packing Corporation, Evansville, Ind.

Description—Pasteurized tomato juice with added salt, retains in high degree the natural vitamin content. The same as Loudon Brand Tomato Juice (THE JOURNAL, June 25, 1932, p 2289).

BOOKLET 'INFANT FEEDING WITH IRRADIATED EVAPORATED MILK'

Sponsor—Irradiated Evaporated Milk Institute, Chicago.

Description—Booklet for distribution to physicians only containing information on the preparation of irradiated evaporated milk, its nutritional advantages for the feeding of normal infants as well as its use under special conditions, such as prematurity, atresia, diarrhea and milk allergy. Detailed regular milk and acid milk formulas and lists of references to recent clinical literature are given.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - CHICAGO, ILL

Cable Address

Medic, Chicago

Subscription price

Seven dollars per annum in advance

Please send in promptly notice of change of address giving both old and new always state whether the change is temporary or permanent Such notice should mention all journals received from this office Important information regarding contributions will be found on second advertising page following reading matter

SATURDAY, NOVEMBER 23, 1935

MEDICAL LITERATURE AND MEDICAL LIBRARIES

The growth of medical literature and its applicability to the practice of medicine is one of the interesting historical phenomena associated with our profession. When printing with movable type was developed, all manner of learning received a mighty impetus. Because medicine is so close to the life of man, medical contributions were among the first to be published. Very early, however, medicine was merely included in publications dealing with science in general. Then as medicine began to specialize and as the value of medical publications for medical advancement began to be realized, periodicals multiplied tremendously.

In a lecture recently delivered by Prof. William Bulloch¹ he reminds us that John Shaw Billings estimated in 1881 that there were 180,000 doctors in the world and that 1,600 of them were contributors to medical literature. In the medical journals of 1879 available to him he counted 20,000 original articles. Today it is estimated that there are something like 400,000 doctors in the world, and the world list of scientific periodicals indicates 23,000 in all, of which 5,000 are medical. Of those periodicals listed as medical it is quite certain that the majority are mediocre and could be committed to oblivion without loss to the profession. Among these are house organs for proprietary products, bulletins recording local statistics, trade journals associated with the promotion of special institutions and similar publications.

In his survey of medical literature Professor Bulloch used as a basic work the *Index Catalogue* of the Surgeon General's Library. Up to 1893 he counted 7,000 articles and books on syphilis. Between 1893 and 1912 there were 14,000 new articles on the subject and from 1913 to 1932, 21,000 more. As an example of the way in which certain subjects receive medical attention, he notes in the course of twenty years 6,780 articles on heart disease and 1,280 on excision of the tonsils. Although vitamins were first interesting around 1914,

more than 1,000 articles on vitamins had been published by 1932. Between 1893 and 1932 there were published 34,000 articles on tuberculosis, or at the rate of two new articles on tuberculosis every day.

In his consideration of the indexing of such literature and its availability to the profession, Professor Bulloch paid special tribute to the *Index Catalogue* of the Surgeon General's Library, regarding it as the greatest publication of its kind ever achieved. He recorded also the history of the *Quarterly Cumulative Index Medicus* and said that an immense debt of gratitude was owing from the world of medicine to the American Medical Association for the publication of this work. Without the *Quarterly Cumulative Index Medicus* the vast amounts of medical periodical literature, now approximating a quarter of a million titles every six months, would be for the most part wasted. This is the literature made available to the medical profession through the *Quarterly Cumulative Index Medicus*. This index now provides a reference service to 1,200 medical publications, although only a few libraries in the entire American continent even approximate this number of publications. Indeed, the majority of medical libraries receive well under 200 medical periodicals. Nevertheless, by a system of lending, all the publications received in the Army Medical Library and in the headquarters of the American Medical Association are available to physicians. The *Quarterly Cumulative Index Medicus* represents a considerable financial burden to the Association. Professor Bulloch's commendation is a well merited recognition of this service to scientific medicine.

RADIANT ENERGY AND BONE HEALING

The important functions that have been assigned in experimental and clinical medicine to radiant energy of certain wavelengths have given tremendous impetus to researches in this field. The role of ultraviolet radiation in metabolism and the relationship between this type of radiation and vitamin D are observations that not only stimulate the scientific mind but appeal to the imagination of the public at large. Thus, unfortunately, has resulted in much commercialism and has set up a false conception of radiant energy as a panacea. Sunlight or artificial radiation is not a specific form of treatment and should not be used without medical guidance and adequate equipment. This form of therapy may play a prominent part in certain abnormal conditions, it is of minor importance in the life of normal persons who are provided with a completely adequate diet.

The proper use of radiation and irradiated materials has often caused remarkable results, among the more prominent of which are the effects on serum calcium and inorganic phosphorus in the healing of rickets and in osteomalacia. These results have led to the study of the use of radiant energy in the healing of fractures.

¹ Professor Bulloch's Schorstein Lecture. Brit. M. J. 2: 810 (Oct 26) 1935.

Two widely divergent views have developed. On the one hand there is the opinion, supported by clinical experience, that ultraviolet radiation is of some benefit in cases of ununited fractures¹. In contrast to this view is that which holds that ultraviolet radiation does not influence the union of fractures² and that the effect of radiation on serum calcium and phosphorus is of little significance in this respect. It would seem that there is no definite correlation between analytic variations of these two elements and the healing of the fracture³.

A detailed investigation of the effect of carbon arc radiation on the healing of bone has recently been reported by Sweeney and Laurens⁴. Experimental fractures of the fibula were studied in twenty-five normal dogs and eighty normal rats. In the majority of the experiments with the dogs, each animal served as its own control, that is, the fibula on one side was fractured, and then, after completely healing, the fibula on the other side was broken in as similar a manner as possible. During the healing of the second fracture the animal was irradiated. In some instances the procedure was varied by irradiating the animal while the first fractured fibula was healing and not irradiating after the second fracture was made. In still another group of dogs, carbon arc radiation was administered in the same amounts per unit of time during the healing of the two fractures. Finally, in a few experiments irradiation was not given during the healing period.

In the studies with the rat, the large number of animals available made it possible to use a group of from seven to ten animals as controls for two irradiated groups of a series. The fractures in all animals were identical and each rat had only one fracture and one period of healing. Measured amounts of carbon arc radiation were given during the healing periods, and roentgenograms were taken at intervals to show the progress of the repair process.

Determinations also of serum calcium and phosphorus were conducted on the dogs at frequent intervals. The results of these carefully conducted experiments indicate that during the stated periods of healing, and omitting consideration of certain abnormal healing rates in several dog experiments, the average repair time for all the fractures was 37 days shorter when the animals were irradiated than when they were not. It is striking that the acceleration of healing was obtained with one type of carbon lamp, irradiation also from another source was used but, in contrast to the former, it actually retarded the healing process. This result may be attributed to the different spectrums produced by the two types of lamps.

Although the extent of shortening of the healing period of the fractures may be too small to be of prime practical or economic significance, the results seem to contribute some helpful information to the controversy regarding the processes involved. The calcium and phosphorus determinations demonstrate that there is no apparent correlation between the concentrations of these elements and the rate of healing of a fracture and ossification. This would seem to suggest that the calcium-phosphorus product of the serum is of little significance as a prognostic index of the rate of bone regeneration. It is true that these experiments were conducted on presumably normal animals with normal bone-regenerating ability. Sweeney and Laurens point out the possibility that, with abnormal animals under the same experimental conditions, all other factors remaining constant, the results might have been a great deal different. This is particularly true in certain cases of fracture due to abnormal bone metabolism.

DUST STORMS AND HEALTH

The extraordinary conditions of drought in parts of Kansas, Colorado, New Mexico, Texas and Oklahoma, which gave rise to dust storms of unprecedented intensity and duration from February to May of this year, received wide interest and publicity. A study of the possible effect on health of these dust storms has recently been published¹. April 29 a "dust conference" was held at Liberal, Kan., the approximate center of the "dust bowl." State health officers from Oklahoma, Colorado and Kansas were present. At this time a comparison of morbidity and mortality for certain of the acute infectious diseases showed similar increases in the three states. Considerable interest was expressed in the bacterial and chemical content of the dust. Two of the Kansas sanitary and public health officials made trips into the dust area and exposed agar plates to secure an index of the number of micro-organisms present in the air during dust storms. The predominating bacteria observed were spore-forming soil types. Molds were almost as numerous as bacteria, and some yeasts were observed. Colon bacillus determinations were made. Characteristic organisms of this group, however, were obtained from only one sample of the nineteen tested.

The role of siliceous dusts in the production of silicosis is well known. The harmfulness of a given dust is dependent on three factors: the amount suspended in the air, the duration of exposure, and the particle size. It is now generally agreed that in the case of quartz-containing dusts the dangerous particles are usually between 0.5 and 5 microns in diameter and are almost always less than 10 microns. The six dust samples analyzed gave a silica content varying from

¹ This subject has been reviewed by Aitken, Robert. *Ultra Violet Light Radiations and Their Uses*. Edinburgh: Oliver & Boyd, 1930.
Laurens, Henry. *The Physiological Effects of Radiant Energy*. New York: Chemical Catalog Company, Inc., 1933.

² Coulter, J. S. and Smith, E. M., Jr. *Radiology* 10: 737 (May) 1931.

³ Murray, C. R. *Minnesota Med.* 13: 137 (March) 1930.

⁴ Sweeney, H. M. and Laurens, Henry. *Effect of Carbon Arc Radiation on Healing of Bone*. *Arch. Surg.* 31: 395 (Sept.) 1931.

¹ Brown, E. G., Gottlieb, Selma and Laybourn, R. L. *Dust Storms and Their Possible Effect on Health*. *Pub. Health Rep.* 50: 1369 (Oct. 4) 1935.

66.9 to 92.9 per cent. The size of the particles varied from 2 to 770 microns. The average values were much higher than those reported for the usual industrial and outdoor dusts.

Kansas experienced its most severe measles epidemic during the five months from January 1 to June 8, with 40,000 cases reported as compared with the previous high total of 22,464 for the twelve months of 1917. In addition to measles, acute respiratory infections prevailed throughout the state in unusually large numbers. Numerous cases also of streptococcal sore throat and corneal ulcers and eye infections were reported. There was no evidence, however, that any pathogenic organisms were carried by dust and therefore the direct cause of the increase in respiratory infections could not be attributed to this factor. The dust was exceedingly irritating to the mucous membranes of the respiratory tract, and this appeared to be a definite contributory factor in the development of many acute infections.

The action on health of dust storms may thus be divided into "immediate" and "future" effects. The former are manifest by the increase in morbidity and mortality from the acute infections of the respiratory tract probably due more to the irritating effect of the dust than to the carrying of pathogenic organisms. The future effect is unknown. It is possible that over a long period the effect might be similar to that seen in persons exposed to mine and other industrial dusts, though the difference in average size of the particles might prevent this from occurring. The most important conclusion is that the dust proofing of houses and the wearing of masks are essential to the comfort and welfare of persons living in areas affected by similar dust storms.

Current Comment

ABSORPTION FROM THE MIDDLE EAR

The fact that epithelial tissue other than that lining the lumen of the gastro-intestinal tract may be permeable to a large number of substances is well known. Vitamin D, for example, may be absorbed through the skin, and lead readily passes through pulmonary epithelium. Recently the possibility of the absorption of substances from the middle ear has been studied. In the normal subject this question would have little significance, as the middle ear, in addition to being small, is closed externally and is rather remotely open to the posterior part of the nasal cavity. In cases of infection of the middle ear, however, an absorption of toxic substances might well occur, as is indicated by the development of fever, leukocytosis and general malaise. Experimental data favoring this view have been obtained.¹ Solutions of drugs that exert easily recognizable effects, such as nicotine, which raises blood pressure, and sodium nitrite, which lowers blood pres-

sure, were injected through the ear drum into the middle ear of dogs. The position of the animal's head was adjusted so that none of the injected material could escape by way either of the eustachian tube or of the external canal. Nicotine produced a maximal rise in blood pressure within five minutes after injection, and in one instance within thirty-six seconds. The maximum decrease in blood pressure from sodium nitrite occurred in seven minutes and from histamine in three minutes. Similar evidence of rapid absorption was obtained with other drugs, including atropine, pilocarpine, strychnine, cocaine, procaine, ethyl alcohol, methyl alcohol, quinine, hydrochloric acid, hypertonic sodium chloride, and sodium hydroxide. These observations leave little reason to doubt that the absorption of a variety of substances from the middle ear may occur.

PIGMENTS OF HUMAN FAT

The fat of many mammals, including man, contains a colored material the nature of which is not clearly understood. An interesting contribution to this problem has been made recently by two Hungarian investigators.¹ Human fat, usually obtained from the abdominal wall or mesenteries, was taken at necropsy from patients who had died of various diseases. The fat was saponified and the remaining pigment was fractionated into its components by means of organic solvents and adsorption in a column of calcium hydroxide. Four distinct pigments were obtained, which were subsequently identified by means of the spectroscope as carotene, lycopene, xanthophyll and capsanthine. Carotene and lycopene were isolated also in crystalline form. Each of these four pigments is known to be widely distributed in the plant kingdom. Some information concerning the actual amounts of the pigments present in the original fat was secured by comparing their solutions with known colored solutions in a microcolorimeter. In the majority of cases the values for total pigment varied between 1 and 3.5 mg. per kilogram of fat, carotene and xanthophyll were present in larger amounts than were lycopene and capsanthine. In a case of cancer of the uterus and in one of icterus, excessively high lipochrome values, 64 and 155 mg. per kilogram respectively, were found. The increase appeared to be a result of an equal elevation in the concentration of each of the four pigments. The significance of these unique observations is as yet largely a matter of conjecture. Apparently the nature of the disease processes in the subject is of some importance. Undoubtedly the chief source of the pigments was the vegetable constituents of the diet. Indeed, it was observed that the fat from subjects who had ingested considerable amounts of red pepper with their food was usually quite rich in capsanthine, one of the pigments of the pepper plant. Furthermore, it is well known that man cannot synthesize carotene, the pro-vitamin A, but depends ultimately on plants for his supply.

¹ Ross, E. L. and Rawson, R. W. Absorption from the Middle Ear. *Arch. Otolaryng.* 22: 312 (Sept.) 1935.

¹ Zechmeister, L. and Tuzson, P. Contribution biochimique à l'étude des pigments de la graisse humaine. *Bull. Soc. chim. biol.* 17: 1110 (July-Aug.) 1935.

Association News

THE KANSAS CITY SESSION

Appointments of Section Representatives to Scientific Exhibit

Representatives from the various sections of the Scientific Assembly have been appointed to the Scientific Exhibit for the Kansas City session as follows

- PRACTICE OF MEDICINE**
Irving S Wright, New York
- SURGERY, GENERAL AND ABDOMINAL**
R S Dinsmore Jr, Cleveland
- OBSTETRICS, GYNECOLOGY AND ABDOMINAL SURGERY**
H Close Hesselstine, Chicago
- OPHTHALMOLOGY**
Georgiana Dvorak-Theobald, Oak Park, Ill
- LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY**
John L Myers, Kansas City, Mo
- PEDIATRICS**
F Thomas Mitchell, Memphis, Tenn
- PHARMACOLOGY AND THERAPEUTICS**
Ralph H Major, Kansas City, Mo
- PATHOLOGY AND PHYSIOLOGY**
J P Simonds, Chicago
- NERVOUS AND MENTAL DISEASES**
Peter Bassoe, Chicago
- DERMATOLOGY AND SYPHILOLOGY**
Clark W Finnerud, Chicago
- PREVENTIVE AND INDUSTRIAL MEDICINE AND PUBLIC HEALTH**
Paul A Davis, Akron, Ohio
- UROLOGY**
Russell S Ferguson, New York
- ORTHOPEDIC SURGERY**
R L Diveley, Kansas City Mo
- GASTRO-ENTEROLOGY AND PROCTOLOGY**
J A Bargen, Rochester, Minn
- RADIOLOGY**
S W Donaldson, Ann Arbor, Mich

Application blanks for space in the Scientific Exhibit may be obtained from any of these representatives or from the Director, Scientific Exhibit, 535 North Dearborn Street, Chicago

RADIO BROADCASTS

The American Medical Association broadcasts over the Blue network and certain additional stations of the National Broadcasting Company at 5 p m eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time) each Tuesday, presenting a dramatized program with incidental music under the general theme of Medical Emergencies and How They Are Met. The title of the program is 'Your Health'. The program is recognizable by a musical salutation through which the voice of the announcer offers a toast 'Ladies and gentlemen your health!'. The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

The next three programs are as follows

- November 26 Common Household Emergencies W W Bauer, M D
December 3 Tuberculosis Morris Fishbein M D
December 10 Hunting Accidents Morris Fishbein M D

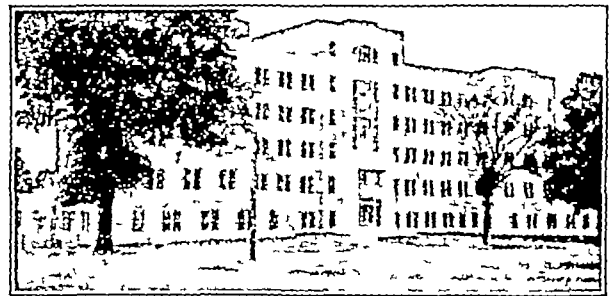
This program is broadcast also on the short waves through KDKA, Pittsburgh, over station W8AK, 11,870 and 12,210 kilocycles

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION PUBLIC HEALTH ETC)

ARKANSAS

New Medical Building for State University—The new building of the University of Arkansas School of Medicine was opened for classes October 1. Built with a loan and grant of \$500,000 from the Public Works Administration, the new structure accommodating 300 students, is five stories high with a sixth story, suggesting a penthouse, in the center. It is of modern American architecture with an exterior of buff-colored face brick and limestone trim. The main entrance is of Batesville limestone. Each department has been allotted space on the first floor. The second floor is occupied by the dean's office, general offices, library, cafeteria and lecture room. The pathology and bacteriology departments occupy the third floor with laboratories for each, museum for pathologic specimens, laboratory for student technicians and an assembly room. The fourth floor is divided between the physiology and chemistry departments. The fifth floor is given over to the departments of anatomy and histology. The sixth floor provides space for a small laboratory for distillation of water, an incubator, a small research laboratory, and cages for animals used in teaching and research. A door opens from the penthouse to the roof where there are larger dog cages, with concrete houses to



University of Arkansas Medical Building

protect the animals from the elements, and three pools for frogs and terrapins used by physiology classes. The Folsom Clinic, formerly in a building adjoining the old medical structure, occupies the first floor and half of the second. Dr Frank Vinsonhaler has been dean of the school of medicine since 1927 and associated with it since 1893. Although designated a department of the old Arkansas Industrial University, the medical school was not actually affiliated with it and was operated by its physician sponsors for thirty-two years as a private institution. In 1911 the legislature accepted an offer of the faculty of the school to transfer the property to the state, provided it would be maintained as a part of the University of Arkansas. Since 1912 it has been operated in the old statehouse, where it was moved at that time.

CALIFORNIA

Psittacosis Reported—Psittacosis was believed the cause of one death and two cases of illness in San Francisco recently, newspapers reported October 24. What was thought to be a new case of the disease was on that day under observation in the San Francisco Hospital.

Changes in Faculty at Stanford—Dr Arthur A O'Neill, a member of the faculty of Stanford University School of Medicine since 1913, has been made assistant clinical professor of medicine, emeritus according to a recent announcement from the dean, Dr Loren R. Chandler. James P. Baumberger, D.Sc., has been promoted from associate professor to professor of physiology and Dr Maurice L. Tamter from associate professor to professor of pharmacology. Other promotions include those of Charles E. Clifton, Ph.D., from assistant professor to associate professor of bacteriology, John Field II, Ph.D., from assistant professor to associate professor of physiology, Drs Victor E. Hall from assistant professor to associate professor of physiology, and John K. Lewis from assistant professor to associate professor of medicine.

Memorial Plaque Unveiled—A bronze plaque was unveiled at the library of the Los Angeles County Medical Association, November 7, in honor of the late Dr Theodore C Lyster, Los Angeles. Dr George Dock, Pasadena, chairman of the library committee, presided. Dr Lyster graduated from the University of Michigan Medical School, Ann Arbor, in 1899. He entered the U S Army in 1900 and was advanced through the various grades until 1930, when he was retired with the rank of brigadier general. He was chief of aviation and professional services in the surgeon general's office, Washington, D C, in 1917-1918, for which he received the Distinguished Service Medal. For four years he was a director of yellow fever elimination for the Rockefeller Foundation. In 1913, during the American occupation, he was chief health officer of Vera Cruz, Mexico. He was a past president of the Southern California Medical Association and at the time of his death in 1933 was associate clinical professor of ophthalmology, University of Southern California School of Medicine, Los Angeles. Dr Lyster was interested in the Barlow Library, serving first as trustee and later as president.

DELAWARE

State Medical Election.—Dr Joseph B Waples Jr, Georgetown, was chosen president of the Medical Society of Delaware at the recent annual meeting in Wilmington, he will take office January 1. Dr William H Speer, Wilmington, was reelected secretary. The society will hold its next annual meeting in Rehoboth, October 12-14.

DISTRICT OF COLUMBIA

Personal—Dr Hugh S Cumming surgeon general, U S Public Health Service, has been appointed one of an executive committee of ten, named by the Health Section of the League of Nations at its recent meeting in Geneva. Dr Cumming was one of the few delegates representing nations outside the league who were appointed to the special group.

Remington Medal to Dr Hilton—Samuel Louis Hilton, Pharm D, Washington, was presented with the Remington Medal by the New York branch of the American Pharmaceutical Association, October 19. The presentation was made at a dinner given to Dr Hilton by the New York branch, the District of Columbia Pharmaceutical Association, the District of Columbia Veteran Druggists' Association, the faculty of the school of pharmacy of George Washington University and the District of Columbia Board of Pharmacy. The medal is awarded annually to the man or woman who has done most for American pharmacy during the preceding year. Dr Hilton, who has served on the U S Pharmacopeia Revision Committee, has been secretary of the district board of pharmacy for eight years.

ILLINOIS

Society News—Dr Lee C Gatewood, Chicago, discussed the diagnosis and treatment of colitis before the Peoria City Medical Society, November 5.—Dr M Herbert Barker, Chicago, addressed the La Salle County Medical Society, October 30, on nephritis, and Dr George E. Shambaugh Jr, "What Can Be Done for Sinus Disease".—Dr Abraham F Lash, Chicago, discussed "Puerperal Sepsis" before the Will-Grundy County Medical Society in Joliet, October 30.—Dr Karl A Meyer, Chicago, discussed "Regional Enteritis Symptoms, Diagnosis and Treatment" before the Adams County Medical Society in Quincy, November 11.—Dr John Albert Key, St Louis, discussed fractures of the joints before the Madison County Medical Society at a meeting in Alton, November 1.

Chicago

Course in Mental Hygiene—The management of children's behavior problems is the theme of a course that opened at the University of Illinois College of Medicine November 18, to continue for eight weeks. The meetings will be held at the Institute for Juvenile Research and the fee is \$10. The course is of particular interest to pediatricians, but other interested physicians are invited.

Dr Hastings Goes to Harvard—A Baird Hastings, Ph D, has resigned as professor of biochemistry in the department of medicine, University of Chicago, to accept the Hamilton Kuhn professorship in biologic chemistry at Harvard Medical School, Boston, succeeding the late Otto Folin. Dr Hastings studied at the University of Michigan and Columbia University receiving the degree of doctor of philosophy from the latter school. He served as a chemist with the U S Public Health Service from 1917 to 1921 as an assistant at the Rockefeller Institute for Medical Research from 1921 to 1922 and associate from 1922 to 1926, when he became

professor of physiologic chemistry at the University of Chicago. Since 1928 he has been professor of biochemistry in the department of medicine. Dr Hastings was visiting professor to Peiping Union Medical College in 1931.

Retiring Professors Honored.—Three professors retiring from the faculty of Loyola University School of Medicine were honored at a dinner at the Palmer House, November 14. Dr Ulysses J Grim is retiring as head of the department of otolaryngology, Dr George W Mahoney of the department of ophthalmology, and Dr Frank M Phifer, the department of genito-urinary diseases. Dr Grim who has been associated with Loyola since 1910, will be succeeded by Dr George T Jordan, clinical professor of ear, nose and throat diseases. Dr Carl F Schaub, clinical instructor in ophthalmology, will succeed Dr Mahoney, who has been connected with the school since 1918. Dr Phifer's successor will be Dr Herbert E Landes, clinical professor of urology. Dr Phifer was appointed professor in 1919 and has been head of the department since 1927. The new appointees will serve until permanent heads are chosen, it was stated. Reuben M Strong, Ph D, secretary of the medical school faculty, was toastmaster at the dinner and Dr Louis D Moorhead, dean of the school, gave the principal address.

Society News—A clinical dermatology program was presented before the Chicago Medical Society, November 6, representing the medical school of the University of Illinois were Drs Theodore Cornbleet and Herbert Rattner. Loyola University, Benjamin Barker Beeson and Vincent B Bowler. Northwestern University, Arthur W Stillians and Erwin P Zeisler, and Rush Medical College, Edward A Oliver and Michael H Ebert. Speakers before the society November 13 were Drs James S Mc Lester Birmingham, President, and James Tate Mason, Seattle. President-Elect of the American Medical Association, on "Clinical Aspects of Nutritional Failure in America" and "Some Considerations in the Etiology and the Surgical Treatment of Peptic Ulcers," respectively.

INDIANA

Debate on Socialized Medicine—Dr Morris Fishbein, Chicago, editor of THE JOURNAL and William Trufant Foster, director of the Pollak Foundation, will discuss the negative and affirmative aspects respectively, of socialized medicine, December 7, when the Indiana High School Debating League will hold a conference at Purdue University, Lafayette.

Society News—A symposium on poliomyelitis was presented before the Lawrence County Medical Society, November 6 by Drs Virgil E Simpson William H Allen, James H Pritchett and Richard T Hudson, all of Louisville, Ky.—Dr Harlan A English, Danville, discussed "Diagnosis and Treatment of Disorders of the Prostate" before the Fountain Warren County Medical Society in Covington November 7.—At a meeting of the Huntington County Medical Society, October 5, Dr Murray N Hadley Indianapolis, spoke on "Appendicitis in Children".—Dr Bernard Fantus, Chicago, discussed "Therapy of Cough" before the Allen County Medical Society in Fort Wayne, November 5.—Dr Arthur N Ferguson addressed the Fort Wayne Academy of Medicine, October 22, on "Mechanics of Referred Pain."

KANSAS

Society News—Drs Charles C Conover and Everett R Deweese Kansas City, discussed "Chronic Functional Disorders of the Colon" before the Kansas-Nebraska Medical Association, October 17 in Hiawatha.—Speakers before the Butler-Greenwood County Medical Society in Eureka, October 18, included Dr Howard E Marchbanks, Pittsburg, on "Hypertensive Heart Disease".—The Northwest Kansas Medical Society was addressed in Norton, October 23, by Drs Leroy A Calkins, Kansas City, Mo and Charles F Taylor, Norton, on "Carcinoma of the Cervix" and "Surgery in Pulmonary Tuberculosis," respectively.

LOUISIANA

Society News—At a meeting of the Orleans Parish Medical Society, November 11, Drs Gladys Richarda Williamson and Robert A Strong, New Orleans, discussed "Erythroblastic Anemia." Idys M Gage, "Pilonidal Sinus," and Charles B. Odum, "A Review of Page's Epidural Anesthesia with a Report of 100 Cases".—At a meeting of the Sixth District Medical Society, October 24 in Jackson, speakers were Drs Gilbert C Anderson, New Orleans, "Signs and Symptoms of Brain Diseases," and Irvine Ashton Rohms, Baton Rouge, "Coronary Thrombosis."

MINNESOTA

Special Scientific Session—The Ramsey County Medical Society arranged a special scientific session in St. Paul, November 22-23 Friday evening, Drs Arnold Schwyzer and Joseph Borg, both of St Paul, discussed pain in the right side of the abdomen, while Saturday morning was given over to a clinical pathologic conference under the leadership of Dr John F Noble Wisconsin physicians attending the Wisconsin-Minnesota football game were invited

Veterinarian Honored—At the annual dinner of the Minnesota Public Health Association in Minneapolis, November 22, Charles E Cotton, D.V.M., secretary and executive officer of the Minnesota Livestock Sanitary Board, was the guest of honor, in recognition of his work in the eradication of bovine tuberculosis Speakers at the dinner included Drs Morris Fishbein, Chicago, editor of *THE JOURNAL*, Charles H Mayo, Rochester, president of the state public health association, J Arthur Myers, professor of medicine and preventive medicine and public health, University of Minnesota School of Medicine and Mr Frederick E Murphy, publisher of the Minneapolis *Tribune* Dr Oscar E Locken, Crookston was toastmaster

Dr Pottenger Gives Bell Lecture—Dr Francis M Pottenger, Los Angeles, will deliver the John W Bell Memorial Lecture of the Hennepin County Medical Society Minneapolis, December 2, on "Diagnosis of Tuberculosis" This lectureship was established in 1934 by the Hennepin County Tuberculosis Society, in honor of the late Dr Bell The lecture is to be delivered at the December meeting each year of the county medical society Dr Bell, who died in 1933, was a member of the House of Delegates of the American Medical Association from 1919 to 1923 He also served as president of the Minnesota State Medical Association, Hennepin County Medical Society and the Minnesota Academy of Medicine, and was a member of the state senate from 1891 to 1895 (*THE JOURNAL*, Aug 18, 1934, p 496)

MISSISSIPPI

Society News—Dr Richard D Sessions, Natchez discussed "Pancreatic Cysts and Pancreatic Abscess" before the Adams County Medical Society in Natchez, recently—Speakers before the Delta Medical Society in Moorhead, October 9, included Drs Carl R Crutchfield, Nashville, Tenn, on "Treatment of Fibroid Tumors" and William S Taylor Isola, "Comatose Malaria"—Dr John H Musser, New Orleans, addressed the Pike County Medical Society, October 5, on "Cholecystitis and Cholelithiasis"—Speakers before the Central Medical Society, Jackson, October 1, included Dr Harvey F Garrison Sr Jackson, on "Purpura Haemorrhagica"—At a meeting of the Homochitto Valley Medical Society in Natchez October 10, papers were presented by Drs Jacob S Ullman and Homer A Whittington on "Menstruation and the Hormones" and "Essential Hypertension," respectively—The Issaquena-Sharkey-Warren Counties Medical Society was addressed in Vicksburg, November 12, by Drs Raymond H Potts New Orleans Laurance J Clark and William K Purks Vicksburg they presented a symposium on rheumatic heart disease—Speakers before the North Mississippi Medical Society in Oxford, October 18 included Dr Otis S Warr, Memphis, Tenn., on "Management of the Patient with Heart Failure."

MISSOURI

Conference on Social Hygiene—The Missouri Social Hygiene Association, cooperating with the St Louis Medical Society, held a conference, October 24, to afford employers and physicians opportunity to discuss social hygiene in its relation to industry Dr Richard S Weiss assistant professor of clinical dermatology Washington University School of Medicine, talked on "Venereal Disease as a Problem for Industry", Dr Ben F May "Venereal Disease and the Community", and Dr Paul J Zentay, president of the social hygiene association "What Can Be Done About It?"

Red Cross Medal to Mrs Elsbeth Vaughan—The International Committee of the Red Cross Geneva, Switzerland, awarded the Nightingale Medal to Mrs Elsbeth Vaughan, St. Louis recently, the presentation will probably take place at the annual meeting of the board of incorporators it was stated Mrs Vaughan is the widow of the late Dr Victor C Vaughan, Detroit. She has been associated with the American Red Cross since early in 1917 in this country and abroad and since 1924 as assistant director of Red Cross Nursing of the midwest branch office in St Louis During the World War she assisted with the organization of nurses for military service. In her present position, Mrs Vaughan directs Red Cross nursing activities in seventeen states included in the area allocated to the midwest branch, according to Milwaukee *Medical Times*

NEBRASKA

Society News—The Seventh Councilor District Medical Society held its annual meeting in Harvard, October 17 with the following speakers among others Drs John R Nilsson, Omaha Operative Technic and After-Treatment, with End Results, in the Treatment of Severe Esophageal Stricture" Robert D Schrock, Omaha, "Fractures of the Tibia into the Knee Joint" and John F Allen Omaha, "Treatment of Mammal or Early Pulmonary Tuberculosis"—Dr Leroy A Calkins Kansas City Mo addressed the Omaha-Douglas County Medical Society October 9, on "Management of the Occipitoposterior Presentation" The society devoted its meeting of October 22 to dedication of the Omaha-Douglas County Central Health Service—The Northwest Nebraska Medical Society, including the counties of Dawes Sioux and Sheridan was organized at Chadron, October 15—Drs John Marshall Neely and Clarence K Elliott, Lincoln, addressed the Lancaster County Medical Society, October 1, on "The Value of Biopsy and Relation of Salts of Blood to Edema," respectively

NEW YORK

Personal—Dr Charles E. Martin has been appointed medical director of Albany Hospital, Albany He has been a member of the staff for several years—Dr John N Hayes, Saranac Lake, has been appointed medical director of Sanatorium Gabriels, Gabriels

Society News—Drs Rosco G Leland Chicago director of the Bureau of Medical Economics, American Medical Association and Frederic E Elliott Brooklyn addressed the Medical Society of the County of Westchester, at White Plains November 19, on medical economics in the nation and in the state, respectively—Dr Edward K. Cravener, Schenectady, addressed the Medical Society of Montgomery County at Amsterdam October 30, on "Bone Atrophy Following Trivial Injuries and Its Compensation Angles" Dr Harold Jackson Davis Albany director of medical care for the Temporary Emergency Relief Administration and consultant on medical care for the Works Progress Administration, spoke on aspects of these projects of interest to the practicing physician

New York City

Hoerber Firm Affiliated with Harpers—The medical publishing firm of Paul B Hoerber, Inc., announces that it is now the Medical Book Department of Harper and Brothers, with offices at 49 East Thirty-Third Street.

Personal—Dr John N Evans, Brooklyn, has been appointed professor of clinical ophthalmology at Long Island College of Medicine Brooklyn—A portrait of Dr John M Wheeler, head of the Institute of Ophthalmology, Columbia University—Presbyterian Hospital Medical Center, was recently hung in the institute as a tribute to Dr Wheeler from his colleagues of the staff—Dr Edward Cathcart has resigned as associate dean of Columbia University College of Physicians and Surgeons to resume private practice in Detroit

Society News—A joint meeting of the Philadelphia Orthopedic Club and the section of orthopedic surgery of the New York Academy of Medicine was held at the academy, November 15 subjects discussed were scoliosis, equalization of the length of legs and recent developments in orthopedics Among speakers were Drs Kristian G Hansson Armitage Whitman, Philip D Wilson, Charles Murray Gratz and George Anopol A symposium on diabetes and pregnancy will be presented before the section of obstetrics and gynecology, November 26 by Drs Elliott P Joslin Raymond S Titus Priscilla White and George V Smith and Mrs O Watkins Smith, all of Boston.—Dr Geza Nemet addressed the New York Roentgen Society, November 18, on "Roentgen Diagnosis of the Heart and Great Vessels"—Drs Boris A Kornblith and Seaton Sailer will address the New York Pathological Society, November 26 on "Lymphogranuloma Venereum" and "Primary Sarcoma of the Breast" respectively—Dr Julius Lewis Amster addressed the American Society for Regional Anesthesia at the New York Academy of Medicine in October on "Spinal Anesthesia for Poor Pediatric Surgical Risks"

Death of Dr Osborn—Henry Fairfield Osborn, Sc.D, for many years president of the American Museum of Natural History, died suddenly November 6 of a heart attack at his home in Garrison, aged 78 Dr Osborn was graduated from Princeton University and taught natural science there for several years In 1890 he joined the faculty of Columbia University as professor of biology and from 1910 until his death was research professor of zoology His connection with the American Museum began in 1891, when he was appointed curator of the department of vertebrate paleontology he was made president in 1908 Among many other activities

Dr Osborn served as vertebrate paleontologist to the U S Geological Survey from 1900 to 1924 and since that time had borne the title of senior geologist. He had served as president of many scientific organizations, among them the second International Congress of Eugenics and American Association for the Advancement of Science. In addition he was a member of numerous foreign societies and had received honorary degrees from universities both in the United States and abroad. In 1923 he received the gold medal of the Roosevelt Memorial Association and at various times was honored with other awards. He retired from the presidency of the museum in 1933 with the title of honorary president.

NORTH DAKOTA

New Members of State Board—Drs John E. Countryman, Grafton, Harry A. Brandes, Bismarck, and William H. Long, Fargo, were recently appointed members of the North Dakota State Board of Medical Examiners. Present officers of the board are Drs William C. Fawcett, Starkweather, president, and George M. Williamson, Grand Forks, secretary-treasurer and general administrative officer.

OHIO

Dr Houssay to Deliver Hanna Lecture—Dr Bernardo Alberto Houssay, professor of physiology, National University of Buenos Aires, Argentina, will deliver the thirty-sixth Hanna Lecture, December 3, at the Cleveland Institute of Pathology, on "The Hypophysis and Carbohydrate Metabolism."

Eugenics Research Prize—Dr Serge Androp of the staff of the Ohio Hospital for Epileptics, Gallipolis, has been awarded a prize of \$3,000 offered by the Eugenics Research Association for original research on the probability of commitment for a mental disorder of any kind, based on the individual's family history. The contest was announced in 1933.

Society News—Dr Virgil S. Counsellor, Rochester, Minn., addressed the Highland County Medical Society, Hillsboro, October 11, on diseases of the pelvis. Drs William W. Trostel, Piqua, and Emory R. Irvin, Bradford, addressed the Miami County Medical Society, Piqua, October 11, on obstetric care. Dr Howard T. Karsner, Cleveland, was guest speaker at a meeting of the Lorain County Medical Society, Lorain, October 9, on "Pathology of Bright's Disease." Drs Floyd C. Hendrickson, Canton, and George N. Wenger, Massillon, addressed the Stark County Medical Society, Canton, October 7, on "Vesical Neck Obstruction in the Female" and "Lumbar and Sacral Anesthesia in Perineal Surgery," respectively. At a meeting of the Columbus Academy of Medicine, October 21, Dr Donald E. Yochem, Newark, spoke on "Intercostal Nerve Blocking in the Treatment of Pulmonary Diseases." Dr John H. Warvel, Indianapolis, discussed "The Management of Diabetes" before the Montgomery County Medical Society in Dayton, November 15. Dr Ralph W. Good, Cincinnati, will address the society, December 6, on "Indications for Splenectomy." Dr Henry L. Bockus, Philadelphia, was guest speaker at a meeting of the Union Medical Association (Sixth Council District) in Youngstown, November 19, on "The Role of Infection and of Disturbed Cholesterol Metabolism in the Genesis of Gallstones."

PENNSYLVANIA

Society News—Dr Sumner L. S. Koch, Chicago, addressed the Erie County Medical Society, Erie, November 6, on surgery of tendons and nerves and skin grafting. Dr Curtis C. Mechling, Pittsburgh, addressed the Cambria County Medical Society, Johnstown, November 14, on "Diagnosis and Office Treatment of Anorectal Disorders."

Philadelphia

Reunion of Resident Physicians—The forty-ninth annual dinner of the Association of Ex-Resident and Resident Physicians of the Philadelphia General Hospital will be held at the Art Club, Philadelphia, December 3. The guest of honor will be Dr Benjamin Franklin Stahl. Clinics will be given in the afternoon at the hospital by Drs George E. Pfahler, Edward J. G. Beardsley, Daniel J. McCarthy, Kenneth M. Lynch, Philip Williams and David Riesman. Ex-interns are asked to send their correct addresses to Dr George Wilson, 133 South Thirty-Sixth Street, Philadelphia.

SOUTH DAKOTA

Personal—Dr Gregory R. Waters, formerly of Chicago, was recently appointed resident physician for the Yankton Sioux Indians at Greenwood, S. D.—Dr Edwin L. Perkins, Sioux Falls, has been appointed physician to the South Dakota penitentiary, succeeding the late Dr William T. Keller.

TEXAS

District Meetings—At the semiannual meeting of the Panhandle District Medical Society at Plainview, October 15-16, guest speakers included Drs George D. Huff, San Diego, on "The Technic of Episiotomy," Nelson M. Percy, Chicago, "Surgery of the Superior Hypogastric Plexus of the Sympathetic Nervous System," Carroll M. Pounders, Oklahoma City, "Treatment of Pneumonia in Infants and Children," and Ray M. Balyeat, Oklahoma City, "Iodized Oil in Treatment of Intractable Asthma." Speakers at a meeting of the Eleventh District Medical Society in Rush, October 15, included Drs George D. Mahon Jr., Dallas, on "Complications of Thyroid Surgery," Joseph B. Foster, Houston, "Treatment of Fractures of the Lower Extremity," and Edward White, Dallas, "Urinary Calculi." At the thirtieth annual meeting of the Fourth District Medical Society in Brady, October 23-24, speakers included Drs Earl B. Ritchie, San Antonio, on "Ringworm Infection of the Skin," Eugene V. Powell, Temple, "Results of Roentgen Therapy of Carbuncles and Other Infectious Reactions," Dewey Sutton, San Angelo, "Mesenteric Vascular Occlusion," and James Shirley Sweeney, Dallas, "Juvenile and Adult Diabetes."

WASHINGTON

Health at Spokane—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a population of 37 million, for the week ended November 9, indicate that the highest mortality rate (20.4) appears for Spokane, the rate for the group of cities as a whole was 10.8. The mortality rate for Spokane for the corresponding week of 1934 was 14.6 and for the group of cities, 11.1. The annual rate for the eighty-six cities was 11.3 for the forty-five weeks of 1935 and the same rate appeared for the corresponding period of last year. Caution should be used in interpretation of these weekly figures, as they fluctuate widely. The fact that a city is a hospital center for a large area or that it has a large Negro population may tend to increase the death rate.

WEST VIRGINIA

Professor Appointed—Dr Simon B. Chandler, associate professor of anatomy at Loyola University School of Medicine, Chicago, has been appointed professor and head of the department of anatomy at the University of West Virginia School of Medicine. Dr Chandler, who graduated in medicine at Northwestern University School of Medicine, Chicago, in 1927, taught anatomy at the University of Arkansas School of Medicine 1922-1924, and became associated with Loyola as assistant professor in 1926.

WISCONSIN

Fund for Research—A fund of \$7,800 has been donated to the University of Wisconsin School of Medicine, Madison, by E. R. Squibb and Sons Company, New York, for research on cyclopropane. The work will be under the direction of Dr Ralph M. Waters, professor of anesthesia.

Appointments at Marquette University—New appointments to the faculty of Marquette University School of Medicine, Milwaukee, for the current year include Drs John E. Mulsow, assistant clinical professor of laryngology, otology and rhinology, Armand J. Quick, assistant professor of pharmacology, Forrester Raine and Eugene A. Smith, assistant clinical professors of surgery. Mr Theodore Wiprud, executive secretary of the Medical Society of Milwaukee County, has been appointed lecturer in medical economics.

Society News—Drs Eben J. Carey and Francis D. Murphy, Milwaukee, were speakers at the annual meeting of the first councilor district of the State Medical Society of Wisconsin in Watertown, October 24, on "Anatomy and Physiology of the Heart" and "Diagnosis and Management of Heart Disease," respectively. Dr Carey also delivered an address at an evening banquet on "Social and Economic Aspects of Medical Education Today." Dr Robert E. Burns, Madison, addressed the Rock County Medical Society, Janesville, October 29, on "Orthopedic Cases of Interest to the General Practitioner." Guest speakers at the annual meeting of the tenth councilor district in Eau Claire in October were Drs Henry E. Michel, son, Minneapolis, on diseases of the skin, Francis D. Murphy, and Milwaukee, diagnosis and treatment of acute nephritis, and Harry B. Zimmermann, St. Paul, tumors of the breast. Dr Rock Sleyter, Wauwatosa, addressed the Waupaca County Medical Society in New London recently on "The Patient with Chronic Complaints." Drs Louis M. Warfield, Milwaukee, and Chester M. Kurtz, Madison, addressed the Medical Society of Milwaukee County, Milwaukee, November 8, on "Treatment of Heart Failure" and "Treatment of Peripheral

Circulatory Failure," respectively. Dr William C MacCarty, Rochester, Minn., gave the opening lecture in the society's current graduate course in gastro-enterology, November 4. Other lecturers in the series are Drs Ralph C Brown, Chicago, Lewis G Cole, New York, and Frank H Lahey, Boston.

PUERTO RICO

Annual Medical Meeting—The Puerto Rico Medical Association will hold its annual meeting at the association's building in Santurce, December 13-15. Dr Esteban Garcia Cabrera, San Juan, is president of the association and Dr Euripides Silva, San Juan, secretary. Members of the American Medical Association are invited to attend.

GENERAL

Society News—Dr Titus H Harris, Galveston, was chosen president of the Central Neuropsychiatric Association at its fourteenth annual meeting in Topeka, Kan., October 25-26. Other officers elected are Drs Benjamin Landis Elliott, Kansas City, Mo., vice president, and Henry W F Woltman, Rochester, Minn., secretary.

New Pharmacopeia Ready in December—The Eleventh Revision of the U S Pharmacopeia will be available December 16, according to an announcement by the board of trustees of the U S Pharmacopoeial Convention. Standards in the new revision will become effective June 1, 1936, superseding the tenth revision. Fifty-eight new substances have been added in the new revision.

Warning Against Impostor—Dr Eugene C Hood, medical superintendent of the Florence-Darlington Tuberculosis Sanatorium, Florence, S C., reports that a woman giving the name of Karr and her address as Cleveland recently cashed checks in Florence stores using the sanatorium falsely as a reference. In each case she told the merchants that she had been to the sanatorium to sell dairy equipment or that the institution "was a prospect for dairy equipment." As the sanatorium has no dairy, Dr Hood said, it has no need for dairy equipment. It is believed that the woman may impose on other hospitals in the same manner.

Change in Status of Licensure—The New York State Board of Medical Examiners reports the following action:

Dr Samuel Taylor Barton, Canastota, license suspended for one year March 15 on the basis of his having committed an abortion.

The California State Board of Medical Examiners reports the following action taken at a meeting in Sacramento, October 22:

Dr Fred M Bantum, Los Angeles, found guilty and placed on probation for five years during which time he shall not have or apply for a federal narcotic permit or have narcotics in his possession and he shall report at each annual Los Angeles meeting.

Dr Leonard R Chapman, Los Angeles, license revoked, found guilty of aiding and abetting an unlicensed practitioner.

Dr Averell H Owen, license restored and placed on probation for five years with the requirement that he report at each annual Los Angeles meeting.

Dr Eugene L Settles, formerly of San Diego, license restored and placed on five years probation without narcotic privileges.

Dr Arthur M Tweedie, Los Angeles, found guilty and placed on probation for five years during which time he shall not have or apply for a federal narcotic permit or have narcotics in his possession and ordered to report at each annual Los Angeles meeting.

The Michigan State Board of Registration in Medicine reports the following action taken at a meeting in Lansing, October 9:

Dr Alice G Vinton, formerly of Grand Rapids, license revoked on conviction of abortion.

The Texas State Board of Medical Examiners has recently reported the following action taken at the June meeting:

Licenses of Drs William Everett Wright, San Antonio, Lem Faulk Sulphur Springs, and T K Jones, Henrietta, revoked because of narcotic addiction.

License of Dr Joseph Clifford Jones, Spearman, revoked through district court because of fraud in obtaining it.

Four Companies Agree to Abandon Unfair Advertising—Four companies dealing in medicinal preparations have entered into stipulations with the Federal Trade Commission to abandon certain unfair advertising practices. These companies are the Koskott Company, New York; Carleton & Hovey Company, Lowell, Mass.; Smith Brothers Inc, Poughkeepsie, N Y, and Dr Louis L Sherman of Oakland, Calif., operating as Clinic of the Air. The commission reports that the Koskott Company, which sells preparations for treatment of the hair and scalp and for coloring the hair, agrees to stop representing that any of its preparations is an effective treatment for thinning or falling hair or that their use will prevent hair from falling or being brushed or combed from the head unless the advertising assertion is limited in reference to excessive thinning and excessive falling of the hair. Other similar representations will be discontinued.

The Carleton & Hovey Company, distributors of "Father John's Medicine," agrees to stop representing it as an effective therapeutic remedy for colds, coughs or throat troubles, it being understood that this agreement will not prevent the respondent from advertising the preparation as a treatment for colds, coughs due to colds or minor throat troubles. Father John's Medicine also will not be represented as effective in the treatment of colds, except by providing the beneficial effects of vitamin A. Other representations will be discontinued.

Smith Brothers, Inc, selling Smith Brothers' Cough Syrup and Smith Brothers' Cough Drops, stipulates that it will cease advertising the drops or the cough syrup as effective remedies for the treatment of colds or that either preparation has a unique advantage over other remedies due to vitamin A content.

Dr Louis L. Sherman, operating as "Clinic of the Air" and dealing in a list of preparations including "Liquid Ferrolax," "Calwhey" and "Red Label Enterol," agrees to cease advertising that these preparations or any combination of them constitute a competent treatment or effective remedy for any of a list of twenty-eight diseases ranging from acidosis, anemia and biliousness to rheumatism, spastic colon and tuberculosis. The respondent agrees also not to represent "Calwhey" as raising resistance or as assisting in eliminating poisons through the kidneys and to cease asserting that by hundreds of tests Calwhey is known to be effective in changing the intestinal flora. Numerous other representations of these preparations will be discontinued according to the stipulation.

Government Services

Thirty-One States Free from Bovine Tuberculosis

Massachusetts, South Carolina, Georgia, Alabama and Louisiana have recently been designated as modified accredited areas by the U S Department of Agriculture, signifying that they are practically free from tuberculosis of cattle. Federal funds were used in the testing that achieved this result. Thirty-one states are now accredited areas. Some retesting will be necessary, but the most difficult part of the eradication of tuberculosis in these areas has been completed, officials said.

New Naval Medical Center

A new naval medical center to function as a medical diagnostic and educational center under the control of the bureau of medicine and surgery has been established under a recent general order reported in the November *Military Surgeon*. The budget bureau will be asked to approve the expenditure of about \$3,200,000 for construction of a new naval hospital. If the appropriation is approved, work will commence about July 1. Capt Ulysses R. Webb has been ordered detached from command of the dispensary at the navy department to command the medical center, which replaces the naval hospital and naval medical school administration set-up.

Government Positions for Physicians

The U S Civil Service Commission announces open competitive examinations for two positions in the Children's Bureau, Department of Labor, and one in the Indian Service. Applications are invited for the positions of director of the division of maternal and child health and director of the crippled children's division in the Children's Bureau, each at a salary of \$6,500 a year. Applicants must have been graduated from recognized medical schools and in addition must have had certain specified experience. In the Indian Service the position is principal medical officer with a salary of \$5,600 a year. Applicants must have been graduated from recognized medical schools and must be licensed to practice in some state or the District of Columbia. In addition they must have had not less than five years experience in the vaccination of new-born infants with bacillin Calmette-Guérin vaccine according to the method of Calmette. They must also have had not less than three years experience in city, state or federal public health laboratories with work in tuberculosis. The two types of experience may run concurrently. Applications for all three positions must be filed not later than December 9. Full information may be obtained from the commission at Washington or from the secretary of the U S Civil Service Board of Examiners at the postoffice or customhouse in any city that has a postoffice of the first or second class.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct 26, 1935

Reduction of the Noise of Vehicles

The campaign against noise, mainly traffic noise, and the formation of the Anti-Noise League have been described in previous letters. The government has been induced to take action by prohibiting the use of motor horns in cities at certain hours. But it has not stopped at this. The Ministry of Transport has appointed a committee to investigate the noise of road vehicles. It has measured the volume of noise made by motorcycles on the road. This foreshadows the time when every vehicle must comply with a certain maximum of measured noise. A new unit of noise, the phon, has been introduced. The noise of a subway train, with the windows open, has been measured at between 90 and 95 phons, which is the greatest noise that a car will be allowed to make in the future, if the committee's recommendations are adopted. The sound of a loud motor horn is represented by from 100 to 105 phons, of a pneumatic drill by 105 to 110 phons and of an airplane engine by 110 to 120. The greatest noise which the human ear can bear without pain is stated to be 130 phons. The adoption of this system of noise measurement and of a legal maximum noise for cars would be a considerable advance on the measures which the Ministry of Transport has taken to secure quieter streets, such as the enforcement of the use of pneumatic tires and the creation of silent zones. It has been hampered in the attempt to rid the roads of noisy vehicles by the fact that the "excessive noise," which is an offense, could not be measured but had to be left to individuals to decide what constituted this nuisance.

Acoustic tests were carried out by the committee on new vehicles with a noise meter designed to simulate the behavior of the human ear. The experiments showed that, while in general private automobiles made little noise, commercial vehicles were less satisfactory and motorcycles still more unsatisfactory. Tests with stationary vehicles showed that exhaust silencing of many motorcycles was unsatisfactory, while that of ordinary cars was satisfactory. Except at high speeds the ordinary automobile is not unduly noisy, but a number of sports cars are. Except at moderate speeds many motorcycles are too noisy. The committee has made the following recommendations: 1. When a vehicle is driven with full throttle at 30 miles an hour (or the maximum legal speed if that is less than 30), the loudness measured at a point 18 inches to one side of the vehicle shall not exceed 90 phons. 2. When the vehicle is stationary with the engine running at the speed that would give maximum power output, the loudness 18 inches behind the exhaust pipe shall not exceed 95 phons. The committee will continue its work under the chairmanship of Dr. G. W. C. Kaye. Among other matters that it is investigating is the noise made by the present type of motor horns.

The Training of Opticians

At the congress of the British Optical Association at Oxford Dr. Pistor, director of the Jena School of Optics, said that there was no longer room for the spectacle dealer who knew nothing about optics. The aim of the International League of Opticians was to raise the standard of the optical calling throughout the world. No one should be permitted any longer to style himself "optician" unless he had qualified by adequate study and training. He should at least be able to produce spectacles to conform to a given prescription and to make a frame according to prescribed measurements. He submitted the following schedule for the qualified opticians training: 1. Three years technical training under a qualified optician

in his workshop and showroom with technical examination. 2. Attendance at a school of opticians for supplementing his knowledge and for learning sight testing and prescription work, with a state-controlled examination at the end of the course. Professor Ronchi, director of the Royal National Institute of Opticians, Florence, said that Italy presented a paradoxical situation. Those who wanted to become opticians were compelled to pass an examination, and yet no schools had been provided where the necessary knowledge may be acquired.

The Fight Against Leprosy

At the conference of the mission to lepers held in London, Dr. Ernest Muir, medical secretary of the British Empire Leprosy Association, spoke of the antileprosy work in India. He said that, just as the home of tuberculosis was the great industrial towns, so the home of leprosy was the villages. Doctors and nurses might keep on for centuries treating those who attended the leprosy homes and dispensaries, but the disease would never tend to diminish, because its real source would remain in the villages. They must get into the villages. In Indian villages such work was proving wonderfully successful. The people were beginning to realize what the danger of leprosy is and what had to be done to prevent it. Dr. N. D. Fraser of the English Presbyterian Mission at Swatow, South China, spoke of his work in establishing outpatient leprosy clinics in country districts. In the Swatow district there were at least 10,000 lepers.

CONSULTANT SERVICES IN MUNICIPAL HOSPITALS

The municipal hospitals are maintained by the local authorities. Poor persons are entitled to free treatment, while those who can afford to pay something are assessed according to their means. The medical staff is a whole time one and of course is salaried. The medical staff of the voluntary hospitals, with the exception of the residents, who are all junior men, is not paid. Their recompense consists in the superior status conferred, which gives them consultant rank. But the municipal hospitals also appoint consultants and specialists for part time work, for which they are paid. As their whole time staff consists of men appointed for life, many of them are experienced physicians and surgeons, and the consultants and specialists are used for cases presenting special difficulties. The Manchester city council has made a new departure in the three large municipal hospitals, which together have 3,500 beds. At present twenty-six consultants have been appointed at a cost of \$22,500 per annum. They visit the hospitals once or twice a week. A new arrangement has been made which will cost \$62,500 per annum. The present system is held to be defective in that the patient is accorded specialist attention only when in the judgment of the medical officer in charge of the case a consultation is considered to be indicated. This is held to be wrong, because in the voluntary hospitals the visiting physicians and surgeons are responsible for the diagnosis and treatment of the cases and every patient is seen by a consultant soon after admission. The new scheme provides for increased frequency of the visits of consultants, who will be personally in charge of all the acute cases in the hospital. There will also be the closest collaboration between the municipal hospitals and the voluntary ones.

The appointment of consultants from the honorary staffs of the voluntary hospitals as a visiting staff to the municipal hospitals is not new, but giving them such increased responsibility and control is an innovation. The municipal hospitals at one time were little more than asylums for the aged and infirm poor. Now their scope is as wide as that of the voluntary hospitals and includes even the treatment of accidents. Some fears are entertained that they may supplant the voluntary hospitals. These used to be entirely supported by the voluntary subscriptions of the charitable, for the benefit of the poor. Now a charge is made according to the circumstances of the patient unless he is indigent. But this usually does not do more than

cover part of his cost to the hospital, so that subscriptions are still necessary. But with a complete hospital service now provided out of the public funds, the subscribers to the voluntary hospitals may decide that they are no longer necessary, especially in these times of excessive taxation, part of which is devoted to the support of the municipal hospitals. Here is another step in the socialization of medicine.

PARIS

(From Our Regular Correspondent)

Oct. 18 1935

The Fourth French Gynecologic Congress

The fourth Gynecologic Congress was held at the Salies-de-Bearn thermal springs, June 8-10. It is the custom at a French medical congress to submit exhaustive surveys of the different aspects of one or two topics of current interest. The subjects and essayists are selected by vote at the preceding annual congress, so that the literature can be thoroughly reviewed and the personal experience of those selected to make the reports added. The subject chosen for this year's congress was "Genital Hemorrhages Exclusive of Those Incident to Pregnancy and Neoplasms."

The first paper was by L. and R. Dieulafoy of Toulouse on the "Vascularization of the Female Genital Tract." The authors' research has shown that a free anastomosis exists between the uterine and ovarian arteries. The intra-uterine anastomoses in the body of the uterus extend only to the midline. There is a rich anastomosis of the veins arising from the vagina, uterus, tubes and ovaries. There are but few valves in the veins. The latter anatomic condition and the free anastomoses between the veins explain the gravity of puerperal and postoperative thrombosis of the ovarian and uterine veins. In the uterine wall the veins begin as immense lacunae without evident intervacular spaces.

Paul Ulrich of Paris read a paper on "Genital Hemorrhages of Local Origin." Uterine hemorrhages can be grouped as menorrhagias and metrorrhagia. The term menometrorrhagia was proposed for cases in which one can no longer distinguish a menorrhagia and a metrorrhagia.

The ovary plays the principal part in endocrine disturbances of the female genitalia, it being understood that this organ in turn is under the control of other glands of internal secretion. Of the latter in the order of their importance, the hypophysis may be mentioned, then the thyroid, the islands of Langerhans and the adrenals.

The ovary elaborates the follicular hormone and the corpus luteum hormone. Ulrich is of the opinion, contrary to that of most authors, that there is no marked antagonism in the action of these two hormones. The corpus luteum hormone (progestin) is really complementary in its action to the follicular (estrogenic) hormone. The two hormones are so closely related from a physiologic and chemical standpoint that it seems difficult to conceive of a marked antagonistic action between the two. The term essential hemorrhagic metritis as suggested recently by some for the menometrorrhagias of ovarian origin ought to be dropped in favor of a division of such hemorrhages into (1) those in which there is a deficiency of the follicular factor, (2) those in which there is a hypersecretion of this principle in which case the secretion of the corpus luteum is deficient, and (3) those in which there is a hypersecretion of progestin. Douay and Champy have described the last group as "deciduoform hemorrhagic metritis."

In the discussion, Douay of Paris stated that his studies show that the abnormal persistence of the corpus luteum is accompanied by a hypertrophy and marked hyperemia of the uterine mucosa and an abnormal development of decidual cells just as if a pregnancy existed. In the hypertrophic form of metritis due to a follicular hypersecretion the determining cause is

the persistence of a follicular cyst. The menstrual period is delayed and then hemorrhages appear. The scrapings reveal a thick mucosa much less vascular than in cases of deciduoform metritis. In these cases the real lesion may be in the ovary or in the hypophysis. According to Douay the hypersecretion of the follicle stimulating, gonadotropic hormone is the cause of hypertrophic metritis of the second type described, while excessive secretion of the luteinizing hormone results in the deciduoform type of metritis.

Francillon-Lobre and Dalsace of Paris advocated the preliminary use of hysterosalpingography in obscure cases of metrorrhagia instead of blindly curetting every patient.

UTERINE HEMORRHAGES DUE TO SYSTEMIC BLOOD CONDITIONS

Emile-Weil and Isch-Wall of Paris read a paper on uterine hemorrhages due to systemic blood conditions. The blood dyscrasia which is found constantly in the course of uterine hemorrhages without local lesions is hemogenesis, the stigmas of which can be quite evident or obscure (fruste). The classic hemogenesis diathesis is characterized either by purpura or by hemorrhages from mucous membranes. The metrorrhagias observed before puberty are an example of the second type. The same is true of the menorrhagias and metrorrhagias of young girls, if local lesions can be eliminated. These include not only anomalies of excessive menstruation but also anomalies of rhythm such as hemorrhage every fifteen days or a menorrhagia on the thirty-fifth day. The phenomenon known as hemotrypsia is characteristic for hemogenesis. One sees a primary hemorrhage followed by others in more remote parts of the body. The menstrual hemorrhage can represent the primary one and be followed by others elsewhere. Control of such a primary hemorrhage is followed by cessation of the other hemorrhages. The evolution of a hemogenesis is characterized by alternate periods of cessation and recurrence in the form of attacks, which are dependent on various causes such as puberty, pregnancy, the menopause or various infections or intoxications. Every metrorrhagia should be investigated as to hepatic and endocrine disturbances and a search made for a possible hereditary syphilis.

The clinical forms of hemogenesis that are of particular interest are the metrorrhagias of a latent hemogenesis (form fruste), the diagnosis involving a search for the minor stigmas and the localized hemogenesis of the uterus, the constant recurrence and resistance of which to all treatment should arouse a suspicion of a systemic etiology. One must look for evidences of hepatic, splenic, medullary (bone marrow) or endocrine dysfunction to explain these metrorrhagias. The latter when accompanied by hirsutism or evidences of virility should lead one to suspect adrenal or hypophyseal dysfunction.

Treatment of Pyloric Stenosis of Infancy

At the April 9 meeting of the Pediatric Society of Eastern France, Rohmer of Strasbourg reported seventy-seven cases. There were eight deaths, but four of the patients were operated on too late, i. e. after failure of medical treatment. Of thirty-four infants operated on under favorable conditions four died, one each of operative shock, bronchopneumonia, peritonitis due to faulty technic, and incomplete division of the hypertrophied muscle fibers. In the forty-one cases in which operation was not performed there were also eight deaths, but here also four should be excluded because the infants were moribund when admitted to the hospital. Hence there were four deaths following medical treatment. The results of the two methods of treatment are about equal. Twelve of the patients who were operated on had been treated medically without success. In order to counteract the effects of the operation, sodium chloride solution in large amounts has been found to be efficacious. This rechlorination method is greatly in favor in France at present,

in postoperative treatment. Feeding can be begun within a few hours after operations for pyloric stenosis in infants. It is exceptional to find that vomiting persists during the first few days after operation. As to medical treatment, frequent feedings in small quantities, preferably with mother's milk as a base and plenty of water, are the chief features. If the vomiting continues after several weeks of medical treatment, immediate operative intervention is indicated. If one operates without waiting for the results of medical treatment, the mother may continue to nurse the infant.

Rohmer is of the opinion that the potential complications of medical treatment are by far more serious than the risks of operation. In mild cases one may try medical treatment, but in the more severe cases an operation should be performed as soon as possible. These more severe cases show on radiographic examination retention of the opaque medium over a period of several hours.

A second paper on medical treatment was read at the same meeting by Vonderweidt and Jullien of Mulhouse. They maintain that even severe cases can be cured by nonoperative treatment. Some may assert that these are simply cases of pylorospasm. The differential diagnosis of the latter from a hypertrophic pyloric stenosis is not easy and they doubt whether a hard and fast line can be drawn between the two conditions as there is a marked element of spasm in true hypertrophic pyloric stenosis. When incoercible vomiting long after taking food and even just preceding feedings, visible peristalsis and a palpable tumor are present, the diagnosis of hypertrophic stenosis is certain.

The medical treatment aims to combat the faulty nutrition, the pylorospasm and the diminution in blood chlorides. Preference is given to breast milk. If this is not feasible, milk powder or cow's milk coagulated with a special ferment is given, as well as carbohydrates with plenty of sugar. The infant should be fed every two hours and in small quantities. Salt is added to each feeding to counteract the chloropenia. Dextrose solution by the drip method is given by rectum, about 50 cc from four to six times in twenty-four hours. For the pylorospasm a drop of a 1:1,000 solution of atropine sulphate is given with each feeding. The excessive gastric peristalsis is greatly relieved by hot applications. If the vomitus contains much acid material, gastric lavage is done, once daily, with a mild alkaline solution. Of twenty-eight cases thus treated twenty-three were cured. Three of the five deaths occurred before 1930. Since 1931, when salt was added to the feeding, eighteen cases have been cured and there were only two deaths. In both of the latter the infants were markedly cachectic when first seen.

In the discussion, Bindschiedler of Strasbourg emphasized the importance of adding sodium chloride to make up for the loss of chlorides.

Exophthalmos in Acromegaly

Exophthalmos is a symptom of certain diseases of the hypophysis and is seen especially in cases of acromegaly, according to Marcel Labbe and Justin-Besançon, who reported such a case at the July 5 meeting of the Société médicale des hôpitaux. The protrusion of the eyeballs resembles completely that seen in severe hyperthyroidism. In their case this symptom appeared three years before the first skeletal evidences of acromegaly, hence in the early stages of the latter the exophthalmos may be readily thought to be of thyroid origin. In the later stages of acromegaly the protrusion of the eyeballs can be masked by changes in the bones surrounding the eye. Experimentally, the exophthalmos observed in acromegaly can be reproduced by injection into guinea-pigs of the acid portions of the anterior hypophyseal lobe. Exophthalmos follows injection of anterior pituitary into thyroidectomized animals.

In the discussion, Azerad called attention to his paper on the difficulties of differential diagnosis between exophthalmic goiter

and acromegaly. A goiter may be one of the first observations in acromegaly. If the goiter is associated with a rise in the metabolic rate, an erroneous diagnosis of hyperthyroidism may be made.

Staphylococcus Anatoxin in Treatment of Sepsis

A man, aged 25, who had an infection of a relatively minor wound, became seriously ill. A high temperature, jaundice, osteomyelitis of the tibia and the jaw, and a pulmonary abscess, in the pus of which *Staphylococcus aureus* was found, appeared within a short time. At the July 5 meeting of the Société médicale des hôpitaux, Robert Debre and his associates reported such a case. The blood culture was positive for the organism and on account of the rapid increase in the signs of a pyemia the prognosis became decidedly unfavorable. 160 cc. of an antistaphylococcus serum prepared by Ramon at the Pasteur Institute was injected without any appreciable improvement. Then the injection of a staphylococcus anatoxin, also prepared by Ramon, was begun. Four doses were given over a period of six weeks. The amounts employed were respectively 0.75, 1.5, 3 and 4 cc. A marked improvement in the general condition was noted after the third injection, but an empyema containing the same organism developed, which required drainage. Nevertheless, the patient recovered.

The authors call attention to the fact that the examination of the blood showed a constantly higher content of staphylococcus antitoxin following the injections of anatoxin. This is confirmed by the observations clinically and in animals of a marked antitoxic immunization following the injection of staphylococcus anatoxin. This antitoxic immunity is accompanied by an antimicrobial immunity in animals. An antitoxic vaccination and an equally efficacious antitoxic serotherapy can now be achieved in staphylococcus pyemia.

Surgical Treatment of Pulmonary Tuberculosis

The surgical treatment of pulmonary tuberculosis was the subject of a number of papers read at the eighth National Tuberculosis Congress, held at Marseilles in April. The first paper was by Leuret and Caussimon of Bordeaux on the "Indications and Results of Extrapleural Thoracoplasty." Every center in which pulmonary tuberculosis is being treated should have a surgical service in which thoracoplasty can be performed. An effort should be made to avoid extensive operations for relatively slight lesions. The chief aim should be to adapt the plastic operations to the subjacent foci, in other words, to collapse the bony thorax only where locally indicated. The use of radiography and injections of iodized oil is the best guide as to how much one can accomplish by resection. As an anesthetic, tribrom-ethanol with the addition of small amounts of ethyl chloride, seems to be the best agent. Even with every possible precaution, thoracoplasty must still be considered a serious procedure. Of ninety one personal cases 80 per cent were benefited. Of this number, 40 per cent may be considered as clinical cures. In 20 per cent of the ninety one cases the result was a failure. The following cases call for operation: (a) those in which pneumothorax is indicated but is impossible owing to obliteration of the pleural space by adhesions, (b) cases in which a pneumothorax has been done but is unsuccessful because of a pleurisy, which either follows the pneumothorax or occurs spontaneously or in which an intercurrent infection leads to a recrudescence of the tuberculous involvement of the collapsed lung.

The important chapter in thoracoplasty is formed by adherent apical lesions, that is, cavities which are inactive with little secretion. Large cavities due to active lesions and necessitating extensive resections are a contraindication to operation. Such cavities can be treated by thoracoplasty after good drainage has been provided for as a preparatory measure. Tuberculous pleurisy with fistula formation is an unwelcome clinical entity and one should not wait too long before attempting a thoraco-

plasty lest the greatly thickened pleura endanger the success of operative intervention. A thoracoplasty should be done only after treatment at a sanatorium and only in patients who do not have dyspnea on exertion and permanent tachycardia. Preliminary phrenicectomy is not indicated.

Maurer and Rolland of Paris in their paper on the same subject stated that the principal indication for artificial pneumothorax is a recent bronchopneumonia of tuberculous origin. It is dangerous to continue to employ the method if it is not successful in loosening up adherent bands between the two layers of the pleura. In such cases phrenicectomy or better still, a thoracoplasty should be done. The former should be performed only if there is much chance of its being a success. A phrenicectomy should not be considered as a necessary preliminary to a thoracoplasty. As to results, these varied according to whether the thoracoplasty had been performed in sanatoriums or in private and public (Paris) hospitals. The mortality in 278 thoracoplasties was only 0.78 per cent.

Professor Guéniot Dies at Age of Nearly 103

An eminent obstetrician of Paris Professor Guéniot, has passed away at the age of 102 years and 8 months. His hundredth birthday was celebrated at a special meeting of the Academy of Medicine, of which he was elected a fellow in 1880 and president in 1905. He was active until a short time ago and engaged in writing his memoirs. In announcing the death of Professor Guéniot, Sireday, the president of the Academy of Medicine, described the excellent work of the deceased in his specialty, obstetrics, and his noble character which made Guéniot a worthy representative of the tradition of medical honor in the highest interpretation of the term.

BERLIN

(From Our Regular Correspondent)

Sept 30, 1935

Incidence of Venereal Diseases and Prostitution

The federal census of venereal patients, taken in 1934, reveals, on the basis of replies to questionnaires sent to physicians and institutions, that in the civilian population there were 12,499 male and 6,587 female patients who received their first treatment during the month in which the census was taken. Hence the annual number of new venereal patients may be placed at 225,000, as compared with 370,000 in the last census year (1927). Therefore, the new cases of venereal disease in 1934 included 47 males and 23 females to each 10,000 of population. There were about 10,000 new cases of gonorrhea and 4,000 new cases of syphilis. The number of new cases of gonorrhea in men was almost three times as great as the number reported in women. About sixty men and a like number of women reported to a physician, during the census month, by reason of two venereal diseases while one man had a triple involvement. About one third of the patients during the census month, sought medical aid of a general practitioner, more than 50 per cent consulted specialists and about one sixth were admitted to hospitals. The decline in the number of new cases as compared with 1927, is reflected in all the morbid types. In general, there was an earlier beginning of treatment in gonorrhea, which is gratifying although the number of cases not treated until the chronic stage was reached (especially in women 18 per cent) is still much too high. Of importance is the early detection of syphilis, particularly among the juveniles since in that group and, to some extent, also among the older men contagion appears to have increased. If 225,000 persons are treated for venereal disease annually in Germany it is evident that of 100 male persons between the ages 15 and 49 about twenty five are treated by a physician by reason of venereal disease the percentage of women so treated is about 12. In the larger cities the danger of infection is often more than twice as great as in the smaller towns.

Interesting observations on the medical supervision of prostitution have been published by Dr Morschhäuser of Cologne. The number of prostitutes regularly supervised by the Cologne board of health is twice as large as formerly, during the period of regimentation, and ranges around 1,200. In recent years the number of voluntary requests for registration has greatly increased. In Cologne the supervision of prostitutes is effected by means of a system that deals with the problem in an individual manner. There are no general provisions with regard to the frequency with which prostitutes must be examined; the intervals range from one to fourteen days, depending on individual conditions. During the beginning period of control the homes of newly registered prostitutes are inspected, in order to determine their hygienic condition. This system of supervision carried out on the basis of individual needs has a salutary effect on the general conduct of the women, as they want to be classed in a higher group, with longer intervals between the stated examinations. Also with respect to women who are regularly examined by a special physician, every fourth examination must be made at the headquarters of the board of health. It is an established principle that these women shall not be given a certificate as to their condition of health. The cards issued by the board of health contain the words 'No guaranty as to condition of health'. Nor are specialists permitted to supply any attest designed to strengthen the evidence furnished by the card issued by the board of health. If any such woman is found on examination to have an infectious venereal disease, it is mandatory that she be sent at once under proper escort to a suitable hospital for treatment.

For the purpose of facilitating search for sources of infection, the board of health has created at headquarters the following special filing cabinets: (1) a complete list of the names of all registered prostitutes, together with photographs, (2) a list of prostitutes arranged according to streets, (3) a list of all the nicknames and pet-names by which prostitutes are known, and (4) a list of all the persons who have become known to the board of health in any connection. These files prove valuable if the infected person cannot give any details concerning the person in question. If a prostitute is discovered to be a source of infection she is immediately escorted from her home by a special official, in order to prevent further contagion and any possibility of her escaping to another city. In the case of infected children, special care is taken to discover the source of the infection. Venereal persons dismissed from a penal institution are taken directly to a hospital, if they have no fixed abode or are known to be asocial and unreliable.

Dr Schoen of Berlin has published statistics on the combating of venereal diseases in connection with disability insurance. In 1933, 11,480 requests for treatment of insured persons and members of their families were received, and about 85 per cent of the requests were granted. Treatment was given to 9,109 insured persons (1930, 30,614). 6,741 of whom were men (1930, 20,534). Syphilis patients numbered 4,212, gonorrhea patients 3,712, 109 patients were infected with both diseases. The number hospitalized was 1,154 (686 men 468 women). Of 8,684 persons treated, a complete cure was effected in 8,513 or 98 per cent. Among the patients there were 1,849 married men and 577 married women. The average cost of treatment for a hospitalized person was 189 marks (\$75), in 1930 the average cost of treatment was much higher (242 marks, or \$97). The average cost of ambulant treatment was 52 marks (\$20) in 1930 78 marks (\$31). The total expenditures for individual treatment amounted to 635,000 marks (\$250,000), in 1930 3,100,000 marks (\$1,240,000). In 1933 the financial situation affected disability insurance to such an extent that it was found difficult to measure up to former performances with regard to the treatment of patients with venereal disease, but care was taken not to cripple the functioning of the consultation centers. Welfare work among noninsured venereal patients was

restricted to 454 persons, whereas, in 1930, 5,663 persons who were uninsured were given treatment. The total expenditures for the consultation centers (which were able to keep expenses down by utilizing in some instances the consultation centers of other organizations) amounted to about 880,000 marks (\$350,000), as compared with 1,900,000 marks (\$760,000) in 1930.

The Deutsche Gesellschaft zur Bekämpfung der Geschlechtskrankheiten published an officially approved leaflet for distribution by physicians among venereal patients, in accordance with legal provisions pertaining thereto. During the past six years a total of 650,000 of these leaflets has been distributed. It is apparent, therefore, that only about 36.5 per cent of the persons receiving first treatment for a venereal infection were given this official leaflet.

MADRID

(From Our Regular Correspondent)

Oct. 11, 1935

International Congress of the History of Medicine

The tenth International Congress of the History of Medicine, organized by a committee of which Dr. Javier Cortezo was chairman, was held in Madrid, September 22-28. Dr. Gregorio Marañón was the president. More than forty-five countries and a large number of medical societies sent delegations. There were the following delegates: Drs. Diepgen from Germany, Max Neuburger of Vienna from Austria, Tricot-Royer from Belgium, Laignel-Lavastine and Guart from France, Giordano and Capparoni from Italy, and Edgar Erskine Hume, Howard Dittick, Edward B. Krumbhaar and Henry E. Sigerist from the United States. The official topics were Arabic medicine in Spain, medicine in America during its discovery and colonization, and medical folk-lore in civilized countries. The official reunion of the delegates took place September 22. Dr. Laignel-Lavastine read an oration in memory of Drs. Jeanselme, Garrison and Menetrier, deceased members of the congress. Dr. Marañón discussed the proposed establishment of an institute of the history of medicine and of a branch of the International Society of the History of Medicine in Spain. Ceremonies for the opening of the exhibition of the congress followed. Collections of instruments, books, electrical apparatus, illustrations of medical treatments, drugs, paintings and other items showing the evolution of medicine and its branches from its early life up to the present were exhibited. The most important collections were those sent by the Wellcome Laboratories of London and by several faculties and academies of medicine and pharmacy and by some national libraries. A general reception marked the end of the evening.

The opening of the congress took place in the Hospital de la Santa Cruz, in Toledo, September 23. Addresses were made by the minister of public education, who represented the president of Spain, by the general secretary of the congress, Mr. Oliver, by the delegate from Italy and by the president of the congress, Dr. Marañón. Receptions were given to the delegates before their return to Madrid, and festivities were held in their honor.

The first plenary session was held September 24. Dr. Capparoni presented an address on Arabic medicine in Spain at the end of the thirteenth century. Dr. Guart spoke on the Persian origin of Arabic medicine. Dr. Angelica Panayotatou, a teacher of hygiene in Alexandria, spoke on the role that both the teachings and the books of Abulkasim (1110 A. D.) and of Averroes (1126-1198) and the many translations of Arabic medical works into Spanish had in the dissemination of medicine in Europe. The Spanish-Arabs of the tenth and eleventh centuries, because of their frequent voyages to the eastern regions of Europe, learned about new methods of treating diseases, new drugs and the preparation of aromatic waters.

Hospitals and reading rooms existed in Spain by that time. The city of Cordoba had fifty hospitals and a library with about 225,000 books, and the rights of the insane to be treated with humanitarianism and the performance of inhalation anesthesia were known by that time. Dr. Bravo spoke on Mohammedan hospitals, physicians and quacks during the reign of Philip II. Dr. Goyanes presented to the audience his translation of Abulkasim's surgery. He made an address in Latin on the importance of the books in the exposition and their meaning to the history of medicine. After the session, the delegates attended the inauguration of the memorial room to Cajal, which contains his death mask, his desk, his microscope and his medals and prizes.

The second session was held September 25. Dr. De Silva Carvalho spoke of medicine at the time of the discovery and colonization of Brazil. Brazilian medicine developed especially from the teachings of a group of Jewish physicians who came to Brazil with the fleet of Pedro Alvarez Cabral and acquired extensive knowledge of diseases of natives and immigrants. Dr. Borzone of Argentina gave a biographic sketch of Manuel Rodriguez de Montonera and emphasized his work on leprosy, that this physician carried on. Dr. Bazzocchi of Italy spoke on medicine and surgery in Peru before the Spanish conquest. Native Peruvians knew something of the therapeutic properties of the fauna, flora and minerals of their soil. The speaker reviewed the history of the treatment of seta and verruga, two native diseases. Dr. Clavijero said that physicians of the old Spanish navy deserve the priority for the administration of vaccination in America.

In the afternoon the delegates were tendered a banquet at the Museo Naval, where they heard lectures on sanitation in the navy and were shown old charts of Spanish explorers and old documents of physicians in the fleets, in which the unhealthful results of feeding the crew with rice were pointed out. In the evening they attended an official reception at the palace of the ministry of foreign affairs.

At the third session, September 26, the topic of medical folk-lore was discussed. Dr. Laignel-Lavastine said that it has both theoretical and practical value. It clarifies several of the factors involved in the evolution of human civilization. Medical folk-lore can be classified into three groups: ethnic, magical and religious and popular folk-lore. It originates in psychologic factors and develops in social factors. Dr. Castiglione reviewed the myths of the medical Italian folk-lore and marked the points of its differentiation from the folk-lore in other countries. Dr. Borzone of Argentina spoke about the method of cutting hair short as a folk-lore method in the prevention of exanthematous typhus in Argentina and he sang popular folk-lore songs, accompanied at the piano by Professor Sphurca. Drs. Karn, Comrie and Sixto spoke on medical folk-lore in Hungary, Scotland and the Philippine Islands, respectively. Dr. Castiglione spoke on the role of the old civilization of the Mediterranean races in the development of medicine. These races inherited the civilization of ancient countries through the Greeks, Romans and Arabians. Arabian Italians and Arabians played an important part in the development of medicine, first in Europe with Galen in Italy and Maimonides in Spain, and then by the discovery of America and colonization. Dr. Gomori spoke on folk-lore in the Balkan countries. Medical folk-lore was an obstacle to the progress of medicine and yet certain folk-lore methods were the basis for scientific studies that resulted in advances in medicine. Bathing originated among the people who lived near the Aegean sea. Rumanians used petroleum as a curative agent and they used the fat of bears for stimulating the growth of hair. There was a suspicion in some oriental countries that malaria was caused by an organism that lived in ponds. Dr. Stoianoff spoke on medical folk-lore in Bulgaria. His interesting article appears in the proceedings of the congress. Dr. Sigerist, direc-

tor of the Institute of the History of Medicine at Johns Hopkins, said that medicine is a social science. Its history should be studied from the sociological and economic angles. The treatment and care of patients are only the means through which medicine obtains its aim, the restoration of healthy individuals to society. The application of medical knowledge is related to social and economic conditions. The members of the Johns Hopkins institute are attempting to establish a new branch of medicine, medical sociology, through which the relations between patients and physicians can be more clearly understood. Dr Decref of Madrid spoke on the hospital for traumatic cases in the Escorial in 1563 and of its role in the development of surgery, and the treatment of fractures in Spain. Dr Hyman I. Goldstein of Camden, N. J., spoke on the priority of Italian physicians in the introduction of liver therapy in anemia. Drs Castellini and Pirera of Naples reported in 1910 and 1912 the results of their work in administering liver extract to patients with anemia. Minot, Murphy and Whipple were unaware of these reports. Dr Felix Martí Ibañez of Barcelona spoke on miracles. There are two large groups of performers: those who pretend to read the stars and those who cure by psychoanalysis, hypnotism, suggestion, chromotherapy, phonotherapy and other methods. In both groups the performers are only exploiters of the faith of the patient. The speaker reviewed the history of the mystical physiology and psychology of India.

At the fifth session, September 27, the delegate from the Philippine Islands spoke on the evolution of medicine and medical folk-lore. Dr Manuel Villaverde reviewed the history of medicine in Cuba, where before the Spanish conquest the natives considered digestive disturbances the cause of all diseases. Drs Guisan and Royo Villanova spoke on medical folk-lore in Switzerland and in the province of Aragon, respectively. Dr Laignel-Lavastine read a paper by Dr Torkoiman on the history of the Sigüenza pharmacy, which was established in 1664. Dr Capparoni spoke on Diego Alvarez Echance, a Spanish physician who accompanied Columbus on his second voyage to America. Dr Javier Cortezo, organizer of the congress and director of *El siglo médico*, gave a biography of Dr Juan Sorapan de Rieros. Dr Francisco J. Blanco Justo delivered an address on the relations between botany and the development of Arabian medicine. Dr Ramiro de Rinedo gave a biography of Saint Isidore, who was a teacher of medicine in Europe in the seventh century.

At the final session, September 28, Dr Reichson emphasized the influence of Galen and his school on the evolution of Scandinavian medicine. Dr Alfonso de la Peña reviewed the evolution of transureteral surgery. Dr Max Neuburger of Vienna gave a biography of Dr Gomez Pereira, Spanish philosopher and physician of Philip II. Dr Isidro de la Villa of the University of Valladolid reported on the ordinances of physicians and pharmacists during the time of the Catholic kings. Dr Sanchez de Rivera spoke on the work of the Spanish physicians of the fifteenth and sixteenth centuries. A visit was paid by the group of Rumanian physicians to the monument erected in the Military Hospital Carabanchel in 1929 to the Spanish physicians who died at Morocco.

The following conclusions were approved. The articles read during the tenth International Congress of the History of Medicine proved that Arabian-Spanish medicine inherited the Greek and Roman civilization and that Spain was the source of dissemination of medicine to the oriental countries; that the civilization of the Latin races had a great influence on the evolution of science and medicine in South America after the colonization in those countries and that medical folk-lore is of importance for the critical study of the origin of civilization and of medicine. It was resolved that further studies on medical folk-lore be made by a committee of members of the International Society of the History of Medicine. The priority of

Carlos Finlay in the discovery of the transmission of yellow fever was proposed and accepted amid applause. A reception and dance was held September 29.

Personal Items

The Gran Cruz del Merito Militar, the highest medal in the Spanish army, has been awarded to Dr Mariano Gomez Ulla for his work as a surgeon in the army. Dr Gomez Ulla is very popular. Members of the parliament voted unanimously to give him the medal.

Two statues were recently unveiled: a bust of Dr Garcia Tapia, professor of otorhinolaryngology at the Faculty of Medicine of Madrid, and a bust of Dr Jose Luis Lopez de Haro. Dr Garcia Tapia's bust was unveiled at Riaza, Segovia. Dr Lopez de Haro's bust was unveiled in Almaden de Minas, a center of mines of mercury. Both physicians are still living.

A ceremony took place in the old University of Alcalá de Henares, September 29, at which the degree "Doctor ad honorem" was bestowed on Drs Max Neuburger of Vienna, Tricot-Royer of Brussels, Howard Dittick of Cleveland, Ohio, Victor Gomiou of Bucharest, Laignel-Lavastine of France, David Giordano of Venice, Pablo Diepgen of Berlin, Reichborn Kjennerud of Oslo and Humphry Rolleston of London.

TURKEY

Oct 14, 1935

The National Medical Congress

The sixth Turkish National Medical Congress has just closed. The sessions of the congress were opened with an address by Premier General Ismet İnönü in which he rehearsed the sacrifices Turkey had made and the efforts put forth in the campaign to control the drug traffic. He concluded with a recommendation that the medical profession continue its efforts to make similar progress in combating the evils of alcoholism and in seeking new light on the understanding and treatment of disease.

Besides the addresses scheduled on the regular program there were addresses by representatives of the Soviet Medical Association who were present as guests of the congress.

Two main subjects for discussion had been chosen. The first was alcohol and other intoxicants. The congress went on record without a dissenting voice, as being in favor of having the government take vigorous steps to control and limit the use of alcoholic beverages. The American experiment in prohibition and its apparent failure were frequently mentioned, but there was a feeling that a similar experiment would probably meet with more success if it was undertaken in Turkey. Dr Fahrettin Kerim Gökay, the general secretary of the association, summed up the discussions on this question. His closing words are noteworthy. He said that though the profession realized that it would have to make progress slowly and in the beginning would probably have to be satisfied if the use of rakı could be limited, it was to be clearly understood that the ultimate goal was absolute prohibition.

The other main subject was rheumatism. The discussions following reports on this subject were so prolonged that a number of papers on miscellaneous subjects that were to have been read on the last day had to be omitted. Emphasis was laid on the value of physical therapy in chronic rheumatic disease and the need of further study along these lines.

The congress prepared a splendid health exhibit for the general public. The various acute contagious diseases, with the method of spread, incubation period, early signs and symptoms were illustrated by pictures, casts, models, and short, vivid sentences. Each disease was presented in a separate booth and the need of skilled medical care for each was emphasized. The subjects were so simply and carefully presented that the information could reach the simplest villager.

In a similar manner the work and progress of the national school for the deaf and blind and of the commissions for the control of tuberculosis, malaria and venereal disease were presented. It is a highly educational exhibit and is to remain open to the public for some months. In the meantime, efforts are being made to get together similar material for a portable exhibit, which can be taken into the villages.

At the closing session of the congress the subjects of hygiene and grip were chosen as the main subjects for discussion at the seventh congress to be held in Ankara in 1937.

ITALY

(From Our Regular Correspondent)

Sept 15, 1935

Problems of Higher Instruction

Problems pertaining to higher instruction have been considered of late by parliament. In the chamber of deputies the minister of public instruction announced that, in some twenty Italian universities, clinics and scientific institutes, all well equipped, have been created, which has required an outlay of about 600,000,000 lire, or \$48,000,000.

Zingale spoke on academic freedom in teaching at Italian universities and on the custom of granting the *venia legendi* in medicine to *privatdozents*. According to the speaker, in recent years the number of *privatdozents* that have been appointed has been large.

In the senate, Professor Giordano recommended a more extensive practical preparation for physicians, who often present themselves for the 'state examination' too soon after graduation from the university. The speaker expressed the view that the *venia legendi* should not be granted to the physician who merely furnishes evidence of having specialized in a given branch of medicine but should be reserved for the physician who demonstrates, at the same time, that he has delved deeply in all the related general sciences.

Senator Maragliano expressed the belief that the minister of public instruction should exercise greater influence in the appointment of university professors than at present. He said also that the instruction in the faculties of medicine is organized on the basis of too doctrinal conceptions, whereas it should be coordinated on the basis of the positive finalities of the studies.

The Academy of Medicine of Turin

Before the Academy of Medicine of Turin Professor Ribeiro of Rio de Janeiro discussed the value of finger prints in legal medicine. Leprosy, he observed, destroys completely the finger prints. This alteration occurs in about 80 per cent of the cases, not only in patients who present nerve lesions but also in those in whom the hand shows no apparent lesions. In the latter cases white lines are observed that cut transversely the figures formed by the papillae, so that it may prove possible to establish an early diagnosis of leprosy dactyloscopically in suspected cases. In the right hand of patients with scleroderma the speaker has observed frank changes that present an entirely different aspect from those of leprosy. Radiologists also develop not infrequently lesions affecting the finger prints. Professor Ribeiro said in conclusion that dactyloscopy preserves nevertheless its medicolegal value, it being impossible to change a finger print or to confound it with another, and even the pathologic lesions constitute a new means of identification.

Petit of the Pasteur Institute of Paris, reported his research on the method of preparing serum with which to combat *Leptospira icteroides*. He observed some similarity between these observations and those characteristic of anterior poliomyelitis and hence he holds that in the spinal cord of patients with poliomyelitis there is a previously unrecognized organism. On injecting a horse with the spinal cord tissue of an animal that died from poliomyelitis, he obtained after three months, serum that had the property of combating the virus of poliomyelitis.

The serum is prepared, at the Pasteur Institute, by the use of the spinal cord tissue of monkeys that have died from poliomyelitis, in about 70 per cent of the horses that are injected in the preparation of the serum there is no production of mumps. The serum has been in use for about fifteen years. The results secured may be summarized thus. If the serum is injected in the preparalytic stage, neither paralysis nor paresis develops. The serum cures the paralysis in a large number of adults but not in children and reduces the mortality about one half.

Visit of French Physicians

A committee of French physicians came to Italy recently to study the application of the law pertaining to compulsory insurance against tuberculosis. They visited first the sanatoriums and the hospitals of Lombardy. They then continued their journey to Rome, where they visited the Carlo Forlanini Institute for the study of tuberculosis. At the Bernardo Ramazzini Sanatorium, Professor Bocchetti explained his ideas concerning postnatorial treatment. The committee visited also the Istituto di igiene e sanita pubblica, the Istituto per lo studio e la cura del cancro, and the Scuola superiore di educazione fisica.

The Public Health Service

Prof. Gianni Petragiani, of the chair of hygiene at the University of Siena, has been appointed "director general" of the public health service.

Prof. Dante De Biasi, academician of Italy, has been appointed director of the Istituto di sanita, a new institute that comprises laboratories of microscopy and bacteriology, as applied to hygiene, laboratories of chemistry, physics and sanitary engineering, a laboratory for biologic researches on the use of opotherapeutic products, a laboratory for investigations on the diffusion and the prophylaxis of malaria, and a laboratory for researches on epidemiology and the prevention of infectious diseases.

Retirement Age for University Professors

To speed the introduction of new blood in the schools and make the conditions of the instructing personnel correspond to those recently established for all civil functionaries, the ministerial cabinet has approved the draft of a law that would reduce by five years the age limit for the compulsory retirement of university professors (at present 75 years) and of school principals and teachers (at present 70 years). The decree will go into effect this year but those who have to leave the service earlier than they anticipated will be allowed certain concessions. For example, in order that teachers may attain the length of service (forty years) necessary to secure the maximum pension, time spent in the supply service will be counted in full.

Marriages

- MARTIN CARL LINDMAN, Rockford, Ill., to Miss Alice Dorothy Port of Youngstown, Ohio, September 2.
 RUBIE M. DURGIN, Berkeley, Calif., to Mr. Andrew B. McKinne of San Francisco, September 14.
 BEVERLY WILKINS NASH to Miss Frances Lucille Bowers, both of Timberville, Va., September 1.
 RICHARD W. TERRILL, Indianapolis, to Miss Frances Brelly of Lawrenceburg, Ind., in September.
 RALPH J. MCQUISTON, Indianapolis, to Miss Barbara Douglas of Franklin, Ind., September 7.
 ALFRED CURTIS ORMOND JR., Zanesville, Ohio, to Miss Anne Shingluff of Cambridge recently.
 THEODORE CAMPBELL THOMPSON, to Miss Cornelia Tomlin, both of New York, August 17.
 EDWARD FRANKLIN BLAND, Boston, to Miss Frances Pomeroy of Winchester, September 7.
 LAWRENCE N. HOST to Miss Gertrude Casey, both of Detroit, September 4.

Deaths

Felix A Larue ♂ New Orleans, Tulane University of Louisiana Medical Department, New Orleans, 1889, in 1898 lecturer and clinical instructor in general operative surgery, including applied anatomy and orthopedics, New Orleans Polyclinic, and in 1900 appointed professor of operative surgery and applied anatomy, when the New Orleans Polyclinic was taken over by Tulane University in 1906 he was given the rank of professor of operative and clinical surgery, in 1924 was made professor emeritus, secretary and treasurer of the Louisiana Board of Medical Examiners, 1905-1910, for many years physician for the French consulate, and in 1913 was awarded the *Officier d'Instruction Publique* by the French government, for many years a member of the board of directors of the Mercy Hospital and St Mary's Orphan Asylum, aged 70 died, October 5, in the Touro Infirmary

Morgan Smith ♂ Little Rock, Ark., Arkansas Industrial University Medical Department, Little Rock, 1889, Tulane University of Louisiana Medical Department, New Orleans 1904, member of the House of Delegates of the American Medical Association, 1912-1914, professor of pediatrics and formerly dean, University of Arkansas School of Medicine, past president and secretary of the Arkansas Medical Society, at one time member of the state board of health and state health officer, member of the American Academy of Pediatrics, fellow of the American College of Physicians on the staffs of the Little Rock General and Baptist State hospitals and St. Vincent's Infirmary, aged 67, died, September 14, of arteriosclerotic heart disease

Daniel Kerfoot Shute ♂ Washington, D C., Columbian University Medical Department, Washington D C., 1883 professor emeritus of clinical ophthalmology, George Washington University School of Medicine and formerly prosector to the chair of anatomy, lecturer, and professor of anatomy past president of the Medical Society of the District of Columbia, member of the American Academy of Ophthalmology and Otolaryngology and fellow of the American College of Surgeons, on the staffs of the Providence Hospital, Central Dispensary and Emergency Hospital, Columbia Hospital, St Elizabeth's Hospital and the George Washington University Hospital, aged 76, died suddenly, October 21, of arteriosclerosis and coronary thrombus

Albert Edward Roussel ♂ Philadelphia, Jefferson Medical College of Philadelphia 1882, emeritus professor of medicine, University of Pennsylvania Graduate School of Medicine formerly associate professor of practice and clinical medicine, Medico-Chirurgical College of Philadelphia, fellow of the American College of Physicians, awarded *Officier d'Academie* and *Chevalier de la Legion d'Honneur* formerly physician to the French and the Argentine consulates aged 72 died, November 2, in the Graduate Hospital of the University of Pennsylvania, of heart disease.

Peter Conover Field ♂ Colonel U S Army, retired, Pasadena, Calif., College of Physicians and Surgeons Medical Department of Columbia College, New York, 1895 fellow of the American College of Surgeons, entered the regular army as an assistant surgeon in 1901, was appointed a captain in the medical corps in 1906 served during the World War in 1927 was made a colonel retired in 1932 for disability in line of duty, aged 65, died, September 9

John McCabe ♂ New York, Columbia University College of Physicians and Surgeons, New York 1902 formerly professor of internal medicine New York Polyclinic Medical School and Hospital and instructor of pediatrics, Bellevue Hospital Medical College aged 57, on the staffs of the New York City Hospital, Jewish Memorial Hospital Long Beach Hospital and the Midtown Hospital where he died October 7, of cerebral hemorrhage.

Cosam Julian Bartlett ♂ Colonel U S Army, retired, Santa Cruz, Calif., University of California Medical Department, San Francisco 1898 entered the regular army as an assistant surgeon in 1901, was appointed a captain in the medical corps in 1906 and a colonel in 1927 served during the World War, retired in 1934 for disability in line of duty, aged 61 died, September 7, in Los Angeles, of coronary occlusion and myocarditis

Charles Parsons Gildersleeve, Port Jefferson, N Y College of Physicians and Surgeons Medical Department of Columbia College, New York 1881, member of the Medical Society of the State of New York, fellow of the American College

of Surgeons, consulting surgeon to St Peter's Hospital, Brooklyn and St. Anthony's Hospital, Woodhaven, N Y, aged 75, died, September 28 of coronary heart disease

Clarence Carl Pflaum, Duluth, Minn., University of Minnesota Medical School, Minneapolis, 1930 member of the Missouri State Medical Association, formerly assistant professor of pathology University of Missouri School of Medicine Columbia aged 35 on the staff of St Luke's Hospital, where he died September 10, of suppurative otitis media, cerebral abscess and secondary meningitis

Heinz Langer, Pittsburgh Friedrich-Alexanders-Universität Medizinische Fakultät, Erlangen, Bavaria, Germany, 1917, member of the Medical Society of the State of Pennsylvania and the American Roentgen Ray Society, served during the World War, aged 47 on the staff of the Western Pennsylvania Hospital, where he died, September 28, of pneumonia

Robert George William Dalby, Ann Arbor, Mich., University of Michigan Medical School, Ann Arbor, 1931, member of the Michigan State Medical Society, instructor in obstetrics and gynecology at his alma mater, on the staff of the University Hospital, aged 29, killed, September 29, in an automobile accident near Northville.

John Francis McEncroe, Schenectady, N Y, College of Physicians and Surgeons, Medical Department of Columbia College New York, 1887, an Affiliate Fellow of the American Medical Association, for many years city physician and police surgeon, aged 74, on the staff of the Ellis Hospital, where he died October 2

Rachel A Watkins Long, Holdrege, Neb., College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906 member of the Nebraska State Medical Association, secretary and past president of the Phelps County Medical Society, aged 55, died, September 29, of carcinoma

Solomon Garfield Smelser, Liberty, Ind., Medical College of Indiana, Indianapolis, 1905 member of the Indiana State Medical Association formerly member of the state board of medical registration and examination, served during the World War aged 55 died, September 16, of sarcoma

Thomas Bernard McQuaid, Everett, Mass., Dartmouth Medical School, Hanover, N H, 1896 member of the Massachusetts Medical Society, member of the local board of health on the staff of the Whidden Memorial Hospital, aged 75, died, September 19, in Webster, of pneumonia

Fred Lewis Neely ♂ Shelton, Wash., Western University Faculty of Medicine, London, Ont., Canada, 1908, served in the Canadian Army during the World War, aged 50, died September 12, in Olympia, as a result of brain injuries received when he fell from a four story hotel window

Isadore Maurice Leavy ♂ Lynbrook, N Y, Long Island College Hospital, Brooklyn, 1911, served during the World War, on the staff of the Montefiore Hospital for Chronic Diseases New York, aged 46, died, October 7, in the Mount Sinai Hospital, New York, of pneumonia

John Brett Trainor, Fall River, Mass., McGill University Faculty of Medicine, Montreal, Que., Canada, 1897, member of the Massachusetts Medical Society, aged 67, on the staffs of the Union Hospital and St Anne's Hospital, where he died, September 20, of cerebral thrombosis

Isidor J Propper ♂ Gary, Ind., Cleveland College of Physicians and Surgeons, Medical Department Ohio Wesleyan University, 1900, aged 67, on the staffs of St Mary's Mercy Hospital and the Methodist Episcopal Hospital, where he died, September 27, of pneumonia

Frank Guy Devereux, Portland, Maine, College of Physicians and Surgeons, Medical Department of Columbia College New York 1880 member of the Maine Medical Association aged 76 died October 2, in the Maine General Hospital, of coronary occlusion

Lotharo L Morey, Vandalia Ill Physio Medical Institute Cincinnati, 1881 Physio-Medical College of Indiana, Indianapolis, 1882, member of the Illinois State Medical Society, aged 78, died September 14 of interstitial nephritis

Osmon Charles Church, Steeleville, Ill Barnes Medical College St Louis, 1910 member of the Illinois State Medical Society, served during the World War, aged 61 died, September 9, in the Christian Welfare Hospital, East St Louis

Joseph Pinkney Turner ♂ Greensboro, N C. University of Maryland School of Medicine, Baltimore, 1896 medical director of the Jefferson Standard Life Insurance Company, aged 63, died, September 29, of coronary thrombosis

Joseph Francis Fallon, Brookline, Mass., Jefferson Medical College of Philadelphia, 1908, member of the Massachusetts Medical Society, served during the World War, aged 53, died, October 14, of hemorrhage due to ruptured esophageal varices

J Fred Eckerson, Shelby, N Y., University of Buffalo School of Medicine, 1899, member of the Medical Society of the State of New York, aged 58, died, September 10, in Medina, of cerebral hemorrhage and hypertension

George Junkin Gouger, Concord, N C. (licensed in North Carolina in 1901), member of the Medical Society of the State of North Carolina, aged 73, died, September 12, of coronary thrombosis and pernicious anemia

Osmyn Baker, Penns Grove, N J. Columbian University Medical Department, Washington, D C., 1899, aged 68, died, October 11, in the Homeopathic Hospital, Wilmington, Del., of cerebral hemorrhage

William Frank Henderson, Blacksburg, Va., Washington University School of Medicine, Baltimore, 1876, member of the Medical Society of Virginia, aged 81, died, September 23, of chronic myocarditis

Auxilien Clement J Gervais, Milton, N Y., University of Vermont College of Medicine, Burlington, 1927, aged 34, died, September 20, in the Vassar Hospital, Poughkeepsie, of chronic nephritis

Arthur Densmore Spence, South Lebanon, Ohio, Miami Medical College, Cincinnati, 1895, member of the Ohio State Medical Association, aged 67, died, October 4, of arteriosclerosis

Alphonso A W Bley, Los Angeles, University of Pennsylvania Department of Medicine, Philadelphia, 1886, also a pharmacist, aged 83, died, September 29, of gastric ulcer

James Edward Poulin, Waterville, Maine, Medical School of Maine, Portland, 1905, on the staff of the Thayer Hospital, aged 55, died, October 2, of lobar pneumonia

Otto Elbert Harmon, Kiowa, Kan., Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1905, aged 61, died, September 17, of carcinoma of the jejunum

James Allan Todd, Toronto, Ont., Canada, University of Toronto Faculty of Medicine, 1879, L R C S, L R C P, Edinburgh, Scotland, 1880, aged 82, died, September 19

William Henry Bennett, Los Angeles, Tufts College Medical School, Boston, 1906, served during the World War, aged 65, died, September 4, of carcinoma of the stomach

Francis Emanuel McNamara, Milwaukee, Hahnemann Medical College and Hospital, Chicago, 1879, aged 79, died, September 17, of atrophic cirrhosis of the liver

Allison Herbert Edwards, Grand Rapids, Mich., Grand Rapids Medical College, 1900, city health officer, aged 53, died, September 29, of coronary occlusion

Otho Christian Buxton, Webster City, Iowa, King Eclectic Medical College, Des Moines, 1885, aged 78, died, September 17, of coronary thrombosis

William Stevenson, Des Moines, Iowa, Drake University Medical Department, Des Moines, 1894, aged 77, died, September 15, of pernicious anemia

William Myron Edgerton, Wichita, Kan., St Louis College of Physicians and Surgeons, 1899, aged 65, died, September 12, of cerebral hemorrhage

Frank Wilmoth Gray, Washington, D C., Howard University College of Medicine, Washington, 1925, aged 42, died, October 20, of bronchopneumonia

John M Campbell, Russellville, Ark., Memphis (Tenn.) Hospital Medical College, 1890, police judge, formerly mayor, aged 76, died, August 28

Edward Abeles, Leavenworth, Kan., Harvard University Medical School, Boston, 1878, aged 80, died, September 21, of cerebral hemorrhage

Cyrus B Phillips, Pitman, N J., University of Maryland School of Medicine, Baltimore, 1882, aged 76, died, September 16, of heart disease

Cyrus Maxwell Boger, Parkersburg, W Va., Hahnemann Medical College and Hospital of Philadelphia, 1888, aged 74, died, September 2

John H Dubbs, Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1891, aged 67, died, September 6

Edward Francis Lawlor, Lawrence, Mass., Baltimore Medical College, 1905, aged 57, died, October 6, of coronary sclerosis

Loring V Miner, Sublette, Kan. (licensed in Kansas in 1901), aged 75, died, September 30, in an automobile accident.

Correspondence

INJECTION METHOD FOR HERNIA

To the Editor—In the past four months a number of my patients who have had injections for sclerosing inguinal hernias have reported that they have been sexually impotent since the injections of the sclerosing fluid. One dated back to eight years, several to two years, and one was of four months.

I think the patient should be told of the possibility of sexual impotence following the use of these injections in all inguinal hernias

OSCAR A STRAUSS, M.D., Chicago.

THE TUBERCULIN REACTION

To the Editor—Dr Ustvedt's statement (*THE JOURNAL*, March 9, p 851) that "tuberculin negative individuals who are not exposed to infection cannot be expected to develop clinical tuberculosis" has been the crux of our argument, which Dr Harrington and I have emphasized in numerous publications for fifteen years. Therefore his statement that "this is a fact that has been neglected by many investigators and lately by Myers and Harrington" is hardly justified. On this point, we are in complete agreement with Ustvedt. One of the objects of our paper (*THE JOURNAL*, Nov 17, 1934, p 1530) was to emphasize the fact that children who react negatively to the tuberculin test, when observed over a period of years and into adult life, are much better risks from the standpoint of the development of clinical tuberculosis than children who at the same time have positive tuberculin reactions. To be sure, each of our negative reactors who later developed clinical tuberculosis first became a positive reactor, whereupon the tuberculosis status was essentially the same as in the group who originally reacted positively to the test, that is, in each instance they developed the benign first infection type of tuberculosis, which every one of our originally positive reactors had when our observations began. One of the main points of our paper was to emphasize the fact that apparently healthy children who react positively to the tuberculin test are not as well immunized as we formerly believed. Already 10 per cent of those whom we examined fourteen years ago have developed clinical forms of disease. Such a record in smallpox or diphtheria would dampen enthusiasm for immunization against these diseases.

Dr Ustvedt calls attention to the observations of Dr Heimbeck, which showed that all the student nurses who were negative to the tuberculin test on admission to the nursing school became positive tuberculin reactors by the time of graduation, and that, during the three years of training, 48 per cent of the girls who were positive to the tuberculin test when they entered training developed clinical tuberculosis before graduation, while 34.6 per cent who were originally negative developed clinical tuberculosis, "including milder forms of tuberculous disease, as erythema nodosum."

On analysis of Dr Heimbeck's figures, one is impressed with the large number of originally negative reactors grouped as having developed clinical disease, who had only erythema nodosum, enlargement of the hilus lymph nodes, and so on. If Dr Heimbeck's students develop the same types of lesions as did the students of nursing and medicine we have observed, many of those he describes with parenchymal lesions must have been due only to the first infection benign type of tuberculosis. We do not look on erythema nodosum, enlarged hilus lymph nodes, or even parenchymal lesions of the first infection type as clinical disease in the strict sense of the word. We have not yet seen one of these persons, either in childhood or in adult life, fall ill from the first infection type of focus per se. When symptoms do appear in this group, they are due in our experience to a manifest complication.

One must assume, therefore, that the 346 per cent of previously negative reactors who, according to Dr Heimbeck's classification developed clinical tuberculosis for the most part had lesions of the first infection type. If this should be carried to its logical conclusion all the girls who became positive to the tuberculin reaction had clinical disease, since all of them must have had lesions somewhere in the body in order to produce positive tuberculin reactions. The fact that the roentgen examination of the chest did not reveal enlargement of the lymph nodes or parenchymal lesions, and the fact that erythema nodosum did not occur, does not rule out lesions so small that the x-ray film would not reveal them in the lungs or hilus lymph nodes or in other parts of the body which do not lend themselves to roentgen examination. Moreover all the girls who entered the school of nursing with positive tuberculin reactions had first infection type of lesions somewhere in their bodies. If one had a complete history of each case and serial x-ray films, in all probability it would be found that they had already passed through the form of tuberculosis which has been seen to develop among the negative reactors when they became positive. Therefore, according to Heimbeck's classification, each of these girls who gave a history of having had erythema nodosum, or had an x-ray film showing at some previous time enlargement of the hilus nodes or even parenchymal involvement, would have to be classified as clinical cases of tuberculosis. The only difference in the two groups is that he saw the one group experience what the other group had experienced before they came under his observation.

In one of our groups of positive reactors, there was x-ray evidence of disease in approximately 22 per cent on first examination, such as pneumonic areas about first infection foci, deposits of calcium in the hilus, and Ghon tubercle formation in the lung parenchyma. If a very complete history were obtainable, in all probability there would be enough others who had had attacks of erythema nodosum and other mild manifestations of the first infection type of disease to increase our percentage to approximately that which Heimbeck observed in his previously negative group of nurses.

During the past fifteen years we have observed the complete evolution of tuberculosis in the bodies of a good many children and adults, that is, we have seen the tuberculin test first become positive and have watched the first infection type of disease develop and come under control without producing any significant symptoms. Later, in the same cases we have observed the reinfection, destructive type of disease make its appearance and progress to the advanced stage with serious illness and in some instances death. We have carefully observed persons negative to the tuberculin test, who later became positive. In the small percentage of this group who develop parenchymal lesions of the first infection type there is an interval of from several weeks to four or five months after the test becomes positive before the lesion is large enough to cast a shadow that can be visualized on the x-ray film. Although these persons are not ill there is an immediate and a remote danger. The immediate danger consists chiefly of bacilli from the first infection focus finding their way to a ramification of a bronchus, the pleura, the blood stream or the subarachnoid space. Tuberculous pneumonia in a very destructive form may follow the outpouring of bacilli in a bronchial ramification. When the lesions are located near the periphery of the lung pleurisy with effusion, which is a reinfection form of tuberculosis, is a rather common immediate danger. Again when the lesion, whether in the parenchyma or in the regional lymph nodes, burrows into a blood vessel, miliary tuberculosis often follows. This also is a reinfection form of disease. When a first infection focus is in or near the central nervous system and its bacilli are set free into one of the ventricles of the brain or directly into the subarachnoid space diffuse tuberculous meningitis usually results. Any one who watches a sufficiently large

group of negative reactors become positive will see some of these reinfection types of tuberculosis, which develop soon after the first infection type of focus is established. Wallgren (*J Pediat* 5 291 [Sept] 1934) has pointed out that these fatal forms of tuberculosis in infants occur most frequently within the first three months after infection develops. Dr Heimbeck has already reported a few such cases among student nurses.

The remote dangers develop long after the first infection focus is laid down and consist of chronic lesions which make their appearance in the lung, kidney, bones and joints. No one can observe a sufficiently large group of negative reactors a long time after they become positive to the tuberculin test without seeing some suffer from these remote dangers. In reality the groups Scheel, Ustvedt and Heimbeck have compared are not comparable unless they know the tuberculosis situation among the ranks from which their positive tuberculin reactors came. The only way a true comparison can be made is to observe the negative reactors who become positive over a period as long as their positive reactors have been positive.

We would be interested to know whether Dr Scheel, reporting on medical students, and Dr Ustvedt, reporting on 4,800 children, used the same classification as Dr Heimbeck with reference to clinical disease. In our group, only cases of frank pulmonary tuberculosis of the destructive reinfection type were included. Apparently, the chief point of misunderstanding lies in the different ways in which cases of tuberculosis are classified. If the same classification was used, we are apparently in very close agreement.

Dr Ustvedt mentions allergy in both his first and concluding paragraphs, and he shows a tendency to minimize its importance. He calls attention to a group of patients with erythema nodosum in which there was a high degree of allergy. In this group there was a morbidity of 103 per cent during the first year and for the following years up to the tenth from 3 to 0 per cent. We are cognizant of the fact that erythema nodosum is sometimes the result of a high degree of allergy to tuberculo-protein but by no means do we consider every case as due to this cause. For example, Pilot (*Central Society for Clinical Research*, October 1933, p 16) after making a careful study of this condition said "It would appear that erythema nodosum is not a clinical entity but a peculiar hypersensitive response of the skin to toxic products from foci of infection due to streptococci, tubercle bacilli, the virus of lymphogranuloma inguinale and perhaps other agents." Therefore there hardly seems justification for considering every case of erythema nodosum as due to tuberculosis, even though the tuberculin test is markedly positive. The South African studies (*Publications of the South African Institute for Medical Research* Johannesburg, vol 5, 1932, *Bull Internat Union Against Tuberculosis* 12 234 [July] 1935), which showed that the highly allergic individuals were far more likely to develop true clinical disease than others, are significant in this connection.

It seems paradoxical to look on allergy to pollens and foods as being a responsible factor for the development of hay fever, some forms of asthma, rhinitis and gastro-intestinal disturbance, and at the same time to look on allergy to tuberculo-protein not only as a factor without harm but one that is beneficial to the human body. There has been an abundance of experimental work to show that allergy is the cause of the much more intense reaction of the tissues to tubercle bacilli of reinfection than is seen in first infection. The harmful effect of allergy to tuberculo-protein is now recognized by such large numbers of workers that we are already looking forward to a method of desensitizing highly allergic individuals in order to prevent necrosis and great destruction of tissue from the reinfection type of disease.

J ARTHUR MYERS, M D, Minneapolis

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address but these will be omitted on request.

ANGINAL ATTACKS WITH GALLBLADDER INFECTION

To the Editor—Kindly discuss the following symptom complex, suggesting the diagnosis, prognosis and treatment including the diet. A man aged 59 single complains of repeated attacks of an anginal syndrome while walking characterized by a feeling of pressure or constriction behind the manubrium sterni which is relieved by coming to a stop or on sitting down. There is no pain associated with the discomfort no dyspnea a slight increase in the pulse rate and it does not radiate but remains fixed back of the sternum necessitating slowing up or sitting down. It passes away in from three to six minutes. He is extremely nervous owing to difficulties at his place of employment. He had insomnia which lasted throughout the latter eight months of 1934 but from which he is now fairly recovered. The chest discomfort first manifested itself during the first week of February 1935, and during March it appeared every second or third day with the same train of symptoms. During April the same thing happened seven times while in May and June it averaged about once weekly. On one occasion it followed a slight difference of opinion with a neighbor. In two or three other instances it manifested itself while he was slowly walking after partaking of a large meal on two of the latter occasions he appeared exhausted, with a somewhat irregular pulse which became regular in a very short time. The heart is not enlarged (the cardiac shadow is normal) and the radial pulse is full and regular, averaging from 60 to 78 throughout the twenty-four hours. It is negative as to murmurs. The blood pressure averages about 105 systolic 68 diastolic he has had low blood pressure for the last fifteen years. The cardiogram in April and June of this year as well as in 1933 was negative. Fluoroscopic examination on various occasions revealed an abundance of gas in the stomach with a pushing up of the left side of the diaphragm. There is a history of cholecystitis with possible stones beginning in 1918 (last colic which was never of the passing stone type, in 1929). The patient has been adhering to a strict low fat diet and relieving the colic with rectal enemas an ice bag and morphine. Many roentgenograms have been taken the last one about two years ago when the gallbladder was not visualized. The roentgenologist's report was pathologic gallbladder. From 1918 to 1929 the patient had about fifteen attacks of dull pain about the gallbladder and on five different occasions had attacks of syncope necessitating his removal to the hospital. The attacks of 1918, 1921 and 1925 came on without warning four or five hours after eating. When he recovered from these attacks gastric discomfort followed by vomiting relieved him completely, and he was able to return to his usual duties within twenty-four hours. The syncopal attacks of 1929 and 1933 were not followed by vomiting but as usual the patient was well in twenty-four hours during his last gallbladder colic in 1929 he was jaundiced for forty-eight hours, the skin and urine cleared up in the time mentioned. The latter happened again during the latter part of the same year. He is not a drinker never had syphilis has normal urine weighs (stripped) 163 pounds (74 kg.) is 66 inches (168 cm.) high and is the picture of health.

M D New York.

ANSWER—The association of myocardial disease and disorders of the gallbladder is a common one and the etiologic role of gallbladder disease in the production of myocardial disease has been recognized for many years. Whether this relationship obtains here can only be conjectured. In spite of negative electrocardiographic observations, frequently observed in cases of the type described, there is no question that this patient suffers from stenocardiac attacks on a myocardial basis. Anginal attacks and even coronary occlusion occur without pain, the only subjective disturbances noted by the patient being precordial pressure or severe dyspnea. Other signs elicited on examination are changes in the rate and rhythm of the pulse as already noted, and in some instances a drop in the systolic blood pressure during or immediately after an attack. Electrocardiographic evidences of myocardial disease may be found only after many years or never. Patients with severe biliary colic may faint if the pain is very intense. Rarely there may be a Stokes-Adams syndrome, but it is hardly possible that it has occurred in this case without some electrocardiographic evidence being found. It should not be difficult to offer advice for prevention of attacks, because the patient himself has noticed that overeating, exertion such as walking after eating, and emotional or gastro-intestinal upsets provoke attacks. Not infrequently cardiac attacks are associated with fullness and belching after eating, so that the condition is diagnosed as "indigestion" and the effect taken for the cause.

It is advisable for the patient to avoid overeating at any one particular meal particularly the many course big dinners, to avoid highly spiced foods and alcoholic beverages, to rest for at least an hour or more after each meal, and under all circumstances avoid undue exertion and emotional upsets. For immediate relief of the attacks glyceryl trinitrate tablets in

0.00065 Gm ($\frac{1}{100}$ grain) doses should be placed under the tongue. Relief is generally obtained after one or two tablets at intervals of two minutes. Some physicians object to the drug because of lowering blood pressure with the resultant diminishing coronary flow. This objection is more academic than real. One of the methylxanthine preparations, such as aminophylline, may be given three times daily for its tendency to promote coronary flow. A combination of 1 Gm. (15 grains) of sodium bromide in 75 cc (2 drachms) of rubarb and cod mixture after meals may relieve both the epigastric and the subjective cardiac distress.

Mackenzie's favorite drug for this was ammonium bromide in 1 Gm doses taken frequently enough to keep the patient free from subjective discomfort, later decreasing the dose. Finally the question of a cholecystectomy must be considered. Should the patient have a recurrence of colic especially of the obstructive biliary type, operation may be advisable as a curative measure for the calculous condition and prophylactic for the cardiac condition.

EPIPHYSEOLYSIS

To the Editor—In August 1934 a boy, aged 15 years fell from his horse. He got up and walked and continued doing his usual farm work, not considering that he was badly hurt. He now states that his only sign of injury was that his leg on the inside and front of the thigh turned black and blue. A month after the fall he began to limp slightly. His lameness gradually became worse. When he came to me in April 1935 he was walking with difficulty with the aid of a crutch. He complained of pain in his knee of pain at night after a strenuous day and of pain in his hip if he lay on the injured side at night. The boy was fat weighing 191 pounds (86 Kg.). His height was 65 inches (165 cm.). There is eversion of the foot on the injured right side and apparent shortening of the right leg of half an inch. Accurate measurement is difficult because of rolls of fat overlying the anterior superior spines. Flexion at the hip joint elicited pain. Roentgen examination discloses pathologic change in the head and neck of the femur, apparently a slipping of the epiphyseal end. The roentgenogram looks like an impacted fracture of the surgical neck of the femur but the clinical history does not line up well with such a diagnosis. I never have known a patient with fracture of the neck of the femur to walk for a month before going lame. Along with the foregoing I suspect endocrinism since at 15 years of age the external genitals are almost infantile in their lack of development. I should like to have suggestions as to diagnosis, prognosis and treatment. At this time I have had the patient in bed six weeks on a reduced diet using sand bags for supporting the leg in a comfortable position. He is now free from pain. Please omit name.

M D Kansas.

ANSWER—The history justifies a diagnosis of "slipping of the proximal femoral epiphysis" or as it has sometimes been called, "epiphyseolysis." This condition is not uncommon. Most of the patients are boys of from 13 to 15 years of age who are abnormally fat. The obesity is particularly marked about the hips, and the patients usually show retardation in sexual development. This picture is sometimes spoken of as Froelich's syndrome.

The theories regarding the etiology of the slipping of the capital epiphysis of the femur vary from one of a purely mechanical basis to that which attributes the condition to disturbances of the endocrine glands. The strain of weight bearing may be the only extrinsic factor to cause the epiphysis to begin to slip, but not infrequently a history can be obtained of minimal trauma such as a fall that causes no immediate symptom or disability. The condition is a progressive one and unless treatment is instituted the slipping usually continues, with some bending down of the neck of the femur until there is marked deformity and disability. Occasionally the capital epiphysis will become completely detached from the neck, remaining as a loose body in the hip joint.

Regardless of what type of treatment is used healing occurs only by the fusing of this epiphysis to the neck of the femur, thus arresting any further growth from the epiphyseal cartilage at this level. This causes little difference in leg length, since the condition itself is usually present after most of the longitudinal growth has been completed, and less than 10 per cent of the growth of the femur itself takes place from this epiphysis.

Treatment that has been most effective is complete immobilization in a plaster body and leg cast, which keeps the affected leg in a position of extreme abduction and internal rotation. The position is the same as that recommended by Whitman for fractures of the neck of the femur. Medical and dietary measures are indicated to attempt to reduce the weight, and beneficial results have been reported from the oral administration of desiccated thyroid.

The shortest period in which one can hope to obtain complete healing is from six to nine months. Roentgenograms should be taken of the opposite hip, since not uncommonly the condition is bilateral, and, if the patient is allowed to be ambulatory on

crutches with the hip that is most marked protected by a cast, slipping of the opposite capital epiphysis may occur

The diet, besides being low in fat, should contain more than the usual amount of vitamins and calcium. There is little evidence that the addition of the inorganic salts of calcium and phosphorus are of any therapeutic value

ERYSIPELAS

To the Editor—I have under my care a man aged 22 who for the past five years has had recurrent attacks of pain swelling and redness on the anterior surface of the legs. He states that the first attack was accompanied by a chill high fever vomiting and headaches. These attacks occur from every two to nine months. The skin lesion occurs on either of the legs but never on the two at the same time. The constitutional symptoms have become milder with each succeeding attack. The skin lesion is a red swollen area with elevated border and feels warm to the touch. A diagnosis of recurrent erysipelas was made and during his present attack he was given 10 cc. of erysipelas antitoxin from which he suffered an allergic reaction a week following the injection. At present I am using ultraviolet irradiation and Parke Davis & Co's Erysipelas Streptococcus Immunogen. Will you please make suggestions for further treatment? Please omit name. MD Texas

ANSWER—Erysipelas is recognized as more than a local disease. There is a general lowered resistance to the streptococcus producing such symptoms. The use of streptococcus toxin and vaccine together in producing active immunization offers the most effective method of prevention of recurrent attacks of the disease. The streptococcus if possible should be obtained from the skin of the patient.

Birkhaug (Nelson Loose Leaf Medicine 1 4490) advised injections intramuscularly every seven to ten days with gradually increasing dosages for seven to eight weeks from a mixture of about 1,000 skin test doses of toxin and 2,000,000 killed streptococci to about 200,000 skin test doses of toxin and 100,000,000 killed streptococci. The majority are protected for two years. The persistence of immunity is determined by intradermal injections of from seven to ten skin test doses of toxin and about 10,000 killed erysipelas streptococci. If there is a red areola larger than 1 cm., the active immunization should be repeated. The test may be repeated every three months if desired.

Nonspecific protein therapy has been of value in raising the immunity, especially in the treatment of erysipelas. However the antitoxin has been reported on most favorably with a lowered morbidity and mortality in the treatment, but no permanent immunity is given and it is not indicated in preventive treatment (Symmers, Douglas, and Lewis, K. M. The Antitoxin Treatment of Erysipelas, THE JOURNAL Sept 24 1932 p 1082).

Fantus briefly reviewed the general treatment in THE JOURNAL, July 21, 1934. The young, the aged and debilitated individuals have a much lowered resistance to the disease. General measures are particularly important in these cases.

DERMATOMYOSITIS

To the Editor—I have a daughter aged 24 who has been bedfast for five months with what has been diagnosed by able men in San Francisco as dermatomyositis. As I am unable to find anything in my textbooks or in current medical literature to which I have access and as I have not been able to find out much about this trouble from the doctors I have consulted, I am asking you to cite references to me or assist me in any way that you feel that you can in ascertaining the latest and best medical light on this subject. Needless to say I am greatly concerned as to the outcome of the case and practically in the dark as to the cause and rational therapy. MD California

ANSWER—Dermatomyositis was described years ago and was given its name by Unverricht in 1891. It is an acute or chronic disease characterized by an insidious onset with vague symptoms such as malaise, anorexia and pain in the back and extremities. These are followed more or less promptly by local edema with an inflammation and degeneration of the muscles and with some form of dermatitis, eczematoid, erysipeloid, urticarial, scleroderma-like, or nodular, such as erythema multiforme or erythema nodosum. Its usual location is on the extremities.

The edema may be soft or hard and is followed by atrophy, sometimes by pigmentation. The disease is supposedly infectious often preceded by infection of the upper respiratory tract. *Bacillus coli*, staphylococci, streptococci or meningococci have been found in the muscles in various cases.

The prognosis is grave. Fifty per cent of the patients die. The acute cases last only one or two weeks, the chronic ones may last as long as two and one half years. Remissions are common, not seldom being followed by exacerbations. When

recovery occurs more or less atrophy must be expected and measures to prevent contractures should be taken early in the course of the chronic cases.

The treatment consists of rest in bed with a good diet, care of the emunctories and of the skin, but without massage.

J. C. McGarrahan (Dermatomyositis, THE JOURNAL, March 3 1934, p 680) made cultures from the nose and tested vaccines made from them by endermic injection. Only those made from the staphylococcus gave a positive skin reaction. The use of a mixture of three staphylococcus vaccines gave prompt improvement.

McGarrahan's case was peculiar in its eosinophilia, as high at one time as 29 per cent. Four weeks after the beginning of treatment with vaccine, it had reduced to 5 per cent and there was a corresponding clinical improvement. The high eosinophilia increased the difficulty of differentiation between dermatomyositis and trichinosis, the disease that most closely resembles it clinically. The history of eating raw pork, the stormy onset not uncommon in trichinosis, and the discovery of embryo trichinae in bits of muscle from near the attachment of a tendon should clear the diagnosis. Removal of infected teeth in McGarrahan's case had little effect. For local treatment he used dry hot flannel bandages with additional baking of the affected parts for a half hour at a time, three times daily.

W. G. Brock (Dermatomyositis and Diffuse Scleroderma, Arch. Dermat. & Syph. 30 227 [Aug.] 1934) tried aminoacetic acid without effect. If desired, it can be given in doses of from 0.6 to 2.0 Gm daily, divided into two or three doses. Brock got the greatest benefit from intravenous injections of typhoid vaccine.

Short accounts of the disease are to be found in Pusey's Dermatology, fourth edition, New York, D. Appleton & Co., 1924; in Sutton's Diseases of the Skin, ninth edition, St. Louis, C. V. Mosby Company 1935; and in Ormsby's Diseases of the Skin, fourth edition, Philadelphia, Lea and Febiger, 1934. All these give references to articles in the literature.

Another recent article is the one by J. T. Ingram and M. J. Stewart (Brit. J. Dermat. & Syph. 46 53 [Feb.] 1934).

DISORDERS OF MENSTRUATION

To the Editor—I have a patient aged 13 years who has had excessive menstruation for about a year. The family history and personal history are negative except that the mother has always menstruated more than normal. About two years ago the patient began to have marked development of secondary sexual characteristics. About a year ago she stumbled while running and since has had excessive flow to the extent of becoming very anemic and not able to be about during her menses. During the last few months she has had vomiting on the first day with much pain following and an excessive flow. On examination the patient is normal otherwise with first degree backward tipping of the uterus and some anemia. She has taken the usual medication and ovarian preparations without any benefit. Please advise as to treatment and probable pathologic condition. Please omit my name and address. MD, Kansas

ANSWER—This is most likely a case of functional uterine bleeding associated with hyperplasia of the endometrium. The condition is now believed to be due to a hypophyseal disturbance. The way to prove the diagnosis of hyperplasia is to perform a curettage. For this purpose the cervix need not be dilated much and only a small amount of material need be curetted out of the uterine canal. Any pathologist can readily make the diagnosis from curetted material. The curettage will also help to rule out any other possible cause of bleeding, such as an intra-uterine polyp.

Functional bleeding may occur at any time in the menstrual cycle but chiefly at the beginning and at the end of the reproductive career when it is spoken of as the 'hemorrhage of puberty and climacteric' or 'menopausal hemorrhage' respectively. The large majority of cases are observed at the time of the menopause.

Ovarian preparations will most likely be of little avail in the treatment of this condition. In most cases of functional bleeding there is not only hyperplasia of the endometrium but also absence of functioning corpora lutea in the ovaries. The changes in the endometrium are the result of an excessive proliferation due to stimulation by an abnormal amount of estrogenic substance. To overcome this condition Novak has recommended the use of anterior pituitary-like gonadotropic extract from the urine of pregnant women. He and others have reported encouraging results with this substance. In women at or near the menopause, one may resort to radiation therapy or to hysterectomy. In a young girl, however, efforts must be made to build up the patient's general resistance, food and drugs should

be prescribed to combat the anemia, and the so-called anterior pituitary-like extract should be administered hypodermically. Occasionally there are spontaneous cures of functional bleeding, especially in young girls.

PILONIDAL SINUS

To the Editor—Will you kindly inform me how to judge the extent of the incision for complete eradication of a pilonidal sinus also land marks injection of dyes and so on? Also please refer me to literature on the subject

SIMON ENGLANDER, M.D. Cleveland

ANSWER—The extent of the incision may best be judged by injecting the sinus with iodized poppyseed oil and taking a roentgenogram to determine the extent of the tract. Frequently the secondary tracts extend quite far laterally, especially secondary to infection in the primary tract. A portion of the cyst wall or the sinus tract may extend into the sacrococcygeal joint or into the hiatus of the sacrum. It frequently is in close relation to the periosteum over the coccygeal segments.

At the time of the operation, the sinus or cyst is evacuated by aspiration or pressure over the sacrum. The point of the syringe is inserted into an orifice and a purse string suture tied round it. Some dye such as methylene blue or indigo carmine is injected and followed by gentle massage of the region.

A small tongue of skin over the region is excised, but the subcutaneous tissues must be widely excised underneath both sides and extending down to the periosteum and where the rudimentary sac enters or ends at the sacral hiatus. If the fascia over the sacrum and the coccyx is stained with the dye it should be removed.

Excision before infection develops is the preferable treatment, as this often produces wide tracts, which prevent good healing.

Three methods of treatment of the wound have been used after excision of the sinuses. These are packing it wide open, partial closure and complete closure. If there is recent or persistent infection, the wound should be left wide open and packed with petrolatum gauze. Some advocate leaving a small drain after obliterating all dead spaces and controlling hemorrhage carefully, while others state that no drains should ever be left. If a drain is inserted it should be at the upper angle of the wound, as it is farther from the anus and there is less danger of infection.

If primary closure is done, a flap is swung over from one side to close the defect. The flap is anchored to the fascia over the sacrum and closed carefully in layers. The lateral incision is closed transversely for about a third of the distance.

Following are references to the literature:

- Cattell R. B. *S. Clin. North America* 14: 1289 (Oct.) 1934.
Glenn Frank. *New England J. Med.* 207: 544 (Sept. 22) 1932.
Newell R. L. *Coccygeal Sinus*. *Brit. J. Surg.* 21: 219 (Oct.) 1933.
Ottenheimer E. J. *Am. J. Surg.* 21: 120 (July) 1933.
Owen H. R. *Pilonidal Cyst or Sinus*. *S. Clin. North America* 14: 117 (Feb.) 1934.
Rogers Horatio. *Pilonidal Sinus*. *Surg. Gynec. & Obst.* 57: 803 (Dec.) 1933.
Stone H. B. *Pilonidal Sinus*. *Ann. Surg.* 76: 410 (March) 1924.
Thomason T. H. *Ann. Surg.* 99: 585 (April) 1934.
Weeder, S. D. *Pilonidal Cyst Its Etiology and Treatment*. *Ann. Surg.* 98: 385 (Sept.) 1933.

UREA TEST IN URINALYSIS

To the Editor—Kindly give me your opinion as to the advisability of including the qualitative and quantitative urea test in a twenty-four hour urine specimen. Is it considered necessary in the ordinary routine examination of patients to include this with the microscopic and the other chemical tests?

J. W. HOPKINS, M.D. Glendale, Calif.

ANSWER—In itself the estimation of urea in the urine is not of much diagnostic value, because its concentration is increased when much food is taken and diminished by a low protein diet. Liver diseases lessen its formation. Advanced renal disease lessens its excretion.

Urea is the chief organic constituent of the urine and its most important nitrogen waste product. Urea represents from 80 to 90 per cent of the total nitrogen of the urine. The amount of urea excreted varies under normal conditions between 20 and 40 grams in twenty-four hours. As urea is the most abundant solid of urine, it influences the specific gravity most. The specific gravity runs quite parallel to the amount of urea. The last two figures of the specific gravity give a fair estimate of the urea content provided there is no sugar and the chlorides are normal. 1020 conforms with the presence of 2 per cent of urea. 1016 with 16 per cent, and so on. When a twenty-four hour specimen is obtainable, the urea should be determined by the best and simplest clinically available method, the hypobromite method. For all clinical purposes the hypobromite method introduced by Knop, with the Doremus ureometer, is

sufficient. For accurate scientific work more elaborate methods are necessary, of which that of Mörner and Sjöqvist gives the most accurate results. Another method is that of Van Slyke and Cullen, which consists in treating the urine sample with urease, aerating the ammonia formed into fiftieth normal acid and titrating back the excess acid.

The quantitative urea test performed by the hypobromite method is so simple that it may well be included in the routine examination of twenty-four specimens of urine.

DELAYED HEALING OF BRUISE

To the Editor—I have a woman patient who severely bruised her leg three months ago. The area was black and blue for about a month and then gradually cleared up. At present the calf is very much enlarged and firm and painful. Roentgen examination shows a mottled appearance of the muscle of the calf and a somewhat moth-eaten appearance of the edge of the tibia. I have not encountered a condition like this before. Will you please advise me concerning this and what the treatment should be? Please do not publish my name.

M.D. Illinois

ANSWER—One is often surprised at how long it takes for a subcutaneous and subfascial extravasation of blood and serum to be absorbed and for the induration of the infiltrated tissues to disappear. This is particularly true if the part involved is in a lower extremity below the knee, where the constantly dependent position permits the action of gravity constantly to retard the return flow of blood.

It is not uncommon for the bones of the leg to show a "moth-eaten" appearance if the patient is beyond middle age and especially if varicosities of the veins are present. Such an appearance, however, does suggest the importance of making a Wassermann test and ruling out the presence of a syphilitic infection.

In the absence of a specific infection or a focus of low grade infection in the teeth or tonsils that could produce a metastatic inflammatory process at the site of injury, the treatment indicated would be rest, elevation of the limb for a part of each day, use of an elastic pressure bandage when the patient is up and about, and the use of warm applications for from half an hour to an hour twice daily while the leg is elevated, so as to stimulate circulation and favor acceleration of the venous return. The treatment that by all means should be avoided is any type of open operation with the associated risk of adding trauma and infection from the outside.

POSSIBLE USE OF OPTOCHIN IN URETER

To the Editor—In a case in my family there is a chronic inflammation of the lower third of the left ureter almost entirely extraluminal, following infection of the maxillary sinuses with streptococci and pneumococci. Both sinuses were opened the granulation tissue was cleaned out, and the results were excellent. But the infection of the ureter followed, possibly through lymph channels opened at operation. Now the streptococci are all gone formerly being present in long chains and only pneumococci are obtained by urethral catheter or the bladder urine. Since infection of the eye yields promptly to optochin, 1 per cent solution would it be safe to irrigate the ureter with the same or a little weaker? Has such internal use of optochin been made? What else would you advise? Certain medicinal dyes by mouth and mercurochrome locally partly control but do not destroy the pneumococci they return after a brief interval and the exudate from the presumably shallow ulcer pus and fibrin, block the ureter and cause severe colic.

M.D., Texas

ANSWER—We have not heard of optochin being used locally in the ureter. What evidence is there that there is a localized infection of the ureter? This is most unusual. If a definite narrowing has been demonstrated at this point by ureteral pyelography, dilation should correct the trouble. It is difficult to believe that any local application of an antiseptic could be of much benefit.

TREATMENT OF SYPHILIS

To the Editor—A man in the early sixties was found to have a positive Wassermann reaction as a result of a routine test. Physical examination is quite negative save for a sluggish pupil. He cannot remember the time of infection but believes that it was many years ago. How vigorous a course of antisyphilitic therapy should such a man be exposed to? Could you outline a safe regimen?

M.D., New York

ANSWER—The question of just how intensive treatment should be for this patient is dependent on the status of his syphilis. The sluggish pupil suggests the possibility of neurosyphilis, the which possibility could be determined by an examination of the spinal fluid. In a man aged 60 or more such an examination is not always advisable, but if his physical condition is otherwise good or if he is young for his years there can be no serious objection to an examination of the spinal fluid. The report of

this test would be a potent factor in determining subsequent treatment. Examination of the cardiovascular system should likewise be made to make certain that the patient does not have a syphilitic aortitis. If the spinal fluid and cardiovascular examinations are negative and there are no other signs of syphilis, little if any treatment is necessary in a person aged 60 or more in whom the infection is of many years' duration. In such a patient occasionally the use of mercury and small doses of potassium iodide by mouth is ample. If the spinal fluid examination is positive, however, treatment with arsphenamine and a bismuth preparation should be given. The dose of arsphenamine should be small, 0.5 Gm. of neoarsphenamine being the maximum dose. Following the first course of arsphenamine and the bismuth compound, subsequent treatment should be directed toward symptomatic relief. Further serologic reexaminations both of the blood and of the spinal fluid, should be dependent entirely on the patient's response to treatment.

IMPROVEMENT IN DIABETES UNDER DIGITALIS

To the Editor—A woman, aged 55 has had diabetes for twelve years and requires 24 units of insulin daily with a careful diet. Following large doses of tincture of digitalis which were begun in February the urine became sugar free. This was first noticed by the patient's husband early in March. The patient is now eating normally without restriction of carbohydrates. The urine without insulin and with daily examinations continues to remain sugar free. Have you any record of similar cases so responding to digitalis?

J T STEELE M.D., Dunsmuir Calif

ANSWER—We know of no similar case that has responded to digitalis in the manner described. Nor do we know of any reasonable explanation for what occurred unless the doses of digitalis were so large as to impair hepatic function.

It must be kept in mind that the improvement of the diabetes may be consequent to the heart failure, which presumably occasioned the administration of the digitalis, rather than to the drug itself. Cases have been reported in which diabetes has improved or disappeared as a coincident liver cirrhosis progressed. It is possible that in this case the period of passive hyperemia of the liver caused by the heart failure was enough to aggravate a previously existent mild hepatic cirrhosis.

If this explanation is correct (and it is only a guess at an otherwise inexplicable phenomenon), the improvement in the diabetes indicates a poor prognosis rather than an improvement. Undue sensitivity to insulin or the future occurrence of hypoglycemic attacks would corroborate this interpretation.

SHORTEST PROCESS OF LABOR

To the Editor—According to statistics what is the shortest time that it has taken a primipara at full term to go through the three stages of labor, all conditions normal, giving birth to a live and normal baby? Please omit name.

M D Arizona

ANSWER—Statistics regarding the length of labor are not reliable, because it is hard to determine when labor actually begins. Numerous cases are on record in which the baby was born within an hour after the first suggestion of pains, but it is more than probable that what the French call "insensible labor" had been going on for some time previously. Precipitate labors occasionally with fatal results, have taken place within an hour and several cases have had to be the subject of legal investigation to eliminate the suspicion of foul play. The shortest labor on record at the Chicago Lying-in Hospital was one hour and ten minutes for the three stages. The patient was a primipara 41 years of age, but in all probability she had had preparatory pains and considerable dilatation before she became aware that labor had begun.

BLOOD CHOLESTEROL AND METABOLISM

To the Editor—I would greatly appreciate information on the value and interpretation of blood cholesterol values. A version given me is that it can be used as an indication of metabolism as basal metabolism is.

L. EDWARD GIOVINE M.D. Flushing N.Y.

ANSWER—The normal limits of blood cholesterol may be considered to be between 120 and 200 mg. per hundred cubic centimeters. There may be wide and rapid fluctuations even during fasting. The intake of large quantities of butter eggs and meat for several weeks increases the blood cholesterol. There is an increase of blood cholesterol in about 50 per cent of pregnant women in the latter half of pregnancy. Low values occur in hyperthyroidism, fevers, anemias, cachexias and uremia.

High values are found in chronic nephrosis and acute nephritis. The highest values occur in pure nephrosis. There is often

an increase in the early stages of malignant growths. Biliary obstruction causes an increase unless there is a marked infection or cachexia. In myxedema and hypothyroidism the blood cholesterol varies from 250 to 750 mg. per hundred cubic centimeters of blood and is of value in diagnosis. There is an increase in diabetes mellitus with a faulty fat metabolism. A persistently high value indicates a bad prognosis. According to Rabinowitch the cholesterol is a more consistent guide to the patient's condition than the blood sugar. In lipemia of diabetes the cholesterol may be four times the normal. Insulin and dextrose cause a rapid reduction. A high blood cholesterol occurs in fasting when the body mobilizes its fat reserves for fuel. The reticulo-endothelial system plays an important part in cholesterol metabolism.

FIBRO ADENOMA OF BREAST IN A GIRL

To the Editor—A girl aged 10 years had a small tumor in the right breast about the size of a walnut. This was removed and a section showed it to be an adenofibroma which contained some dilated ducts. Several months later a mass developed in the left breast which is similar to the one that was in the right breast. This has gradually increased until it is about the size of a chicken egg. Should this tumor be removed or if not what treatment should she have? The breasts are undeveloped. Please omit name.

M D, Michigan

ANSWER—Five per cent of all benign fibro-adenomas of the breast are found under the age of 15 or before the onset of menstruation. Sixteen per cent of these benign tumors are multiple and of these multiple tumors one third occur bilaterally with or without an interval of time intervening between the appearance of the tumors. No immediate operation is indicated because of the bilaterality and multiplicity of these tumors. There is no reliable method for their cure except surgery, but in this instance the expectant treatment might be used, normal breast development being awaited before further surgery is attempted. There is no danger of malignant change at this age, although doubling or tripling the size of the tumor in a short period would justify its removal. The endocrine balance in this patient should right itself when menstruation is established and the object should be to delay treatment until then.

PAGET'S DISEASE

To the Editor—I have a patient who has been carrying a slight daily fever of a degree or two. The pulse ranges from 88 to 96. Pains and aches occur in the upper part of the body (chest area posteriorly and anteriorly). Some loss of weight has occurred. The spine over the cervical area is bent forward somewhat. When the patient walks he walks wide and flat footed to a degree rather marked. The blood shows 3,200,000 red blood cells and 56 per cent hemoglobin. The urine is normal. Paget's disease of the bone was found in the pelvis on roentgen examination. Will you tell me the best line of treatment to pursue? Please omit name.

M D Rhode Island

ANSWER—There is no specific medical treatment, and parathyroidectomy is not indicated in Paget's disease. The best that can be done is to treat the symptoms and to make sure that such treatment does not do harm.

SUTURE DEVICES IN TONSILLECTOMY

To the Editor—Is there an instrument on the market which mechanically and simply sutures bleeding points in the tonsillar fossae following tonsillectomy? May I have any information that you have on the subject?

DAVID MEZZ, M.D. Brooklyn

ANSWER—There are a number of instruments which mechanically and more or less simply carry a suture through the tissues of the tonsillar fossa and beneath the bleeding point. Having carried the catgut strand through by means of the instrument, the operator must then tie the suture himself. Any of the large surgical houses will supply information as to the names, and manner of use of instruments of this character.

OSMOTHERAPY

To the Editor—Hypertonic dextrose in 50 per cent solution has been prescribed in 20 cc. doses twice weekly for repeated intravenous use in scalp and skin infections. Is there not an appreciable element of danger in producing occlusion of the veins and a thrombus? What is the theory of this treatment?

M D Michigan

ANSWER—There is danger of damage to the veins which can be minimized by very slow injection. This is a form of "osmotherapy" depending for its effect on the upsetting of the delicate osmotic and colloidal balance of the blood and tissue fluids, which may result in an alteration of metabolic processes and a possible stimulation of resistance and repair.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country March 14. Oral examination for Group A and B applicants will be held in Kansas City Mo. May 11-12. Applications for written examination should be filed with the secretary before Jan. 15. Sec. Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada, Dec. 7. Sec. Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St. Louis Jan. 11. Sec. Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY Kansas City, Mo., May 9. Sec. Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY New York Dec. 30. Sec. Dr. Walter Freeman, 1726 Eye St., N. W. Washington D. C.

AMERICAN BOARD OF RADIOLOGY Detroit, Dec. 12. Sec. Dr. Byrl R. Kirklint, Mayo Clinic, Rochester, Minn.

ARIZONA Basic Science Tucson Dec. 17. Sec. Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

CALIFORNIA Reciprocity Los Angeles Dec. 4. Sec. Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO Denver Jan. 7. Sec. Dr. Harvey W. Snyder, 422 State Office Bldg., Denver.

CONNECTICUT Endorsement Hartford Nov. 26. Sec. Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

KANSAS Topeka, Dec. 10-11. Sec. Board of Medical Registration and Examination, Dr. C. H. Ewing, 609 Broadway, Larned.

KENTUCKY Louisville Dec. 3. Sec. Department of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

MARYLAND Medical (Regular) Baltimore, Dec. 10-13. Sec. Dr. John T. O'Mara, 1211 Cathedral St., Baltimore. *Medical (Homoeopathic)* Baltimore Dec. 10-11. Sec. Dr. John A. Evans, 612 W. 40th St., Baltimore.

MINNESOTA Basic Science Minneapolis Jan. 7-8. Sec. Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA Basic Science Omaha Jan. 7-8. Dir. Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NORTH CAROLINA Endorsement Raleigh, Dec. 9. Sec. Dr. Ben J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA Grand Forks Jan. 7-10. Sec. Dr. G. M. Williamson, 4% S. 3d St., Grand Forks.

OHIO Columbus Dec. 3-5. Sec. State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA Oklahoma City Dec. 11. Sec. Dr. James D. Osborn Jr., Frederick.

TENNESSEE Memphis Dec. 18-19. Sec. Dr. H. W. Qualls, 130 Madison Ave., Memphis.

UTAH Salt Lake City, Dec. 10-12. Dir. Department of Registration, Mr. S. W. Golding, 326 State Capitol Bldg., Salt Lake City.

VIRGINIA Richmond, Dec. 11-13. Sec. Dr. J. W. Preston, 28% Franklin Rd., Roanoke.

WISCONSIN Basic Science Milwaukee Dec. 21. Sec. Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical* Madison Jan. 7-10. Sec. Dr. Robert E. Flynn, 410 Main St., LaCrosse.

Pennsylvania July Examination

Mr. W. M. Denison, director, Bureau of Professional Licensing, reports the examination held by the Pennsylvania State Board of Medical Education and Licensure at Philadelphia and Pittsburgh, July 9-11, 1935. Four hundred and twenty-four candidates were examined, of whom 418 passed and 6 failed. The following schools were represented:

| School | PASSED | Year Grad. | Number Passed |
|--|------------|------------|---------------|
| Yale University School of Medicine | (1933) | 1 | 1 |
| George Washington Univ. School of Med. | (1933) | 1 | 1 |
| Georgetown University School of Medicine | (1934, 23) | 23 | 23 |
| Howard University College of Medicine | (1934, 3) | 3 | 3 |
| Emory University School of Medicine | (1932) | 1 | 1 |
| University of Georgia School of Medicine | (1934) | 1 | 1 |
| Loyola University School of Medicine | (1935) | 1 | 1 |
| University of Louisville School of Medicine | (1933) | 1 | 1 |
| Lulane Univ. of Louisiana School of Medicine | (1933) | 2 | 2 |
| Johns Hopkins University School of Medicine | (1932) | 2 | 2 |
| University of Maryland School of Medicine and College of Physicians and Surgeons | (1934, 7) | 7 | 7 |
| Boston University School of Medicine | (1931) | 1 | 1 |
| Harvard University Medical School | (1933) | 1 | 1 |
| University of Michigan Medical School | (1934) | 1 | 1 |
| St. Louis Univ. School of Medicine (1911) | (1932, 8) | 10 | 10 |
| University of Nebraska College of Medicine | (1934) | 1 | 1 |
| Cornell University Medical College | (1934) | 1 | 1 |
| University of Buffalo School of Medicine | (1920) | 1 | 1 |
| University of Rochester School of Medicine | (1933) | 2 | 2 |
| Ohio State University College of Medicine | (1933) | 2 | 2 |
| Western Reserve University School of Medicine | (1934, 3) | 3 | 3 |
| University of Oklahoma School of Medicine | (1921) | 1 | 1 |
| Hahnemann Medical College and Hospital of Philadelphia | (1933, 13) | 13 | 51 |
| Jefferson Medical College of Philadelphia | (1932, 2) | 2 | 78 |
| Medico-Chirurgical College of Philadelphia | (1915)* | 1 | 1 |
| Temple Univ. School of Med. | (1933, 9) | 9 | 77 |
| University of Pennsylvania School of Medicine | (1931) | 1 | 1 |
| (1932, 2) (1933, 18) (1934, 33) | | | 54 |
| University of Pittsburgh School of Medicine | (1934, 61) | 61 | 61 |

Woman's Medical College of Pennsylvania (1932) (1933, 2), (1934, 5)
Vanderbilt University School of Medicine (1934, 2)
Medical College of Virginia (1934, 2)
University of Wisconsin Medical School (1934)
University of Toronto Faculty of Medicine (1907)
University of Western Ontario Medical School (1934, 2)
McGill University Faculty of Medicine (1931)
Albert Ludwigs Universität Medizinische Fakultät, Freiburg (1926)
Friedrich Wilhelms Universität Medizinische Fakultät, Berlin (1934)
Universität Heidelberg Medizinische Fakultät (1933)
Universität Leipzig Medizinische Fakultät (1931)
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultása Budapest (1929)
Licentiate of the Royal College of Physicians of Edinburgh and of the Royal College of Surgeons of Edinburgh (1933, 2)
University of Edinburgh Faculty of Medicine (1926)

| School | FAILED | Year Grad. | Number Failed |
|---|-----------|------------|---------------|
| Georgetown University School of Medicine | (1933) | (1934) | 1 |
| St. Louis University School of Medicine | (1934) | (1934) | 1 |
| Hahnemann Medical College and Hosp. of Philadelphia | (1934) | (1934) | 1 |
| University of Pittsburgh School of Medicine | (1934, 2) | (1934) | 2 |

Twenty-two physicians were licensed by reciprocity and 15 physicians were licensed by endorsement from January 1 through August 28. The following schools were represented:

| School | LICENSED BY RECIPROCITY | Year Grad. | Reciprocity with |
|--|-------------------------|------------|------------------|
| Howard University College of Medicine | (1932) | (1934) | Georgia |
| Loyola University School of Medicine | (1934) | (1934) | Illinois |
| Northwestern University Medical School | (1934) | (1934) | Illinois |
| Rush Medical College | (1933) | (1933) | Louisiana |
| Johns Hopkins University School of Medicine (1930) | (1932) | (1932) | Maryland |
| University of Maryland School of Medicine and College of Physicians and Surgeons | (1929) | (1929) | N. Carolina |
| (1932) (1934) Maryland | | | |
| Boston Univ. School of Medicine (1911) New Hamp | (1931) | (1931) | Mass. |
| Tufts College Medical School | (1906) | (1906) | Mass. |
| University of Michigan Medical School | (1929) | (1930) | Michigan |
| St. Louis University School of Medicine | (1932) | (1932) | Missouri |
| University of Cincinnati College of Medicine | (1929) | (1929) | Ohio |
| Western Reserve University School of Medicine | (1932) | (1932) | Ohio |
| Hahnemann Med. College and Hosp. of Philadelphia | (1933) | (1933) | Washington |
| (1934) New Jersey | | | |
| Jefferson Medical College of Philadelphia | (1928) | (1928) | New Jersey |
| Temple University School of Medicine | (1933) | (1933) | New Jersey |
| Vanderbilt University School of Medicine | (1931) | (1931) | Tennessee |

* License has not been issued.
† Verification of graduation in process.

Ohio Reciprocity and Endorsement Report

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports 33 physicians licensed by reciprocity and 4 physicians licensed by endorsement on Oct. 5, 1935. The following schools were represented:

| School | LICENSED BY RECIPROCITY | Year Grad. | Reciprocity with |
|---|-------------------------|------------|------------------|
| University of Arkansas School of Medicine (1933) | (1934) | (1934) | Arkansas |
| College of Medical Evangelists | (1933) | (1933) | Maryland |
| Howard University College of Medicine | (1930) | (1930) | Georgia |
| Emory University School of Medicine | (1903) | (1903) | Indian |
| Illinois Medical College Chicago | (1934, 2) | (1934) | Indiana |
| Indiana University School of Medicine | (1932) | (1932) | Iowa |
| State University of Iowa College of Medicine | (1934) | (1934) | Kentucky |
| University of Louisville School of Medicine | (1922) | (1922) | Michigan |
| Johns Hopkins University School of Medicine | (1931) | (1931) | |
| University of Michigan Medical School (1928) | (1932) | (1932) | Michigan |
| (1932) (1933) (1934, 2) Michigan | | | |
| Wayne University College of Medicine | (1934) | (1934) | Missouri |
| St. Louis University School of Medicine (1933) | (1934, 2) | (1934) | Nebraska |
| University of Nebraska College of Medicine | (1930) | (1930) | New York |
| University of Buffalo School of Medicine | (1933) | (1933) | N. Carolina |
| Duke University School of Medicine | (1931) | (1931) | Indiana |
| University of Cincinnati College of Medicine | (1934) | (1934) | Penn. |
| Hahnemann Med. College and Hospital of Philadelphia | (1928) | (1928) | Penn. |
| Jefferson Medical College of Philadelphia | (1932) | (1932) | Penn. |
| University of Pennsylvania School of Medicine | (1934) | (1934) | Tennessee |
| University of Pittsburgh School of Medicine (1930) | (1934) | (1934) | Virginia |
| Vanderbilt University School of Medicine | (1927) | (1927) | New York |
| Medical College of Virginia | (1930) | (1930) | |
| Queen's University Faculty of Medicine | | | |

| School | LICENSED BY ENDORSEMENT | Year Grad. | Endorsement of |
|---|-------------------------|------------|----------------|
| Rush Medical College | (1935) | (1935) | N. B. M. Ex. |
| Harvard University Medical School | (1933) | (1933) | N. B. M. Ex. |
| Columbia Univ. College of Physicians and Surgeons | (1931) | (1931) | N. B. M. Ex. |
| McGill University Faculty of Medicine | (1933) | (1933) | N. B. M. Ex. |

South Dakota July Examination

Dr Park B Jenkins, director, Division of Medical Licensure, reports the written and practical examination held by the South Dakota State Board of Health and Medical Examiners at Rapid City, July 16-17, 1935. The examination covered 14 subjects and included 115 questions. An average of 75 per cent was required to pass. Fourteen candidates were examined, all of whom passed. Three physicians were licensed by reciprocity and 1 physician was licensed by endorsement. The following schools were represented:

| School | PASSED | Year | |
|---|-------------------------|-----------|-------------|
| | | Grad | Per Cent |
| Rush Medical College | | (1934) | 85 86 |
| University of Louisville School of Medicine | | (1934) | 86 |
| Tulane University of Louisiana School of Medicine | | (1922) | 81 |
| University of Minnesota Medical School | (1932) 88 | (1935) | 85 |
| Kansas City College of Medicine and Surgery | Missouri (1921) | | 78 |
| Creighton University School of Medicine | (1933) 84 | (1934) 80 | 84 85 |
| University of Nebraska College of Medicine | (1928) 80 | (1934) | 88 |
| University of Pittsburgh School of Medicine | | (1934) | 81 |
| School | LICENSED BY RECIPROCITY | Year | |
| | | Grad with | Reciprocity |
| Creighton University School of Medicine | | (1933) | N Dakota |
| Ohio Oklahoma | | | |
| School | LICENSED BY ENDORSEMENT | Year | |
| | | Grad of | Endorsement |
| Johns Hopkins University School of Medicine | | (1927) | N B M Ex |

Book Notices

Diseases of the Chest By J Arthur Myers M.D. Professor of Medicine University of Minnesota Medical School. National Medical Monographs. Edited by Morris Fishbein M.D. Cloth Price \$3. Pp 385 with 62 illustrations. New York: National Medical Book Company Inc. Doubleday Doran & Co, Inc. 1935.

The writer in his preface states that our knowledge of diseases of the chest has increased so materially during the last ten years that much of what was written on the subject a decade ago is already obsolete. This increased knowledge has revolutionized methods of diagnosis, treatment and prevention. The x-ray film, the bronchoscope and the microscope are today the indispensable armamentarium of every physician who wishes to make a correct diagnosis of a pulmonary disease. The film locates and outlines the extent of disease, the bronchoscope visualizes a lesion and makes it possible to remove foreign bodies, secretions or tissue for biopsy, and the microscope is the "court of last appeal" in revealing the etiology of the condition. However, a careful history and physical examination are still the fundamental basis for the physician's diagnosis of disease.

The book discusses the first infection type of tuberculosis followed by a discussion of the tuberculin test in diagnosis. The percentage of positive reactors is steadily decreasing, until at present only about 30 per cent of college students and 15 per cent of high school students react positively. Then comes discussion of the roentgen examination in the diagnosis of tuberculosis of the first infection type. Myers advises periodic x-ray films of the chests of all children reacting positively to the tuberculin test. Chapter 4 deals with the examination and classification of tuberculosis of the first infection type. A history of exposure or the presence of an erythema nodosum is of great significance. On physical examination there is often no evidence of disease. Sputum is usually not obtainable, but a swab of the larynx and pharynx or the stomach contents may reveal tubercle bacilli. A classification is given for cases of this type. Chapter 5 discusses the treatment, prognosis and prevention of the first infection type.

Part II begins with chapter 6, on reinfection foci, endogenous and exogenous. Then follows a chapter on the acute forms of reinfection tuberculosis, such as miliary tuberculosis, meningitis, pneumonia and pleurisy. In chapter 8 the chronic reinfection types of pulmonary tuberculosis are considered. They are classified into minimal, moderately advanced and far advanced lesions. The next chapter discusses treatment. Chapter 10 is an excellent discussion of pneumothorax, giving the technic indications and results with some fair roentgenograms. Chapter 11 treats the subject of surgery of the chest wall and chapter 12 the interruption of the phrenic nerve. The last chapter on tuberculosis discusses the magnitude of the problem today.

Part III contains chapter 14, on nontuberculous diseases of the chest, and begins with the subject of pneumonia. Thirty pages are devoted to lobar pneumonia and bronchopneumonia. The next chapter is devoted to suppurative conditions of the bronchi, lungs and pleura. Chapter 16 considers tumors within the thorax. It is to be regretted that only nine pages are devoted to primary carcinoma of the lung, and only six lines to the physical observations in this disease, which today ranks second only to gastro-intestinal malignancy in frequency. A few lines are devoted to sarcoma, endothelioma and mediastinal growths. Chapter 17 discusses massive collapse, foreign bodies, spontaneous pneumothorax and embolism. Chapter 18 presents seven pages on pulmonary diseases due to moldlike bacteria, molds and yeastlike fungi. The next chapter describes diseases caused by inhalation of dust, such as hay fever, bronchial asthma and pneumoconiosis. There is an excellent chapter on silicosis.

Each chapter is followed by a brief list of references for those who desire more detailed information. There is an alphabetical index of twenty pages. For the medical student and the practicing physician, this book has presented the status of our present knowledge of the more important chest diseases.

International Narcotics Control By L E S Eisenlohr. Cloth Price \$4. Pp 295. London: George Allen & Unwin Ltd. 1934.

According to its preface, 'this book is concerned with dangerous drugs solely as a subject of international administration.' A great deal of work has obviously been devoted to the preparation of the book, but it is unfortunate that not more attention was given to accuracy and that the subject was not presented in complete and well balanced form. The book is highly theoretical and frequently inaccurate. By its omissions it produces a poorly balanced and somewhat distorted view of the situation. Its sophomoric pronouncements will not impress those familiar with the problem.

The discussion overemphasizes opium and the opium derivatives, pays little attention to the coca leaf and cocaine, and hardly mentions cannabis, although all these three classes of dangerous drugs have been the subject of international control, to the further strengthening of which increasing study is now being given throughout the world. Opium production in India and the Near East receives extended treatment. The situation in China, which produces about 90 per cent of the world total, receives scant attention.

Under the book's title of international control the author makes the statement that international control does not exist and proceeds, with airy disregard of actualities, to argue in support of a vague and impracticable proposal to supply the needs of the entire world for narcotic drugs from a single international factory under control of and operated by the League of Nations, to draw its raw material from three or four poppy farms nothing being said as to the coca leaf supply.

The book is confined almost entirely to the activities of the League of Nations and of the Permanent Central Opium Board in the field of narcotic control, treats the Supervisory Body, which is entirely independent and the most powerful organ functioning in international narcotic administration, as a sort of minor committee of the Permanent Central Opium Board and shows an almost total ignorance of the extensive practical and direct collaboration in these matters that has existed entirely outside the league for many years and has accomplished as much if not more than has the league. The collaboration of the United States and other nations not members of the league, without which no progress could have been made, is barely mentioned. In fact, the book gives the United States little or no credit for its work toward international cooperation to suppress the abuse of narcotic drugs and entirely omits mention of the consistent American effort to keep to the fore the question of limitation of the production of raw materials. The few references to the United States are inaccurate and misleading.

Although police preventive work is one of the most important factors in the international control of narcotic drugs the author plainly knows little of the organization of international police work in this field and has apparently based wide speculation on a few published league documents. Fault is found with the Opium Advisory Committee for not handling police work, and the author presents with apparent seriousness the naive idea

that the league secretariat could effectively supervise and conduct an interchange of police information concerning the illicit traffic, a function for which it is neither suited nor equipped and which it is not and cannot legally be authorized to perform.

As examples of inaccuracy in regard to the police side of the question, it may be pointed out that the book in listing governments definitely in a position to offer direct international police cooperation omits Canada and France, two of the most important and most active. Statements in the book in regard to specific cases of illicit traffic are mostly incorrect and misleading.

Inaccuracies in regard to existing administration include the statement that only three countries have abandoned the use of diacetylmorphine (heroin), whereas in July 1934, when the book was written, the use of this drug had already been abandoned or prohibited in nine countries.

The book discusses the two international boards that have executive and administrative functions under the drug treaties, the Supervisory Body and the Permanent Central Opium Board, but treats them as merely organs of the League of Nations. They are declared by the treaties that created them to be entirely independent of the league, and it is to this independence that they owe the cooperation of governments which has enabled them to function so effectively. Another inaccuracy is the statement that a representative of the United States participated in the selection of the first members of the Permanent Central Opium Board. It was not until five years later, when the independence of that body had been proved and well established, that the American government participated in the selection of its members.

On the basis of a total misconception of the nature and functions of the League Opium Advisory Committee, the work of that body is subjected to a most incomplete and unfair analysis. All its faults and errors—and they are not few—are emphasized, whereas its accomplishments are minimized or ignored.

Public Health Administration in the United States. By Willson G. Smittle, A.B., M.D., Dr.P.H., Professor of Public Health Administration, School of Public Health, Harvard University. Cloth. Price \$3.50. Pp. 458 with 23 illustrations. New York: Macmillan Company, 1935.

A clarification and summary of public health administrative practices in the United States has long been needed. Rosenau's *Preventive Medicine and Public Health* has been a scientific textbook in this field, as have the numerous contributions by Chapin, particularly *Sources and Modes of Infection*. The appraisal forms developed by the Committee on Administrative Practice of the American Public Health Association have given a skeletonized picture of what is being done, but it has remained for the author of this textbook to give a comprehensive summary of practices in official public health work and voluntary public health work and the relationship of these to the practicing physician. The book is comprehensive and complete and at the same time sufficiently concise so that its size is kept within reasonable bounds. The author has maintained a judicial attitude and has fairly set forth the advantages and disadvantages of various sorts of organization and different types of administrative practice. His proposed budgets are much more in line with reasonable possibilities in communities as they exist than those formerly proposed by Winslow. The author disclaims any pretension of presenting a philosophy of public health and yet he has done so in simply setting forth his opinions as to various practices. His chapter on the practicing physician and the public health department is particularly good. In this he takes the reasonable stand that the health officer has his duty to perform in protecting his community against disease and in the promotion of public health and that he ought to recognize that certain services are best performed by the practicing physician. On the other hand, he warns the physician that failure to accept his share of the responsibility or to meet opportunities in preventive medicine will place on the health officer the obligation to do what is necessary for the protection of the public health. He emphasizes over and over again that the relationship between health officer and practicing physician should be "one of mutual assistance and mutual advantage" and that "no health officer can carry on satisfactory work without the cooperation and whole hearted support of the organized medical profession of his community. No physician can practice

modern medicine in an effective way without the aid of a well organized, effective health department. The dependence of one on the other is mutual and success is contingent upon mutual understanding and confidence."

Silicosis and Tuberculosis. Observations on the Origin and Character of Silicotic Lesions as Shown in Cases Occurring on the Witwatersrand. By F. W. Simson, M.B., Ch.B., and A. Sutherland Strachan, M.A., B.Sc., M.D., Department of Pathology, The South African Institute for Medical Research, Johannesburg. Publications of the South African Institute for Medical Research No. XXXVI (Vol. VI). Paper. Pp. 367, 405 with 14 illustrations. Johannesburg: South African Institute for Medical Research, 1935.

During the years 1926 to 1933 inclusive, the lungs of 4,910 diseased South African miners and native laborers were examined by the authors. This number includes many persons who in life suffered from varying degrees of silicosis. The objective of the investigation was to develop evidence relative to a controversy, the points of issue of which are here taken from the authors' introduction.

"Can the nodular fibrosis which is recognized as the characteristic lesion in silicosis be produced as a simple response of the lung tissue to the presence of silicious dust?" or

"Is an element of tuberculosis always necessarily present in the original development of the lesions?"

The accumulated evidence is grouped into three sections, designated by the authors respectively as "The Histology of Silicotic Lesions from the Lungs of Diseased Gold Miners," "Results of Inoculation into Guinea-Pigs of Silicotic Lesions from the Lungs of Deceased Gold Miners," and "Preliminary Observations on the Mineral Residues Extracted from Silicotic Lungs." From their personal investigation and from their appraisal of pertinent literature, the authors accept an affirmative answer to the first question, namely, that silicosis may develop in the lung without the necessity of tuberculosis as contributory to the original development of the lesions. They do, however, recognize the high frequency of an infective factor and point out that with the naked eye it is possible to distinguish between "simple" and "infective" lesions. The authors submit that their accumulated evidence demonstrates

"That the retention in the lung of silicious dust is a necessary precursor to the development of silicosis, whether in its 'simple' or its 'infective' form, and that the amount of retained dust determines the degree of the silicotic process which follows."

"That, although some silicotic lesions are infective from the outset, in very many other lesions no evidence whatever of the influence of an infective factor is found, either at their origin or in their further progress. The latter lesions appear to be the outcome of a distinctive pathological reaction of the lung tissue to the presence of the retained silicious dust."

This publication reflects still further credit on the South African group of workers in dusty lung diseases. A carefully prepared brochure, presented with admirable restraint, it carries conviction that at least in the Witwatersrand district the pathology of silicosis is as described in this highly technical but no less engaging booklet.

Handbook of Physiology. By the late W. D. Halliburton, M.D., LL.D., F.R.C.P., and R. J. S. McDowall, M.B., D.Sc., F.R.C.P., Professor of Physiology, University of London, King's College. Thirty-fourth edition. Cloth. Price \$5.50. Pp. 871 with 386 illustrations. Philadelphia: P. Blakiston's Son & Co. Inc., 1935.

This volume is now in its thirty-fourth edition. The last edition was published in 1933. The present edition, like the others since 1928, is under the editorship of R. J. S. McDowall. The author points out that physiology has now developed such a tremendous fund of information that it is not possible for any medical student to acquire in the time at his disposal anything but a fraction of what is available. For this reason the present edition of Halliburton's book publishes in dark type numbers which the student ought to memorize as he goes along. Moreover, blank pages are provided at the end of the various chapters for the notes of the lectures given by individual instructors. The book has been kept quite up to date in all its editions and obviously needs no special recommendation. To the present edition the publisher adds an interesting historical note pointing out that the first edition of this book was developed by Kirkes in 1848, making a book of 705 pages with ninety-seven illustrations. The fourth edition (1860) carried the name of Mr

Savory, the sixth edition, that of Mr Baker Successive editions included the 1876 edition edited by Dr Klein, the tenth to the thirteenth (in 1892) edited by Mr Baker and Dr V D Harris, and then in 1896 came the selection of Professor Halliburton on the recommendation of Sir William Gowers Under Professor Halliburton the book passed through seventeen editions in twenty-nine years and sold a total of 116,000 copies

Consultations de cardiologie. Par Georges Marchal médecin de l'Hôpital Tenon Préface du Docteur Ch Laubry médecin de l'Hôpital Broussais Paper Price 25 francs Pp 227, with 13 illustrations Paris Masson & Cie 1935

This presents thirty case histories with the symptoms, physical observations, laboratory examination and the treatment given under the care of the author There are two interesting cases in the series not commonly encountered, a syphilitic pulmonary arteritis, or Ayerza's disease, with excellent roentgenographic studies, and another of cardiac failure as a result of filariasis There are a number of points of diagnosis and results of treatment that do not conform to American views The author discusses a case of rheumatic pancarditis described as cured by treatment with sodium salicylates administered orally and intravenously Another case of syphilitic myocarditis with congestive heart failure is described which, according to our standards, would be classified as hypertensive vascular disease with systemic syphilis The book is of interest only from the standpoint of the citation of thirty rather interesting case histories and presents a fair concept of the present French view of the various types of heart disease.

The Doctor and the Public A Study of the Sociology Economics Ethics and Philosophy of Medicine Based on Medical History By James Peter Warbasse M.D Cloth Price \$5 Pp 572 with 19 illustrations New York Paul B Hoeber Inc. 1935

After a surgical practice of a quarter of a century, Dr Warbasse is devoting himself to the economic aspects of medical work. He expresses his point of view by saying that the solution of the medical problem is to be found in expanding the functions of the medical profession and in increasing the employment of physicians Dr Warbasse seems inclined to favor voluntary socialization of medicine without political control—a handsome ideal but certainly, in the present state of our civilization, only an ideal In this volume he traces the history of health protection from the earliest times giving special attention to the development of medicine among the Greeks and among the civilized countries of the middle ages More than two thirds of his volume is thus devoted to a brief history of the development of scientific and preventive medicine. With chapter 8 he begins a discussion of medical education of the public, quoting largely from the reports of the Committee on the Costs of Medical Care In chapter 10 he turns his attention to his main thesis Here he outlines the organization of various forms of group practice in the United States, pointing out that some form of socialization of medicine is coming and urging the development of a system under which doctors would be on salaries and employed by groups of patients under contractual relationships

Living Along with Heart Disease By Louis Lerin M.D Cardiologist to the St Francis Hospital and New Jersey State Prison Hospital Trenton N J With a foreword by Thomas M McMillan M.D Associate Professor of Cardiology Graduate School of Medicine University of Pennsylvania Cloth Price \$1.50 Pp 126 New York Macmillan Company 1935

The purpose of the author 'is to present to the reader a simplified explanation of the various aspects of heart disease, with the ultimate hope of instilling sane optimism in the patient's philosophy of heart disorders' Medical books for the layman are difficult to write especially if they are intended for the reader who is also a sufferer from the diseases described. This small book, however, will probably do no harm to the cardiac patient who reads it and may interpret heart disease helpfully to certain patients The discussion includes chapters on the fear of heart disease, the types 'leaky' hearts myocarditis hypertension, heart pain, treatment, questions and answers, the philosophy of heart disease, and the physician It is a good summary of heart disease in general and will give the layman a sound point of view on the whole subject Unfortunately, heart disease is not a single entity and it would appear some-

what difficult for the practicing physician to decide for whom to prescribe this book The handling of patients in practice is so individual a matter that the amount and type of explanation of their disease which seems justified must be varied to suit each case Does it profit the patient with angina pectoris to read about subacute bacterial endocarditis or cardiac arrhythmia, or to know the procedures used in the treatment of congestive failure which he may sometime experience after a coronary thrombosis? The style of the book is breezy and at times dramatic, but it suffers from an attempt at popular appeal through the use of slang and literary gymnastics and contains a few errors of fact However, these are of minor importance and are outweighed by the amount of helpful advice that is given

Experimental and Clinical Researches on Angina Pectoris and Its Surgical Treatment. By Rene Leriche FRCS F.A.S.A. Professor of Clinical Surgery Strasbourg Macewen Memorial Lecture 1934 Paper Price 1/6 Pp 24 with 7 illustrations Glasgow Jackson Wylie & Co 1935

In this lecture Leriche presents a summary of his views concerning angina pectoris and its surgical treatment based on experimental and clinical studies, which, with Fontaine, he has carried on for some ten years For the details of these studies as well as for a comprehensive view of the whole subject of the surgical treatment of angina the reader must look elsewhere, for the author confines himself strictly to the topic, viz, his own conclusions based on his own work Leriche accepts the coronary origin of angina yet considers spasm a prominent feature in some cases Pain, he says is a symptom and not the real disease He discusses the physiology of the nervous mechanism involved in pain, also the importance of anastomosis as a compensatory factor There are still many questions to be solved, such as the cause of thrombosis, which is the "greatest unknown factor in arteritis" The indications for operation are considered The operation of choice is the removal of the stellate ganglion His conservatism is shown by the fact that in nine years he has performed but eighteen operations The results he regards as encouraging The article is a model of clear, terse writing and will be consulted by all who are trying to familiarize themselves with this important subject.

Fifty Years a Surgeon By Robert Tuttle Morris Cloth Price \$3.50 Pp 347 New York E P Dutton & Co Inc, 1935

The name of Robert T Morris is familiar to most American medical readers Through our generation he has contributed largely to the literature of medicine and to its letters His career began just before the coming of the age of asepsis, so that he is able to tell us in his excellent style what surgery was like in that early period. He begins his book in his early days, which depict his interest in the woods and in nature, an interest which has no doubt made happy his declining years Then comes the story of his medical education and his early years at Bellevue Hospital The concluding chapters in his book concern such interesting topics as osteopathy, fads and cures, psychoanalysis sex and birth control professional jealousies and fee splitting On each of these subjects he ventures his personal opinion and casts the light of his experience It should of course, be recognized that these chapters do not aim to be authoritative or necessarily comprehensive. The book is personal in every sense of the word and, as such, one of the most interesting autobiographic documents that has been recently available

Modern Criminal Investigation By Harry Söderman D.Sc Head of the Institute of Police Science School of Law, University of Stockholm Sweden and John J O Connell Deputy Chief Inspector New York City Police Department Cloth Price \$3 Pp 481 with 110 illustrations New York & London Funk & Wagnalls Company 1935

The biologic laboratory comes more and more into the investigation of the methods of crime Microscopic studies of hair, finger prints, precipitin and agglutinin studies of the blood, anthropologic measurements, are all within the range of biologic study In this volume the author considers all these methods as well as many others and relates a considerable number of interesting medicolegal cases in which their application was of significance. The book is up to date and certainly should be in the hands of every judge, lawyer and physician who is interested in medicolegal work.

Medicolegal

Pneumoconiosis Following Inhalation of Limestone Dust, Employer Not Liable—Christopher had been an employee of the defendant company, which operated a rock quarry and stone crusher. After he had been so employed for a year, ill health compelled him to quit work. Two months later he died. The plaintiff, administrator of Christopher's estate, sued the defendant company, alleging that death was caused by the inhalation of limestone dust. From a judgment dismissing the petition, the plaintiff appealed to the Court of Appeals of Kentucky. The plaintiff alleged that the harmful and deadly effect of the inhalation of limestone dust and small particles of limestone rock was unknown to his intestate, Christopher, but was known to the defendant, Christopher's employer, or that the defendant could have known of it by the exercise of ordinary care, and that the defendant negligently compelled Christopher to work in the dust and small particles of limestone rock and did not furnish him with a mask to go over his mouth and nose to prevent the inhalation of such dust and particles. The Court of Appeals, however, was unable to find any statute requiring the defendant to provide Christopher with such a mask and could find in the record no allegation that masks had been tried and found capable of advantageous use, or of any use, in work of the character of that in which Christopher was engaged, or that any men anywhere had ever used masks in that sort of work. The needs of society, said the court, may be such that very dangerous work must be undertaken to supply those needs. Men have the right to employ other men to do such work, and if in the doing of it the servant is injured, the liability of the master, if any, must be found not in the inherent hazards of the work but in some negligence of the master in the way that he has the work done. An employer is not required to adopt a particular method because it affords greater safety for the employee, but he is required to adopt the usual and customary method employed by ordinarily prudent men in like work under similar circumstances. The judgment in favor of the defendant stone company was affirmed.—*Christopher's Adm'r v Blanton Stone Co., Inc* (Ky) 80 S W (2d) 590

Hospitals Liability for Self-Inflicted Injury of Mentally Disordered Patient—The defendant hospital association maintained a general hospital for medical, surgical, obstetric and pediatric cases. On February 15 the plaintiff was brought to the hospital by his brother and was admitted as a patient. The brother seems to have named Dr. Richard Johnson as the patient's attending physician, and Dr. Johnson, on being notified of the plaintiff's admission to the hospital, prescribed a sedative, strict rest in bed, no visitors, and other measures appropriate for a mentally distressed patient. No history of the case was taken by any one on behalf of the hospital. The patient was cared for in a ward room on the second floor until February 18, because no single room was available. On that day, when a single room on the third floor became available bars were placed on the outside of the lower half of the window in such a way as to prevent the lowering of the upper sash more than a few inches, and the patient was removed to it. The placing of the bars at the window, it was explained, was an action taken in all cases of nervous patients. On the floor where the patient was, there were then a supervisor, a graduate nurse and four student nurses. According to the record, they called at the patient's room frequently. He had been last visited by one of them some time after 4 o'clock in the afternoon, when shortly thereafter and about three hours after his transfer to the safeguarded room, he broke the glass in the upper sash of the window and jumped out. The patient had manifested evidences of agitation but apparently no discoverable evidences of a suicidal tendency. No physical restraints were applied. No nurse was in constant attendance. The patient was severely injured by his fall, and by his guardian he sued the defendant hospital association. The jury returned a verdict in his favor and the hospital association appealed to the Supreme Court of Minnesota.

If the actions of a patient, said the Supreme Court are such that a reasonably prudent person should anticipate an

inclination on his part to attempt to escape or to commit suicide, reasonable care should be exercised to prevent such an act. In the opinion of the court, however, the known facts in this case were not such as to charge the hospital association with negligence in not recognizing that the patient contemplated escape or suicide. A reasonably prudent nurse or intern in a general hospital could not have anticipated that the patient, under the circumstances, would suddenly jump out of bed, step up on the window sill, climb over the large lower half of the glass, break the pane in the upper half, and throw himself out of the window. The plaintiff's own attending physician knew as much as the hospital authorities did, or more, concerning the plaintiff's condition, and yet he gave no instructions to apply restraints nor did he direct that the bars should be put on the windows.

The nurses and interns at a general hospital, said the Supreme Court, are charged with the duty of carrying out the instructions of the attending physician, except in cases of emergency. When a patient enters a hospital on the advice of his physician, he has the right to expect that the instructions of his physician will be complied with. He relies on the skill of his own physician, but he knows nothing of the ability of the interns and nurses. When an emergency arises it is, of course, incumbent on the nurses or interns to exercise their own judgment until report can be made to and instructions received from the attending physician. Such, the evidence shows, was the practice at the defendant hospital. The rule has been laid down in *Byrd v Marion General Hospital*, 202 N C 337, 162 S E 738, as follows:

The great weight of authority however establishes the principle that nurses in the discharge of their duties must obey and diligently execute the orders of the physician or surgeon in charge of the patient unless of course such order was so obviously negligent as to lead any reasonable person to anticipate that substantial injury would result to the patient from the execution of such order or performance of such direction. Certainly if a physician or surgeon should order a nurse to stick fire to a patient no nurse would be protected from liability for damages for undertaking to carry out the orders of the physician. The law contemplates that the physician is solely responsible for the diagnosis and treatment of his patient. Nurses are not supposed to be experts in the technique of diagnosis or the mechanics of treatment.

The court was unable to agree with the plaintiff that the defendant hospital association, through its employees, should have ascertained the plaintiff's condition before admitting him to the hospital. The plaintiff was left at the hospital by his brother, who gave no information concerning his ailment. The instructions received from the plaintiff's physician, who presumably was aware of his patient's condition, indicated nothing more than that the patient was in need of rest. So far as the record shows, the patient's physician was not an employee of the defendant hospital association and his negligence therefore, if there was any, cannot be imputed to the association. If the defendant association had maintained and operated a hospital for the purpose of treating and curing diseases, physical and mental, and had its own staff of physicians and specialists for that purpose, probably it would have been its duty to ascertain all it could concerning an entering patient's previous history, a rule especially apt with respect to hospitals specializing in the cure of mental disorders. The hospital maintained by the defendant association, however, was merely a place to which physicians sent patients under their own care. The hospital association did not take on itself the curing of any disease, either by medical treatment or by surgical operation. The hospital attendants performed routine services and carried out the instructions of the attending physician. Patients were not furnished with a nurse in constant attendance, unless requested. Relatives of the patient must be charged with a knowledge of these facts. It would be a harsh rule indeed, said the Supreme Court, that would charge the authorities of a general hospital to go in search of the relatives of every patient entering it under the care of a physician of his own or a relative's selection, and ascertain, independently of the attending physician, the nature of the patient's ailment and then to exercise their own judgment as to treatment required.

The Supreme Court reversed the judgment of the trial court in favor of the plaintiffs and ordered that, notwithstanding the verdict, judgment be entered for the defendant.—*Mesdahl v St. Luke's Hospital Ass'n of Duluth (Minn.)*, 259 N W 819

Workmen's Compensation Acts Ophthalmia Due to Exposure a Compensable Injury—The plaintiff was employed by the defendant to operate a machine removing snow from the highway. His work required him to keep his eyes constantly on the snow. On March 23 he worked at his task for twelve hours, the day being "quite warm for that time of year" and the sun shining brightly. At the end of the day he was burned about the face, as if sunburned, and his eyes were inflamed. The skin of his face desquamated. His eyes grew worse, and during the week an ulcer developed in the right eye and on or about May 18 another developed in the left eye. There was a severe infection and ulceration on the conjunctivae and the corneas of both eyes, with the appearance of pus. The plaintiff instituted proceedings against his employer, under the Nebraska workmen's compensation act. An award in his favor by the compensation commissioner was sustained by the district court, and the employer appealed to the Supreme Court of Nebraska.

The condition of the plaintiff, said the Supreme Court, was produced by "snow blindness" or "snow ophthalmia." The condition is rare in the climate in which the plaintiff was working and therefore the court concluded that it was unexpected and unforeseen. There was no dispute as to the existence of "a burning" in snow blindness, and the injury to the eyes of the plaintiff was therefore violence to the physical structures of the body. The injury said the Supreme Court, was due to the reflection of ultraviolet rays of sunlight from the bright snow which had to continue for several hours before it manifested itself or became known to the person exposed. In this instance, the condition manifested itself on the day of exposure and therefore may be said to have occurred suddenly. In the light of these facts, the judgment of the court below sustaining the award of the compensation commissioner was affirmed.—*Hayes v McMullen (Neb)*, 259 N W 165.

Malpractice Degree of Care and Skill Required, Qualifications of Expert Witness—The physician-defendant treated oblique fractures of both bones of a patient's leg. Three weeks after reducing the fractures he massaged and manipulated the foot and ankle. Immediately thereafter his patient complained of a severe tearing sensation in the leg. After her complaint no roentgenogram was made until after six weeks. A roentgenogram then showed the fragments to be out of place and not united. After an operation which included bone grafting, union was effected and the wound healed. The record shows that the patient subsequently died, but the time and cause of death is not stated and there is nothing to indicate that it was connected with the injury described. The plaintiff individually and as administratrix of the estate of the deceased patient, sued the defendant-physician. From a judgment holding that no cause had been established the plaintiff appealed to the district court of appeal, second district division 2, California.

The plaintiff based her suit on the claim that the physician-defendant caused the fragments of the broken bones to slip from their places when he massaged and manipulated the foot and ankle, and that he failed to have roentgenograms taken and in other respects to use ordinary care and skill in determining whether the fragments were or were not in proper position. The court of appeal drew a distinction between proper treatment and the care and skill required by law. "Proper treatment," said the court, implies that no error shall be committed thereby that an approximate perfect result will be produced, that such result is guaranteed whereas the law demands only that the physician use reasonable care to attain such approximate perfection. In the absence of evidence to the contrary the law will presume the exercise of a reasonable degree of care and skill. The absence of skill is not presumed from the mere failure of treatment to produce a cure. If a physician possesses a reasonable degree of learning and skill and in the treatment of the patient's injury, exercises ordinary care and skill, measured by the standards of his profession in the same locality he is not liable for the results that follow. It is a rule, said the court, that proof of negligence or lack of care or skill on the part of a physician in

a malpractice case consists only in the opinion of experts. To qualify as an expert in a malpractice case, the witness must show not only that he possesses learning and knowledge on the subject of inquiry, sufficient to qualify him to speak with authority on the subject, but also a familiarity with the treatment and degree of care and skill of other practitioners in the locality in question sufficient to qualify him to say whether or not the defendant's treatment was consistent with what other physicians in the exercise of reasonable care might do under similar circumstances. As the expert called as a witness by the plaintiff failed to show that he possessed sufficient familiarity with practice in the locality with respect to treatment of oblique fractures of the leg bones, the trial court properly sustained an objection to his competence.

Viewed in the light most favorable to the plaintiff, the evidence wholly failed to establish a case of malpractice. The motion of the defendant to dismiss the case for lack of evidence was properly granted.—*Rasmussen v Shuckle (Calif)*, 41 P (2d) 184.

Narcotics Possession Unlawful Although Obtained on Physician's Prescription—The defendant, according to the record, applied to a physician for a remedy for arthritis. The physician testified that the defendant had contracted a cold, had a high fever and was suffering considerable pain, and that because of the defendant's ailments he prescribed one-half grain tablets of morphine sulfate and five grain tablets of sodium salicylate. The defendant was thereby enabled to obtain twenty tablets of morphine sulfate containing one-half grain each. He was later arrested and it was found that he had consumed or otherwise disposed of, within eight hours, twelve such tablets. Eight tablets were found in his possession and he was charged with unlawful possession under the Kansas law. Two physicians who examined him after his arrest testified that there was no visible sign of arthritis and that his actions while in custody presented the picture of a drug addict. The analyst of the state food laboratory testified that it would be impossible for a normal person, one not addicted to the use of narcotic drugs, to consume twelve one-half grain tablets of morphine sulfate within eight hours. The defendant was convicted and appealed to the Supreme Court of Kansas.

The fact that the defendant procured the narcotics found in his possession on the basis of a prescription issued to him by a physician, said the Supreme Court, does not exempt him from the operation of the statute making the possession of narcotic drugs unlawful if he misrepresented his condition to the prescribing physician. The quantity of narcotic drugs procured and the use of them by the defendant tended to show an unlawful use whether the defendant used them himself or sold some of them to others. The court, being convinced that the defendant had obtained by subterfuge the narcotic drugs in his possession, affirmed the judgment of conviction.—*State v Strode (Kan)* 42 P (2d) 603.

Privileged Communications Testimony of Examining Physician Inadmissible, Presence of Third Person as a Waiver—The plaintiff, as beneficiary, sued the Policy Holders Life Insurance Association for the benefits promised in a policy of insurance issued to his wife. To prove that the insured wife, in her application for the policy, made misrepresentations concerning her previous health, the insurer sought to introduce the testimony of a physician who examined her some time after the policy had been issued. The trial court excluded his testimony on the ground that it was privileged and therefore inadmissible under the California statute of privileged communications. Judgment was rendered for the plaintiff, and the insurer appealed to the California district court of appeal, second district, division 1.

According to the testimony, the insured, some time after her insurance policy had been issued, applied to the Coffey-Humber Clinic for treatment. There she was examined by the physician whose testimony was excluded by the trial court. The clinic is maintained by the W. K. Kellogg Foundation, but this physician was not employed by the clinic or by the foundation but by W. K. Kellogg personally. His sole duty was to examine prospective patients and at a subsequent time to reexamine such as were accepted, but only for the purpose of determining

the efficacy of the treatment given by the clinic. He had nothing whatever to do with directing or administering treatment. The physician whose testimony was excluded made a physical examination of the insured in the presence of the physician's stenographer, took her history and reported it to the Kellogg Foundation and to the clinic. It is fair to assume, said the district court of appeal, that a patient applying to the Coffey-Humber Clinic for treatment was not treated solely on the patient's statement that he or she had cancer. The physician whose testimony was excluded had regular hours at the clinic and made appointments with patients. No patient could receive treatment unless examined by him or some other physician who performed similar duties. That examination, the court of appeal was convinced, was an indispensable part of the treatment given. The California statute of privileged communications provides, among other things, that—

A licensed physician or surgeon cannot, without the consent of his patient be examined in a civil action as to any information acquired in attending the patient, which was necessary to enable him to prescribe or act for the patient.

The proffered testimony of the examining physician was within the scope of the statute and was properly excluded.

The insurer contended that the insured, by permitting the presence of the stenographer during the examination, waived her privilege. The mere presence of a third person, the court of appeal said, does not mean that the privilege has been waived as to the physician. The capacity in which the third person is present controls. The court of appeal held that where a third person is present as an agent of the attending physician, the privilege is not waived so far as relates to the attending physician. Because the stenographer was not offered as a witness, the court did not determine whether she could or could not have been required to testify. The judgment of the trial court against the insurer was affirmed—*Kramer v Policy Holders Life Ins Ass'n (Calif)*, 42 P (2d) 665.

Dental Practice Acts Revocation of License for Default in Annual Registration, Injunction to Prevent Unlawful Practice—A law requiring a dentist to register annually, paying a fee for doing so, and authorizing the irrevocable cancellation of his license if he fails, is valid, according to the Court of Appeals of Kentucky, even though the defaulting dentist was licensed when annual registration was not required, was absent from the state when the annual registration law was passed, had been continuously absent ever since and was given no notice of the prospective cancellation of his license. Equity will enjoin such an unlicensed dentist from practicing, even after the grand jury has failed to indict him for the unlawful practice of dentistry—*Commonwealth ex rel Attorney General v Pollitt (Ky)*, 80 S W (2d) 543.

Malpractice Cerebral Hemorrhage Attributed to Chiropractic Adjustment—This is the third opinion rendered by the Supreme Court of Florida in this case, and the case is as yet unsettled. Briefly, the plaintiff's wife died from a cerebral hemorrhage following chiropractic adjustments of her spine by the defendant-chiropractor. The plaintiff charged that the defendant negligently used so much force and violence in attempting to adjust the vertebrae that he ruptured a vessel at or near the base of his patient's brain and thereby caused a hemorrhage into and around her brain and spinal cord, from which his patient died. The plaintiff obtained a judgment in the trial court, but on appeal the Supreme Court of Florida held that although the evidence was sufficient to warrant a finding that death resulted from the chiropractic adjustments, it was insufficient to prove that those adjustments were done in an unskilful or negligent manner. The Supreme Court was induced, however, to give a rehearing, and on that rehearing it held that the testimony of physicians that the rupture of the blood vessel in the brain was caused by violence, together with the defendant-chiropractor's own testimony that a properly made adjustment could not have caused such a rupture, was legally sufficient to sustain a verdict against the chiropractor. The court on this occasion affirmed the judgment of the trial court in favor of the plaintiff. *Foster v Thornton* 152 So 667, abstr THE JOURNAL, Oct 20, 1934 p 1260. Again the Supreme

Court granted a rehearing and reviewed the evidence for a third time. This time the court was unable to reach a conclusion, three justices being in favor of affirmance of the trial court's decision and three for reversal. Ordinarily, in such a situation, the judgment of the lower court would be affirmed, but in this case the Supreme Court thought that the ends of justice would be better served by remanding the case for a new trial, and it was so ordered—*Foster v Thornton (Fla)*, 160 So 490.

Hospitals Abscesses Following Hypodermic Injections by Nurse—The plaintiff entered the defendant hospital as a paying patient, under the care of her own physician, for care during childbirth. Her physician, she alleged, instructed a nurse employed by the hospital to administer a hypodermic injection of magnesium sulfate in the fleshy part of each arm, whereas the nurse administered those injections in the large muscles of the hips or thighs. Abscesses developed at the sites of the injections. The patient sued the hospital, contending that it failed to provide her with a competent trained nurse. The trial court gave judgment for the patient, and the hospital appealed to the Supreme Court of Oklahoma.

There was no substantial dispute except as to whether the nurse was instructed by the attending physician concerning the site of the hypodermic injections. All medical witnesses testified that the usual site of injection was the large muscle of the hip or thigh, but the patient's attending physician testified that he preferred to give such injections in the arms. There was no evidence of error in the nurse's technique of administration. Neither was there any evidence to show that similar abscesses would not have followed injections into the arms. Nothing in the evidence indicated that the site of injection had anything to do with the abscesses, except as it determined their location. In the opinion of the Supreme Court, the evidence indicated only that, except for the nurse's negligent act, the abscesses would have occurred in some part of the body other than the places at which they did occur. There was no evidence to show that the injury would have been less likely to occur or be less severe if injections had been made in the arms. The evidence did not show that the nurse's negligence was the proximate cause of the injury.

The judgment of the trial court was reversed, with directions to enter judgment for the defendant hospital—*Masonic Hospital Association of Payne County v Taggart (Okla)*, 43 P (2d) 142.

Society Proceedings

COMING MEETINGS

- American Association for the Study of Neoplastic Diseases Baltimore, Dec. 19-21 Dr Eugene R Whitmore 2139 Wyoming Avenue NW Washington D C Secretary
- American Student Health Association New York, Dec. 27-28 Dr Harold S Diehl University of Minnesota Medical School Minneapolis Secretary
- Eastern Section American Laryngological Rhinological and Otolological Society Newark, N J Jan 3 Dr Henry B Orton 24 Commerce St. Newark N J Chairman
- Middle Section American Laryngological, Rhinological and Otolological Society Milwaukee Jan 11 Dr William E Grove 324 East Wisconsin Avenue Milwaukee Chairman
- Mid Western Section American Laryngological Rhinological and Otolological Society, St. Louis Jan 14 Dr Harry W Lyman Carleton Building St. Louis Chairman
- National Society for the Prevention of Blindness New York Dec 5-7 Mr Lewis H Carris 50 West 50th Street New York, Managing Director
- Puerto Rico Medical Association of Santurce, Dec. 13-15 Dr Euripides Silva Ave. Fernandez Juncos, Parada 19 Santurce, Secretary
- Radiological Society of North America Detroit Dec 2-6 Dr Donald S Childs 607 Medical Arts Building Syracuse, N Y Secretary
- Society of American Bacteriologists New York, Dec. 26-28 Dr I L Baldwin College of Agriculture University of Wisconsin Madison Wis Secretary
- Society of Surgeons of New Jersey Jersey City Jan 15 Dr Walter B Mount 21 Plymouth St. Montclair Secretary
- Southern California Medical Association Los Angeles Nov 29-30 Dr Robert W Langley 1930 Wilshire Boulevard Los Angeles Secretary
- Southern Section American Laryngological, Rhinological and Otolological Society Jackson Miss Jan 18 Dr Robin Harris Lamar Building Jackson Miss Chairman
- Southern Surgical Association Hot Springs Va Dec. 10-12 Dr E W Alton Ochsenr 1430 Tulane Ave. New Orleans, Secretary
- Western Surgical Association, Rochester Minn Dec. 6-8 Dr Albert H Montgomery 122 South Michigan Boulevard Chicago Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to *THE JOURNAL* in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

57 205-350 (Sept. 15) 1935

- Plexus Omentalis and Its Relation to Capillary Innervation in Omentum of Rabbit N A Michels Philadelphia—p 205
Aortic (Depressor) Nerve and Its Associated Epitheloid Body, Glomus Aorticum, J F Nonidez New York—p 259
Fetal Death Prolonged Gestation and Difficult Parturition in the Rat as Result of Vitamin A Deficiency K E Mason, Nashville, Tenn—p 303

American Journal of Diseases of Children, Chicago

50 573-826 (Sept.) 1935

- Cutaneous Reactions to Hemolytic Streptococcus Nucleoprotein in Persons with Scarlet Fever J D Lyttle, D Seegal and Elizabeth L. Jost New York—p 573
*Prophylactic Use of Parents' Whole Blood in Anterior Poliomyelitis Philadelphia Epidemic of 1932 J Stokes Jr, I J Wolman H C Carpenter and J Margolis Philadelphia—p 581
Respiratory Metabolism in Infancy and in Childhood XV Daily Energy Requirements of Normal Infants S Z Levine, T H McEachern, M A Wheatley E Marples and M D Kelly New York—p 596
Body Build Factor in Basal Metabolism of Boys M Molitch Jamesburg N J—p 621
Familial Studies on Lobar Pneumonia Epidemiologic Studies on Families of Children with Pneumococcal Lobar Pneumonia. J J Bunim and J D Trask New Haven Conn—p 626
*Occurrence of Tubercle Bacilli in Blood of Umbilical Cord and in New-Born Infants of Tuberculous Mothers M Siegel and B Singer New York—p 636
Coarctation of the Aorta Report of Three Cases E. N. Ballantyne Hamilton Ont—p 642
*Maldevelopment and Malescent of Testes Report of Treatment with Anterior Pituitary-like Gonadotropic Hormone from Urine of Pregnant Women G B Dorff Brooklyn—p 649
Appendicular Form of Bacillary Dysentery with Notes on Mesenteric Adenitis and Inflammation of Distal Portion of Ileum J Felsen New York—p 661

Prophylactic Use of Whole Blood in Anterior Poliomyelitis—Stokes and his associates discuss and tabulate the results of prophylactic injection of parents' blood, pooled convalescent serum and pooled adult serum in 2,179 children in Philadelphia. An attempt to analyze statistically the incidence of poliomyelitis in a group of 620 children who received injections in a certain census tract area of Philadelphia, and its relation to the group who did not receive injections in the same area, is described. A small group of eleven children who contracted poliomyelitis from five to eighteen days following the injection of whole blood or serum is described. The mild nature of the attack is emphasized as apparently favoring such prophylaxis, since residual paralysis developed in only one child. The authors state that, if one assumes that parents' whole blood usually contains as large amounts of immune bodies against poliomyelitis as does pooled adult serum, the advantage of a readily available supply for immediate use probably will determine its choice. This procedure is particularly applicable in the presence of a widespread epidemic without adequate preparation for it. If in the future passive immunization with serum or whole blood proves to be effectual, it is possible that the availability of lymphic serums may rectify such lack of preparation. They believe that, in view of the experiences in Philadelphia and in Bradford and the favorable clinical impressions derived from them, parents' whole blood should be used as a prophylactic measure whenever possible in large epidemics of poliomyelitis, both for the sake of the children and for the purpose of accumulating further statistics regarding its value. Over the period of an epidemic more than a single injection would seem advisable since passive immunization probably does

not persist for more than from four to six weeks. Lymphic human serums of high neutralizing value against the virus of poliomyelitis which apparently retain their antibody titer, should be made available wherever epidemics arise.

Tubercle Bacilli in Infants of Tuberculous Mothers—

Siegel and Singer studied fifteen new-born infants of tuberculous mothers for evidence of the transmission of tubercle bacilli by way of the umbilical vein. Cultures of umbilical blood by the Loewenstein method were negative for tubercle bacilli in fourteen infants. In the one in which the culture of umbilical blood was positive, the placenta had a large tuberculous area. The child was born prematurely at seven months and died three hours after birth with no demonstrable lesions on postmortem examination. A culture of the heart blood was strongly positive for tubercle bacilli. The mother died of tuberculosis eighteen hours after delivery. In the fourteen cases in which cultures of umbilical blood gave negative results, the placentas were normal on routine macroscopic examination and on microscopic study of several sections. The new-born infants in this group showed no evidence of tuberculosis. Four died within one month and cultures of the heart blood and of specimens from the liver, spleen and lungs were negative for tubercle bacilli. Ten are normal, as shown by repeated roentgenograms of the chest and results of intracutaneous tests with 10 mg of tuberculin. Of the fourteen mothers in this group, nine had advanced pulmonary tuberculosis and five had minimal, nondestructive lesions. The tuberculous process in those mothers with advanced phthisis progressed during the postpartum period and caused death in five instances. Those with minimal lesions showed no progression after labor. Cultures of blood taken before and after labor from five mothers with advanced pulmonary tuberculosis were negative for tubercle bacilli by the Loewenstein method.

Maldevelopment and Malescent of Testes—Dorff gives the results in fourteen boys having hypoplastic genitals who were treated with the anterior pituitary-like gonadotropic principle from the urine of pregnant women (and with the anterior pituitary growth hormone). In seven of eight patients with undescended testes there was some increase in size and descent, while in the other patients with hypoplastic testes there was a double or triple increase in size. The first apparent sign of the effectiveness of the therapy was usually a blushing or pinkish coloration of the scrotum and often of the penis. With the enlargement of the scrotum, an increase in the size of the testes was observed and, later, of the penis. There appeared blond, fuzzy pubic hairs, which later became pigmented, more numerous and longer. This progression of development was noticed even in the younger children. It was necessary to administer a large quantity of extract before beneficial effects were evident and a larger number of total rat units before effectual results were obtained. The response was slow, and very little change could be observed during the first few months of therapy. The most efficacious dosage was found to be a large dose of anterior pituitary-like gonadotropic principle from the urine of pregnant women (250 rat units) given from three to five times a week until there was a genital response, and then the same amount given three times a week. There were two predominant types of persons in the author's series: those with adiposogenital dystrophy and those with mild or masked hypothyroidism. A lowered basal metabolic rate, evident in patients with primary hypogonadism and in those with hypothyroidism, will remain low, even after the administration of the anterior pituitary-like gonadotropic principle, although there may be a slight increase. The basal metabolic rate at the onset of treatment was on the minus side, and the author feels that under true basal conditions and on several repetitions of this test there would be still lower minus rates. If there are no mechanical factors to obstruct descent, good results can be anticipated and obtained in patients with maldeveloped or maldescended testes. Also, there is the possibility of developing an apparently absent testis, and therefore treatment should be given. Treatment may be started at any time before puberty. However, patients closer to puberty show a more rapid response. Although the author discontinued thyroid therapy during his study, he thinks that it should be given along with the anterior pituitary-like gonadotropic principle in order to obtain the best

results in the patients with mild or masked hypothyroidism. Patients with hypoplastic and undescended testes should not be submitted to surgical procedures until a course of intensive treatment with the anterior pituitary-like gonadotropic principle has been instituted for one year without success.

American Journal of Medical Sciences, Philadelphia

190 435 582 (Oct.) 1935

- Pathologic and Immunologic Problems in the Virus Field T M Rivers New York—p 435
- Serologic Classification of Hemolytic Streptococci in Relation to Epidemiologic Problems H F Swift, Rebecca C Lancefield and K Goodner, New York—p 445
- Acute Vasospastic Hypertension. Case with Signs of Cerebral Irritation and Severe Retinitis with Remission N M Keith and H P Wagoner Rochester Minn—p 454
- Suggestion for Simple Treatment of Acute Arterial Spasm E P Lehman University Va—p 459
- Study of Venous Blood Pressure in Some Common Diseases W B Wartman Philadelphia—p 464
- Demonstration of Collateral Venous Circulation in Abdominal Wall by Means of Infra Red Photography E Jones Nashville Tenn—p 478
- *Studies of Peripheral Vascular Phenomena IV Effect of Artificial Fever on Pulse-Volume Changes of Finger C A Johnson S Osborne and G Scupham Chicago—p 485
- *Metabolic Rates in Therapeutic Fever I Kopp Boston—p 491
- Study of Coagulation Defect in Hemophilia and in Jaundice A J Quick Milwaukee Margaret Stanley Brown and F W Bancroft, New York—p 501
- Gaucher's Disease of Late Onset with Kidney Involvement and Huge Spleen J S Horsley Jr J P Baker Jr and F L Apperly Richmond Va—p 511
- Hyperparathyroidism with Renal Insufficiency D E Bellin and B S Gershwin Brooklyn—p 519
- Pellagra Analysis of Cases Admitted to the Pennsylvania Hospital Since 1922 T C Garrett Philadelphia—p 525
- The Psychologic Background of Colitis F Bodman Bristol England—p 535
- The Common Denominator of Disease G Draper New York—p 545

Effect of Artificial Fever on Pulse-Volume Changes of Finger—Johnson and his associates observed an increased pulse-volume change with all types of artificial fever except foreign protein, which gave a primary decrease of the pulse-volume change associated with the chill. They interpret the increased pulse-volume change as increased circulation, a result of the vasodilatation and probably increased cardiac output. The effect of artificial fever on peripheral circulation, when induced by general heat with prevention of heat loss, was about the same with all the methods used. The finger volume change increased from about 0.01 cc. control to from 0.06 to 0.08 cc. The maximal circulatory response occurred at a temperature considerably lower than the maximum used. The amplitude of the excursions measuring the circulatory response showed marked variations as the temperature was maintained, which they interpreted as due to instability of the vasomotor system and instability of the heat regulating mechanism which is intimately associated with the vasomotor system. This indicates that there may be an optimal temperature at which a maximal circulatory response occurs. This suggests that high therapeutic fevers up to 106 F as often used are too high unless factors other than circulation play a part and are brought out only by fevers above the optimum. The circulatory response to artificial fever induced with foreign protein differed from that obtained with artificial fever induced by external heat. Foreign protein uniformly in five patients gave a primary vasoconstriction associated with the chill and followed by a vasodilatation. The vasodilatation was never as great as that produced by the other methods unless heat loss was prevented by insulating the body and the fever maintained. Clinically good results are obtained with foreign protein therapy in spite of the fact that the peripheral circulatory response is not as great with fever induced by other methods. The fundamental difference in the results of foreign protein fever and that produced by external heat is that the vasoconstriction and vasodilatation of foreign protein fever is probably of central origin, while the vasodilatation with fevers produced by other means is chiefly of peripheral origin. Artificial fever induced by external heat is dangerous unless proper precautions are taken, and even then some patients do not tolerate fever well, particularly those with impairment of the cardiovascular system. Proper equipment is paramount. A recording thermometer should be used so that an accurate observation of the temperature can be had at all times. A physician should be present at all times, and means for emergency treat-

ment of heat exhaustion should be available. The ability to tolerate this type of artificial fever seems to be related to the cardiovascular reserve. The question of how long the fever should be maintained is debatable. The authors feel that it should not be run to the point of exhaustion. Regarding the best method of inducing artificial fever from external heat, they believe that the ordinary electric light cabinet is probably the best. The most dangerous method is probably the hot water bath.

Metabolic Rates in Therapeutic Fever—Kopp determined the metabolic rates of seven patients having neurosyphilis in whom fever was induced by artificial means. In six patients, in whom fever was induced by the combined method of diathermy current, electric cabinet and hot moist air, determinations were started about two and one-half hours after a light breakfast. In the seventh patient, in whom fever was induced by diathermy current, electric cabinet and hot moist air, a method combining the diathermy current, the electric blanket and hot moist air, electric blanket and mixed typhoid vaccine, all determinations were made under basal conditions. An increase in the metabolic rate occurred when fever was induced by the combined method of diathermy current, electric light cabinet and hot moist air. Though a rather suggestive linear relationship was present, fluctuations of a fairly marked degree occurred at different temperature levels when the group is taken as a whole. This may be due to individual variations in the degree of discomfort manifesting itself especially by hyperpnea, the metabolic rates at higher levels paralleling, as a rule, the amount of hyperpnea present. Repeated metabolic rates obtained on one patient under basal conditions in a series of experiments during which body temperature was raised by similar methods and maintained at different levels from one to three hours revealed a fairly uniform increase in body metabolism for each degree of temperature rise. The removal of the insulating hot, moist air blanket when the body temperature had reached its desired height was followed in nearly all cases by a rather steep fall in metabolic rate whether body temperature remained at the same level, fell or even rose. Metabolic rates for similar temperature levels were higher when the temperature was rising than when falling. The diathermy current alone over short intervals had no specific effect on the basal metabolic rate, provided no rise in body temperature occurred. Alteration of the frequency of the diathermy current at increased temperature levels also caused no appreciable change in the metabolic rate. The increases in metabolic rate obtained on the one patient, in whom a rise of temperature was induced by the five different methods, showed a rather striking parallelism and did not differ much from the accepted rise of 7.2 per cent for each degree Fahrenheit, except in fever induced by diathermy current alone. In the latter the average rise in metabolic rate was 2.4 per cent and 3.9 per cent for each degree of fever. The rapidity of the rise in body temperature played no part in the results obtained. Repeated fever treatment of one patient over a period of seven months had no residual effect on the basal metabolic rate.

American Journal of Physiology, Baltimore

113: 251 504 (Oct. 1) 1935

- Comparison of Effects of Sympathin and Adrenine on the Iris W B Cannon and A Rosenbluth Boston—p 251
- Assay of Three Hormones Present in Anterior Pituitaries of Seven Types of Cattle Classified for Age Sex and Stage of Reproduction R W Bates O Riddle and E L Lahr Cold Spring Harbor N Y—p 259
- Exhaustibility of Sympathin Stores J A Dye Boston—p 265
- Differential Depression of Vasomotor Mechanisms by Adrenin L C Wyman and Caroline tum Suden Boston—p 271
- Goat's Milk Anemia G O Kohler C A Elvehjem and E B Hart Madison Wis—p 279
- Study of Mechanism of Hypertension Following Intracisternal Kaolin Injection in Rats Leukocytic Reaction and Effect on Lymphatic Absorption J Q Griffith Jr W A Jeffers and M A Lindauer Philadelphia—p 285
- Basal Metabolism and Urinary Nitrogen Excretion of Oriental Women Abby H Turner South Hadley Mass and F G Benedict Boston—p 291
- Relation of Paraflocculus to Movements of Eyes R S Dow Portland Ore—p 296
- Area and Intensity Time Relation in Peripheral Retina C H Graham and R Margaria Philadelphia—p 299
- Influence of Epinephrine on Blood Sugar Lactic Acid and Inorganic Phosphorus of Completely Hypophysectomized Dogs I L Chaikoff Berkeley Calif F L Reichert L S Read and M E Mathes San Francisco—p 306

- Calculation of Cardiac Output and Effective Peripheral Resistance from Blood Pressure Measurements with Appendix on Size of Aorta in Man H C Bazett F S Cotton L B Laplace and J C Scott Philadelphia—p 312
- Relation of Suprarenal Cortical Hormone to Nitrogen Metabolism in Experimental Hyperthyroidism G A Koelsche and E C Kendall Rochester, Minn—p 335
- Mechanism of Photosensitization in Man H F Blum, W G Watrous and R J West Berkeley Calif—p 350
- Excretion of Inulin Creatinine Xylose and Urea in Normal Rabbit B J Kaplan and H W Smith New York—p 354
- Nerve Control of Coronary Vessels with New Experimental Evidence for Pathways of Efferent Constrictor and Dilator Neurons in the Dog C W Greene Columbia Mo—p 361
- Effect of Temperature on Rate of Blood Flow in Normal and in Sympathectomized Hand. N E. Freeman Boston—p 384
- Control of Coronary Blood Flow by Reflexes Arising in Widely Distributed Regions of the Body C W Greene Columbia Mo—p 399
- Errors of Routine Analysis in Counting of Leukocytes W R Bryan L L Chastain and W E. Garrey, Nashville Tenn—p 416
- Leukocyte Count of Young Male Adults Observed After a Period of Rest and During Mild Activity in Early Morning W R Bryan L L Chastain and W E. Garrey Nashville Tenn—p 430
- Influence of Sodium Fluoride on Basal Metabolism of Rat Under Several Experimental Conditions P H Phillips H E English and E B Hart Madison, Wis—p 441
- Fetal Carbohydrate Metabolism Following Adrenalectomy Insulin and Glucose Experiments on the Mother E L Corey, Charlottesville, Va—p 450
- Histamine like Substance in Gastric Juice C L Brown and R G Smith with technical assistance of Jean L Kyer, Ann Arbor Mich.—p 455
- Effect of Viosterol on Oxygen Consumption of Frog's Muscle. S Gelfan Chicago—p 464
- Blood Regeneration in Severe Anemia Fractions of Kidney Spleen and Heart Compared with Standard Liver Fractions F S Robscheit Robbins G B Walden and G H Whipple Rochester N Y—p 467
- Action Potentials of Auditory Nerve. A J Derbyshire and H Davis Boston—p 476

Am. J Roentgenol & Rad Therapy, Springfield, Ill.

34 289-432 (Sept.) 1935

- Sialography with Particular Reference to Neoplastic Diseases H T Kimm J W Spies and J J Wolfe Peiping China—p 289
- *Roentgenologic Bone Changes in Sickle Cell and Erythroblastic Anemia Report of Nine Cases A G Grinnan, New York—p 297
- *Bone Changes of Leukemia in Children J M Baty and E C Vogt, Boston—p 310
- *Evaluation of Injury and Faulty Mechanics in Development of Hypertrophic Arthritis H P Doub and H C Jones Detroit—p 315
- Roentgen Diagnosis of Fractures of Base of Skull W Ginsburg Moscow U S S R—p 325
- Prolapsing Lesions of Gastric Mucosa E P Pendergrass and J R Andrews Philadelphia—p 337
- Diverticulum of Cardia of Stomach Case Report J M Bonnar and B Kaplan New Bedford, Mass—p 351
- *Removal of Lymph Nodes in Cancer of Cervix. F J Tauszig St Louis—p 354
- Pulmonary Changes Associated with Upper Respiratory Tract Abnormalities and Diseases T G Clement Duluth Minn—p 364
- Relief of Pain by Roentgen Irradiation in Paget's Disease of Bone Cassie B Rose Chicago—p 374
- Preliminary Observations Concerning Effects of Roentgen Irradiation in Presence of Fluorescein M E Goodrich, Toledo Ohio—p 378
- Irradiation in Carcinoma of Lip I I Kaplan and S Krantz New York—p 381
- Giant Cell Tumor of Spine Report of Case G W Murphy Asheville N C—p 386
- Pelvic Kidney with Ureter Opening Near Urethral Orifice Report of Case E. M. Van Buskirk Fort Wayne Ind.—p 395

Bone Changes in Sickle Cell and Erythroblastic Anemia—Grinnan observed four cases of sickle cell and five of erythroblastic anemia, all of which showed roentgenologic bone changes. The four cases of sickle cell anemia showed thickening of the frontal parietal, occipital and temporal bones, with thinning of the inner tables and very thin or absent outer tables. The skull changes found in sickle cell anemia and erythroblastic anemia are so similar that they cannot be differentiated by roentgen examination alone. Changes of the long bones were found in only one case of sickle cell anemia. They consisted of cortical thinning, expansion of the shafts and medullary trabeculations. Striations were also present in the pelvis and scapulas. The bone changes seen are not typical of sickle cell anemia alone but also resemble those of erythroblastic anemia. The five cases of erythroblastic anemia showed bone changes in varying degrees depending on the age of the patient and the duration and severity of the disease. Three of the erythroblastic cases showed thickening of the skull and extensive changes in the long bones and other bones of the skeleton. The earliest definite bone changes found in erythroblastic anemia occurred in the metacarpals and skull. Four of the cases of erythro-

blastic anemia occurred among children of Italian parentage. All four cases of sickle cell anemia occurred in Negro children. One case has been presented because it shows that the presence of erythroblasts, even for a relatively short time, produces medullary thickening of the skull. This condition occurred in a child of English-Irish parentage, while it is generally accepted that this occurs only in the Mediterranean races. The bone changes found on roentgen examination in sickle cell anemia and erythroblastic anemia are very similar and are not alone diagnostic of either condition.

Bone Changes of Leukemia in Children—Baty and Vogt made roentgenograms of part or all the skeleton in forty-three cases of leukemia. The most frequent change was a narrow, transverse zone of diminished density just proximal to the metaphysis of the long bones. This zone or line varied from 2 to 5 mm. in width and was most marked in bones in which growth is rapid, as in the lower ends of the femurs and tibiae. It seemed relatively more prominent as the disease progressed. The line was present in the bones of 70 per cent of the forty-three cases. It was present in the bones of sixteen patients less than 3 years of age and in twenty-nine less than 6 years of age. In attempting to analyze the occurrence in the different types of leukemia, it was found that the zone was present in 80 per cent of the cases of myeloid leukemia and in 65 per cent of the cases of lymphoid leukemia. This zone of diminished density is not peculiar to leukemia and its production is not entirely clear. Infiltration and erosion of bone by masses of leukemic cells probably plays some part, particularly in instances in which it is most marked. Microscopic sections of some of these bones showed leukemic infiltration in the region bordering the metaphysis, but the masses of infiltrating cells were not definitely greater than in other regions. The line of rarefaction is very similar in location and in appearance in the Trümmerfeld zone, which is demonstrable in roentgenograms of the bones in scurvy. Neuroblastoma with generalized miliary metastases may simulate rather closely the more advanced changes of leukemia. In both diseases the roentgenograms of the skull may show a diffuse granular mottling and the cranial sutures may be separated as the result of increased intracranial pressure. The pelvis and spine may also give much the same roentgen picture in the two diseases. The bones of the extremities should, however, furnish the information necessary to make a differentiation. It is important that the entire extremities be examined, including the phalanges. One of the most important points in the differentiation is found in the distal bones of the extremities. The metastases of neuroblastoma involve particularly the proximal ends of the large bones, as the humeri and femurs, and much less, if at all, the bones distal to the knees and elbows. Another disease, rare in children, that may cause cortical absorption, osteoporosis and softening and has to be considered in the differential diagnosis is hyperparathyroidism. No real difficulty should be encountered in recognizing the difference in the roentgenogram as well as the clinical and hematologic pictures between leukemia and erythroblastic anemia. The bones in erythroblastic anemia may be very porous as the result of marked hyperplasia of the marrow substances, with thinning of the cortex of the long bones, but the diffuse invasion and infiltration of the dense parts are not seen as in leukemia. A typical feature of erythroblastic anemia is the thickening of the cranial vault. What is said of erythroblastic anemia also applies to congenital hemolytic icterus and sickle cell anemia, although the changes in the latter two conditions are seldom as marked as in erythroblastic anemia.

Evaluation of Injury in Development of Hypertrophic Arthritis—In a series of extra-articular fractures of the bones of the lower legs that Doub and Jones studied they could find no evidence that a single severe trauma had any influence in producing hypertrophic arthritis. In one case that showed beginning changes about the knee joint the bowing of the femur was sufficient to alter the mechanics of the joint and thus account for the changes that were present. The authors selected cases of fracture so that they might be sure that sufficient trauma was applied to produce organic injury of surrounding structures. A single injury with hemarthrosis alone would not seem sufficient to produce permanent arthritic changes. It would seem that advancing age, with its attendant factors of arteriosclerosis and loss of elasticity and fibrillation of the

cartilage, is one of the greatest factors in the production of hypertrophic arthritis. This also includes long-standing wear and tear and minor traumas. The mechanical theory as to the etiology of hypertrophic arthritis must certainly be given a great deal of consideration. Faulty mechanics locally, as in the case of angulation of a long bone projecting the lines of force in such a way as to produce abnormal pressure on certain parts of the articular surfaces of the nearby joints may produce quite marked changes in the joint. The cartilage shows evidence of gradual erosion in the areas of abnormal pressure and this is followed by eburnation of the bone and marginal lipping. There may be anatomic changes also that produce more general changes, such as extensive scoliosis of the spine, which may not only affect the vertebrae themselves but may produce unequal strain on the peripheral joints and affect them also.

Removal of Lymph Nodes in Cancer of Cervix.—Tausig has applied to cancer of the uterine cervix the methods successfully employed by many persons in cancer of the mouth, namely, irradiation of the primary tumor and surrounding tissues and surgical resection of the tributary lymph nodes. He has attempted a combination of lymph node removal with irradiation in twenty-six group 2 and 3 (League of Nations classification) cases of cancer of the cervix. His experience with the eight more advanced group 3 cases is distinctly discouraging. On the other hand, the eighteen group 2 cases with but one primary death due to embolus and with eleven of the patients still clinically well, although five of these eleven showed cancer in the glands removed, justify the belief that this method should be given further trial. His recommendation is that only patients in good physical condition, preferably young and not obese, be selected and that the operator should be reasonably experienced in pelvic cancer surgery. With these limitations, it is fair to hope that by this method the percentage of cures in group 2 cases of cancer of the cervix may be materially increased.

Archives of Dermatology and Syphilology, Chicago

32: 545-706 (Oct.) 1935

The Tyranny of Words C M Williams New York—p 545

Inhalations of Ethyl Iodide in Fungous Infections Further Studies

J H Swartz with assistance of Margaret Reilly Boston—p 551

Some Quacks in Old London and Morbus Gallicus W R Riddell, Toronto—p 556

*Estrogenic Substance in Blood of Patients with Acne T Rosenthal and T Neustaedter New York—p 560

The Hospital Saint Louis Historical Sketch B B Beeson Chicago—p 563

Exclusion of Neurosyphilis by Means of the Hinton Reaction of Blood J L Grund Boston—p 569

Contact Dermatitis Due to Crude Petroleum J M Adams New Orleans and F L Irby El Dorado Ark—p 573

Blood and Oxygen Supply of Skin F R Schmidt Chicago—p 576

*Relation of Adrenal Glands to Hypertrichosis Results of Irradiation of Adrenals and Review of Literature H D Niles New York—p 580

Primary Complex of Tuberculosis of Skin Review of Literature H E Michelson Minneapolis—p 589

*Enlargement of One Sternoclavicular Articulation as Valuable Clinical Sign of Late Prenatal (Congenital) Syphilis M Dorne and S J Zakon Chicago—p 602

Differentiation of Sharply Outlined Eczematoid Patches E D Chipman San Francisco—p 605

Meadow Grass Dermatitis (Dermatitis Bullosa Striata Pratensis) E F Corson Philadelphia—p 616

Mixed Tumors of Palate A B Absher New York—p 622

Estrogenic Substance in Blood of Patients with Acne

—By means of the method of Frank and Goldberger in the determination of values for estrogenic substance in the blood of girls with acne, Rosenthal and Neustaedter obtained results that paralleled closely the earlier work on estrogenic substance in the urine determined according to the technic of Kurzrok and Ratner. This leads them to believe that associated with acne there is abnormality of formation or of utilization of the sex hormone. Although their series of cases (twenty-nine) was small, they believe that it can be assumed that a definite relationship exists and that a deficient secretion of the follicle-ripening hormone may prove to be the direct or indirect factor in the cause of one type of acne. In the course of routine filtered roentgen therapy in the treatment of acne it is conceivable that the pituitary gland is affected by the relatively low dosage of irradiation administered and in consequence induces a normal ovarian response.

Relation of Adrenals to Hypertrichosis.—On the assumption that benign adrenal hyperactivity might cause hypertrichosis without the other symptoms which occur with tumors of these glands, Niles treated twelve patients having hypertrichosis with supposedly inhibitory doses of roentgen rays to the adrenals. They received from one to nine treatments, the average number being 3.83. Some patients were given a maximal dose once a month, others, small cumulative doses three times a week, and some, both types of treatment. Although with both procedures a few patients showed a slight loss of superfluous hair after the first one or two treatments, this did not continue, and the final result was unsatisfactory in all the treated patients. In spite of these results, the author still believes that hyperactivity of the adrenals may be a factor in some cases of hypertrichosis. Failure may have been due to insufficient dosage or improper intervals between treatments, although several patients received all the radiation that was considered safe. It also may have been due to the fact that in these patients some other gland than the adrenals was at fault. He believes that the ultimate satisfactory treatment of this condition will be from the endocrine point of view.

Enlargement of One Sternoclavicular Articulation in Prenatal Syphilis.—Dorne and Zakon present the observations in a group of twelve patients demonstrating enlargement of the sternal end of the right clavicle as a sign of prenatal syphilis. These patients are all persons with recognized prenatal syphilis whom they have had under observation and treatment for varying periods and who also present other signs of prenatal syphilis. The enlargement of the sternal end of the clavicle reaches a permanent stage about the age of puberty and hence becomes a valuable permanent stigma of prenatal syphilis.

Archives of Internal Medicine, Chicago

56: 413-626 (Sept.) 1935

*Treatment of Severe Diabetic Acidosis Comparison of Methods, with Particular Reference to Use of Racemic Sodium Lactate. A. F. Hartmann with technical assistance of Marie Morton St. Louis.—p 413

*Differential Diagnosis Between Cerebral Hemorrhage and Cerebral Thrombosis Clinical and Pathologic Study of Two Hundred and Forty-Five Cases C D Aring and H H Merritt, Boston—p 435

Pathology of Vessels of Pulmonary Circulation Part II O Brenner Birmingham, England—p 447

Urticaria Due to Sensitivity to Cold Survey of Literature and Report of Case with Experimental Observations H D Levine, Boston.—p 498

Experimental Concentric and Eccentric Cardiac Hypertrophy in Rats. D A Ryland and W Dock, San Francisco—p 511

Studies of Hepatic Function II In Portal Cirrhosis and Congestive Heart Failure A Cantarow Philadelphia—p 521

Peripheral Vascular Diseases Review of Some of Recent Literature with Critical Review of Surgical Treatment G W Scupham and G de Takáts, Chicago—p 530

Treatment of Severe Diabetic Acidosis.—As a result of a study of eighty-six patients with diabetic acidosis, the method of treatment that Hartmann recommends includes 1 Immediate parenteral administration (one half intravenously, the remainder subcutaneously and intraperitoneally) of 60 cc. of a sixth-molar solution of racemic sodium lactate per kilogram of body weight 2 Immediate administration of 2 units of insulin per kilogram of body weight 3 Administration of 40 cc. of Ringer's solution per kilogram of body weight as soon after the administration of sodium lactate as possible 4 Repeated administration of insulin six hours later in a dose of 0.5 unit per kilogram of body weight 5 Transfusion of citrated whole blood or plasma (20 cc. per kilogram of body weight) if edema due to reduced plasma protein develops

Differential Diagnosis Between Cerebral Hemorrhage and Cerebral Thrombosis.—Aring and Merritt present an analysis of the data obtained from the records of 245 cases of cerebral vascular lesion studied clinically and at necropsy 1 Cerebral vascular accidents are rare in patients below the age of 40, but cerebral hemorrhage occurs more frequently than cerebral thrombosis in the decade from 40 to 50 2 The occurrence of a sudden severe headache or vomiting at the onset is strongly in favor of a diagnosis of cerebral hemorrhage. Convulsions are more frequent in cases of cerebral hemorrhage. The convulsions that occurred in cases of cerebral thrombosis were usually associated with syphilis or a lesion in the motor

cortex. The onset with immediate unconsciousness is more frequent in cases of cerebral hemorrhage (51 per cent) than in cases of cerebral thrombosis (32 per cent). The presence of coma on the patient's admission to the hospital is probably a more reliable index to the relative frequency of cerebral hemorrhage. Signs of progression of the cerebral vascular lesion after the onset are more frequent in cases of cerebral hemorrhage. 3 Abnormalities in the depth, rate, rhythm and sound of the respirations are more frequent in cases of cerebral hemorrhage. 4 The systolic blood pressure was greater than 200 mm in 41 per cent of the cases of cerebral hemorrhage, as compared with 26 per cent of the cases of cerebral thrombosis. Cerebral hemorrhage or cerebral thrombosis is not rare in a patient with normal blood pressure. 5 There was no evidence of arteriosclerosis in 10 per cent of the cases of cerebral hemorrhage, as compared with 1 per cent of the cases of cerebral thrombosis. 6 Abnormalities in the eyes are found more frequently in cases of cerebral hemorrhage. 7 Stiffness of the neck is usually indicative of a cerebral hemorrhage. It was found in 55 per cent of the cases of cerebral hemorrhage and in only 7 per cent of the cases of cerebral thrombosis. 8 The bilateral occurrence of the Babinski sign was noted almost twice as often in cerebral hemorrhage as in cerebral thrombosis. 9 The initial leukocyte count was markedly increased in 55 per cent of the cases of cerebral hemorrhage, as compared with 10 per cent of the cases of cerebral thrombosis without complications. 10 The cerebrospinal fluid pressure was increased in 57 per cent of the cases of cerebral hemorrhage and in 22 per cent of the cases of cerebral thrombosis. In 38 per cent of the cases of cerebral hemorrhage the cerebrospinal fluid pressure was greater than 300 mm., and in 18 per cent the pressure was greater than 400 mm. In the cases of cerebral thrombosis a pressure greater than 300 mm was rare and a pressure greater than 400 mm did not occur. A grossly bloody fluid was found in 74 per cent of the cases of cerebral hemorrhage, and it was rarely if ever found in cases of cerebral thrombosis. 11 In 50 per cent of the cases of cerebral hemorrhage the patient died within four days of the onset, and in only 28 per cent of the cases of cerebral thrombosis did the patient die in this period. Cerebral vascular lesions do not cause sudden death.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

16: 513 576 (Sept.) 1935

- Unemployability a Medical Problem. B Fantus Chicago—p 517
- Fever Therapy in Pelvic Conditions. Results of Experimental and Clinical Studies. W Bierman, E A. Horowitz and C. L. Levenson New York—p 520
- Physical Treatment in Postural Defects. Helen D. Denniston Madison Wis.—p 525
- Physiologic Effects of Acetyl Beta Methyl Choline Chloride by Iontophoresis. Preliminary Report. A. J. Kotkis and R. H. Melchionna with technical assistance of W. F. Alexander and J. Lucido St. Louis—p 528
- Underwater Therapy in Chronic Arthritis. E. M. Smith Hot Springs Ark.—p 534
- Treatment of Arthritis with Massive Doses of Vitamin D. I. Dreyer and C. I. Reed Chicago—p 537
- Some Effects of Electric Currents on Human Respiratory Movements. H. Neufeld Brooklyn—p 544
- Ionization Treatment of Hay Fever. J. R. Walker, B. F. Walker and G. W. Walker Fresno Calif.—p 549
- Use of Iontophoresis. H. L. Levant New York—p 552
- Röntgenographic Studies of Colon with Double Contrast Enema. J. Gershon Cohen Philadelphia—p 555

Iowa State Medical Society Journal, Des Moines

25: 471 520 (Sept.) 1935

- Treatment of Acute Nephritis in Children. C. A. Aldrich Winnetka Ill.—p 471
- Otitis Media. Its Management. R. Stahr, Fort Dodge—p 475
- Management of Respiratory Infections from Standpoint of Ventilation and Drainage. J. V. Treyner Council Bluffs—p 477
- Statistical Study of Cases Seen in Allergy Clinic at the University Hospital 1933-1934. Julia Cole Iowa City—p 479
- Headache. Differential Diagnosis in Periodic Types. T. R. Gittins, Sioux City—p 481
- Complications of Specific Urethritis. G. D. Jenkins Burlington—p 488
- Purpura Complicated by Cerebral Hemorrhage and Gangrene of Lower Extremities. M. G. Meyer Marshalltown—p 491
- Hypothyroidism in Pregnancy. W. O. Purdy Des Moines—p 493

Journal of Allergy, St. Louis

6: 517-614 (Sept.) 1935

- Observations on Nature of House Dust Allergen. M. B. Cohen, T. Nelson and B. H. Reinartz Cleveland—p 517
- Diphtheria Immunization of Allergic and Nonallergic Individuals by Intracutaneous Injection of Alum Precipitated Toxoid. R. A. Kern, J. Crump and T. A. Cope Philadelphia—p 525
- Studies in Absorption of Undigested Proteins in Human Beings. V. New Technic for Quantitatively Studying Absorption and Elimination of Antigens (Preliminary Report). A. Walzer and M. Walzer Brooklyn—p 532
- Studies in Sensitization. Influence of Occupation on Sensitization in Man as Determined in Study of Thirty Two Bakers. A. Colmes, B. T. Guild and F. M. Rackemann Boston—p 539
- Ragweed (Contact) Dermatitis Produced Experimentally in Guinea Pig. L. A. Brunsting and R. J. Bailey Rochester Minn—p 547
- Permanent Results Following Treatment for Late Hay Fever. A. Vander Veer New York and J. A. Clarke Jr. Philadelphia—p 551
- *Surgical Anesthesia Deliberately Induced by Ether for Semipermanent Relief of Chronic Intractable Bronchial Asthma. Preliminary Report. I. S. Kahn San Antonio Texas—p 556
- Studies on Relation of Micro Organisms to Allergy. II. Role of Yeasts in Allergy (Preliminary Report). S. M. Feinberg and H. T. Little Chicago—p 564
- Wheat Millers Asthma. W. W. Duke Kansas City, Mo—p 568
- Trichophyton Hypersensitiveness. Report of Case with Immediate or Reaginogenic Type of Reaction. W. J. Tomlinson Philadelphia—p 573
- Patch Tests with Lacquers. L. Goldman Cincinnati and H. Pfosi, Zurich Switzerland—p 579

Anesthesia for Relief of Asthma.—Kahn did not secure prolonged relief in chronic intractable bronchial asthma lasting months, as was hoped for, as a result of surgical anesthesia by ether administration. The amount and the duration of relief obtained would, however, conservatively indicate that in surgical ether anesthesia the allergist possesses another weapon, at least in some instances, of decided value in breaking the recurrent asthmatic paroxysm habit of pollen etiology when other simpler measures have failed. This relief measure may have a far wider field of usefulness in intractable asthma of other etiologies, specific or nonspecific, and may also explain the correction of asthma and other hypersensitivity conditions heretofore ascribed to surgical intervention, intentional or coincidental. While ether anesthesia, both by rectum and by inhalation has undoubtedly been previously employed successfully to relieve a severe acute asthmatic paroxysm, the author believes that his three cases are the first instances of deliberately induced surgical ether anesthesia for the sole purpose of securing relief of a semipermanent character in chronic daily recurring asthma, the anesthetic being administered at the time when the patient was actually comfortable and completely or almost completely symptom free.

Journal of Bacteriology, Baltimore

30: 213 334 (Sept.) 1935

- Bacterial Variation. Inquiry into Underlying Principles Governing Cell Morphology of *Bacillus Megaterium*. L. F. Rettger and Hazel B. Gillespie New Haven Conn.—p 213
- Differences in Effect of Phenyl Mercuric Chloride on Different Races of Bacteriophage and Similarity in Effect on a Phage and Its Homologous Organism. N. R. Goldsmith Pittsburgh—p 237
- Studies on Growth Phases of *Clostridium Septicum*. A. Hoyt Los Angeles—p 243
- *Bactericidal Principle in Excretions of Surgical Maggots Which Destroys Important Etiologic Agents of Pyogenic Infections. S. W. Simmons, Washington D. C.—p 253
- Antigens of *Salmonella Anatum*. P. R. Edwards Lexington, Ky.—p 269
- Gram Positive Non Spore Bearing Anaerobic Bacilli of Human Feces. A. H. Eggerth Brooklyn—p 277
- Study of Microbial Variation in Yellow Pigment Producing *Coccus*. F. E. Cohen Minneapolis—p 301
- Occurrence of Strain of *Azotobacter Chroococcum* Which Does Not Ferment Mannitol. N. R. Smith, Washington D. C.—p 323

Bactericidal Principle in Excretions of Surgical Maggots.—Simmons obtained a potent bactericide from surgical maggots of the species *Lucilia sericata*, and the technic for its collection is described. Bactericidal tests with this substance were conducted with seven species of bacteria of etiologic importance in pyogenic infections. The results showed that exposures of from five to ten minutes were usually sufficient to give a 100 per cent kill of dense saline and broth suspensions of the organisms. The addition of organic material apparently has less effect on the potency of this material than on that of ordinary disinfectants. The active principle is of a nonviable nature and is not destroyed by autoclaving for twenty minutes.

at a pressure of 10 pounds. No indication of lysis could be demonstrated, and the thermostability and other reactions of this substance rule out the possibility of a bacteriophage as the active principle. The material was desiccated, and in this dry condition it apparently maintains its potency over a longer period than when in aqueous solution. The remarkable bactericidal potency of the excretions against *Staphylococcus aureus*, hemolytic streptococci and *Clostridium Welchii* accounts in part for the gratifying results obtained in such infections under maggot therapy. The investigation reveals a field with potentialities of producing other new and useful disinfectants from living organisms.

Journal of Industrial Hygiene, Baltimore

17: 185-242 (Sept.) 1935

- Heated Globe Thermometer for Evaluating Environmental Conditions of Comfort and for Studying Radiation Convection Effects. C. P. Yaglou. Boston.—p. 185.
- Antirachitic Effect of Ultraviolet Radiation Transmitted by a Smoky Atmosphere. H. M. Barrett. Toronto.—p. 199.
- Comparison of Mortality Rates from Bronchitis and Pneumonia, and from Respiratory Tuberculosis in Coal Miners and Other Residents in the Counties of Nottingham, Derby, Glamorgan and Monmouth, 1921-1923. P. Stocks. London, England.—p. 217.
- Effects of Inhalation of Hydrogen Fluoride. II. Response Following Exposure to Low Concentration. W. Machle and K. Kitzmiller. Cincinnati.—p. 223.
- Id. III. Fluorine Storage Following Exposure to Sublethal Concentrations. W. Machle and E. W. Scott, Cincinnati.—p. 230.

Journal of Pediatrics, St. Louis

7: 303-434 (Sept.) 1935

- Recollections and Reflections on Forty-Five Years of Artificial Infant Feeding. J. L. Morse. Boston.—p. 303.
- Treatment of Hyperthyroidism in Children and Younger Adolescents. E. Rose, Elizabeth Kirk Rose and C. P. Pendergrass. Philadelphia.—p. 325.
- Observations on Prophylactic Value of Specific Immune Serum in Experimental Poliomyelitis. E. W. Schultz and L. P. Gebhardt. Stanford University. Calif.—p. 332.
- Effects of Gelatin Hydrating Solution on the New-Born. M. J. E. Senn. New York.—p. 352.
- Nomograms for Calcium Ion Concentration of Blood and Body Fluids. I. N. Kugelmass. New York.—p. 358.
- *Common Disorders of the New-Born. Their Diagnosis and Treatment. B. E. Bonar, Salt Lake City.—p. 362.
- Transient Localized Cyanosis of the New-Born. L. H. Smith. Portland, Ore.—p. 376.
- Psychologic Problems in Adolescent. B. I. Beverly. Chicago.—p. 380.
- *Leukemia in Childhood with Onset Simulating Rheumatic Disease. C. H. Smith. New York.—p. 390.
- *Estrogenic Treatment of Gonorrheal Vaginitis. Report of Seventeen Cases. L. E. Goldberg, C. L. Minier. Newark, N. J. and E. L. Smith. Belleville, N. J.—p. 401.

Disorders of the New-Born.—Bonar states that, since reduction of neonatal morbidity and mortality rates is dependent largely on the prevention or early diagnosis and treatment of disorders of the new-born by the general practitioner, his first duty is to determine the seriousness of certain symptoms promptly before the condition of the infant becomes grave. This demands a thorough physical examination and continued observation of the baby rather than delegating the entire responsibility to untrained or less competent attendants. Once the physician has found that the symptoms denote the existence of definite disease, the decision must rest with him whether or not he himself desires or has the equipment to diagnose and treat the infant. If not, the patient should be referred promptly to a capable consultant, for at no other time of life is procrastination so likely to result in an unfavorable outcome. Particularly is this true of certain infections and of a few disorders producing such common symptoms as cyanosis, vomiting and hemorrhage, for the diagnosis and treatment of which simple diagnostic and therapeutic methods applicable to practice in the home or less well equipped hospital are discussed.

Leukemia with Onset Simulating Rheumatic Disease.—Smith discusses three cases illustrating the group of children having leukemia in whom the pains in the joints are not associated with evidences of visible inflammation and clinical differentiation from rheumatic disease becomes difficult. The migratory pains in the limbs and joints are often vague, and roentgen examination of the long bones discloses no deviations from the normal. In all other respects, too, the symptomatology and physical signs resemble those cases of rheumatic disease

in childhood in which joint pains are not associated with objective signs of inflammation. The history of the three cases prior to admission to the hospital so closely resembled rheumatic fever that treatment was directed toward that condition in two. The diagnosis of lymphoid leukemia was made on the recognition of the characteristic pathologic white blood cell. Cardiac signs, when present in leukemia, may be attributed to anemia. In one case remission in fever and joint pains followed the administration of salicylates. The response to salicylate therapy may perhaps be of significance, since it may differentiate the suggestive early case of leukemia with bone and joint pains from a case of true rheumatic disease. Bone and joint pain in leukemia of childhood may perhaps be explained on an anatomic basis. At birth and for the first three or four years of life, the long bones are entirely filled with actively functioning red marrow. At about 7 years of age fat appears, which is observed grossly at puberty. The conversion of active red marrow to nonfunctioning yellow marrow is complete at 21 years of age, with the exception of residual islands of red marrow in the upper end of the proximal long bones. It is conceivable that the encroachment on actively functioning hematopoietic tissue within the inelastic bony skeleton of the child produced by the invasion and multiplication of leukoblastic cells accounts for pain in the extremities. The pain in the initial pathologic phase of leukemia is due to increased pressure within the bone caused by crowding of the multiplying cells. As the pathologic process continues, rarefaction occurs within the bone. The next step consists of the spread of leukemic cells beyond the cortex and results in an elevation of the periosteum. In the cases cited the patients did not survive beyond the stage of infiltration, so that the roentgenogram could throw no light on the pathologic process responsible for the clinical symptoms. During the period in which the diagnosis of rheumatic disease seems likely, abnormal leucocytes make their initial appearance in the circulating blood. Abnormal lymphocytes possessing distinctive microscopic features were present in the blood smear in the three cases. The cytoplasm was usually scanty and took on a deeply basophilic stain. Vacuoles were present in some cells, and in others the cytoplasm was marked by its content of coarse azure granules. The immature lymphocytes appeared in varying percentages in the peripheral blood of all cases. The diagnosis of leukemia should be considered with the recognition of these cells even when they are few in number in the differential smear. The differentiation between cells of the myeloid and lymphoid series, as well as the recognition of the identifying characteristic of the abnormal cells, was facilitated by a combination of several techniques.

Estrogenic Treatment of Gonorrheal Vaginitis.—From their observations in seventeen cases of gonorrheal vaginitis in children, Goldberg and his associates are of the opinion that short or long duration of the disease prior to the administration of amniotin is not a factor in effecting a cure. The results from the oral method do not differ materially from those by hypodermic injections. The former method would appear to be preferable because of the natural disinclination of a child to be pierced by a needle and also because of the slight danger of an associated abscess, which occurred in one of their cases. The time limit, which is an important factor in therapy, is unquestionably much shortened in effecting cures by amniotin as compared with that by the old methods. Protracted treatment is a disadvantage in any disease, particularly in pediatric practice. The recurrences after this kind of treatment are in all probability much less than with any other type of therapy. The success of the estrogenic treatment, in their opinion, depends on the conversion of the epithelial lining of the vagina from an immature type of childhood to an adult type, as demonstrated by Lewis. They are in accord with Huberman and Israeloff who believe that the acquired layer of cornified epithelial cells acts as a protective barrier against the rapidly multiplying gonococci, thus preventing reinfection. The infecting organisms that were already lodged in the subepithelial spaces have been destroyed. No ill effects and no definite change in the genitals or in the mammary glands were observed in any of these children given estrogenic substance despite the large dosage that was sometimes necessary. Possibly, injurious effects may be delayed in appearing. The last biopsies taken revealed a decided retrogression in the epithelial layers from

the adult type back toward the immature type of the vaginal epithelial tissue of childhood. In a subsequent series the authors observed enlargement of the breasts in five of eleven cases under treatment with amniotin

Journal of Pharmacology & Exper Therap, Baltimore

54: 1126 (Sept) 1935

- *Relative Efficiency of Series of Analeptics as Antidotes to Sublethal and Lethal Dosages of Pentobarbital, Chloral Hydrate and Tribrom Ethanol (Avertin") O W Barlow Cleveland—p 1
Studies on Ether Dosage After Preanesthetic Medication with Narcotics (Barbiturates Magnesium Sulphate and Morphine) F A Calderone Westbury Long Island N Y—p 24
Pharmacologic Action of Alkaloids of Fumaceous Plants II Corydine R A Waud London Ont—p 40
Studies on Barbiturates XII Factors Governing Distribution of Barbiturates J M Dille C R Linegar and T Koppányi Washington D C—p 46
Id XIII Analysis of Duration of Action of Barbiturates T Koppányi C R Linegar and J M Dille Washington D C—p 62
Narcosis and the Chronaxie. P K Knoefel Nashville Tenn—p 72
Alcohol Injected Intravenously Effect of Habituation on Rate of Metabolism H W Newman and W C Cutting San Francisco—p 82
Sex Variation in Ketonuria of Ether Anesthesia in Rats G A Emerson Nashville Tenn—p 90
Quantitative Assay for Testicular Hormone by Comb Growth Reaction Second Communication T F Gallagher and F C Koch Chicago—p 97
Comparative Study of Choline and Certain of Its Analogues I Pharmacologic Activity of Acetylphosphocholine and Acetylarsenocholine Relative to Acetylcholine A D Welch and M H Roepke Toronto—p 118

Analeptics as Antidotes to Pentobarbital, Chloral Hydrate and Tribrom-Ethanol—Barlow studied the effect of various analeptics in albino rabbits against lethal doses of pentobarbital, chloral hydrate and tribrom ethanol. The experimental procedures were of two types. In one maximally hypnotic doses of each agent were administered and the course of hypnosis noted. The antidotal effects of one of a series of analeptics was then determined as judged by deviations from the usual course of hypnosis. The analeptic measures tested included artificial respiration, exposure to an atmosphere containing 90 parts of oxygen and 10 parts of carbon dioxide, and medication with one of the various antidotal agents. In the other experiment the 100 per cent lethal dosage of the depressants was determined. The influence of the analeptics of definite value, as determined by the results of the first study, on the course of poisoning from lethal doses of each of the three hypnotics was then determined. Under such conditions any recoveries noted following treatment could be attributed to the effects of the analeptic measures alone. From five to ten rabbits were used in each series of experiments with each dosage of the several analeptics or other resuscitation measures. The report represents in excess of 1,600 experiments

Journal of Urology, Baltimore

34: 289-348 (Oct) 1935

- Renal Calculi Etiology and Prophylaxis M B Wesson San Francisco—p 289
Replacement Lipomatosis of Kidney E W Exley and T J Devereaux Minneapolis—p 296
Cystitis Follicularis F Hinman San Francisco and J Cordonnier East St. Louis Ill—p 302
Cast of Vesical Calculus Weighing Almost Two Pounds J Daland Philadelphia—p 309
New Way of Ridding Bladder of Paraffin W G Schulte Salt Lake City—p 313
*Retention of Urine Due to Ephedrine with Discussion of Mode of Action and Therapeutic Usage J J Valentine New York and J S Fitzgerald Utica N Y—p 314
Suppurative Orchitis Its Diagnosis and Treatment C P Mathe San Francisco—p 324
New Cystoscope Holder for Demonstration Purposes M D F Blasucci New York—p 337
Simplified Interpretation of Cystometrograms Three-Factor Principle M Muschat Philadelphia—p 340
Converting or Observation Sheath for Stern McCarthy Resectoscope Greater Precision in Visualizing Results of Resection F E B Foley St Paul—p 344

Retention of Urine Due to Ephedrine—Valentine and Fitzgerald state that acute retention of urine due to the action of ephedrine is of significance to urologists because of the widespread use of this drug in asthma and associated conditions. They present three cases with a discussion of the probable mode of action. An attempt was later made to utilize this principle

in the treatment of "dribbling" or weak sphincteric control. In the first case a hypodermic injection caused symptoms in less than an hour. The vesical content could not have been greatly increased in this period. Severe pain with but 16 ounces (480 cc.) of urine in the bladder was noted in the second case. The third patient had pain and retentive symptoms with but 2 ounces (60 cc.) of urine in the bladder. From reported and their own observations, the authors are led to conclude that the retention will occur only in those patients who are developing prostatism or reaching the prostatic age. Red blood cells and albumin were present in all three cases and cleared on cessation of the drug. After observing the retention caused by ephedrine, the authors decided to test its value when there is need of better sphincteric control, i.e., in dribbling and in incontinence. They used it in five cases—all ambulatory. No improvement was noticed in two patients. Both were old men who were incontinent in their first two months following suprapubic prostatectomy. The internal sphincter was destroyed and the external sphincter relaxed. In another, an old man who had had perineal prostatectomy, improvement was definite, but over a long period of time. Such change was no more rapid than is frequently observed postoperatively without ephedrine. In the remaining two cases the effect was more striking. In one an internal sphincter traumatized by resection was made more tonic. Urination became more difficult, the residual increased and the dribbling ceased. In the other case the incontinence predicated on an old lesion of the central nervous system was markedly improved. The tone of the internal sphincter was increased enough to carry on its normal function.

Kentucky Medical Journal, Bowling Green

33: 395-438 (Sept) 1935

- Potential and Skin Cancer W J Young Louisville—p 429
Sixty Degrees Convergent Strabismus Corrected with Operation J K Hatcher on Louisville—p 436

Medical Annals of District of Columbia, Washington

4: 231-262 (Sept) 1935

- Meningitis in Children Review of Three Hundred and Thirty One Cases J W Lindsay E C Rice and M A Selinger Washington—p 231
The Varicose Ulcer A Horwitz Washington—p 243
Aortic Embolectomy Report of Case H H Kerr Washington—p 249
Colostomy Preliminary to Uretero-Enteric Anastomosis Report of Case W R Morris Washington—p 251
Massive Lymphosarcomatous Invasion of the Heart Report of Case W M Yater and H H Leffler Washington—p 253

Nebraska State Medical Journal, Lincoln

20: 361-408 (Oct) 1935

- Inventory of Surgical Considerations Which Are Fundamental to Further Progress in Our Art W Bartlett St. Louis—p 361
*Water Balance in Surgical Patients F A Collier Ann Arbor Mich—p 365
Operative Treatment of Patellar Fracture C G McMahon Superior—p 368
Interchangeable Signs and Symptoms Between Circulatory and Digestive Systems F W Niehaus Omaha—p 375
Postoperative Treatment of Peritonitis C C Johnson Lincoln—p 379
Disease of Childhood from the Standpoint of a General Practitioner A E Buchanan Fremont—p 382
Anorexia in Children H B Hamilton Omaha—p 385
Refinements in Tear Sac Surgery W H Stokes Omaha—p 388
Demonstration of Results of Radiation Therapy in Hopelessly Inoperable Carcinomas A F Tyler Omaha—p 394
Obstructive Dyspnea with Illustrative Cases of Various Types W A Cassidy Omaha—p 396
Autogenous Streptococcus Vaccines M J Breuer Lincoln—p 398
Importance of Fungus as Cause of Asthma in Nebraska G R Underwood Lincoln—p 400
Meckel's Diverticulum Causing Intestinal Obstruction Report of Case C Andrews Lincoln—p 401

Water Balance in Surgical Patients—Collier emphasizes that while the normal person at rest or during light activity loses from 800 to 1,500 cc of water by vaporization from the skin and lungs, the surgical patient with infection fever or hyperthyroidism or under abnormally warm environmental conditions will lose from 1,500 to 3,000 cc daily. The abnormal losses of fluid are important sources of water depletion to surgical patients. Vomiting, diarrhea drainage from intestinal and biliary fistulas or massive exudations from inflammatory surfaces such as burns, may carry away large amounts of fluid

daily. With the water loss in these instances there is also an important loss of body fluid substance. From the standpoint of water alone the losses are serious, because they carry out no physiologic purpose. If all the water losses of the body are not considered in estimations of the water requirements of surgical patients, a depletion of body fluids is likely to occur. On the basis of two clinical experiments the author has used 6 per cent of the total body weight in calculating the water requirements of the body tissues in several dehydrated patients. This estimation along with a consideration of the amount of fluid for vaporization, for abnormal losses and for a reasonable output of urine, gave him a rather exact indication of the amount of fluids needed to restore the dehydrated patient to the normal condition. The maintenance of a satisfactory water exchange is fundamentally the maintenance of a satisfactory urine output. The kidney functions with the water available after all the other channels of water excretion have been cared for. For the sick person he considers a satisfactory urine output to be about 1,500 cc a day. Normal kidneys working at a maximal concentration require close to 500 cc. of water a day to excrete an average amount of waste material. In extensive kidney disease when the concentration power has been considerably impaired, three times as much water is required to carry out the same function. The 1,500 cc volume then is ample to provide for the kidney function of practically all persons. An abundance of water can be best supplied by the use of a 5 per cent solution of dextrose. The dextrose is rapidly oxidized and the water is left available for all body needs. It is the author's custom to use sodium chloride solution for the parenteral administration of fluids only when the chemistry of the blood has shown that salt is needed. Too much salt solution may be the cause of edema.

New England Journal of Medicine, Boston

213 593-638 (Sept. 26) 1935

- Expected Lags Between Clinical Diagnosis and X-Ray Confirmation H. A. Christian Boston—p. 593
- Electrosurgical Cholecystectomy I. Experimental Observations L. R. Whitaker Boston—p. 596
- *Anterior Poliomyelitis with Reference to Occurrence of Two Attacks in Same Individual. Report of Two Cases L. Cohen Iowa City—p. 601
- Torsion of Pregnant Uterus. Report of Two Cases H. F. Day Boston—p. 605
- Postoperative Gas Pains E. J. Ottenheimer Willimantic Conn—p. 608
- Incarcerated Bladder in Scrotal Hernia. Case Report F. J. Petrone Fall River Mass., and E. Vieira East Providence R. I.—p. 614
- Arteriographic Comparison of Thrombo-Angitis Obliterans and Arteriosclerosis E. A. Edwards Brookline Mass.—p. 616
- Allergy to Life. Interpretation of Neurotic Constitution E. Moschowitz, New York—p. 617
- Atropine Fever in Early Infancy C. K. Johnson Burlington Vt.—p. 620

Two Attacks of Anterior Poliomyelitis in Same Individual—Cohen points out that the immunity acquired by man as a result of one attack of anterior poliomyelitis occasionally is slow in developing. The active virus may remain in the nasopharyngeal secretion of the individual for a period up to four months following an attack, as shown by Lucas and Osgood. Therefore any relapse occurring within this period can be explained as an autoinfection of the individual by the active virus present in his own nasopharyngeal secretions, thus occurring before the full development of immunity following the first attack. This does not, of course, completely eliminate the possibility that the second attack may be a reinfection from a new external source. When the interval between the two attacks is two or more years, the reinfection is undoubtedly a new one from an external source, as the active virus has experimentally never been found to be present in the nasopharyngeal secretion of a patient later than four months after the termination of the acute febrile stage of the disease in such virulence as to reproduce the disease in a monkey. There have been no cases of a second attack reported, whether a recrudescence or a reinfection occurring in the interval between four months and two years following recovery from the first attack. Thus the author concludes that immunity to anterior poliomyelitis once it is fully developed either as a result of an attack or a recrudescence of an initial attack, is absolute only up to a period of two years. The thirteen proved cases of reinfection with anterior poliomyelitis reported in the literature are

tabulated and two new cases are cited. One of these two cases differs from all others in that there was total paralysis of two extremities and almost total paralysis of a third. Complete recovery occurred following the first attack. The three extremities that were affected as a result of the first attack were affected to practically the same degree during the course of the second attack. The fourth extremity (the left arm), which was also completely paralyzed during the course of the second attack and was not affected during the first attack, is the only one that has recovered to any appreciable degree.

New York State Journal of Medicine, New York

35:901-950 (Sept. 15) 1935

- New Scientific Method of Identification C. Simon and I. Goldstein New York—p. 901
- Maternal Welfare. J. K. Quigley Rochester—p. 907
- Treatment of Type of Malnutrition (Simmond's Disease like) with Preputiary Growth Hormone. L. Berman New York—p. 916
- School Health and the Physician W. P. Brown Albany—p. 919
- Clinical and Pathologic Study of Alcoholism L. H. Ziegler and Henrietta C. Horner Albany—p. 921
- 35:951-1000 (Oct. 1) 1935
- Industrial Dermatoses. Causes, Prevention and Treatment. J. J. Eller and L. Schwartz, New York—p. 951
- Hay Fever and Hyperesthetic Rhinitis. Treatment by Ionization L. M. Hurd New York—p. 965
- Facts Concerning Treatment of Anemia. W. P. Murphy, Boston—p. 973
- Chronic Appendix Syndrome C. F. Tenney New York—p. 977
- Pulmonary Abscess with Especial Reference to Packing Treatment of Connors T. C. Case New York—p. 981

Ohio State Medical Journal, Columbus

31 729-816 (Oct. 1) 1935

- Cancer of Esophagus F. W. Dixon Cleveland—p. 745
- Management of Strabismus R. F. Thaw Akron—p. 749
- Glycosuria in Pregnancy and Its Clinical Significance H. J. John, Cleveland—p. 751
- Medicolegal Aspects of Silicosis in Ohio P. M. Holmes Toledo—p. 757
- *Recurrent Acute Intussusception. Treatment with Barium Enemas and Massage Under Fluoroscopic Control M. M. Miller and C. L. Beatty Akron—p. 759

Treatment of Recurrent Acute Intussusception—Miller and Beatty state that the possibility of avoiding operation in certain selected, promptly diagnosed cases of intussusception has not been sufficiently recognized. The desirability of an effective means of relieving intussusception without repeated resort to surgery is especially great in the case of individuals with recurrent attacks. They believe that it is in such cases that the nonsurgical approach of Retan and Stephens may be of the greatest value. In their case of recurrent acute intussusception, the child had one attack at the age of 20 months and a second attack nearly three months later. In both attacks the child presented the symptoms (sudden onset, intermittent abdominal cramps, prostration and collapse) and the characteristic sausage shaped tumor mass of intussusception. In neither attack had sufficient time elapsed for the passage of mucus and blood. In both attacks the diagnosis of intussusception was confirmed by a barium sulphate fluoroscopic examination within three hours of the onset and the obstruction was relieved by extra-abdominal manipulation. The use of barium sulphate enemas and massage under the fluoroscope appears to be a valuable procedure deserving a therapeutic trial in all very early cases of acute intussusception.

Pennsylvania Medical Journal, Harrisburg

38 929-1088 (Sept.) 1935

- Deforming Scars. Their Causes, Prevention and Treatment. J. P. Webster New York—p. 929
- Lighting and Electric Cataract. J. V. Connole, Wilkes Barre—p. 939
- Treatment of Fractures of Pelvis and Their Complications G. C. Weil J. P. Henry and H. W. Rusbridge Pittsburgh—p. 942
- Treatment of Pharyngeal Diverticula by Combined One Stage Closed Method T. A. Shallow Philadelphia—p. 946
- Blood Pictures in Infections. From the Standpoint of the General Practitioner M. M. Strumia Bryn Mawr—p. 950
- Ureteral Strictures and Their Treatment. B. M. Hance, Easton—p. 953
- Development of Roentgen and Radium Therapy E. P. Pendergrass Philadelphia—p. 956
- Diagnosis and Modern Treatment of Amebiasis J. A. Kolmer Philadelphia—p. 959
- Fractures of Both Bones of Forearm J. Howorth Wilkes Barre—p. 964
- Postvaccinal Encephalitis in Siblings. Case Reports I. D. Sturgeon Jr. Uniontown—p. 968

Public Health Reports, Washington, D C

50: 1239 1292 (Sept. 13) 1935

Accuracy of Certified Causes of Death Its Relation to Mortality Statistics and International List H Emerson G Baehr W J V Deacon W H Guilford T F Murphy C Norris J O Spain W R Tracy Jessamine S Whitney R C Williams W R Williams and G H Van Buren—p 1239

Radiology, Syracuse, N Y

25 261 390 (Sept.) 1935

- Oral Cholecystography Evaluation of Method and Suggestions for New Nomenclature E P Pendergrass and P J Hodes Philadelphia—p 261
- Primary Results of Teloradium Treatment in Cancer of Larynx and Hypopharynx at the Radiologic Clinic of the University of Lund 1931 1933 L Edling Lund Sweden—p 267
- Fibrin Bodies in Artificial Pneumothorax H K Taylor and I D Bobrowitz New York—p 274
- Daphnia Magna as Biologic Dosimeter for Soft X Rays H Kersten and G G Snider Cincinnati—p 285
- Hypertrophic Osteo-Arthropathy E L Rypins Bloomington Ill—p 289
- Evipal Anesthesia for Radium Therapy G H Twombly and G T Pack New York—p 295
- *Analysis of Cholecystographic Findings in Three Hundred Cases with Comparison of Operative Findings in Cases Operated On J B Johnson and H C Harrell, Galveston Texas—p 300
- Pancreatic Cysts S Bruck Philadelphia—p 303
- *Actinomycosis and Roentgen Therapy with an Illustrative Case H Fried New York—p 308
- Ureteral Obstruction in Carcinomatous Cervix L S Drexler Brooklyn—p 315
- Treatment of Carcinoma of Bladder with Radon Tubes A B Friedman New York—p 319
- Sarcoma of Antrum Complicated by Pregnancy Treated by Irradiation Case A Kean New York—p 321
- Custodial Care of Cancer Patients A Lief New York—p 325
- Some Lawsuits I Have Met and Some of the Lessons to be Learned from Them I S Trostler Chicago—p 329
- Observations on Rats with Transplantable Fibrosarcoma Treated with Cevitamic (Ascorbic) Acid J A Pollia Los Angeles—p 338
- Observations on Use of 800 000-Volt Roentgen Rays in Radiation Therapy H Schmitz, Chicago—p 341
- Osteopetralosis I S Hirsch, New York—p 349

Analysis of Cholecystographic Observations—Johnson and Harrell employ the oral and intravenous administration of the dye in cholecystography and keep the patient in the department throughout the time consumed by the examination. The oral method was used in 189 cases, 153 of which were found to be normal. Two of these were diagnosed as poor function, and as no intravenous study was done the diagnosis remained doubtful. Cholelithiasis was demonstrated in fifteen cases by the oral method alone. A diagnosis of "pathologic gallbladder" was made in an additional nineteen cases in which the viscus failed to be filled with the dye. In four cases a negative diagnosis made by the oral route was questioned clinically but was substantiated by intravenous study. In nine cases no shadow was observed after the oral administration of the dye, only to be followed by normal observations after the dye was given intravenously. In two cases following oral dye in which the diagnosis was doubtful, a diagnosis of disease of the gallbladder could be made by the intravenous method. In one case in which the gallbladder failed to fill after oral dye there was only slight filling after the dye was given intravenously. In twenty-six cases the diagnosis of disease of the gallbladder was arrived at after the giving of dye by mouth was confirmed by intravenous study. In another case, in which a normal shadow with good function was found by the oral method, an intravenous study was doubtful. In sixty cases the referring physician requested that the examination be done by the intravenous method there being a desire for quantitative measure of liver function as well as a study of the gallbladder itself. Of these cases, thirty-five were found to be normal and twenty-eight diseased. Of the 300 patients examined, only thirty-two were operated on. In the only case in which operation was performed for possible pathologic changes of the gallbladder, despite a negative roentgen diagnosis the gallbladder was removed and the pathologist classified the condition as chronic cholecystitis. In six other cases a negative roentgen diagnosis was confirmed. In the two cases studied orally, in which there was poor filling operation revealed a diseased gallbladder in each instance. Of the oral examinations revealing stones, three patients were operated on and cholelithiasis was found in each instance. The other pathologic diagnosis made by the oral

administration in which the viscus was filled was that of obstruction due to carcinoma of the head of the pancreas. This was confirmed by operation. Of the pathologic diagnoses made by the oral method owing to nonfilling of the organ, seven patients were operated on. All were diseased, three of them containing cholesterol stones as well. In the case doubtful by the oral method and negative intravenously, a negative operative diagnosis was made. In seven of the cases studied intravenously and orally in which a pathologic roentgen diagnosis was made, the observations were confirmed at operation. The five cases in the intravenous and pathologic group in which operation was performed were found to be pathologic.

Actinomycosis and Roentgen Therapy—Fried states that there is unanimity of opinion that surgical drainage together with roentgen therapy can bring about a complete cure in actinomycosis without the administration of iodides. However, when iodides are given in large doses and for a long period of time they may also be very effective. It is generally accepted that the efficacy of irradiation in this disease is brought about by the indirect action of the rays, which alters or so modifies the tissues as to render them poor mediums for the growth of micro-organisms. Whether the changes produced in the tissues are physical, chemical or biologic is not known. Another contributing factor that aids the favorable action of the rays is the high degree of radiosensitivity of the lesions in this disorder. Because the mode of extension of the disease is more often by continuity than through the blood vessels and lymph channels, the author found it necessary to use a special technic in which the fields of irradiation extended from 2 to 5 cm beyond the palpable borders of the lesion, the rays being sufficiently penetrating to reach from 2 to 3 cm beyond the depth of the lesion. The results of the treatment in his case are satisfying because a complete cure was obtained and the patient is free from any residual keloids or disfiguring scars. Hypertrophic scars resulting from actinomycosis are covered by a thin layer of epithelium and therefore require a much smaller number of roentgen exposures than in the case of ordinary spontaneous keloids. The technic of radiation therapy in this disease apparently varies with each worker. Some use the larger initial dose method, others rely on the simple fractionated dosage, while still others administer the protracted fractionated technic.

Virginia Medical Monthly, Richmond

62 303 360 (Sept.) 1935

- Serologic Tests for Enteric Fevers A Corpening Richmond—p 303
- Fourteen Hundred and Fifteen Spinal Anesthetics with Especial Reference to Indications Complications and Mortality Cases Reported and Charts J M Emmett Clifton Forge—p 304
- Poliomyelitis J A Shield Richmond—p 309
- Total Thyroidectomy for Chronic Heart Failure D G Chapman, Richmond—p 310
- Basis For or Against Use of Digitalis in Certain Disturbances C C Haskell East Orange N J—p 317
- Diagnosis of Syphilis of Gastro-Intestinal Tract C Williams Richmond—p 322
- Extragastric Manipulation for Removal of Foreign Bodies in Stomach by Way of Esophagus J Horgan Washington D C—p 326
- Problems in Breast Feeding J S Weitzel Richmond—p 328
- Treatment of Habitual Abortion H F Kane Washington, D C—p 334
- Anemias Dependent on Food Deficiencies J P Baker Jr, Richmond—p 335
- New French Cardiac Unit T C Merrill Paris France—p 340
- Medical and Surgical Diathermy P D Stout, Bristol Va Tenn—p 342

Western J Surg, Obst. & Gynecology, Portland, Ore

43 477 534 (Sept.) 1935

- Preiodine and Postiodine Days Review of Thirty Seven Thousand Two Hundred and Twenty Eight Cases of Goiter at the Mayo Clinic C H Mayo and C W Mayo Rochester Minn—p 477
- Toxic Adenoma of Thyroid Gland with Associated Hypothyroidism H H Searls San Francisco—p 483
- Quantitative Observations on Effect of Iodine in Exophthalmic Goiter in Chicago W O Thompson S G Taylor 3d, Phebe K Thompson and Lois F N Dickie Chicago—p 489
- Malignant Goiter Survey of Geographic Types R Ward San Francisco—p 494
- Goiter Clinical Analysis Report of Unusual Cases M S Rosenblatt Portland Ore—p 505
- Impedance Angle Test for Thyrotoxicosis M A B Brazier London England—p 514

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Urology, London

7 213 312 (Sept.) 1935

- Leiomyoma of Prostate Gland F S Patch and L J Rhea—p 213
 Renal Adenoma J Carver—p 239
 Bilateral Urinary Calculus H P Winsbury White—p 235
 Endoscopic Resection for Enlarged Prostate F M Loughnane—p 244
 Uses of Sodium Ortho Iodohippurate in Urography A Heritage—p 255
 Elimination of Pain from Urologic Investigation G Parker—p 259

British Medical Journal, London

2 527 564 (Sept 21) 1935

- Pink Disease A J Wood and I Wood—p 527
 Prevention and Prognosis of Late Toxemias of Pregnancy J S Fairbairn—p 531
 Ovarian and Pituitary Hormones Margaret Fairlie—p 533
 *Fallacy of Sugar Tolerance Test in Diagnosis of Diabetes Mellitus O Leyton—p 536
 Stenosing Tendovaginitis at Radial Styloid Brief Review of Some of Literature Report of Case W M Brown—p 538
 Cardiac Resuscitation W B Primrose—p 540

Sugar Tolerance Test in Diagnosis of Diabetes Mellitus—Leyton presents five cases that disprove the opinion that the sugar content of the blood rising above 0.25 per cent, and remaining high for two hours, indicates diabetes mellitus. He believes that, among the patients of physicians who treat diabetes by restricted diet, a percentage of the patients treated most successfully who have never complained of thirst or polyuria belong to the category of those recorded here.

East African Medical Journal, Nairobi

[12]: 159 198 (Sept.) 1935

- Observations on Ancylostomiasis and Anemia in Kenya with Especial Reference to Digo and Embu Districts D Plum—p 162
 Surgical Treatment of Vesicovaginal Fistula C V Braimbridge—p 186
 Sterility Problems A T Schofield—p 188

Glasgow Medical Journal

6: 113 176 (Sept.) 1935

- The Chemical Constitution of Sex Hormones J H Blackwood—p 113
 Developmental Defects of Lens and Their Embryology Ida Mann—p 126

Journal of Laryngology and Otology, London

50: 729 808 (Oct.) 1935

- Treatment of Otosclerotic and Similar Types of Deafness by Local Application of Thyroxine A A Gray—p 729
 *Demonstration of Particles of Malignant Growth in Sputum by Means of Wet Film Method L S Dudgeon and C H Wrigley—p 752

Demonstration of Particles of Malignant Growth in Sputum—Dudgeon and Wrigley have examined the sputum of fifty-eight persons believed to be suffering from malignant growth of the lung or respiratory tract. They have been able to demonstrate the histologic type of growth present in twenty out of twenty-six positive cases. They obtained the sputum as soon as it was expectorated, so as to avoid, as far as possible, both autolysis and the lesser digestive action of the polymorphonuclears. Each specimen of sputum was poured on an unglazed porcelain tile. Film preparations were then made by spreading the material with a scalpel on clean glass slides. Whenever possible, blood-streaked fragments were chosen. In the absence of these the more solid portions of sputum were used. In fixing the wet films, Schaudinn's fluid was prepared by adding one volume of absolute alcohol to two volumes of a saturated aqueous solution of mercuric chloride. The best fixation is achieved by leaving the slide immersed in the fluid for twenty minutes. When a rapid diagnosis is needed, a minimum of two minutes is all that is necessary. It is then transferred to methylated spirit to which a few drops of tincture of iodine have been added. A washing in distilled water prepares the slide for staining. Mayer's hemalum gives the most constant results as a nuclear stain. The slide is left in the stain for about two minutes or less. Deep staining should be avoided. It is then transferred to tap water. In the water the color changes from a reddish purple to blue, and the slide

must be left until "blueing" has taken place. During this time the thick or uneven parts of the film can be removed from the slide by touching them with a needle. As a counterstain a weak solution of eosin is used. The slide is then taken through the alcohols to xylene in the usual way and mounted with Canada balsam and a cover slip. It has been the authors' practice to make six preparations from each specimen of sputum, and in many cases several specimens have been taken at different dates. Particles of new growth in sputum, when fixed and stained by the foregoing method, are of two types. 1 The common form, associated with 'oat-celled' tumors. These fragments, which stain deep blue, consist of a cluster of cells that are slightly smaller than polymorphonuclear leukocytes. The individual cells may belong to one of two varieties. Cells of the first variety have no obvious cytoplasm. Their nuclei show fine granularity, a well defined eccentric nucleolus, and also that variation in density of staining so often seen in malignant tissue. The second variety of cells have a similar nucleus but also a small rim of light blue cytoplasm. Among a cluster of cells of either variety it is usually possible to find typical oat-shaped cells. 2 Fragments of either columnar or squamous celled growth. The individual cells in this group are differentiated from those of the oat-celled variety by their greater size, larger nuclei and the presence of a considerable amount of cytoplasm, which stains pink with eosin. In 68 per cent of proved cases of carcinoma of the lung or larynx it was possible to establish the diagnosis from the examination of the sputum, and in the majority of instances the microscopic type of growth present could be distinguished. A description is given of the characteristic appearances of inflammatory and "scavenger" cells, as seen in the preparations.

Journal of State Medicine, London

43 497 558 (Sept.) 1935

- Side Lights on Health of Workers and Their Occupations T Oliver—p 497
 Health Aspects of Town Planning A J Shinnie—p 505
 Standardization of Food R K Brown—p 513
 Modern Conception of Tuberculosis and Its Prevention and Treatment G S Johnston—p 521
 Prevention of Maternal Disability by Postnatal Care Amy Fleming—p 537
 Scope of Postnatal Care Margaret M Basden—p 544

Journal of Tropical Medicine and Hygiene, London

38 225 236 (Sept 16) 1935

- Certain Serologic Tests Used in Diagnosis of Leishmaniasis in Dogs F Marchesi and R Scapaticci—p 225
 Investigations on Seasonal Variations of Canine Leishmaniasis in Rome F Marchesi, F Crauz and R Scapaticci—p 226
 Peculiar Febrile Hepatosplenomegaly with Arthritis Note A Castellani—p 229
 Diagnosis of Hepatosplenomegalies A Castellani—p 230

Lancet, London

2 647 696 (Sept 21) 1935

- Respiratory and Vascular Changes in Mammal Before and After Birth J Barcroft—p 647
 *Combined Distance Radiation of Hypopharyngeal Cancer S Cade and F M Allchin—p 652
 Treatment of Low Calcium Tetany with Calciferol R S Stacey—p 656
 *Azotemia in Acute Bright's Disease J B Rennie—p 658
 Amount of Hemoglobin in Blood E R Holiday Phyllis M Tookey Kerridge and F C Smith—p 661
 Old Laboratory Strains of Polymorphic Trypanosomes H L Duke—p 665

Combined Distance Radiation of Hypopharyngeal Cancer—Cade and Allchin's treatment of cancer of the hypopharynx deals with a method of therapy that they describe as the 'combined distance radiation.' All patients were examined by indirect laryngoscopy, the situation, extent and type of lesion were determined, oral hygiene and dental treatment precede active irradiation. Roentgenograms of the chest, neck and a barium sulfate swallow are carried out, full blood counts are done weekly. The skin of the neck and the mucous membrane of the mouth are inspected daily, a complete laryngologic examination is done weekly or twice weekly. About one third of the total number of patients treated are not hospitalized. The method of treatment consists in a combination of radiation in the following order (1) preliminary x radiation

for five days, (2) simultaneous α and gamma radiation and (3) gamma radiation with the 2 Gm radium unit continued after cessation of α -rays. The rationale underlying the combined method is based on the following observations: 1 It was pointed out by Quick that a larger tissue dose can be given with safety and comfort by the combined method than by either method alone. If the total maximal dose given by each method alone is represented by 100 per cent, allowing a reduction of 25 per cent for each type, a total dose of 150 per cent can be delivered by the combined method. 2 From the cases treated it appears that a variation of the wavelength used increases the degree of radiosensitivity. 3 The local tolerance of the skin and mucous membrane is increased. 4 The limit of general tolerance of the patient is never reached before the limit of the local tolerance of the skin or mucous membrane, so that treatment need not be interrupted before an adequate dose is delivered. The number of cases treated by the combined method during the last three and a half years was fifty-two. The longest period of survival to date is three and a half years. One patient died from other causes, free from disease by histologic examination after complete postmortem examination. Among the unsuccessful cases are those, the majority, in which initial improvement and even total disappearance of the disease was followed by local recurrence within periods varying from six to eighteen months and those in which the disease progressed in spite of and actually during the treatment. Of the fifty-two patients with hypopharyngeal cancer, seventeen remain free from disease for periods up to three and a half years.

Azotemia in Acute Nephritis.—Among ninety-eight children suffering from acute nephritis Rennie found azotemia in 60 per cent of those examined within seven days of the onset and in 51 per cent of those examined in the second week. The degree of azotemia bore no relation either to the amount of edema or to the height of the blood pressure. The nonprotein nitrogen of the blood bore no relation to the incidence or the severity of the cerebral manifestations in acute nephritis. A single observation of the nonprotein nitrogen of the blood early in the disease is of no prognostic value. The persistence of azotemia after the third week of illness was found to be of grave significance. A sufficient amount of protein in the diet does not militate against the disappearance of azotemia and has apparently no harmful effect.

2 697 752 (Sept. 28) 1935

Neurotropic Virus Diseases. E. W. Hurst—p. 697

The Forceps Operation. A. J. Wrigley—p. 702

*Value of Breathing Exercises in Asthma. J. L. Livingstone and Marjorie Gillespie—p. 705

Stabilization of Acromioclavicular Joint. C. P. G. Wakeley—p. 708

Working Capacity After Duodenal and Gastric Ulcers. Record of Four Hundred and Thirty Cases. H. H. Bashford and W. L. Scott—p. 710

Punctate Basophilia in Rheumatic Cases After Chrysotherapy. G. J. Griffiths and J. Race—p. 714

*Lipiodol as Therapeutic Agent. G. Harrower—p. 715

Value of Breathing Exercises in Asthma.—Livingstone and Gillespie assert that, in seventy-five cases of asthma treated for one year with expiratory breathing exercises, good clinical results were obtained in fifty-two, improvement in twelve and no improvement in eleven cases. The improvement seemed to depend on the patient acquiring mobility of the chest, natural diaphragmatic breathing and control of the diaphragm. There is also a considerable psychologic factor. The treatment requires perseverance and effort on the part of the patient and the physician over a considerable time. A number of patients were able to abort impending attacks by these exercises, this appeared to be due to loosening and expulsion of mucus rather than to any other factor. This method of treatment is simple and applicable in all cases; it is sound treatment from the physiologic point of view. Eleven patients were unable to learn diaphragmatic control. In spite of the fact that good results are claimed from breathing exercises alone, it is held that specific treatment should not be neglected—e. g., removal of feathers or of foods—or operation in gross nasal disease.

Iodized Poppy-Seed Oil as Therapeutic Agent.—Harrower reports two cases of localized chronic inflammatory meningitis, both having a certain amount of paresis with loss of control of rectal and bladder sphincters. In both of them

iodized poppy-seed oil was injected into the cisterna magna primarily for diagnostic purposes, and the symptoms were alleviated, with complete cure later. In the author's opinion the good results of injection are due to a chemical inflammation superimposed on the chronic condition, causing absorption of the adhesions and of any blood clot or pus present with relief of the edema of the nerve roots. Lumbar or cisternal puncture is always followed by a reaction in the cerebrospinal fluid, but, judging from the almost immediate benefit in his cases, he is convinced that the iodized oil was the primary factor in producing a return to health.

Medical Journal of Australia, Sydney

2 275 302 (Aug. 31) 1935

Acute Aseptic Meningitis. I. M. Allen and F. M. Spencer—p. 275

Notes on Maternal Mortality. K. Wilson—p. 281

Maternal Mortality. Some Practical Points in Prevention. M. E. Smith—p. 285

Use of Composite Filters in α Ray Therapy. C. E. Eddy and J. O. Sullivan—p. 288

2 303 332 (Sept. 7) 1935

Coastal Fever and Endemic Tropical Typhus in North Queensland. Recent Investigation. Clinical and Laboratory Findings. M. L. Unwin—p. 303

Some Points in Treatment of Appendicitis. A. J. Trinca—p. 308

Therapeutic Abortion. Review of Some Cases. W. R. Griffiths—p. 311

Paralysis of External Rectus Muscle. Inquiry into Reasons for Post-operative Restoration of Lateral Movement. H. L. St. V. Welch—p. 315

2: 333 366 (Sept. 14) 1935

Role of Surgery in Certain Vascular Diseases of Extremities. A. E. Coates—p. 333

*Simple Colorimetric Method for Determining Concentration of Urea in Blood. Vera I. Krieger—p. 340

Dr. John Hughlings Jackson. A. W. Campbell—p. 344

Correction. Appreciation and Some Reminiscences. A. G. Butler—p. 348

Method for Determining Concentration of Urea in Blood.—Krieger used the test Patterson described for detecting gross retention of urea in the blood in more than 500 specimens of blood. The results illustrate the value of this test in indicating the presence of concentrations of urea in the blood stream above the normal range of from 20 to 40 mg. per hundred cubic centimeters. Of 170 specimens of blood in which the urea exceeded 50 mg. per hundred cubic centimeters, only six failed to give the yellow coloration. These exceptions occurred between 50 and 70 mg., of the 350 specimens with a blood urea of 50 mg. or less, ten showed a trace of color. In these ten cases the blood urea level was from 40 to 50 mg. For the rapid detection of abnormal amounts of urea, this test is without doubt of great value. With as little as 0.2 cc. of blood, gross retention of urea can be detected in a few moments.

Practitioner, London

135 377 608 (Oct.) 1935

Modern Tendencies in Treatment. J. A. Gunn—p. 377

Recent Advances in Dietetics. S. J. Cowell—p. 384

Neurology and General Medicine. E. Bramwell—p. 390

Recent Advances in Treatment of Nervous Diseases. M. Critchley—p. 399

Recent Advances in Treatment Associated with Endocrine Glands. E. C. Dodds—p. 403

Recent Advances in Treatment of Heart Disease. K. E. Harris—p. 413

Recent Advances in Treatment of Gastro-Intestinal Disorders. A. H. Douthwaite—p. 421

Advances in Treatment of Kidney Disease. T. I. Bennett—p. 433

Recent Advances in Treatment of Diabetes. G. Graham—p. 443

Some Recent Advances in Gynecology. E. Holland—p. 455

Recent Advances in Treatment of Diseases of Children, Including Immunization Methods. A. Moncrieff—p. 468

Recent Advances in Treatment of Diseases of Skin. J. T. Ingram—p. 479

Advances in Treatment of Venereal Diseases. R. Lees—p. 490

Recent Advances in Urology. A. E. Roche—p. 497

Recent Advances in Treatment of Fractures. A. J. Cokkinis—p. 507

Some Recent Advances in Surgery. H. Bailey—p. 526

Advances in Physical Treatment. J. Mennell—p. 533

Some Recent Advances in Medical Electricity. Justina Wilson—p. 540

Advances in Treatment in Otolaryngology. R. S. Stevenson—p. 549

Advances in Treatment of Eye Diseases. H. B. Stallard—p. 560

New Anesthetic Agents and Methods. F. B. Parsons—p. 577

Favorite Prescriptions. The Pharmacopoeia of St. Thomas's Hospital. J. Woolley—p. 593

Paris Médical

2: 229 240 (Sept. 28) 1935

- *Mental Sequel to Traffic Accidents P. Chavigny—p. 229
 Index of Leukocyte Shifting N. A. Schulz—p. 232
 From Dental Caries to Ganglionic Tuberculosis of Mediastinum G. Rosenthal—p. 235
 *Serum Accidents and Landry's Syndrome After Vaccinotherapy J. Olmer and J. Paillas—p. 236

Mental Effect of Traffic Accidents—Chavigny discusses the fear neurosis that frequently develops following an automobile or airplane accident. The neurosis frequently involves not only riding in an automobile itself but hearing a car or crossing the street. Except in persons whose occupation necessitates immediate renewal of automobile driving or airplane flying the condition is usually of favorable prognosis. The forgetting of the accident eventually leads to recovery in the majority of cases.

Landry's Syndrome After Vaccinotherapy—Olmer and Paillas describe a case in which a man, aged 35, who received three injections of a pneumococcus vaccine for a chronic bronchopneumonia, afterward developed a vaccinal reaction of serum type rapidly complicated by an acute ascending polyneuritis. The latter, after temporarily regressing, finally caused death from bulbar involvement. The authors discuss the possible pathogenesis involved and consider it probable that in this rare instance the vaccine caused a colloidoclasia, which in all respects was comparable to the disturbances produced by serotherapy.

Presse Medicale, Paris

43: 1377 1392 (Sept. 4) 1935

- Gouty Tophus F. Rathery and Conte—p. 1377
 *Influence of Hypoglycemic State on Evolution of Bronchial Asthma J. Wegierko—p. 1379

Hypoglycemia and Bronchial Asthma—Wegierko's interest in the possible effect of hypoglycemia on bronchial asthma was aroused by a patient with diabetes whose attacks of asthma seemed to improve following the administration of insulin. In order to test this hypothesis the patient was given a large dose of insulin (30 units) in a fasting state and while suffering from an asthmatic attack. The asthma subsided during the development of the resultant hypoglycemia, and the patient remained free from asthma for two succeeding months. A further group of twelve patients with asthma was given insulin during an asthmatic attack to produce hypoglycemia. In all instances the asthmatic attacks subsided with the appearance of hypoglycemia. In some instances, however, they reappeared with the return of normal glycemia. No conclusions can be drawn regarding the possible therapeutic role of artificially produced hypoglycemia in asthma, but attention is merely directed toward the curious fact.

43: 1393 1408 (Sept. 7) 1935

- Spasmodic or Hypertonic States of Levator Palpebrae Superioris in Focal Cerebral Lesions H. Schaeffer—p. 1393
 *Value of Xanthoproteic Reaction in Diagnosis of Renal Insufficiency N. O. Irdelp, M. Guehan and Mlle. Mufide Kazim—p. 1396

Xanthoproteic Reaction in Renal Insufficiency—Irdelp and his co-workers investigated the xanthoproteic reaction in renal insufficiency with parallel blood urea determinations. The technic of the reaction is simple. The plasma or blood is dealbuminized by the addition of an equal quantity of 20 per cent trichloroacetic acid. To 2 cc. of the filtrate placed in a test tube 0.5 cc. of concentrated nitric acid is added. After shaking, the mixture is heated, without boiling, for half a minute over a flame. After cooling, 1.5 cc. of a 33 per cent solution of sodium hydroxide is added and the volume adjusted to 4 cc. with the addition of distilled water. After ten minutes, the yellow liquid is placed in an Autenricht colorimeter and the color matched. The normal value lies between 15 and 35 (usually around 20) but is raised in certain pathologic states. The authors made these determinations in 128 cases of acute, subacute and chronic nephritis. Also the blood urea was determined in all instances and the indicanemia in a large number of cases. The value of the xanthoproteic reaction was raised in all cases of renal insufficiency and was parallel with the blood urea and especially the indicanemia. The authors conclude that the reaction is indisputably valuable in the diagnosis and prognosis of renal insufficiency and may prove an important supplement to the information furnished by measurement of the blood urea.

Tumori, Milan

9: 281 536 (July Oct.) 1935

- Sacrococcygeal Chordoma Case P. Pattarin—p. 281
 Lesions Due to Oil Substances L. Giacobbi—p. 308
 *Venom of Bee and of Wasp as Analgesics in Cancer of Female Genitalia P. Natale—p. 324
 Local and General Effects of Tar in Relation to Genesis of Tumors and Factors That Modify Them G. F. De Gaetani—p. 349
 Changes of Salivary Glands in Patients Presenting Cancer of Mouth L. Supino—p. 370
 Contribution to Study of Primary Tumors of Liver A. Cacciamali—p. 377
 Cutaneous Fibrosarcoma with Pulmonary Metastases Case G. Sciacchitano—p. 427
 Neuroglia in Cachexia Due to Neoplasm M. Cattabeni—p. 439
 Statistic and Systematic Reports on Malignant Tumors Observed During 1932 P. Celli—p. 449

Analgesic Effects of Bee Venom in Cancer of Female Genitalia—Natale observed the analgesic effects of bee and wasp venom in forty-eight cases of cancer of the female genitalia. He injected subcutaneously a first solution containing 0.00001 Gm. of bee venom per cubic centimeter and a second solution containing 0.00003 Gm. of venom per cubic centimeter. The wasp venom was administered in solutions of the same concentrations. The author started with small daily doses of from 0.2 to 0.5 cc. of the first venom solution. These were gradually increased to 2 cc. by the time the second solution was administered. The injections were given every day until the maximal effect was obtained. Of twenty-six patients treated with bee venom, eight obtained no relief, four showed temporary diminution of pain and fourteen showed complete relief. Treatment was well tolerated by all patients. Only cases of mild pain responded to treatment. Those with moderate or intense pain evinced no improvement. The duration of the sedative effect varied. An injection of from 2 to 3 cc. of the second solution of bee venom generally abolished the pain for twenty-four hours. In some cases the sedative effect did not last more than a few hours, while in others the pain disappeared for from several to eight days, and permanently in six cases. The analgesic action is seldom accompanied by disturbances, such as nausea and vomiting, which frequently result from the usual sedatives. The maximal arterial pressure is generally lowered by about 10 mm. of mercury. The effects of wasp venom treatment as a rule correspond to those obtained with bee venom. The wasp venom, however, may cause mild pains in the beginning. Of twenty-two cases treated with wasp venom, four patients presenting mild pain and four others with severe pain obtained no relief. In fourteen cases the pains disappeared by the third or fourth day. The results obtained with wasp venom were less marked than those obtained with bee venom, but they lasted longer. The analgesic action of wasp venom continued for a few days, generally from three to four but sometimes for as many as thirteen days. Neither venom produced local reaction or vomiting or nausea. Lipothymia was not observed after administration of wasp venom as it was in several patients after administration of bee venom. The hypotensive action of the wasp venom did not differ from that of the bee venom. Fifteen minutes after injection there was a gradual fall in the arterial pressure to from 5 to 10 mm. of mercury.

Semana Medica, Buenos Aires

42: 821 896 (Sept. 19) 1935 Partial Index

- Cardiac Diseases and Surgery A. Chuco—p. 821
 Functional Uronephrosis Due to Effort Treatment by Denervation of Renal Pedicle and Nephropexis J. Salleras—p. 836
 *Patiño Mayer's Signs (Lymphocytosis) in Syphilis F. A. Pataro—p. 838
 Allergic Rhinosinusitis E. Riccitelli and Y. Franchini—p. 843
 Tuberculous Bacillema and Tuberculoma of Sclera Case I. M. Hernández J. Lijó Pavla and M. Dusseldorp—p. 845
 Melenia in the New Born J. R. Abdala and J. C. Pellerano—p. 859

Patiño Mayer's Signs of Syphilis—Pataro states that lymphocytosis, with more than 30 per cent lymphocytes in the blood and when associated with a clinical picture of suggested syphilis, is of value in the diagnosis of syphilis except in febrile or infectious diseases in which lymphocytosis is a characteristic of the disease. In primary syphilis, lymphocytosis appears when the ganglionic reaction begins to develop, that is, about one week after appearance of the initial chancre. In secondary, tertiary and congenital syphilis, lymphocytosis exists with a positive Wassermann reaction or with a negative Wassermann

reaction that turns positive a few days later. Syphilitic lymphocytosis increases when antisyphilitic treatment is begun (reactivation) but decreases and remains stationary with more than 30 per cent lymphocytes in the blood of patients who have had sufficient treatment and intensifies itself in patients who have not. The author gives Patiño Mayer credit for discovering these signs. He calls "Patiño sign" the primary lymphocytosis, and "tattooing of the blood by lymphocytosis, described by Patiño," the persistence or intensification of lymphocytosis after treatment.

Deutsche medizinische Wochenschrift, Leipzig

61 1583 1622 (Oct. 4) 1935 Partial Index

- Pathogenesis of Distant Thrombosis H Storz—p 1583
*Diagnostic Significance of Kauffmann's Diuresis Test Rubbaum and Gemeinhardt—p 1586
*Behavior of Blood Pressure in Disturbances of Peripheral Blood Perfusion M Ratschow—p 1589
Pure Glucoside of Squill (Scilla Maritima) in Treatment of Cardiac Disturbances F Bach and A Berr—p 1591

Significance of Kauffmann's Diuresis Test—Rubbaum and Gemeinhardt made the Kauffmann diuresis test on three groups of persons: healthy ones, patients with compensated heart disease and patients with a slight degree of decompensation. On the basis of suggestions in the literature and of their own observations, they modified the test in some points so that it differed slightly from Kauffmann's original test. In none of the tested groups did they find that Kauffmann's diuresis test was a suitable diagnostic aid. The outcome of the parallel tests without elevation of the legs corroborated these results. The authors discuss a number of factors in Kauffmann's test that may be sources of error.

Disturbances of Peripheral Blood Perfusion—Under the collective term disturbances of peripheral blood perfusion Ratschow designates a group of vascular diseases the most important symptoms of which are disorders of the extremities of the organism (hands, feet, nose, ears). However, the local restriction of these disorders is only apparent, for the disease processes usually involve the entire vascular system. For this reason it seemed desirable to look for signs that would permit an estimation of vascular regions that are not directly within the sphere of the diseased tissues. A changed behavior of the blood pressure would seem likely, but the blood pressure is practically normal in the majority of patients with disturbances in the peripheral blood perfusion. However, in some patients with Buerger's disease a constant increase in blood pressure has been observed, the author himself observing two such cases. In this connection he points out that recent studies by Förster and others revealed that Buerger's disease may be the cause of multiple sclerosis, transverse myelitis and other neurologic disorders. He concludes that, particularly in younger persons, hypertension of unknown origin would suggest the possibility of obliterating endarteritis. In patients with Raynaud's disease, the typical attacks are occasionally accompanied by attacks of hypertension. It is assumed that, if hypertension is present during the attack, the disease process involves vascular regions of internal organs. The author points out that the determination of the fluctuations in the blood pressure which develop in response to tolerance tests on the peripheral circulation gives more information than does the ordinary determination of the blood pressure. There are two ways of doing this: (1) The local pressure can be registered by means of the recording sphygmomanometer of Tvcos and (2) the modification of the blood pressure by the stasis experiment of Hertzell can be determined. In employing Hertzell's stasis experiment the author observed the greatest deviations from the normal curve in patients in whom the larger peripheral vessels had become stenosed or occluded. In thirty-four patients with arteriosclerosis without hypertension he was able to corroborate Lange's observation that the increase in blood pressure is absent after stasis, whereas in arteriosclerosis with hypertension the increase in blood pressure was greater than in normal persons. In arteriosclerotic diabetic gangrene the blood pressure curves corresponded with those of uncomplicated arteriosclerosis as a proof that peripheral gangrene alone does not permit conclusions regarding the condition of the larger vessels. There were also cases of Buerger's disease with gangrenous processes of the toes in which the functional tests indicated that larger vessels

were relatively unimpaired. Patients with acrocyanosis often showed considerable fluctuations in the increase and decrease but otherwise showed a normal behavior. Patients with Raynaud's disease had normal blood pressure changes outside of the attacks, whereas during the attacks the stasis experiment did not elicit fluctuations.

Klinische Wochenschrift, Berlin

14: 1417 1448 (Oct. 5) 1935 Partial Index

- *Behavior of Cevitamic Acid and Glutathione in Immunized Animals H J Jusatz, T Bersin and H Köster—p 1419
Synthesis of Lipoid Soluble Silicon Compounds H P Kaufmann—p 1420
*Action of Magnesium on Heart, L. Zwillinger—p 1429
Increase in Basal Metabolic Rate if Artificial Pneumothorax is Filled with Carbon Dioxide A V von Frisch and A Schneiderbauer—p 1433
*Two New Methods for Staining of Blood, H Hirschfeld—p 1437

Behavior of Cevitamic Acid in Immunized Animals—Jusatz and his associates determined that prolonged feeding with a diet deficient in vitamin C results in a reduction of the cevitamic acid as well as of the glutathione in the adrenals. The artificial administration of vitamin C prevents this and again produces an increase in these two reducing substances in the adrenals of animals that have received a vitamin deficient diet. Thus there seems to be a close relationship between glutathione and cevitamic acid in the adrenals. The simultaneous occurrence of these two reducing substances in the adrenals is doubtless of functional importance. The authors observed that glutathione exerts a protective action on cevitamic acid. In the experiments described in this report, the authors aimed at determining the behavior of these two reducing substances in immunized animals, because former observations of one of the authors had indicated that an adequate supply of vitamin C is necessary for the development and maintenance of immunity. The blood of animals that for several months have been deprived of vitamin C has only a slight bactericidal power, and the capacity to form antibodies is reduced and retarded. If these animals are given vitamin C in the form of cevitamic acid, the bactericidal power of the blood and the antibody formation are increased. After immunization with horse serum, the glutathione content of the blood of rabbits is reduced. In animals that for several months had been fed on rations deficient in vitamin C and were then immunized, the adrenals contained smaller amounts of cevitamic acid and of glutathione than did those of the animals that had not been immunized. This indicates that cevitamic acid and glutathione are consumed in the course of antibody formation that takes place in immunization with horse serum. If a vitamin deficient diet accompanies antibody formation, the supply of these substances in the adrenals becomes exhausted.

Action of Magnesium on Heart—Zwillinger reports the history of a patient who had chronic bronchitis, emphysema, cardiac myodegeneration and a severe decompensation. Treatment with digitalis had been given for some time but this medication had to be interrupted on account of toxic manifestations. However, several days after the interruption of the digitalis therapy it became necessary to aid the circulation with strophanthin, but soon there developed extrasystoles and then paroxysms, ventricular flutters and fibrillations. These attacks of flutters and fibrillations were accompanied by cyanosis and cessation of pulsation and of the respiration, but they were of only short duration. Between the attacks there existed extrasystolic arrhythmia. Quinidine was without effect. In the course of an especially severe and prolonged attack of ventricular flutter, when even the corneal reflexes had been abolished and a spontaneous recovery was not expected the patient was given for the first time an intracardial injection of 10 cc of a 15 per cent solution of magnesium sulfate. After a few seconds, consciousness returned. The attack of fibrillation was interrupted and there followed a few extrasystoles but soon the sinus rhythm was undisturbed. Later attacks of extrasystolic arrhythmia could again be interrupted by injections of magnesium sulfate. The patient, who died as the result of a bronchopneumonia, had an uninterrupted sinus rhythm before death. The observations on this patient induced the author to further studies on the action of magnesium. He tried magnesium sulfate in a number of patients with extrasystole or

tachycardia. In all cases the effect was prompt. The extrasystoles, no matter of what origin, disappeared within a few seconds, but this effect persisted at the most for three hours. The author states that it is advisable to inject first 4 cc. of a 10 per cent solution of magnesium sulfate as a sensitivity test. In extrasystoles he employs from 10 to 20 cc. of the 15 per cent solution. The injection of magnesium sulfate was tried also in three cases of prolonged auricular flutter and in two cases of auricular fibrillation but was ineffective, while it proved effective in a case of strophanthin intoxication. The author made experiments on rabbits in order to determine the effect of magnesium sulfate on strophanthin or digitalis intoxication. Observations made so far indicate clearly that it exerts an influence on digitalis and strophanthin intoxication.

New Methods for Staining Blood—Hirschfeld first describes a simple oxydase reaction which requires only two reagents that are available in any laboratory, namely, strong solution of iodine and methylene blue. He puts about ten drops of the iodine into a small watch glass. A drop of water, the size of a pinhead, is placed in the center of a cover glass that fits over the watch glass. The clean side of a thin cover glass, on which blood has been spread but not fixed, is pressed onto the drop of water to make the two cover glasses adhere. Then the cover glasses with the blood downward are placed over the watch glass. The developing iodine vapors fix the spread. This requires five minutes on the average, but a slightly longer time is necessary if the room temperature is low, and a shorter time is sufficient in case of high temperature. The cover glass is carefully removed and is stained for five minutes with Löffler's methylene blue. Then follows washing with a strong water stream and the cover glass is dried by means of blotting paper. The preparations should now have a brownish color. Then follows mounting with Canada balsam. After describing the appearance of the various blood elements if this method is used, the author points out that if the preparations are stained too much so that the granules appear black a new preparation must be made and the time of exposure to the iodine vapors must be shortened. If, on the other hand, the staining is too weak, the exposure to iodine must be prolonged. The second staining method described by the author is the staining of the granulophilytes in the dry preparation. In this test it is necessary to make extremely thin spreads so as to have the erythrocytes in a single layer. Löffler's methylene blue is poured over an unfixed spread and is allowed to act on it for about five minutes. Then the stain is poured off and water is carefully dropped on the slide to wash the stain. Whereas otherwise there results complete hemolysis from the use of watery solutions, Löffler's methylene blue solution extracts only the hemoglobin and leaves the stroma of the erythrocytes visible, so that in many the granulofilamentous substance is recognizable. However, as yet the stromas are too pale to make counting easy. To bring them out more clearly the slides are set up aslant and left to dry in the air. Then they are either passed through a flame five times or are fixed for three minutes in methyl alcohol. Then they are put for two minutes into a half diluted Manson's solution (borax-methylene blue) or, still better, into carbolated gentian violet. After careful rinsing and drying there follows mounting with Canada balsam. In these preparations the erythrocytes are quite clear and the granulophilytes have a clear blue-violet color. To be sure, the granules and the stromas are not quite as clear as in the case of supravitral methods, but they are clear enough to permit the determination of the percentages. Even the leukocytes can be counted by one who has sufficient experience.

Monatsschrift f. Geburtshilfe u. Gynäkologie, Berlin

100 125 184 (Sept.) 1935

Secretion of Gastric Juice and Gastric Motility During Normal Pregnancy. Vagohypertonic and Toxic Hyperemesis. H. Winkler —p. 125
Significance of Colposcopy for Cancer Research. H. Rogge —p. 135

*Significance of Mobile Fetal Head Above Pelvic Inlet in Primiparas. J. Farkas —p. 138

*Interstitial Form of Tubal Pregnancy. P. N. Logwinsky —p. 144

Fetal Head Above Pelvic Inlet in Primiparas—Farkas studied the obstetric material of the institute for midwifery in Budapest with regard to the degree of engagement of the fetal

head. He reaches the conclusion that the "floating" head signifies in primiparas not always a disproportion between the child and the pelvis. He found that in a total number of 3,829 primiparas there were 305 (8 per cent) in whom the head was floating. The pelvis was contracted in fifty of these but was normal in the others. Delivery was spontaneous in more than 87 per cent of these cases. The author thinks that the condition of the abdominal walls and the uterine contractions do not play an important part in the retarded engagement of the fetal head, but that an increased resistance on the part of the lower portion of the uterus is the chief cause. Since the necessity of a surgical intervention is possible in these cases, he thinks that delivery should be done in an obstetric institution.

Interstitial Pregnancy—Logwinsky points out that, according to the localization and the direction of the growth of the ovum, various classifications have been suggested for interstitial pregnancy. Glaesmer classifies interstitial pregnancy according to the direction in which the ovum develops into three types: (1) growth in the direction of the isthmus, (2) growth in the musculature of the fundus uteri and (3) growth in the lateral wall of the uterus. After citing figures on the frequency of interstitial pregnancy the author points out that the etiology of this and of other forms of ectopic pregnancies is not fully understood as yet, but, on the basis of reports in the literature and of his own observations, he thinks that inflammatory changes in the tubes play the most important part. The diagnosis of interstitial pregnancy is rather difficult. Asymmetry of the uterus is not a definite proof, because this is present also in the early stages of angular pregnancy. To be sure, the uterus becomes spherical if the growing ovum begins to fill the uterine cavity, whereas the asymmetry increases constantly in interstitial pregnancy. Some authors ascribe considerable importance to the Simon-Ruge sign, that is, to the fact that the upper boundary of the fundus uteri becomes oblique as the result of the hypertrophy of one of its angles. However, according to Glaesmer, this sign develops only if the ovum grows in the musculature of the fundus uteri but is absent if the growth progresses in the direction of the isthmus or of the lateral uterine wall. Other signs that have been cited as indicative of interstitial pregnancy are the wide base of the uterus and the displacement of the round ligament. Interstitial pregnancy results nearly always in rupture and usually is accompanied by threatening hemorrhages. For this reason early diagnosis is important for the best treatment is early surgical intervention. The author considers the wedge-shaped resection of the pregnant angle of the uterus the method of choice, because it does not make impossible further conception and normal delivery. He performed this operation in the two cases of interstitial pregnancy described by him. However, in cases in which the fetal sac has already damaged the uterine wall, supravaginal amputation of the uterus is necessary.

Münchener medizinische Wochenschrift, Munich

83: 1597 1632 (Oct. 4) 1935 Partial Index

Specific Infectious Rheumatism. L. Aschoff —p. 1597

Erroneous Diagnoses in Rheumatism. O. Vontz —p. 1598

Treatment of Chronic Inflammatory Articular Rheumatism. H. Hennes —p. 1602

*Ten Years' Autohemotherapy of Pneumonia. G. Tillmann —p. 1604

Ten Years' Autohemotherapy of Pneumonia—Tillmann calls attention to the various quinine preparations that have been recommended for the treatment of pneumonia. He evaluates the monovalent and the polyvalent serums, pointing out that they are rather expensive that valuable time is lost in their preparation that the administration of large amounts of serum involves dangers and that the results obtained with the specific serums have not been noticeably better than those produced with other methods. He himself obtained better results with autohemotherapy than with any other method. He gives a brief description of a case treated in 1925, in which he first observed the favorable effect of autohemotherapy. In the course of the last eight years he has resorted to it in 100 cases of true pneumonia and in sixty-five cases of postoperative pneumonia. The youngest patient was 4 months old and the oldest 77 years. The author asserts that any one who has seen the pronounced changes produced by autohemotherapy in severe cases of pneu-

monia may be convinced that it is a causal treatment. He observed that the earlier in the course of the pneumonia the autohemotherapy is begun, the more rapid is the success. The technic is simple, but it is best done by two persons: the physician withdraws the blood from the vein and the assistant injects it into the thigh. From 50 to 60 cc. of blood is usually employed in adults, but it is best to use syringes of not more than 10 cc. capacity. It is advisable to inject the blood from one opening in several directions. In nurslings in whom only 5 cc. of blood is required, it may be withdrawn from the cervical vein. The author concludes that autohemotherapy, if applied early, is the best method for uncomplicated pneumonia.

Wiener klinische Wochenschrift, Vienna

48 1175 1198 (Sept. 27) 1935

- *Aspects of Urinary Melanogen. O. Fürth and A. Friedrich—p. 1175
- Nephroses. H. Elias—p. 1177
- *Criticism of Links' Serochemical Method for Early Diagnosis of Carcinoma. E. Epstein—p. 1179
- Results of Treatment of Offending Ears. R. Demel—p. 1185
- Indications for Tonsillectomy in Acute and Chronic Inflammatory Processes of Tonsils. G. Hofer—p. 1185
- Methods of Examination in Appendicitis. B. Hoch—p. 1187

Aspects of Urinary Melanogen.—Fürth and Friedrich call attention to their previous studies on the elimination of melanogen in the urine in case of melanosis and report further studies. They used a simple method of conservation of the urine, which long ago was recommended by von Zeynek. The authors thought that it might prove possible to effect a precipitation of melanogen from the urine saturated with barium hydroxide by means of mercury acetate. When to 50 cc. of the mixed melanogen urine saturated with barium hydroxide there were added 10 cc. of glacial acetic acid and then 20 cc. of a saturated aqueous solution of mercury acetate, a voluminous coarsely flocculated precipitate developed, which contained all the melanogen. This precipitate was immediately filtered off, carefully washed with water and dried at room temperature in the vacuum above concentrated sulphuric acid. They produced melanin from the melanogen of the urine by means of oxidation with iron chloride and report the results of the analysis of the melanin, carbon-hydrogen, nitrogen sulphur and chlorine contents. Finally they describe experiments on the artificial production of melanogenuria in rabbits.

Criticism of Serochemical Diagnosis of Carcinoma.—Epstein calls attention to a serochemical method for the early diagnosis of carcinoma, devised by Links. The favorable estimation of Links' test by several other investigators who employed it induced the author to try the method. He reached the conclusion that Links' formula cannot serve as a basis for a serodiagnosis of carcinoma. The essential part of the formula, the product of the potassium and magnesium factors, proves, in the majority of cases, without significance for the correctness of the diagnosis, whereas the Sahli factor indicates merely the anemic condition.

48 1199 1230 (Oct. 4) 1935 Partial Index

- Pathology of Inflammation. R. Maresch—p. 1202
- Gastro-Intestinal Aspects of Influenzal Diseases. K. Hiebaum—p. 1204
- *Habituation to Use of Insulin. F. Mainzer and W. Joel—p. 1206
- Foreign Body in Renal Pelvis. R. Chwalla—p. 1210
- *Spontaneous Cure of Multiple Pulmonary Echinococcus. V. Stern—p. 1211

Habituation to Use of Insulin.—In studies on the course of forced feeding cures with insulin, Mainzer and Joel noted that during intravenous administration of insulin the descending portion of the blood sugar curve of persons who are habituated to insulin does not differ from that of the normal curve but returns more rapidly to the initial level and has a tendency to a hyperglycemic reaction. This is the result of a hypophyseally conditioned counterregulation of the adrenals. This observation explained that in the insulin-habituated diabetic patient sudden abstinence from insulin may result in a complete breakdown of the carbohydrate metabolism and also that following a forced feeding treatment with insulin, a diabetes like disturbance can be observed following a sugar tolerance test. That the reduction of the blood sugar is more rapid in the case of intravenous administration of insulin than in the case of subcutaneous administration is understandable. However, that this

reduction in the latter case is slower in the insulin-habituated organism than in the normal organism requires an explanation. In view of the sudden action of the intravenously administered insulin, there is no possibility for a counterregulation during the phase of reduction in the blood sugar content. Thus there are, in spite of the different degrees of counterregulation in the insulin-habituated and in the normal organism, practically identical curves of the reduction phase. The onset of the counterregulation coincides under these conditions with the exhaustion of the insulin effect. It is different in the case of subcutaneous administration, in which the resorption is slower and the insulin effect persists twice as long or longer. If therefore the counterregulation begins at the same time as in the case of the intravenous test, its influence must become evident in the descending branch of the blood sugar curve. In accordance with this, the blood sugar decreases more slowly and less deeply in the insulin-habituated than in the normal organism. Another cause for the inhibited hypoglycemia in the insulin-habituated organism is the initial 'insulin hyperglycemia' that develops even in the case of subcutaneous administration of insulin. The author describes observations in a case of acromegaly which indicate that the counterregulation is effected by the hypophysis and partly without the intermediate action of the adrenals.

Spontaneous Cure of Pulmonary Echinococcus.—Stern discusses the diagnosis of pulmonary echinococcus, pointing out that the diagnosis is not difficult with the aid of roentgenologic and intradermal examinations. He mentions the roentgenologic aspects and enumerates the disorders that must be considered in the differential diagnosis. He stresses that roentgenoscopy alone cannot be the basis of the diagnosis but that the anamnesis and clinical and laboratory examinations also must be considered. He states that, although most of these factors have been discussed in previous reports, little is as yet known about the roentgenologic aspects of the spontaneous cure of pulmonary echinococcus cysts. He differentiates two forms of spontaneous cure: (1) the perforation of the cyst into a bronchus and (2) the calcification of a cyst. The spontaneous cure of multiple pulmonary echinococcus can take place according to the first, the second or the mixed type. The author reports the history of a man aged 30, whose anamnesis revealed that for a while he had had attacks of coughing with expectoration of numerous membranous shreds. He discusses the differential diagnosis and points out that this case fills in a gap in the roentgenologic aspects of pulmonary echinococcus in that it reveals the various stages of development of the echinococcus cyst. Moreover, it refutes the statement of Grossmann, who maintained that a spontaneous cure was impossible in case of a multiple pulmonary echinococcus and it contradicts Axelrod, who denied the possibility of the calcification of a dead echinococcus cyst. The roentgenologic aspects of this case corroborated the importance of Steiner's symptom, namely the double contour or the shadow of the echinococcus cyst. Another noteworthy aspect of this case is that both types of spontaneous cure took place, perforation into the bronchus and calcification of a dead cyst.

Zentralblatt für Gynäkologie, Leipzig

59 2337 2400 (Oct. 5) 1935

- *Local Healing of Ureteral Fistulas and Its Therapeutic Promotion. W. Stoeckel—p. 2347
- *Pregnancy Pyelitis and Ileus as So-Called Toxicosis. Focal Allergy During Pregnancy. G. von Bud—p. 2355
- Late Results of Pregnancy Pyelitis. H. Jacoby—p. 2364
- Renal Calculi and Pregnancy. G. Tzschupolopoulos—p. 2366

Local Healing of Ureteral Fistulas.—Stoeckel says that it has long been known that ureteral fistulas frequently heal spontaneously and that many surgeons are of the opinion that spontaneous cure should be waited for. The author concedes that the spontaneous healing is always a symptomatic success for it means liberation from a painful and disagreeable disorder. However, from the functional point of view, spontaneous healing is frequently not a success: it is not desirable if the kidney to which the fistulous ureter belongs has become excluded as the result of ureteral obliteration or has become severely infected, or if these two conditions coexist. The author shows that, if preservation and functional restoration of the 'fistulous' kidney is demanded and aimed at, it must be understood that

spontaneous healing is possible only in case of incomplete fistulas and not even in all these cases, and that it is always impossible in case of complete fistulas. He illustrates this with diagrams and emphasizes that a complete ureterovaginal fistula can heal only by way of obliteration of the ureter, that is, with exclusion of the pertaining kidney. Thus spontaneous cure in such cases is equivalent to nephrectomy and should be replaced by early vesical implantation of the fistulous ureter. In some incomplete fistulas, the kidney can be saved. If in case of incomplete fistula the ureter is bent, much depends on how the ureteral peristalsis influences the angle in the ureter, for if it intensifies the angle it prevents healing, but if it stretches the angle it promotes healing. The treatment should aim at stretching the site of the fistula. An attempt should be made to bridge and to immobilize the site of the fistula by means of a retaining ureteral catheter. The author designates such a procedure as "active waiting."

Pregnancy Pyelitis (Ileus) as Toxicosis Focal Allergy During Pregnancy—Von Bud states that he treated twenty-five cases of pregnancy pyelitis. Observations convinced him of the importance of focal infection and of the therapeutic value of the elimination of the infectious foci. He also observed that pyelitis is preceded or followed by subcutaneous suffusions, pyoderms, dermatoses, subicterus, anemias, renal and biliary calculi, colpitudes, hydramnion, edemas and atony of the uterus. The puerperal pyelitis are to be regarded as flare-ups. Pregnancy pyelitis often results in abortion, premature birth or congenital disorders in the fetus, such as skin diseases and congenital icterus. Severe pyelitis of pregnancy may result in the death of the mother from uremia, sepsis or so called toxicosis. The author shows further that pyelitis of pregnancy may become complicated by pregnancy ileus. In discussing the etiology of pyelitis and ileus of pregnancy, he expresses the opinion that they are systemic disorders and that stasis and infection are promoting and eliciting factors but not causes. He is inclined to think that these disorders of pregnancy develop on the basis of a focal allergy and shows that pregnancy pyelitis may be regarded as a "dermatosis" of the renal pelvis. He regards cystic mole and chorionepithelioma as a skin disease of the trophoblast of the young ovum. He shows that the elimination of the foci of infection before, during or after pregnancy has a desensitizing effect.

Vrachebnoe Delo, Kharkov

17:305 368 (No 5) 1934 Partial Index

Symptoms of Food Poisoning of the Type of Botulism I S Slutskiy

N A Goyseev and Sh A Rossin—p 309

Erythrocyte Sedimentation Test in Abdominal Typhus of Children

S M Benderskaya—p 325

*Vaccine Therapy of Whooping Cough L L Kandyba and A G Geyler

—p 339

Question of Liquidation of Trichinosis V A Kabys—p 355

Determination of Blood Dextrose After Method of Hagedorn and Jensen

M Tobvin—p 359

Vaccine Therapy of Whooping Cough—Kandyba and Geyler report the results of bacterial vaccine therapy in 142 children ranging in age from 4 months to 12 years, suffering from whooping cough. The vaccine was of the concentration of 4 billion microbes to 1 cc. The total amount injected in the course of treatment divided in five or six injections with intervals of one or two days amounted to from 20 to 24 billion microbes. The authors conclude that the bacterial vaccine therapy of whooping cough manifests signs of specificity and gives satisfactory results, although it does not, as a rule, succeed in aborting the course of the disease. The therapeutic effect manifests itself in the diminution of the number and the severity of coughing spasms and in the abatement or termination of vomiting. The duration of the disease is shortened. The earlier the vaccine therapy is instituted, the better the results. In order to obtain a therapeutic effect, the treatment should be instituted not later than the eleventh or twelfth day of the disease. Vaccination begun after the nineteenth day was as a rule without effect. Vaccine therapy did not exert any influence on the course of intercurrent complications of whooping cough. The existence of pneumonia is no contraindication to vaccine therapy. Local reaction was observed in 70 per cent and general in 30 per cent of the cases. The authors conclude that the vaccine therapy is a harmless method.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

79 4872-4946 (Oct 19) 1935

Indications for Gynecologic Operation H Van Der Hoeven—p 4872

*Hemorrhages in Course of Diabetes Mellitus A C M Lips—p 4879

Increasing Mineral and Vitamin Content of Milk P Schoorl—p 4887

Decrease in Acute Appendicitis Mortality C Van Staveren—p 4892

Monozygotic Quadruplets L J Frijda—p 4896

Mastoiditis Sinus Thrombosis and Cerebral Abscess Unusual Case

with Recovery J M T Gozé—p 4899

Acute Hemolytic Anemia J M Planteydt—p 4901

Hemorrhages in Course of Diabetes Mellitus—Lips reports a case of diabetes mellitus in a youth, aged 16. The patient exhibited occasionally hematuria while receiving a daily administration of insulin. Omission of insulin one day caused the patient to feel thirsty and dizzy and it led to repeated vomiting of stomach contents mixed with blood. A state of coma supervened from which the patient recovered on carefully regulated insulin treatment. From the review of the literature and his own case, the author arrives at the conclusion that hemorrhages in the course of diabetes treated by insulin are not caused by insulin but are due to the toxic changes in the blood vessels. Insulin or, when insulin is not administered, trauma, embolism or thrombosis should be considered only contributing factors.

Acta Pædiatrica, Stockholm

18: 1-66 and 1-41 (Sept 18) 1935 Supplement No 2

Course and Therapy of Diabetes Mellitus in Children C W Herlitz.

—p 166

*Treatment of Diabetes Mellitus During Childhood Without Dietetic Restrictions B Söderling—p 1-41

Treatment of Diabetes Mellitus—Söderling shows that in recent years a number of investigators have demanded a diet with a greater carbohydrate content for patients with diabetes mellitus. He himself has prescribed an entirely unrestricted diet for twenty-one diabetic patients, aged between 3 and 34 years, reasoning that the incretory deficiency is satisfactorily compensated by insulin. The patients have been under observation from six to thirty months. The author adhered to three guiding principles. 1 The well being of the patient is of primary importance. At each control attention was paid to his weight, working capacity, mood, polydipsia and polyuria. 2 The urine must be free from acetone, that is, Legal's test must be entirely negative. 3 Insulin is administered in such a manner that hypoglycemia and an abrupt decrease in the curve are avoided. The patients were put on an ordinary home diet and even sugar and sweet desserts were taken. This treatment was highly satisfactory in that the patients were able to lead active lives, felt well and had a considerable margin of safety against infections, acidosis and insulin reactions. In sixteen renewed hospitalization proved unnecessary, and precoma or coma did not develop in any of the patients. The insulin dosage, the consumption of carbohydrates, the sugar content of blood and urine and the physical development are discussed. The author stresses that he observed no impairment of the insulin apparatus as the result of the free diet. In two cases the insulin requirement had increased after a year, whereas it was surprisingly constant in the majority of cases. Of seventeen patients of an earlier date, nine continued to receive the same amount of insulin, four were given a larger dose and four a smaller dose after the diet was changed from a restricted one to a free one. The physical and sexual development progressed normally in the course of this treatment.

Bibliotek for Læger, Copenhagen

127: 319 342 (Sept.) 1935

*Synthetic Androsterone Preliminary Experiences with Its Effect on Seminal Vesicles in Castrated Male Rats E. Jacobsen and J T Christensen—p 319

Investigations on Hyperlipemia and Cholesteroluria J Bing and U Starup—p 332

Synthetic Androsterone—Jacobsen and Christensen report that a compound prepared from cholesterol, made according to the method of Ruzicka and chemically identical with Butenandt's androsterone, exerted a distinct effect on the growth of the seminal vesicles in castrated rats, the necessary dosage depending on the age of the animals and the length of time since castration. A strong regeneration resulted from a daily dose of 3 mg. 1 mg daily when administered immediately after castration, to a certain extent prevented castration atrophy.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 105, No 22

CHICAGO, ILLINOIS

NOVEMBER 30 1935

THE MODERN TREATMENT OF SURGICAL SHOCK

CHARLES H. FRAZIER, M.D., Sc.D.

John Rhea Barton Professor of Surgery University of Pennsylvania School of Medicine
PHILADELPHIA

The subject of traumatic shock is perennial, like our poor relations it is always with us. It has provided a veritable storehouse of controversy. Theories as to the causation of shock as advanced even today and championed so vigorously are such that many of the papers on this subject have the tenor of a debating society about them. And yet the condition we know as shock was known to the ancients although not designated by this term until 1795, when James Latta¹ so termed it. In dealing with a subject on which so much thought and experimentation have been expended, it is of particular interest to look back a few years to find out what was known of the subject a generation ago. Fifty years ago that peer of surgeons D. Hayes Agnew² discussed shock, and many of his observations appear quite modern. The symptoms associated with shock as observed by Agnew are much the same as they are known today. Agnew defined shock as a "term used to express the collective phenomena which follows the infliction of some violence to the body through the nervous system." The causes of shock were classified as psychical and physical.

Just how much actual shock can be produced by psychic trauma is difficult to say but every physician has seen patients who have responded to an apparent psychic injury by the symptoms of mild primary shock. I recall the case of a sturdy man who came to the operating room with his blood pressure so low that operation had to be deferred and restoratives given. Later I found the cause of his dilemma. A substitute orderly had prepared him for operation, and in the conversation that ensued the patient was told by the orderly that he was going to have an operation from which he had seen no one recover.

Shock was expected in Agnew's day, just as it is today, to follow severe physical trauma. For the treatment of shock Agnew advised placing the patient in the recumbent position with the head low, with the application of external heat and blood transfusion if there had been loss of blood. In cases in which there was engorgement of the right side of the heart, bleeding was to be resorted to. Stimulants were to be carefully given brandy and whisky by mouth, subcutaneously or by rectum.

But the concept of the mechanism of shock has been changed since Agnew's day. Agnew quotes Mitchell, Keen and Moorehouse, who made their observations during the Civil War and who felt that the medulla and the pneumogastric nerve were chiefly concerned in initiating the condition of shock, but he himself felt that the central factor in shock was more widespread. Agnew accounted for the pooling of blood in the "deep venous trunks by associating together feebleness of the heart and paralysis of the walls of the blood vessels." He did not hit far amiss of the mark. The fall in temperature Agnew explained on the basis of a temporary arrest of tissue metamorphosis. Today, in spite of the more accurate data concerning the state of the organism, during the condition termed shock there is no unanimity of opinion as regards the actual mechanism of the initiation of the condition.

I shall review hastily some of the various theories regarding the cause of shock. Crile's³ theory that the marked physiologic and nervous depression associated with shock is the result of exhaustion of the vital nerve centers received widespread attention until it was shown by Forbes and his co-workers that the changes in the central nervous system were the result and not the cause of shock. In addition, Dolley,⁴ Janeway and Ewing⁵ and Cannon⁶ produced evidence to discount this theory. Notwithstanding the mass of evidence against this theory, it is occasionally reviewed. O'Shaughnessy and Slome⁷ in January 1935 published data on experiments on traumatic shock and discussed their data in relation to Crile's³ theory.

For a time Yandell Henderson's⁸ theory held a prominent place in all discussions on shock. Henderson believed that the loss of carbon dioxide from the body was the initiating factor in shock, closely allied with this view was the question as to whether or not acidosis might be the factor of prime importance in shock. The effect of the loss of carbon dioxide by hyperventilation and its relation to shock was studied also by Janeway and Ewing,⁵ and Mann⁹ studied the effects of a possible loss of carbon dioxide through the opened abdomen. But experiments indicate that the loss of carbon dioxide is not the cause of shock. As regards the relation of acidosis to the cause of shock, the experiments of the Medical Research Committee¹⁰ showed that a marked acidosis could be produced by the injection of acid without producing shock.

3 Crile George, Surg. Gynec. & Obst. 37:342 (Sept.) 1923.

4 Dolley, D. H. J. N. Research 20:275 1909 21:95, 1909, 22:331 1910.

5 Janeway H. and Ewing E. Am. J. Surg. 59:158 1914.

6 Cannon W. B. Studies in Experimental Traumatic Shock Arch. Surg. 41:1 (Jan.) 1922.

7 O'Shaughnessy Laurence and Slome, David. Brit. J. Surg. 22:589 (Jan.) 1935.

8 Henderson Yandell. Am. J. Physiol. 21:126 1908.

9 Mann F. Bull. Johns Hopkins Hosp. 25:205 1914.

10 Medical Research Committee. Reports of the Special Investigation Committee on Surgical Shock and Allied Conditions, London: His Majesty's Stationery Office 7:245 1919.

Read before the Section on Miscellaneous Topics, Session on Military Medicine at the Eighty-Sixth Annual Session of the American Medical Association Atlantic City, N. J. June 14 1935.

1 Latta James. A Practical System of Surgery. Edinburgh 1795 (cited by Linnaman G. C. Ann. Surg. 38:846 1903).

2 Agnew D. H. Principles and Practice of Surgery. Philadelphia, J. B. Lippincott Company 2:376 1881.

Following the work of Dale, Laidlaw and Richards¹¹ on the relationship between histamine and shock, a theory was advanced that shock was caused by the liberation of toxic substances generated at the site of the injury. Histamine or histamine-like substances were known to occur in injured tissues, and varying degrees of a shocklike state could be produced by the injection of histamine. Cannon and Bayliss¹² found that when a cat's thigh was traumatized shock did not result if the blood supply to the extremity was excluded, even though the nerve supply to the limb was intact. That toxemia *per se* was not the cause of shock was suggested by the work of Parsons and Phemister,¹³ who injected the blood drawn from the femoral veins of the traumatized limb of dogs and reinjected this material into normal animals without producing shock.

Recently Freeman¹⁴ has postulated that the phenomena of shock may be explained on the basis of hyperactivity of the sympathetic-adrenal system. By the repeated injections of epinephrine he was able to reduce the blood volume in animals, a fact previously established by Gasser, Erlanger and Meek.¹⁵ In addition, Freeman¹⁴ caused a reduction in blood volume by the initiation of "sham rage" in cats in which the cerebral cortex had been destroyed. With associated paralysis of vasoconstrictor fibers by ergotoxine or after a complete sympathectomy, injections of epinephrine or "sham rage" did not cause a reduction of blood volume and shock did not result.

Speaking still of recent theories advanced for the causation of shock, Swingle and his associates¹⁶ stated that the manifestations of surgical shock and deficiency of the adrenal cortical hormone were similar, and they thus proposed the use of adrenal cortical extract in the treatment of shock. Since shock and a deficiency of the adrenal cortical hormone are not related, it is apparent that this theory adds nothing of value to the treatment of shock. Furthermore, the adrenal cortical extract has a slow, prolonged action and, if used in the treatment of shock, its effect will not be manifest until it is too late to meet the emergency.

When so many theories are advanced for the explanation of a condition, it is generally conceded that no one theory can be accepted. This naturally does not preclude the possibility of finding some truth in any one or in all the theories. But the theories cited have provided facts that may be used to advantage.

During the World War the problem of traumatic shock naturally again came to the forefront. Some advances both in its prevention and in its treatment were made, but under the stress of military emergencies conditions for experimental work and careful observation were not always of the best. The large number of cases seen by the military surgeon in combat in a short time could not be duplicated in civil practice even in the most active traumatic surgical service. Despite the tense situation of the World War, valuable contributions were made, and the publications on shock by the Medical Research Committee, the combined observations of both British and American medical officers, are of outstanding interest.

Following the armistice the study of shock from the experimental standpoint was revived. This included not only a critical analysis of existing theories but an attempt to determine the conditions that prevailed in the organism during traumatic shock. It is in this respect that the postwar study of shock has excelled and, despite the controversial points relating to the nature and cause of shock, certain phenomena are now recognized and accepted.

Unquestionably the most striking phenomenon associated with traumatic shock is the decrease in blood volume and the loss of the fluid elements that eventuate, in a concentration of the corpuscular elements. It has been assumed, following the work of Dale, Laidlaw and Richards,¹¹ that the loss of fluid is due to a change in the permeability of the finer vessels of the circulatory tree. In traumatic shock the plasma proteins fall in spite of the fact that the concentration of the hemoglobin increases. One must therefore assume that in this condition the plasma proteins pass from the blood into the intercellular fluids and, as a result of their osmotic effect, draw an additional amount of fluid from the circulation. Acknowledgedly every injury to the tissues is followed by local changes in the circulation. When the injury is severe not only fluid but the cellular elements of the blood gain access to the tissue spaces, and when this transudation is severe enough there occurs a change in the blood volume.¹⁷ Do not these observations adequately explain the reduction in the circulating blood volume and the consequent fall in blood pressure? When the blood pressure or blood volume falls to a critical level, further transudation of fluid from the vessels takes place and the plasma proteins and blood volume decrease simultaneously. Hence in recent years we have come to consider shock as due solely to the loss of fluids into the tissues outside the vascular system.

Freeman noted that dehydration stimulated medullo-adrenal secretion and like injections of epinephrine reduced blood volume. He maintained that arterial constriction rather than dilatation better explained the phenomena of shock. Arterial constriction tends to slow the blood stream and in turn would lead to stasis in the capillaries and the escape of fluid and protein with its attending reduction of the blood volume.

But regardless of the mechanism, the loss of blood volume is a definite reaction to tissue injury and must be reckoned with in treatment. To be sure, fear, anxiety, pain, cold, dehydration and fatigue are contributing factors.

The restoration and maintenance of blood volume may be accepted then as of basic importance in the treatment of shock, and the problem of treating shock is inseparably connected with the maintenance of blood volume. When the degree of shock is severe, no matter what the theories, any or all of the methods of treatment may fail. Paradoxically, it may be said that the time to begin the treatment of shock is before its onset. As preventive measures one must consider the alleviation of pain, of fear and of anxiety. It has been suggested¹ that shock may be relieved by spinal anesthesia, even though the blood pressure is already low. Spinal anesthesia would of course relieve pain, but it is questionable whether it is wise to introduce an additional blood pressure lowering agent in shock, even though certain experiments on animals are reported in which a low blood pressure rose following spinal anesthesia. Mor-

¹¹ Dale, H. H., Laidlaw, P. P. and Richards, A. N. Medical Research Committee No. 26, 1919, p. 9.

¹² Cannon, W. B. and Bayliss, W. M. Medical Research Committee Special Report Series No. 25, London, His Majesty's Stationery Office, 1919.

¹³ Parsons, Eloise and Phemister, D. B. Surg. Gynec. & Obst. 51: 196 (Aug.) 1930.

¹⁴ Freeman, N. E. Am. J. Physiol. 103: 185 (Jan.) 1933.

¹⁵ Gasser, H. S., Erlanger, J. and Meek, W. J. Am. J. Physiol. 50: 31 (Oct.) 1919.

¹⁶ Swingle, W. W., Pfaffner, J. J., Vars, H. M., Bolt, P. A. and Parkins, W. M. Science 77: 58 (Jan. 13) 1933.

¹⁷ Blalock, Alfred. Experimental Shock Arch. Surg. 20: 959 (June) 1930.

phine is a valuable adjunct to other forms of treatment and prompt attention to the source of painful stimuli is important.

In the treatment and prevention of shock the prevention of psychic trauma too often is overlooked. Intangible as the factor is, I can best illustrate what I mean by recalling the value of what is termed "vocal anesthesia" in conjunction with spinal or local anesthesia. Not only do patients whose mental processes are diverted from the disconcerting ordeal complain less about the operative procedure, but in the case of spinal anesthesia, in which a fall in blood pressure is not unusual, there is stabilization of the pressure. The ability to distract the patient's attention in the treatment of shock is of value in the alleviation of pain. Reassurance to the patient by different means is helpful and taxes the resources of the surgeon.

Lowering the head of the patient and the application of external heat have long been known and accepted as routine procedures.

But if one recognizes the loss of blood volume as the essential etiologic factor, the restoration of blood volume must be acknowledged as the predominant and indispensable agent. In mild shock, intravenous therapy at times causes an immediate relief of symptoms. However, if the patient is losing fluid from the blood stream rapidly and continuously the addition of more fluid is of little service unless the solution can be kept within the circulation. Adequate circulation can be maintained for a short period of time by the introduction of a solution of 10 per cent dextrose and physiologic solution of sodium chloride, but there is need for a solution that diffuses less rapidly. For this reason blood is more efficacious, but if blood is not readily available an acacia solution may be substituted.

During the World War acacia was suggested as a substitute for blood in the treatment of shock by the British physiologist Bayliss.¹⁸ At that time the difficulty of obtaining a pure preparation discouraged the use of acacia and it was almost universally abandoned. Today, however, reliable preparations of acacia in ampules are on the market and may be used without fear of harmful reactions. I have employed this agent when there was need for the rapid restoration and maintenance of fluid volume and have seen no ill effects when it was given in proper concentration. Acacia has again come to the fore in that it is available in stock and convenient containers.

For a time during the World War it was thought that, since there is an associated acidosis in shock, solutions of sodium bicarbonate might be given intravenously to some advantage. Cannon¹⁹ treated several soldiers by this method and was able to cause a transient rise in blood pressure, but this method of treatment was short lived. It has however, during this year been revived by Coonse and his associates.²⁰ It is sufficient to say that the use of a sodium bicarbonate solution is not without danger should it cause an uncompensated alkalosis. In fact I can see no particular advantage in bicarbonate solutions when the same results may be obtained by the much less dangerous physiologic sodium chloride and dextrose solutions.

Recently my attention has been called to the beneficent effect of 10 per cent ethyl alcohol in 10 per cent dextrose given slowly and this I have employed to

advantage. As much as 2 liters may be given intravenously in twenty-four hours. Patients receiving this solution experience a feeling of warmth and well being. Alcohol in the form of whiskey or brandy has long been considered valuable for its stimulating effect and, in addition to its stimulating effect, affords easily available calories.

It must be admitted that during the postwar period definite advances were made in that there was a more accurate understanding of the phenomena of shock, although the mechanism is still not well understood.

How may the treatment of shock be summarized? Primarily, in the removal of all contributing causes. These are not only associated with physical trauma but include psychic, nervous and humoral aberrations. I am not unmindful of the effect of pitressin in maintaining blood pressure and of the stimulating effect of caffeine. But above all these I would emphasize employment of agencies to maintain blood volume. These include saline and dextrose solutions, dextrose and alcohol solutions, solutions of acacia and last, but not least, blood transfusion.

Finally, what is the difference between the treatment of shock in civil life and that in military engagements? It is acknowledged that the treatment of shock should begin at the earliest possible moment, and the treatment of shock in wartime is a matter of organization. How much treatment can be carried out at the first aid stations and how promptly can the injured be transported to field hospitals? These are problems that must be left to the military surgeon, who must keep constantly before him the importance of the avoidance of every unnecessary delay in applying the essential remedies.

3400 Spruce Street

ABSTRACT OF DISCUSSION

DR. CHARLES C LUND, Boston. There is no question that the real treatment for the severe case is replacement of blood. I believe with Blalock and many others that on a quantitative basis the loss of circulating fluid is the essential thing in the picture to which treatment should be directed. There is some unpublished work of Dr. Nowak of the Boston City Hospital, with some elaborate cross circulation experiments, which goes far to confirm this point of view. In every way he seems to show that the loss of fluid into the tissues even when there is no external hemorrhage, produces the largest proportion of the shock in the typical animal experiment. I am in complete agreement with Dr. Frazier that I would hesitate to use sodium bicarbonate at the present moment. Pure acacia solves some of the problems when blood is not immediately available and may be of tremendous importance at first aid stations. I think, though, that the acacia problem is not finished. Acacia stays in the blood a long time. It has been recovered six months or longer after introduction. It is a gummy solution and, according to a pharmacologist, tends to coat and clog the capillaries in the liver. In reasonable amounts, I am sure that it can do nothing but good, but I think that repetitions of doses of acacia say, 500 cc. three or four times in twenty-four hours, and three or four times more in the next twenty-four hours, might be bad, and I would like to see animal work done to find what the upper limit of tolerance of acacia in the way of dosage is. As for alcohol that is a little shocking to the teaching that I have received in physiology. I am interested to hear that its use for shock has been observed by Dr. Frazier and found to be of benefit. The old shock enema with alcohol in the form of whiskey and so on I have always felt was one of the worst things that could be used. Of course, about 10 cc. of pure alcohol per hour would not overload the system at any one time and would be an available source of fuel.

DR. NORMAN E. FREEMAN, Boston. At the Massachusetts General Hospital we have been studying the peripheral distribution of blood to the tissues of the body in cases of shock.

¹⁸ Bayliss W. M. Medical Research Committee Special Committee Report I London His Majesty's Stationery Office 1919 p. 11.
¹⁹ Cannon W. B. Medical Research Committee Special Committee Report II 1919 p. 96.
²⁰ Coonse G. H. Fossie P. S. Robertson H. F. and Aufranc O. E. New England J. Med. 212: 647 (April 11) 1935.

The blood flow in the hand has been determined both in patients presenting the classic picture of shock and in patients whom we believed to be on the road to such a condition. It may briefly be stated that the blood flow in the hand is markedly reduced and may actually be zero in severe cases. This fact is quite in accord with the clinical picture of cold extremities and empty veins, which will not fill with blood even when a venous tourniquet is applied. In other experiments we have tried to analyze the various factors, acting in the clinical cases, which may reduce the peripheral blood flow. The results seem to show that cold, pain, fear and asphyxia depress the peripheral circulation. It is well recognized that these stimuli, together with dehydration and hemorrhage, are all potent factors in producing shock. The consequences of a diminished blood flow are tissue asphyxia and acidosis. Landis has shown that tissue asphyxia leads to an increase in the permeability of the capillaries, allowing plasma to leak out. If the reduced circulation in the hand in cases of shock were also present throughout the body, it can readily be seen how the blood volume would be still further reduced by loss of plasma through asphyxiated capillaries. As Dr Frazier has brought out, the essential dominant feature in shock is a reduced effective blood volume. Any method that raises the blood volume will increase the vital flow of blood to the tissues and thus not only prevent further loss of plasma but actually bring back the blood that is stagnant in the peripheral tissues. The treatment of shock, as Dr Frazier has stated, depends to a large extent on the early restoration of an effective blood volume.

THE TREATMENT OF ACUTE ALCOHOLISM

WITH TEN PER CENT CARBON DIOXIDE AND
NINETY PER CENT OXYGEN
INHALATION

LEON J. ROBINSON, M.D.
AND
SYDNEY SELESNICK, M.D.
BOSTON

For many years the Fifth Medical Service of the Boston City Hospital has been in charge of almost all medical alcoholic patients admitted to this hospital. It is estimated that approximately 700 alcoholic patients are admitted to this service for treatment each year. The opportunity has been present, therefore, to study alcoholism in all its phases.

The acute alcoholic patient¹ generally can be given a good prognosis as to recovery. For this reason, even when medical aid is sought for him, he receives little active therapy. In the paralytic stage of acute alcoholic poisoning, however, emergency treatment may be life saving. Patients in this stage present a picture best described by Sollmann,¹ who states that the symptoms are those of beginning medullary paralysis. Respiration is slow and stertorous, the pulse is scarcely discernible, the skin is cold and cyanotic, the pupils are generally dilated, the reflexes are abolished, the temperature may fall severely. Though death is relatively uncommon, the coma may become deeper and terminate in paralysis of respiration or of the heart, or in pulmonary edema. The patient may die within half an hour after the onset of this paralytic stage. If coma lasts beyond thirteen hours, recovery is rare. Death may also occur later after a prolonged debauch.

From the Fifth Medical Service, Boston City Hospital, John A. Foley, M.D., Physician in Chief, and the Department of Medicine, Boston University School of Medicine.

For the blood chemistry determinations of carbon dioxide, sugar and lactic acid we are indebted to Miss Eunice Smith of the Clinical Laboratory, Boston City Hospital.

¹ Sollmann, Torald. *Manual of Pharmacology*, ed. 3. Philadelphia: W. B. Saunders Company, 1930, pp. 654-698.

as a result of gastric irritation and hemorrhage² or of exhaustion. By analogy with animals it would require about a pint of whisky taken at once to cause coma in man.¹

As it was felt that the best way to combat the condition caused by the ingestion of alcohol would be to remove or lessen the alcohol concentration in the body, rather than merely treat the symptoms of alcoholic depression, a consideration was given to the metabolism of alcohol. Obviously, oxidation of alcohol by the body leads to recovery from acute alcoholism.

METABOLISM AND EXCRETION OF ALCOHOL

Himwich and his co-workers³ state that the ingestion of alcohol is followed by an acidosis resulting from a relative retention of carbon dioxide and an accumulation of lactic acid, causing a diminution of the alkali reserve. They attribute the after-effects, or "hangover," to increased arterial lactic acid. Observing a slight rise in blood sugar levels as alcoholism progressed, they postulate that the blood sugar rises because alcohol spares dextrose, possibly diminishes hepatic oxidation, and the acidosis favors transformation of glycogen to dextrose. They state further that alcohol transforms muscle glycogen to lactic acid.

Sollmann¹ states that less than 2 per cent, and never more than 10 per cent, of alcohol is excreted by the lungs and kidneys. The remainder is completely oxidized in the tissues to carbon dioxide and water (quoting Atwater and Benedict⁴), probably with acetic acid as an intermediate stage.

Mellanby⁵ asserts that alcohol in the body is oxidized at a constant unchangeable rate of approximately 0.185 cc, or 0.148 Gm of alcohol per kilogram per hour, regardless of the amount of alcohol present in the body.

Haggard and Greenberg,^{6b} taking strong exception to Mellanby's view, state that "the rate of oxidation is proportional to the amount of alcohol present," the decrease ranging between 15.9 and 21.1 per cent of the alcohol present.

Concerning urinary excretion of alcohol, in their thorough investigation, Haggard and Greenberg^{6a} find that, although "the concentration of alcohol in the urine bears no relation to the volume of urine secreted, the amount of alcohol eliminated through the kidneys, however, varies directly with the volume secreted," and "the percentage of the total amount of alcohol ingested that is lost through the kidneys depends, therefore, upon the amount of urine passed." They state that "during sixteen hours following ingestion of alcohol from 2.1 per cent to 4.3 per cent of the total amount is eliminated through the kidneys, the variation depending upon the rate of secretion of urine."

Miles⁷ found that from 1.2 to 1.6 per cent of the alcohol appeared in the urine during the first two hours subsequent to ingestion.

² Weiss, Soma and Mallory, G. K. Lesions of the Cardiac Orifice of the Stomach Produced by Vomiting. *J. A. M. A.* 98: 1353-1355 (April 16) 1932. Mallory, G. K., and Weiss, Soma. Hemorrhages from Lacerations of the Cardiac Orifice of the Stomach Due to Vomiting. *Am. J. M. Sc.* 178: 506-515 (Oct.) 1929.

³ Himwich, H. E., Nahun, L. H., Rakieten, Nathan, Fazikas, J. F., Du Bois, Delaheld, and Gildes, E. F. The Metabolism of Alcohol. *J. A. M. A.* 100: 651-654 (March 4) 1933.

⁴ Atwater and Benedict. *Mem. Natl. Acad. Sc.* 8: 231, 1902.

⁵ Mellanby, Edward. British Medical Research Committee, Special Report Series 31, 1919.

⁶ Haggard, H. W., and Greenberg, L. A. Studies in the Absorption, Distribution and Elimination of Ethyl Alcohol. *J. Pharmacol. & Exper. Therap.* 52: 137-179 (Oct.) 1934. (a) II The Excretion of Alcohol in Urine and Expired Air and the Distribution of Alcohol Between Air and Water, Blood and Urine, *ibid.* pp. 150-167. (b) III Rate of Oxidation of Alcohol in the Body, *ibid.* pp. 167-179.

⁷ Miles, W. R. The Comparative Concentrations of Alcohol in Human Blood and Urine at Intervals After Ingestion. *J. Pharmacol. & Exper. Therap.* 20: 265-317 (Nov.) 1922.

Concerning the elimination of alcohol in the expired air, Haggard and Greenberg^{8a} state that "the total amount of alcohol eliminated (in the expired air) in the eight hours following administration was 3.94 per cent of the amount ingested."

Haggard⁸ has shown, using ether, that the rate of elimination of volatile substances through respiration is nearly proportional to the volume of breathing.

Henderson, Haggard and Coburn⁹ and White¹⁰ have shown that the inhalation of from 7 to 10 per cent of carbon dioxide will cause rapid deetherization after ether narcosis.

Haggard and Greenberg^{8a} assert that, by increasing the volume of breathing with inhalation of carbon dioxide, 10 per cent or more of the amount of alcohol ingested can be eliminated in the first hour or two.

Hunter and Mudd¹¹ administered carbon dioxide to three patients in alcoholic coma, each of whom recovered consciousness within half an hour after carbon dioxide was inhaled for thirty minutes or more. They did not determine the blood alcohol concentration. A fourth patient was not unconscious but had some improvement in his thick speech after thirty minutes of carbon dioxide. They also secured a volunteer to drink 28 cc of 95 per cent alcohol on each of two separate days, and blood alcohol determinations were made. On the second day of the test, carbon dioxide was administered for fifty minutes. The blood alcohol curve fell more rapidly than on the first day of the test, when no carbon dioxide had been given.

With carbon dioxide treatment the peak of the alcohol level was reached at about the same time as the curve for the untreated condition. However, it not only started falling a half hour earlier but fell 21.1 mg in the first forty-two minutes of beginning decline as compared to a fall of 57 mg in the control, in the first thirty-four minutes of beginning decline. They did not state whether arterial or venous blood was used.

Van Wulften Palthe¹² found that oxygen inhaled by man and animals largely relieved the symptoms of alcoholic intoxication and that oxygen inhalation prevented death in rabbits which had been given alcohol in doses lethal to control animals.

Barach¹³ asserted that although lethal doses of alcohol caused the same number of deaths among rabbits kept in air as among those kept in an oxygen tent, intoxicated men at rest showed improved sensory function during oxygen inhalation. On withdrawal of the oxygen, the men lapsed into their former state of intoxication. If, however, from 7 to 10 per cent of carbon dioxide in oxygen was given, the improvement was permanent. He concluded that alcohol intoxication is not due to the kind of oxygen want that is susceptible of relief by oxygen inhalation.

PURPOSE OF STUDY

Since carbon dioxide increased the respiratory excretion of alcohol, and since the oxidation of alcohol might be increased through the administration of oxygen, it is conceivable that the inhalation of a combination of

10 per cent carbon dioxide and 90 per cent oxygen mixture might accelerate recovery from acute alcoholic coma, especially of the paralytic state with respiratory depression and cyanosis. If it did no more than keep such a patient from dying of respiratory depression, it would, by keeping him alive, enable him to oxidize the alcohol himself.

It also seemed advisable to determine whether this therapy alone increased the rate of fall in the blood alcohol level. This was accomplished by following the venous blood alcohol curve. Changes in venous blood sugar, carbon dioxide capacity and lactic acid were also followed.

METHODS

The persons selected were alcoholic patients who not only had an odor of alcohol on their breath and a history of drinking alcohol but were comatose, stuporous, drowsy or ataxic.

At the start of the experiment, 30 cc of oxalated blood was obtained from the cubital vein of the arm. The skin was sterilized with 2 per cent aqueous mercurochrome (rather than tincture of iodine, because of its alcoholic content).

An open slot mask connected with a tank containing a mixture of 10 per cent carbon dioxide and 90 per cent oxygen was then placed over the patient's face. The patient was allowed to breathe this mixture for thirty minutes, the expired air passing from the mask out through the open slot. At the end of thirty minutes the inhalation was suspended and 30 cc of blood again withdrawn as before.

In the control cases no carbon dioxide-oxygen therapy was given, here also blood being withdrawn on admission and at the end of thirty minutes.

On each sample of blood carbon dioxide capacity, alcohol, sugar and lactic acid determinations were made. Sodium fluoride was used as a preservative in the portion intended for blood lactic acid and sugar determinations. The blood plasma intended for the carbon dioxide capacity determination was prepared and protected according to the methods suggested by Peters and Van Slyke¹⁴. In the determination of blood alcohol the method used was that described by Turner¹⁵ based on the Naville modification of the Nicloux method. For an account of the method in full, Turner's article is recommended.

RESULTS

Clinically the patients receiving carbon dioxide-oxygen inhalation improved more rapidly than those who did not. However, as our purpose was to obtain chemical substantiation of the clinical observations we will first discuss the laboratory results and then interpolate the clinical results.

Normally, according to Schweisheimer,¹⁶ human blood contains about 0.03 per cent of alcohol, or about 30 mg per hundred cubic centimeters of blood.

Naville¹⁷ asserted that slight intoxication in human beings starts when the blood alcohol content ranges from 0.1 to 0.2 per cent (from 100 to 200 mg per hundred cubic centimeters of blood), is marked at 0.25 per cent (250 mg per hundred cubic centimeters of blood) is grave at 0.3 per cent (300 mg per hundred

⁸ Haggard H W. The Absorption Distribution and Elimination of Ethyl Ether. *J Biol Chem* 50: 737-783 (April) 1924.

⁹ Henderson Landell Haggard H W and Coburn R C. The Therapeutic Use of Carbon Dioxide After Anesthesia and Operation. *J A M A* 74: 783-786 (March 20) 1920.

¹⁰ White J C. Deetherization by Means of Carbon Dioxide Inhalation with Some Observations on Pulmonary Ventilation and Ether Tension During Ether Anesthesia. *Arch Surg* 7: 347-370 (Sept.) 1923.

¹¹ Hunter F T and Mudd S G. Carbon Dioxide Treatment in Acute Alcoholism. *Boston V & S J* 190: 971-974 (June 5) 1924.

¹² Van Wulften Palthe P M. Alcohol Poisoning. *Deutsche Ztschr f Nervenh* 92: 9-100. 1926.

¹³ Barach A L. Action of Oxygen in Counteracting Alcoholic Intoxication. *Am J Physiol* 107: 610-615 (March) 1934.

¹⁴ Peters J P, and Van Slyke D D. Quantitative Clinical Chemistry. Baltimore: Williams & Wilkins Company 1931 volumes I and II.

¹⁵ Turner R G. Blood Alcohol and Its Relation to Intoxication. *J Pharmacol & Exper Therap* 44: 305-324 (March) 1932.

¹⁶ Schweisheimer. *Deutsches Arch f klin Med* 100: 271, 1913.

¹⁷ Naville F. Difficulties et erreurs dans le diagnostic de la cause des morts dites naturelles. *Revue med de la Suisse Rom* 48: 742-749 (Sept 10) 1928.

cubic centimeters of blood) and is profound (coma or death) at 0.35 to 0.4 per cent (from 350 to 400 mg per hundred cubic centimeters of blood)

It will be noted that in the control group (table 1) at the end of half an hour the blood alcohol level fell little if at all, the greatest fall being 26 mg (1, table 1)

On the other hand, in the group treated with carbon dioxide-oxygen inhalation for half an hour (table 2) in all but two cases the alcohol level, at the end of half an hour, fell more than the greatest fall in the control group. In the two exceptions a rise of 26 mg occurred in one (7, table 2) and in the other a fall of but 8 mg (6, table 2). These apparent exceptions will be discussed later.

The remaining seven cases, then, show a decrease greater than in the control group. In five of these cases (1, 2, 3, 5, 8, table 2), a decrease of 99 mg or more is noted—a fall occurring during a half hour of carbon

accounted for, can be readily understood by a consideration of the following evidence.

Although the concentration of alcohol in the peripheral venous blood, contrary to Miles,⁷ does not reach as high a level as in the peripheral arterial blood, the peripheral arterial and venous blood alcohol concentrations are in close agreement during the period of decline in alcohol concentrations, which decline begins to occur at the end of an hour and a half following alcohol ingestion.^{6a}

From the figures presented by Haggard and Greenberg it seems that although the peripheral venous blood alcohol level never actually represents the height of the arterial blood alcohol level (at its peak the arterial blood alcohol level is 53 per cent higher than the venous) a rise or fall in the venous level reflects a similar though greater rise or fall in the arterial level. They also show that the peak of blood alcohol absorption is

TABLE 1—Control Patients

| Alcoholic Condition | Venous Blood | | | | | | | | | | | |
|--------------------------|---------------------------|--------|--------|-------------------------|--------|--------|--|--------|--------|--------------------------------|--------|--------|
| | Alcohol Mg per 100 Cc. | | | Sugar Mg per 100 Cc. | | | Carbon Dioxide Capacity Volume per Cent | | | Lactic Acid, Mg per 100 Cc. | | |
| | 0 | ½ Hour | Change | 0 | ½ Hour | Change | 0 | ½ Hour | Change | 0 | ½ Hour | Change |
| 1 Stupor | 510 | 484 | -26 | 122 | 103 | -19 | 30 | 38 | + 2 | 25.7 | 21.7 | - 4.0 |
| 2 Coma | 492 | 488 | - 4 | 104 | 114 | +10 | 30.5 | 38 | - 1.5 | 29.5 | 21.5 | - 8.0 |
| 3 Odor of alcohol ataxia | 492 | 492 | 0 | 84 | 82 | - 2 | 4.5 | 4.4 | + 0.4 | 31.5 | 32.3 | + 0.7 |
| 4 Coma | 432 | 419 | -13 | 96 | 90 | - 6 | 17 | 30 | + 7.0 | 28.2 | 35.5 | + 7.3 |
| 5 Odor of alcohol ataxia | 418 | 391 | -27 | 85 | 93 | + 8 | 30.5 | 31 | + 0.5 | 62.4 | 40.6 | -21.8 |
| 6 Drowsy | 352 | 347 | - 5 | | | | | | | | | |
| 7 Coma | 431 | 410 | -21 | 121 | 117 | - 4 | 30.5 | 30.5 | - 3.0 | 28.9 | 24.5 | - 4.4 |

* Rest of blood spilled

TABLE 2—Results of Inhalation of Ten per Cent Carbon Dioxide and Ninety per Cent Oxygen for Thirty Minutes

| Alcoholic Condition | Alcohol Mg per 100 Cc. | | | Sugar Mg per 100 Cc. | | | Carbon Dioxide Capacity Volume per Cent | | | Lactic Acid Mg per 100 Cc. | | |
|---|---------------------------|--------|--------|-------------------------|--------|--------|--|--------|--------|-------------------------------|--------|--------|
| | 0 | ½ Hour | Change | 0 | ½ Hour | Change | 0 | ½ Hour | Change | 0 | ½ Hour | Change |
| 1 Odor of alcohol ataxia | 431 | 294 | -137 | 94 | 100 | + 6 | 38 | 45 | + 7.0 | 62.4 | 51.2 | -11.2 |
| 2 Stupor | 544 | 444 | -100 | 115 | 87 | -28 | 31.5 | 37 | + 5.5 | 28.7 | 29.9 | + 1.2 |
| 3 Stupor | 654 | 523 | -131 | 100 | 80 | -20 | 40 | 44.5 | + 4.5 | 26.2 | 23.8 | - 2.9 |
| 4 Coma | 510 | 467 | -43 | 88 | 77 | -11 | 42.4 | 45 | + 2.6 | 30.6 | 30.7 | - 5.9 |
| 5 Odor of alcohol ataxia | 462 | 363 | -99 | | | | | | | | | |
| 6 Odor of alcohol ataxia | 338 | 330 | - 8 | 97 | 116 | +19 | 45 | 44.4 | - 0.6 | 39.4 | 32.7 | - 6.7 |
| 7 Coma | 387 | 413 | + 26 | 135 | 123 | -12 | 45 | 45.5 | + 0.5 | 29.9 | 20.2 | - 9.7 |
| 8 Coma, cyanosis slow shallow respiration | 404 | 281 | -123 | 78 | 84 | + 6 | 39.5 | 42 | + 2.5 | 38.6 | 37.6 | - 1.0 |
| 9 Coma cyanosis clammy.. | 448 | 413 | - 35 | 84 | 87 | + 3 | 38.9 | 37.5 | - 1.4 | 67 | 64.5 | - 2.5 |

* Rest of blood spilled

dioxide-oxygen therapy, which is sufficient in itself to reduce the blood alcohol from that level causing dangerous coma with respiratory depression and cyanosis to a level which produces the ordinary arousable type of alcoholic intoxication.

In the two other treated cases in which there is a decrease in the blood alcohol level but in which that decrease is less than 99 mg, we still note that one decrease (4, table 2) equaled 53 mg, or twice the decrease in the untreated case showing the greatest spontaneous fall (26 mg, 1, table 1). The other case (9, table 2) shows a decrease of 35 mg, which is still greater than the greatest spontaneous decrease in the control group. However, we will classify the latter case with the other two unsatisfactory or nonspectacular response cases, making three treated cases (6, 7, 9, table 2) which do not show a significantly greater decrease than the greatest spontaneous decrease.

That these do not invalidate the proof of the efficacy of carbon dioxide-oxygen inhalation in causing an accelerated significant decrease in total body alcohol level, and that their apparent paradoxical effect is easily

reached only after one and one-half hours following ingestion.^{6a} Even with intravenous injection of alcohol, in dogs, it required from twenty to twenty-five minutes for equilibration of alcohol concentration between arterial and venous blood and body tissues.^{6a}

We had no way of knowing how long before admission any of our patients had ingested alcohol, because of their intoxicated state. If their last alcoholic drink had been within less than an hour and a half before admission, from Haggard and Greenberg's experiments, it is seen that the blood alcohol level must have been rising. Even though carbon dioxide-oxygen inhalation might have been lessening the total amount of alcohol by increasing pulmonary expiration of alcohol, still some rise in blood alcohol concentration would have occurred, since equilibrium and the peak level would not yet have been reached. The rise might not be great or might even be prevented by a rate of excretion equaling absorption, but a spectacular fall would not be recorded. Thus, we believe, explains the apparent failure to secure an appreciably accelerated decrease in blood alcohol in cases 6, 7 and 9, table 2, which seem not to bear out the results in the remaining cases.

We had considered doing gastric lavage before administering therapy to rule out alimentary post-absorption. It was felt, however, that, by the time these patients were apprehended by the police and brought to the hospital, absorption would be complete. Furthermore, it is now refuted that the alimentary absorption of alcohol is complete at the time the concentration of the alcohol in the blood reaches its maximum.^{6b}

To summarize, it would seem from the foregoing evidence that carbon dioxide-oxygen inhalation definitely accelerates the decrease in venous blood alcohol, that an accelerated decrease in venous blood alcohol with carbon dioxide-oxygen therapy represents an accelerated decrease in total body alcohol, and that, if therapy is instituted before the blood alcohol level reaches its peak, the venous blood alcohol analyses fail to reveal the actual accelerated decrease of blood alcohol that occurs. (One need not be concerned, in actual therapy, as to whether or not this peak has been reached, for obviously administering carbon dioxide-oxygen increases the pulmonary excretion of alcohol and so decreases total body alcohol.)

Carbon dioxide-oxygen inhalations were administered for thirty minutes arbitrarily in order to have a definite control time. In actual clinical work the alcoholic patient in coma can be given carbon dioxide-oxygen inhalations as long as is necessary to reduce the patient from a state of dangerous coma, with cyanosis and respiratory depression, to a state of alcoholic intoxication without respiratory embarrassment.

We wish to emphasize that this is an emergency treatment and is not indicated in the moderate degrees of intoxication so frequently encountered.

CLINICAL RESULTS

In every case of unarousable alcoholic coma, with slow, jerky, shallow respirations and cyanosis, carbon dioxide-oxygen inhalation caused the respirations to become deep and regular almost at once. The patient rapidly turned from a cyanotic cold patient to a pinkish warm one. At the end of a half hour of therapy he had recovered sufficiently so that he could breathe normally when left to himself. He could be aroused by painful stimuli. (Every case treated showed the latter response invariably on the second venipuncture, whereas no response to the first venipuncture was often noted.)

In those patients not in coma but who were stuporous, the reaction to painful stimuli was enhanced and the speech improved following therapy. These patients clinically do not require carbon dioxide-oxygen inhalations at all but in this investigation were used to obtain additional blood alcohol studies.

Patients in alcoholic stupor should be watched for signs of coma, and if coma develops carbon dioxide-oxygen therapy is then indicated, although obviously no harm and much good can be done these patients by carbon dioxide-oxygen inhalations even though they are merely stuporous.

It was not our intention to bring these patients to an immediate state of sobriety but to bring them from coma along the road of recovery to a point at which ordinary moderate intoxication would prevail without respiratory depression. From the latter stage of intoxication in practically all instances patients recover.

To repeat. This is an emergency, not a routine, therapy for acute alcoholism and is indicated only in the comatose alcoholic patient.

OTHER LABORATORY RESULTS

A blood sugar elevation occurs in anesthesia by chloroform, nitrous oxide and ethylene¹⁸ and in morphine narcosis in dogs.¹⁹ Himwich and his co-workers³ report that blood sugar rises in alcoholism also. We cannot confirm their results.

No significant changes in blood sugar levels were found before or after carbon dioxide-oxygen therapy.

Morphine narcosis and also alcoholism were found to cause a rise in blood carbon dioxide content.²⁰ In our series the blood carbon dioxide capacities were low normal or below normal (accepting as normal from 43.3 to 55.9 volumes per cent¹⁴). This is in agreement with the results of Himwich and his co-workers³ to the effect that a carbon dioxide retention occurs in alcoholism.

Carbon dioxide-oxygen therapy had little appreciable effect on the venous carbon dioxide capacity and did not tend to produce a carbon dioxide retention.

The blood lactic acid levels tended to be above normal in all groups (normal blood lactic acid from 10 to 20 mg and possibly 30 mg per hundred cubic centimeters of blood¹⁴). They were not proportional to the concentration of blood alcohol, blood sugar or blood carbon dioxide capacity.

That high lactic acid content causes an acidosis in alcoholism and in anesthesia by ether, chloroform, nitrous oxide and ethylene has been shown.²¹

Long²² asserted that adding carbon dioxide to the inhalation of oxygen caused blood lactic acid to disappear in normal resting human beings.

In this study, carbon dioxide-oxygen inhalation produced no appreciable lowering of the blood lactic acid content, which is in accord with the observations of Ronzoni, Koechig and Eaton,²¹ who reported that the high blood lactic acid concentration in ether anesthesia is not influenced appreciably by the blood carbon dioxide or oxygen tension. It is also in accord with the observations of Anrep and Cannan,²³ who found that the lactic acid concentration in alkalemia and acidemia is not influenced appreciably by the blood carbon dioxide or oxygen tension.

CONCLUSIONS

Acute alcoholic coma with dangerous respiratory depression, paralysis and cyanosis is a medical emergency. Death may be definitely prevented and recovery accelerated by inhalation of a mixture of 10 per cent carbon dioxide and 90 per cent oxygen for a length of time sufficient to reestablish and maintain normal respiration and color even after the inhalation is suspended.

A minimum time of half an hour should be observed. If necessary, the inhalation may be carried out longer.

An accelerated decrease in venous blood alcohol levels is produced by carbon dioxide-oxygen inhalation over a period of thirty or more minutes, indicating an accelerated decrease in total body alcohol.

No significant blood sugar observations were recorded either before or after carbon dioxide-oxygen therapy.

18 Stander H J and Radelet A H. Blood Studies in General Anesthesia. *Science* 63: 642 1926

19 Rakieten Nathan Himwich H I and Du Bois Delafield. Morphine Acidosis. *J Pharmacol & Exper Therap* 52: 437-444 (Dec) 1934

20 Rakieten Himwich and Du Bois.¹⁹ Himwich and others.³

21 Himwich and others.³ Ronzoni Ethel Koechig Irene and Eaton Emily P. Ether Anesthesia. III. Role of Lactic Acid in the Acidosis of Ether Anesthesia. *J Biol Chem* 61: 465-492 (Sept) 1924. Stander and Radelet.¹⁸

22 Long C N H. The Lactic Acid in the Blood of a Resting Man, *J Physiol* 58: 455-460 (May 23) 1924

23 Anrep G V and Cannan R K. The Concentration of Lactic Acid in the Blood in Experimental Alkalemia and Acidemia. *J Physiol* 58: 244-258 (Dec. 28) 1923

In alcoholic intoxication there was a tendency to lowered blood carbon dioxide capacity. No appreciable change and no carbon dioxide retention was produced by carbon dioxide-oxygen therapy.

The blood lactic acid content was elevated in alcoholism but was unaffected by carbon dioxide-oxygen therapy.

The purpose of the carbon dioxide-oxygen therapy is not to arouse completely a comatose alcoholic patient but to reduce him from a state of dangerous paralytic alcoholism to the less deep stage of anesthesia from which he can safely be expected to recover.

The therapy is recommended as an emergency treatment and is not indicated in the general run of moderately intoxicated patients so frequently encountered.

ROSACEA INTERPRETED AS A BACTERID FROM FOCAL INFECTION

HERMANN FEIT, MD
ELIZABETH ANN LASZLO, MD
AND
FRANK VERO, MD
NEW YORK.

The definition of rosacea is not as easy as one would suppose. The essential characteristics are, first, the location in the midportion of the face, the so-called flush area, second, the chronicity of the disease, and, third, erythemas of different types. In addition to these one may find thickening of the skin, telangiectases, papules, pustules, crusts, scars, seborrhea, and, in cases complicated with acne, comedones. For the patient rosacea is a serious problem chiefly on account of the psychic disturbance caused by the disfigurement. Any physician who has treated many cases knows how unsatisfactory are the therapeutic results and how frequently one sees recurrences in apparently cured cases. The reason for this is probably that most treatment is directed at symptoms rather than at the cause of the disease.

A clinical experience gave impetus to our present study. A woman with a pustular eruption of the face, of several years' duration, consulted one of us. The eruption resembled an iodide acne, but there was no history of iodide ingestion, although it was suspected that iodoform gauze might have been used in the treatment of a recently abscessed tooth. The patient asserted that her teeth were examined every three months by a competent dentist. She made no improvement under local treatment but returned a few months later completely cured after a visit to the Mayo Clinic at Rochester, Minn., and attributed her cure to the draining of a maxillary empyema caused by an infected tooth.

The recovery of this patient was so dramatic that we decided to study the question of focal infection in rosacea further and have since investigated fifty cases. Patients with rosacea applying for treatment at the Vanderbilt Clinic have been studied in cooperation with the School of Dental and Oral Surgery and the Nose and Throat Department for possible focal infections. Examination of the gastro-intestinal and genito-urinary tracts was made in all cases in which the history indi-

cated the possibility of focal infection in these organs. Most patients were tested with toxins or vaccines of bacteria commonly found in infected teeth and sinuses.

The majority of these patients had previously received the usual forms of treatment for rosacea without appreciable improvement, and our efforts were concerned chiefly with the detection and removal of focal infections. The results in this regard are summarized in table 1. The group studied had had rosacea for an average of four years. The proportion of females to males was four to one. The greatest number of cases belonged to the age group of 30 to 40 years. It surprised us that the next largest number belonged to the group between 20 and 30.

FOCAL INFECTIONS

The infections most frequently found were dental (twenty-nine cases). Dr. Daniel E. Ziskin,¹ who made many of the dental examinations, considered as possible foci of infection not only frank periapical abscesses but also advanced periodontoclasia (pyorrhea), pulpless teeth with or without roentgen evidence of periapical infection, and caries with pulp involvement. Five cases of simple caries were included because the recent investigations of Boedecker² on the permeability of the teeth to dyes indicated that toxic material may be absorbed from such lesions. Clinical inspection of the teeth and roentgen examination were supplemented by vitality tests with the galvanic current.

The next largest number of focal infections was found in the paranasal sinuses, of which the maxillary was most frequently involved. The third most frequent type of infection was chronic tonsillitis. In addition, otitis media, cervical adenitis, chronic appendicitis and deep-seated cutaneous infections were considered as possible foci. Eighteen patients suffered from chronic constipation, and Billings³ believed that in such cases the intestine might act as a focus.

Since these cases were tabulated one of us has observed a patient with endometritis whose rosacea has cleared up following curettage.

OTHER ETIOLOGIC FACTORS

Other evidence of pyogenic infection was obtained from the histories. In one case the rosacea began after a puerperal sepsis. Two patients stated that their eruptions began soon after severe attacks of influenza. Seven patients gave a history of tonsillectomy and six of appendectomy in recent years. Two patients had arthritis.

In seven cases, the onset was preceded by some disease of the genital tract necessitating operative intervention such as hysterectomy, ovariectomy, salpingectomy or the removal of fibroid tumors. The last histories could be considered to support the theory of causation either by focal infection or by endocrine disturbance. It was interesting that four of our fifty patients had had thyroidectomies. Twelve patients reported the habitual intake of drugs of which phenolphthalein was the most frequent. Phenobarbital, acetylsalicylic acid and bromides were also reported.

Demodex folliculorum was found in a large number of our cases although not in all. The technic used was that advised by Ayres and Anderson.⁴ The fact that

From the Department of Dermatology, Vanderbilt Clinic, Columbia University College of Physicians and Surgeons.

Read before the Section on Dermatology and Syphilology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.

1 Ziskin, D. E. Personal communication to the authors.
2 Boedecker, C. F. *Metabolic Disturbances in Relation to Teeth*. Bull. New York Acad. Med. 10: 553 (Sept.) 1934.
3 Billings, Frank. *Focal Infection*. New York: D. Appleton Company, 1916.
4 Ayres, Samuel, Jr., and Anderson, N. P. *Demodex Folliculorum Its Role in the Etiology of Acne Rosacea*. Arch. Dermat. & Syph. 25: 89 (Jan.) 1932.

this parasite is found in many other dermatoses made us doubtful as to its pathogenic significance. It must be admitted that in some of our elderly patients whose foci of infections could not be removed the rosacea improved greatly under the use of an ointment⁵. We did not, however, feel certain that this improvement was due to antiparasitic action.

SENSITIZATION TESTS

In twenty-seven cases intradermal skin tests were made with staphylococcus toxin prepared by the method of Parker⁶ and streptococcus toxin prepared by the method of Wadsworth⁷ (table 2). These toxins were used in dilutions (1:10 to 1:50 for the staphylococcus toxin and 1:400 for the streptococcus toxin) which had been found to give few positive reactions in the Allergy Clinic. Of this group, seventeen gave an immediate and thirteen a delayed reaction to the staphylococcus toxin, five an immediate and seven a delayed reaction to streptococcus toxin. Thirteen cases were also tested with a colon bacillus vaccine prepared for us by Dr R. Lyons⁸ from a hemolytic strain of colon bacillus. It consisted of 1:1,000 suspension of sedimented bacteria killed by heating to 60°C for one-half hour. Previous tests with this vaccine on a number of patients by one of us (E. A. L.) had shown very few positive reactions. Of thirteen cases two showed immediate and nine delayed reactions. A number of patients also reported a flare up of their eruption (focal reaction) after the intradermal tests.

TABLE 1—Focal Infections

| | Cases | |
|---|-------|----------|
| Number of cases: | | |
| Male | 60 | |
| Female | 9 | |
| Average duration | 4 | years |
| Dental infections | 20 | |
| Accessory sinuses | 13 | |
| Tonsils | 12 | |
| Nose | 3 | |
| Otitis | 2 | |
| Cervical adenitis | 2 | |
| Chronic appendicitis | 1 | |
| Infected hemorrhoids | 1 | |
| Abscess of knee | 1 | |
| Carbuncle | 1 | |
| | Cases | Per Cent |
| Definite focal infections were found in | 43 | 86 |
| Focal infections not found in | 7 | 14 |
| Several patients had multiple foci | | |
| Results after removal of focal infections | | |
| Cleared up | 14 | 28 |
| Greatly improved | 13 | 26 |
| Improved | 12 | 24 |
| Unimproved | 1 | 2 |
| Unknown (patients could not be followed up) | 10 | |

Stool examination of several patients showing a positive reaction to *Bacillus coli* showed the presence of hemolytic strains in the intestine.

RESULTS FROM THE REMOVAL OF FOCAL INFECTIONS

We have considered as cured cases in which the skin returned to normal except for the presence of telangiectases and scars and which remained clear during our period of observation, which varied from one to three years as greatly improved cases which showed no papules or pustules but some erythema and as improved cases in which papules and pustules of diminished

number and severity continued to develop. It is probable that the results would have been better were it not for the refusal of some patients to undergo the various operations indicated, such as dental extraction and tonsillectomy. In some elderly patients the advisability of such an operation seemed questionable. It should also be borne in mind that, as Billings has emphasized, foci of infection are often multiple, that a patient may develop one primary and then a number of secondary foci, and that only the successful removal

TABLE 2—Sensitization Tests

| | Number of Cases | Immediate Reaction | Delayed Reaction | | |
|------------------------|-----------------|--------------------|------------------|----------|----------|
| Staphylococcus toxin | 27 | 17 | 13 | | |
| Streptococcus toxin | 27 | 5 | 7 | | |
| Colon bacillus vaccine | 13 | 2 | 9 | | |
| Age of Patients | | | | | |
| 10 to 20 | 20 to 30 | 30 to 40 | 40 to 50 | 50 to 60 | 60 to 70 |
| 1 | 9 | 22 | 8 | 6 | 4 |

of all foci can insure the patient against reaction from the bacteria concerned. It should be stated that it was necessary to give some patients mild local treatments or ultraviolet radiation in order to keep them under observation. The majority had, however, had similar treatments before without appreciable improvement, and we do not think that the use of these accessory measures invalidates our conclusions as to the effectiveness of the removal of the foci of infection.

COMMENT

The etiology of rosacea is probably complex. One observes three types of erythema—in early cases a bright redness of the cheeks and nose which makes the skin hot and is undoubtedly due to active congestion with increased velocity of circulation. This hot redness comes on in attacks of varied duration. Later one sees a dusky bluish redness with a cold skin. This is probably due to passive congestion and a diminished velocity of the blood flow. This cold redness is more chronic and often accompanied by thickening of the skin and visible dilatation of superficial venules. It is the condition called by the French, "couperose," and seems to be the essential symptom of rosacea. The disease may stop here. Later one may see a third type of erythema consisting of transitory red blotches, which are hot, indicating active congestion and which frequently occur alone or associated with papules and pustules. The capillary bed of the cheeks reacts more violently than that of other areas of skin to various physiologic stimuli. These areas also seem especially susceptible to injuries which lead to paralysis or weakening of the walls of the small vessels.

It cannot be accidental that this disease as well as lupus erythematosus, lupus vulgaris, syphilis, leprosy and certain drug eruptions so frequently localizes in the so-called flush areas of the face, that is, the central portions of the cheeks and the lower portion of the nose. The coldness of the skin in chronic rosacea indicates that the capillary circulation is sluggish. The visible superficial venules undoubtedly represent places of slowed circulation, and Thibierge⁹ and others have described dilation and even sacculatation of the venules of the deep corium. It seems possible that this slowed circulation offers a mechanical explanation of the susceptibility of such areas to injury by bacteria or toxins.

⁵ A sulfur ointment with an alkaline reaction containing sulfur potassium hydroxide petrolatum hydrous wool fat zinc sulfate and water.

⁶ Parker J. T. J. *Exper. Med.* 40: 61 (Dec.) 1924.
⁷ Wadsworth A. B. Standard Method of the Division of Laboratories and Research of the New York State Department of Health 1927.

⁸ Lyons R. Personal communication to the authors.

⁹ Thibierge G. *La pratique dermatologique*, vol. 1. Acne rosée p. 228.

gaining access to the blood stream. This situation seems similar to the condition observed in other areas which leads erythema induratum to localize on the lower legs and chilblain lupus to localize on the nose and fingers.

The hypotheses suggested as the cause of rosacea are too numerous for us to attempt to discuss here. Emphasis has been laid by most writers on gastrointestinal disturbances, endocrine disturbances and so forth. Wile,¹⁰ Stokes,¹¹ Andrews¹² and others mention focal infection as a causative factor, but the importance of such infections has not been stressed. Linser¹³ considers rosacea an allergic reaction of elderly persons toward the commonly found pyogenic bacteria; he found a more pronounced reaction in the areas of rosacea than on the normal skin areas of the arm to staphylococcus vaccines (freshly prepared, concentrated, centrifuged and killed cultures) and believed that he was able to desensitize his cases. We believe that the fact that so many of our cases cleared up or improved after the removal of the foci of infection indicates that rosacea, or at least the pustular lesions of rosacea, could be interpreted as bacterids. We use this word as analogous to other "ids" to denote lesions due to access of bacteria or to their toxins to sensitized areas of skin which are caused not by the invasive growth of the bacteria but by an allergic reaction to them.

The detection of such bacteria in the blood stream would be difficult, because they probably invade infrequently and in small numbers. Micro-organisms do not long survive in the "ids" that they produce. We cannot prove that the bacteria fail to proliferate in the pustular lesions of rosacea, because such lesions are apt to be secondarily infected with staphylococci or streptococci from the skin surface. The evidence of cutaneous allergy to these bacteria obtained by our skin tests supports this point of view. We were particularly interested in the reactions to the colon bacillus, which suggest that the intestine may act as a focus of infection in some cases. The lesions would seem analogous to the rosacea-like tuberculid of Levandowsky, which is presumably caused by invasion of sensitized areas by the tubercle bacillus. It also seems analogous to the pustular bacterids of the hands and feet described by Andrews.¹⁴

The third type of erythema, the blotchy, active hyperemia, would seem to be caused by bacterial sensitization. Whether the other erythemas are due to focal infection seems more doubtful. There is much to suggest that endocrine or other factors affecting the neurovascular mechanism in this area may play a role. It was striking, however, that in a number of our patients not only the pustulation but the diffuse chronic erythema disappeared after the removal of the foci of infection. The deep acne of the chin, according to Brocq,¹⁵ who devotes a whole chapter to this form of acne, is mostly found in women at the age of 25 to 45 and belongs, in our opinion, to rosacea. These women have

endometritis, disturbances of the ovaries, tubes, menstrual disorders, and congestive flushes from the uterus and are very recalcitrant to treatment. The skin is bluish and cold, and very few if any comedones are present. The patients are not in the acne age nor have they acne lesions in the usual locations. Several such cases were observed only recently by one of us which cleared up after removal of the foci of infection.

SUMMARY

1 Fifty cases of rosacea were studied from the standpoint of focal infections.

2 In 86 per cent various focal infections were found.

3 Removal of these foci resulted in fourteen cures, thirteen greatly improved, twelve improved, and one unimproved, ten were not observed for a sufficient length of time. It goes without saying that for many reasons not all foci could be removed.

4 The close relationship between foci of infection and bacterids is apparent.

952 Fifth Avenue—162 East Eightieth Street—111 East Seventy-Fifth Street.

ABSTRACT OF DISCUSSION

DR SAMUEL AYRES JR, Los Angeles. For the past five or six years I have been studying the problem of rosacea and I have been conscious of the importance of focal infection in the etiology of certain skin disorders. I have not, however, associated these two ideas. Most of the older textbooks stress the importance of gastro-intestinal disturbances, hypochlorhydria, alcohol indulgence, and so on. More recently three other etiologic factors have been emphasized. Dr Anderson and I called attention to the probable causal relationship of *Demodex folliculorum*. Stokes and Beerman considered psychic factors of great importance and pointed out that they frequently led to secondary functional disturbances, which in turn produced rosacea. And now our attention is called to the possibility that the lesions of rosacea may represent bacterids. All three theories are probably correct as applied to certain types of cases. A fourth type of erythema in our experience has been the commonest and is the type usually associated with *Demodex* infestation. This type of erythema is usually the earliest manifestation and persists relatively unchanged throughout the course of the disease except for occasional exacerbations or sometimes a gradual increase in intensity. It may be diffuse or somewhat blotchy and is most pronounced on the central portion of the face, including the medial aspects of the cheeks, lower half of the nose and middle of the forehead. One or more of these areas may be involved. The skin is usually dry and nearly always characterized by minute dry follicular plugs or scales. This appearance is so characteristic that we have given it the name pityriasis folliculorum (*Demodex*) when the pustular element is lacking. In addition to the redness and insignificant scaling there usually are a few scattered extremely tiny superficial vesicopustules. Some cases show severe papulopustular elements. One patient, whose condition had resisted all manner of treatment, was completely cured by an antiparasitic ointment. However, the most characteristic features of this fourth type of erythema are the dryness, the follicular scaling and the minute vesicopustules. In many cases the entire picture is inconspicuous. The patient is usually a woman who complains that her face is so dry that she can't use soap. In our experience *Demodex* can be found readily in large numbers in the majority of cases of rosacea by simply picking off a few follicular scales or taking a droplet of pus from several of the superficial vesicopustules and examining them under the low power of the microscope after adding a drop of 40 per cent solution of potassium hydroxide. In contrast, we have found *Demodex* only rarely in superficial or deep pustules in many cases of acne vulgaris or sycosis vulgaris, which we consider an adequate control. Furthermore, under the local application of a strong antiparasitic ointment such as the one mentioned by the authors,³

10 Wile, Udo. Cutaneous Manifestations of Systemic Diseases. Bull New York Acad Med 8: 289 (May) 1932.

11 Stokes, J. H. and Beerman, Herman. Effect on the Skin of Emotional and Nervous States. IV. The Rosacea Complex. A Reappraisal with Special Reference to the Constitutional Background and the Rationale of Treatment, Arch Dermat & Syph 26: 478 (Sept) 1932.

12 Andrews, G. C. Dermatology. Philadelphia: W. B. Saunders Company.

13 Linser, P. Rosacea. Etiology and Treatment. Med Klin 30: 357 (March 16) 1934.

14 Andrews, G. C., Birkman, W. F., and Kelly, R. J. Recalcitrant Pustular Eruptions of the Palms and Soles. Arch Dermat & Syph 29: 548 (April) 1934.

15 Brocq, L. Cliniques dermatologiques. Paris: Masson & Cie 1927.

there is rapid clinical improvement, often as much as from 80 to 90 per cent within one or two weeks, accompanied by a progressive decrease in the number of *Demodex* organisms that can be found

DR. MYER SOLIS-COHEN, Philadelphia In acne rosacea and acne vulgaris I take cultures of the nares, nasopharynx and tonsils or tonsillar fossae, and sometimes the urine and feces, in addition to the pustule. Many physicians fail to realize that the removal of infected tissue does not necessarily remove the focus of infection, because infecting bacteria may remain behind on adjacent tissues. Instead of the bacterial origin having failed as the authors say, may it not be that every possible focus has not been examined and that a focus has been regarded as removed when the infecting bacteria have been still present? As bearing on the question as to whether the cause is a germ or a bacterid, I find the same organism in the pustule and in the nares, throat or infected tooth. I regard the skin lesions as secondary and believe that the primary focus is commonly in the upper respiratory tract and the mouth. Gastro-intestinal and urinary infections I look on also as secondary. In many instances I feel that a tooth infection is secondary, a devitalized tooth being a place of lessened resistance, which becomes infected secondarily by organisms from the nose and throat. Experiments I made several years ago showed a lack of correspondence between bacteria that were infecting the patient and those producing a reaction when injected intracutaneously. An acne or other secondary lesion is seldom cured merely by the removal of infected tissue or the drainage of an infected cavity at the primary focus. As a rule it is necessary in addition to raise the patient's resistance to the infecting organism by means of a potent vaccine that contains this infecting germ and its soluble exotoxin. In chronic and focal infections, however, the organism that appears or predominates in a culture is not always of etiologic significance. I employ the pathogen-selective culture in which the inoculum is planted simultaneously in a rich culture medium and in the patient's whole, coagulable blood. Organisms killed by the patient's blood are regarded as having no causal relationship to the infection, while those that survive in it are believed to be important etiologically. Remarkable and rapid cures of long standing cases have followed this method of treatment.

DR. E. S. LAIN, Oklahoma City Treatment is not the central theme for this discussion, however, it is closely related to it. Several years ago when it seemed to have become generally accepted that focal infection was a cause of lupus erythematosus, and after having previously noted for quite a period of time the close relationship between lupus erythematosus rosacea, remembering also that many cases of rosacea in certain patients seemed sometimes to resemble tuberculid, I thought of trying gold in the treatment of rosacea. I have found that in a series of some fifteen or twenty cases the treatment of certain types of rosacea with intravenous gold is almost if not entirely as satisfactory as in the case of lupus erythematosus though without clearing the focal infection. Of course, it is also subject to the same relapses. In our clinic, gold in rosacea has now become almost a routine treatment instead of roentgen therapy, though our number of cases is small compared to that of others.

DR. JOHN H. STOKES, Philadelphia It is easy to say the cause. I wonder whether something might not be gained by dermatologists forming a habit of speaking of the predisposing and the exciting causes. Focal infection is undoubtedly an element. So equally without doubt on the California coast is *Demodex* and so equally perhaps is the deficiency of hydrochloric acid in the peculiar intestinal flora which these patients develop. If one will concede the process to be a complex one, peace can be brought into these warring camps, and it is much easier to understand why one fails in an acne with this, why another fails in a rosacea with that and why he also succeeds with something else. If he speaks of the rosacea background which is the vascular element in the situation, and analyzes it into four or five constituents he can then readily concede that a focal infection is perhaps the thing that pulls the trigger on the predisposing causes in a particular case. In the end this kind of multiple factorial analysis of a great many complex causal pictures in dermatology will bring a very much better

understanding of the situation. It is difficult and extremely unwise to speak of sole causes in many dermatoses.

DR. HERMANN FEIT, New York As Dr. Ayres brought out in his group of patients who live in California and belong to the better class of people, he finds a great many cases of *Demodex folliculorum*. It is interesting that a parasite of this kind is able to produce one of the erythemas. Dr. Solis-Cohen partly agrees with our observations as to the removal of focal infection to remove the symptom complex. Dr. Lain stated that he treats his cases of lupus erythematosus in the same way that he treats the cases of rosacea. As I tried to show in our diagram, it cannot be accidental that this butterfly pattern of the face is found in so many diseases, but I cannot agree with him that one should use the gold preparation, which has many dangers. It is not justified, in my opinion. I have seen quite a few accidents from gold. It is not indicated unless one is dealing with a tuberculous lesion. I don't know whom Dr. Stokes referred to when he said the cause of rosacea. If I said that focal infection is the cause of rosacea, I tried to explain that these bacterids come on only after the two first erythemas have developed. I think that I said purposely that in most cases the disease stopped at the second erythema, the congestive erythema, of which I showed the picture. Naturally, up to this point focal infection has absolutely nothing to do with the disease, and all the other factors that are so well known are the causes of this peculiar mechanism, but after this is established and the patient has a focal infection we believe that when it comes into the circulation it causes these papular and pustular eruptions.

TRAUMATIC SEGMENTARY ARTERIAL SPASM

ALBERT H. MONTGOMERY, M.D.

AND

JAY IRELAND, M.D.
CHICAGO

Every surgeon knows the serious consequences that may follow traumatic injuries that interfere with the necessary blood supply to any part of the body, especially the extremities. When the vascular obstruction is the result of something that was done in the course of a surgical operation or manipulation, the condition assumes a tragic aspect not only for the patient but also for the surgeon. Particularly in work on the extremities the surgeon is kept constantly on the alert in regard to the blood supply by visions of possible gangrene, amputation, ischemic palsy and malpractice suits. However, despite our knowledge and vigilance, accidents to a vital blood supply may occur and it is possibly safe to say that most surgeons of experience have encountered an alarming situation of this kind. Vascular trouble may arise from a number of very common agents, such as tourniquets, constricting splints, too tight suturing, the injection of anesthetic or sclerosing substances, or subfascial hematomas.

In our work at the Children's Memorial Hospital we have been confronted with two cases of arterial obstruction following operative procedures on the arm. The threatening clinical picture presented in these two cases and the fact that they did not seem to result from any recognized causative factor has prompted us to describe our observations in detail.

CASE 1—A boy aged 9 years, of Polish descent, entered the Children's Memorial Hospital Sept. 30, 1930, with a history of having fallen down stairs about four weeks previously, injuring his right elbow. Following the accident the child complained

Read before the Chicago Surgical Society, May 3, 1935.
From the Surgical Service of the Children's Memorial Hospital and the Department of Surgery of Rush Medical College of the University of Chicago.

of pain in the arm and the mother noticed that the elbow was swollen and discolored. No treatment had been administered except that his mother had applied alcohol and hot water bottles to his elbow. There was no history of any previous illness to be obtained and his family history was unimportant.

The physical examination was negative except for the right arm. The right elbow, which was larger than normal, was held in an extended position and could not be flexed. The condyles were displaced medially and posteriorly.

Roentgenograms showed a comminuted fracture through the condyles of the humerus, with posterior and median displacement of the fragments and callus formation. There was also a median dislocation of the radius and ulna.

An open operation under ether anesthesia was performed October 4, thirty-four days after the injury and the bone fragments were aligned and the dislocation of the radius and ulna was reduced. There was some difficulty in manipulating the bones into line, necessitating a definite amount of trauma to the soft tissues during the operation. The elbow was dressed in flexion at 90 degrees with a posterior molded splint. One hour after operation it was noticed that the forearm, hand and fingers of the injured arm were dead white and that no pulse was palpable in the radial and ulnar arteries. The dressings were immediately opened and the arm extended but no improvement in the circulation followed. Then in the fear that the wound had been sutured too tightly or that a ligature or suture had been inadvertently placed about the brachial artery the child was again anesthetized and the wound reopened. When the arteries were exposed it was evident that there was no visible or palpable pulsation in the brachial, radial or ulnar arteries and all three vessels appeared to be smaller than normal with no macroscopic evidence of injury. There was no indication of a thrombus formation and no ligature or suture was around any of the arteries. The wound was left open and warm moist dressings were applied with the arm elevated.

One hour later the ulnar pulse was palpable at the wrist and the color of the hand had returned to normal. The radial pulse did not return to normal until two days later. The wound was resutured five days after the second operation. No vascular disturbance followed and the healing was uneventful. When last seen, four years after the injury, there was no sign of circulatory trouble in the arm.

CASE 2—A Polish boy, aged 5 years, entered the Children's Memorial Hospital April 28, 1934, complaining of an injury to his left elbow, sustained in a fall one hour before coming to the clinic. He had never had any serious injury before and the personal and family history was essentially unimportant.

The physical examination was negative except for the left arm, which showed a fusiform discolored swelling of the left elbow with a lateral angulation of the arm below the site of injury and marked tenderness over both condyles of the humerus. The condition of the forearm and hand was very striking. The skin everywhere distal to the elbow was dead white and distinctly colder than that of the opposite hand and forearm. No pulsation could be palpated in the radial or ulnar arteries of the injured arm.

Roentgenograms of the left elbow showed a supracondylar comminuted fracture of the humerus with marked lateral displacement of the lower fragments, and a posterior dislocation of the radius and ulna.

Four and one-half hours after the injury an attempt was made under nitrous oxide anesthesia to reduce the fracture dislocation. The manipulation apparently had no effect on the circulation of the forearm, for its appearance remained unchanged with no sign of any pulsation in the radial and ulnar vessels. The condition seemed to demand immediate relief, so the anesthetic was continued and the fractured area was exposed by an open operation. A large hematoma was removed from the antecubital region, but the distal circulation remained unchanged. Pulsations were seen and felt in the brachial artery down to within an inch of its bifurcation but not distal to this region, and no pulsations were present in the exposed radial and ulnar arteries. The pulsation ceased at a definite localized place as though the blood were striking against a solid structure. All three arteries appeared smaller than normal. There was no visible contusion or any laceration of the arteries, and no thrombus could be felt.

The arteries were not incised, but the wound was left wide open and warm moist dressings were applied with the arm elevated. On the following day the radial and ulnar pulses were still absent, but the hand was warm, the nails were not completely blanched, and after pressure on the skin there was some visible return circulation.

Three days after operation a weak but inconstant radial pulse was palpable for the first time since the injury. It improved very gradually, so that thirty days following the accident it was similar to and remained like that of the normal right arm.

May 9, eleven days after the first operation, the wound was sutured and a posterior molded cast was applied. The wound healed kindly and on June 20, fifty-three days after the injury, the fracture and dislocation were reduced by open operation with no circulatory disturbance.

We have presented here two cases of occlusion of the brachial artery, one immediately following a simple supracondylar fracture of the humerus and the other after an open operation to reduce a similar fracture. The absence of any pulsation was demonstrated by operative exposure of the vessels, but no evident cause for the condition could be found.

Our rather trying experience with these two cases which presented a condition with which we were unfamiliar led us to look up the literature on this subject. All the references were by continental European surgeons and by Farani,¹ a Brazilian. The earliest report we found was by Kroh² in 1915. He described two cases of traumatic arrest of the blood flow in the large arteries of the extremities following war wounds. On operative exposure of the vessels they appeared normal except that they were contracted in size. After massage in one case the circulation became reestablished. In the second case the femoral artery was seen to be contracted to the size of a knitting needle. To the author's surprise he noticed while the artery was exposed that it dilated to its normal size. In 1917 Kroh reported a third case involving the brachial artery. During operation the vessel was seen to be collapsed, but it dilated to its normal caliber after massage. In 1920 von Kuttner and Baruch³ collected fifteen case reports and added eight cases of their own. We have found reports of seventeen cases published since that time. The addition of the two cases that we have described brings the total of reported cases to forty-four up to date. In many instances the reports were fragmentary and incomplete, so that deductions are rather difficult to make.

This vascular disturbance has been designated by various authors as "arterial stupor," "arterial contusion" and "traumatic segmentary inhibition of arteries." We have chosen to use the term traumatic arterial segmentary spasm, as it seems to be the most descriptive of this condition in which no pathologic changes are demonstrable in the affected vessels. Lexer⁴ has stated that of all the vessel coats the intima is the most susceptible to trauma. However, it does not seem probable that the intima of the arteries in our cases could have been loosened enough to obliterate the lumen and yet allow the pulse to reappear after such a short period of time. Moreover, in the cases in which the affected segment of the artery was excised for treatment, the intima as well as the other vessel coats was found to be unchanged.

1 Farani A. Do espasmo vascular em cirurgia de urgencia. Brazil med. 41: 1364-1365 (Dec. 24) 1927.

2 Kroh Fritz. Erfahrungen einer Sanitätskompanie. Beitr. z. Klin. Chir. 97: 344-396 (No. 4. Kriegschir. 2. No. 8) 1915. Frische Schussverletzungen des Gefäßapparates, ibid. 108: 61-75 1917.

3 von Kuttner H. and Baruch M. Der Traumatiscbe segmentäre Gefäßkrampf. Beitr. z. Klin. Chir. 120: 24 1920.

4 Lexer E. General Surgery. American Edition. New York and London D. Appleton & Co. 1910. pp. 549-550.

The vascular obstruction seems to be confined for the most part to the large arteries of the extremities. In this group of cases the femoral artery was affected in sixteen instances, the brachial artery in thirteen, the radial, popliteal and posterior tibial arteries three times each, the axillary twice, and the external iliac and the carotid once each. The causative factor in every case was some definite trauma. In twenty-six instances, many of them war casualties, the condition was ascribed to gunshot or high explosive injuries. Fractures involving the femur, radius or humerus were reported in ten cases. Among the other causes mentioned were a kick by a horse, a fall, vehicle injuries, airplane propeller contusion and operative wound trauma. It is noticeable that the gunshot injuries and fractures are blamed for thirty-six of the forty-four cases in this series.

The manner in which these traumatic agents produced such striking vascular changes has been a matter for discussion. Thrombosis must be considered, but in no case was a thrombus palpable and in those cases in which the artery was opened no thrombus was found. It does not seem probable that a thrombus would be removed or become canalized so rapidly that the circulation would return as soon as it did in these cases. Blood clots pressing on the artery were found in some cases, but their removal did not relieve the obstruction in any instance, and in the fracture cases there was no evidence of pressure of bone fragments on the arteries. From the absence of any pathologic change involving the artery and the complete return of circulatory function after a brief period, it would seem that the condition is one of arterial spasm probably on a basis of nerve disturbance, very likely a sympathetic nerve imbalance causing a spasmodic constriction of the artery. This theory is favored by Kroh, Reichle⁵ and Finally.⁶

That such a condition as vascular spasm exists is quite generally admitted. Makins⁷ noticed that in a certain proportion of wounds in close proximity to large vessels a diminution of the normal caliber of the arteries was present shortly after the injury. Leriche⁸ stated that oscillometric tests proved every traumatism in man to be a traumatism to vasomotoricity, furthermore, that always after a shock or a blow, though there is no wound or fracture, the peripheral nerve endings are excited and by reflex action, will immediately disturb the equilibrium of the vasomotor system for a shorter or longer period of time. Leriche and Heitz⁹ regarded an obliterated main vessel as a "nerve" the fibrous cord of which represents the segment of the vasomotor chain, since it contains the remnants of the perivascular sympathetic. Moreover he thinks that the "nerve" is abnormal and has functions which are distorted.

5 Reichle Rudolph. Zur Frage des traumatisch segmentären Gefäßkrampf, Beitr z klin Chir 124: 650-654 1921

6 Finally Rudolph. Acute gangrenöse Folgefolge von traumatischen Vaskularkrampf, Nederl tijdschr v geneesk 70: 1038-1044 1926. Akute Gangran infolge traumatischen Gefäßkrampf ref Zentralbl f d ges Chir 35: 106 1926

7 Makins G H. Surgical Experiences in South Africa (1899-1900), ed 2 London Oxford University Press 1913, pp 148. Gunshot injuries of the Arteries Brit M J 2: 1569-1577 1913. On the Vascular Lesions Produced by Gunshot Injuries and Their Results Brit J Surg 3: 353-421, 1916. Cerebral Embolism Consequent on the Reception of Gunshot Injury to the Carotid Arteries Lancet 2: 543-546 (Sept. 23) 1916. Gunshot Injuries to the Blood Vessels New York William Wood & Co 1919. 1251 1919, Lancet 1: 30 1920. Specimens Showing the Effects of Gunshot Injury on the Heart and Blood Vessels Brit J Surg 3: 107-132 (July) 1920

8 Leriche R. Problem of Osteo-Articular Diseases of Vasomotor Origin. Hydrarthrosis and Traumatic Arthritis. Genesis and Treatment J Bone & Joint Surg 10: 492-500 (July) 1928, De l'importance en pathologie et en thérapeutique des réaction vaso-motrices post-traumatiques Médecine D 341-342 (Feb) 1928

9 Leriche R., and Heitz J. Résultats de la sympathectomie péri-artérielle dans le traitement des troubles nerveux post-traumatiques d'ordre réflexe Kyon chir 14: 754-792 (July Aug) 1917

Makins,⁷ in discussing thrombosis, stated that the vessel may be narrowed both above and below the thrombosed spot and added that this was a condition usually seen when the normal arterial circulation is arrested either by a thrombus or by a large wound involving the lumen. Although he did not state that this is due to a nervous influence, it does indicate that some mechanism can affect a vessel causing it to be constricted enough to be visible to the naked eye.

Coller and Maddock¹⁰ classify Raynaud's disease as a type of arterial spasm and state that pure spasm may be associated with other conditions such as anterior poliomyelitis. Morton and Scott¹¹ reported four cases of angiospasm following trauma in which painful spastic attacks were produced by exposure to cold, as in a case of Raynaud's disease, and Kerr noticed that during an attack of Raynaud's disease the radial pulse could not be felt in his patients. Lewis and Kerr,¹² in discussing this disease, stated that the vasodilatation is held in check or prevented by a simultaneous tendency to vasoconstriction. In the cases comprised in this report only the large arteries were involved, whereas according to Royle¹³ in Raynaud's disease the small arteries and arterioles are the vessels that are affected.

Besides the evidence that sympathetic nerve involvement may cause arterial contraction there is also some evidence that somatic nerve involvement causes vascular changes. Bardenheuer¹⁴ stated, in relation to fracture, that injury to the nerves often results in circulatory disturbance. Stapford¹⁵ reported histologic changes found in the arteries of a limb in which the popliteal nerves were injured without damaging the popliteal vessels. Microscopic examination showed an endarteritis in the walls of the dorsalis pedis artery.

Also, some evidence has been produced to show that not all vascular changes are under nervous control. Kerr stated that local areas of blanching may appear in a skin that has been deprived of all nerve supply. This suggests a chemical factor that may control the size of the vessel, as hypothesized by von Kuttner and Baruch. Recently Snithwick, Freeman and White¹⁶ showed that epinephrine caused marked vasospasm in man following complete sympathetic denervation of the extremities, and Odermatt¹⁷ injected epinephrine perivascularly and was able to produce arterial spasm.

Von Kuttner and Baruch, Winterstein¹⁸ and Laqua¹⁹ favor the myogenic or arterial musculature contractio basis as the causative factor.

10 Coller F A. and Maddock W G. The Function of Peripheral Vasoconstriction. Ann Surg 100: 983-992 (Nov) 1934

11 Morton J J. and Scott, W J M. The Measurement of Sympathetic Vasoconstrictor Activity in the Lower Extremities. J Clin Investigation 9: 235-246 1930. Studies on the Activity of the Lumbar Sympathetic Nervous System. Ann Surg 92: 919-930 (Nov) 1930. The Differentiation of Peripheral Arterial Spasm and Occlusion in Ambulatory Patients. J A M A 97: 1212-1215 (Oct 24) 1931. Some Angiospasm Syndromes in the Extremities, Ann Surg 94: 839 (Nov) 1931. Sympathetic Activity in Certain Diseases. Especially Those of the Peripheral Circulation Arch Int Med 48: 1065-1097 (Dec) 1931

12 Lewis, Thomas and Kerr W J. Experiments Relating to the Peripheral Mechanism Involved in Spasmodic Arrest of the Circulation in the Fingers. A Variety of Raynaud's Disease Heart 15: 17-16 (Aug) 1929. Kerr W J. Recent Experimental Studies on Raynaud Disease Tr A Am Physicians 48: 189-201 1930

13 Royle N D. The Surgical Treatment of Raynaud's Disease at Similar Conditions. M J Australia (supp 11) pp 341-343 (Nov) 1927

14 Bardenheuer Bernhard. Die permanente Extensionsbehandlung der subcutanen und complicierten Fracturen und Luxationen der Extremitäten und ihre Folgen Stuttgart F Enke 1889

15 Stapford J B. quoted by Makins

16 Smithwick R H. Freeman N E. and White J C. Effect of Epinephrine on the Sympathetomized Human Extremity Arch Surg 29: 758-767 (Nov) 1934

17 Odermatt quoted by Laqua¹⁹

18 Winterstein O. Ueber Gefäßverletzungen mit Beiträgen zu traumatischen segmentären Arterienkrämpfen und zur traumatischen Thrombose der Vena subclavia Schweiz med Wchnschr 56: 360-361 (April 23) 1925 (ref Zentralbl f Chir 52: 2487-2488 [Oct Dec 1925])

19 Laqua K. Der segmentäre Gefäßkrampf Beitr z klin Chir 137: 673-676 1926

Veau, Viannay, Lacoste and Ferrier²⁰ recognized three states of traumatic segmentary arterial spasm

1 The lowest state This is a vasoconstriction detectable only by the sphygmomanometer There is only a partial arrest of arterial circulation

2 State of confirmed stupor In this type there is complete arrest of circulation

3 Grave state This is characterized by a complete permanent arterial circulatory arrest with gangrene of the extremity from the very beginning

Probably similar states may occur elsewhere in the body This vascular disturbance may be somewhat analogous to the condition of local nerve shock following gunshot wounds in which there is a temporary loss of sensation and power in the injured limb A similar explanation may be given to the absence of hemorrhage in completely divided arteries lying exposed in an open wound Also, such a condition may be present in the occurrence of cerebral symptoms that immediately follow injury or ligation of the carotid arteries

The diagnosis of a case of arterial spasm following injury is very difficult without operative exposure of the artery, as was done in our cases However, such diagnoses have been made by Farani without previous experience and also by others after experience with a few cases One wonders whether some of the measures used in other vascular diseases might be of diagnostic value in traumatic segmentary arterial spasm Brown²¹ employed intravenous injection of a foreign protein typhoid vaccine, as a test for vascular spasm He showed that in spastic vascular disease of the arteries the injection of foreign protein causes the extremities to become decidedly warmer but that in obliterative disease the increase in temperature is none or very slight For a similar purpose Morton and Scott suggested the use of local, spinal and general anesthesia and they interpreted their results similarly to Brown's However, general anesthesia was employed in both our cases with no subsequent rise in temperature The Pascon oscillometer would be of diagnostic aid in the mild cases in which occlusion is not complete

Lexer stated that a positive diagnosis of complete rupture or closure by thrombus formation of the principal artery can be made if after injury the extremity becomes cool, pale or cyanotic and the pulse can no longer be felt Our cases showed these symptoms, yet no thrombus was present Thus arterial spasm can exhibit a clinical picture that would tend somewhat to disprove Lexer's statement

The time of disappearance of the spasm is fairly uniform In most of the cases the spasm had disappeared in twenty-four hours In a case of Soubeyran and Michon²² the spasm was present to some extent for more than a year In our cases the radial pulse returned in one hour in one instance and not until the third day in the other, although signs of improved circulation were evident after twenty-four hours

The outlook in cases of arterial spasm is good so far as life is concerned, as there was only one death in this series that was attributable to the vascular condition

In that case the artery was exposed and massaged When this failed, a segment of the artery was excised and death ensued One other death occurred in this series but it was undoubtedly due to shock, as the pulse in the femoral artery returned to normal after hot serum irrigations The foot became warm and the posterior tibial pulse was palpable

Amputation of the limb was performed on six of the forty-four patients because of gangrene Four patients had sustained gunshot wounds that caused infection and arterial spasm A similar condition occurred in another case following a lacerated wound In the final case the gangrene was probably due to improper treatment. The arterial spasm complicated a simple fracture of the femur The femoral artery was exposed in three places Hemorrhage and gangrene followed, necessitating amputation

Concerning the treatment, there seems to be no doubt that the conservative measures should be tried first When the diagnosis of traumatic segmentary arterial spasm is most probable, it is suggested that if a recent fracture or dislocation is present it should be reduced or that if some other mechanical cause is found for the absent pulse it should be removed If this fails to bring about a return of the circulation, an open operation should be undertaken immediately and the artery exposed at the site of the trauma However, Farani and Reichle do not subscribe to this view Farani did not operate on any of his three patients and all recovered Reichle suggested that one might wait eighteen hours before operation is undertaken to see whether the circulation will return Most surgeons, however, will probably not have the diagnostic ability or the fortitude to employ this passive treatment but will feel that their patient and their own peace of mind will be served better by an open exposure of the artery If this shows an arterial spasm, the simple treatment that was used in a number of the cases in this series, including our own, would seem to be sufficient The wound is left open and continuous warm moist dressings are applied, with the arm kept at rest in elevation

Various surgeons have employed other methods Kroh massaged the artery in the open wound and the circulation returned to normal immediately Ducastaing²³ successfully irrigated the exposed artery with warm serum, but Soubeyran failed with this method. Von Kuttner and Baruch suggested the use of atropine but evidently did not employ it

Incision into the artery to search for the thrombus was considered in our second case but fortunately it was not done In opening into the artery one must always remember that suture may not be successful and that a thrombosis or vessel hemorrhage may occur and make vessel ligation mandatory After four cases of simple ligation of the brachial artery complicating fracture of the humerus, Makins had a resulting gangrene in three instances

For the more grave cases in which the arterial spasm does not yield to the simple methods, periarterial sympathectomy, ganglionectomy and concomitant vein ligation have been suggested Ligation of the artery or excision of the affected segment of the artery would seem to be contraindicated in the treatment of this acute condition but might be tried

Possibly one of the most promising methods of treating peripheral arterial occlusion is that recently

20 Veau, V. Viannay, C. Lacoste and Ferrier. *La stupeur artérielle*, Presse méd. Aug. 15 1918, pp. 425-426. Viannay, C. Lacoste and Ferrier. *La stupeur artérielle*, Bull. et mém. Soc. de Chir. de Paris (Rapport de M. V. Veau) 44: 1321-1329 (July 17) 1918. Viannay, C. *La stupeur artérielle*, ibid. 44: 1322-1323 (July 17) 1918. *La stupeur artérielle traumatique*, Presse méd. 27: 106-107 (Feb. 27) 1919.

21 Brown, G. E. *The Treatment of Peripheral Vascular Disturbances of the Extremities*, J. A. M. A. 67: 1212-1215 (Oct. 24) 1931.

22 Soubeyran and Michon. *Note sur un cas de contusion artérielle*, Bull. et mém. Soc. de Chir. de Paris 44: 805-808 (May 1) 1918. Soubeyran. *A propos de la stupeur artérielle*, Bull. et mém. Soc. de Chir. de Paris 45: 908-910 (June 4) 1919.

23 Ducastaing, R. *Note sur quatre cas de stupeur artérielle traumatique*, Bull. et mém. Soc. de Chir. de Paris 45: 604-611 (April 2) 1919.

employed by Reid²⁴ and his associates, who use intermittent increased and decreased air pressure by means of an air tight chamber applied to the extremity

Amputation should be performed only as a last resort when a definite gangrene is present. We mention this particularly because among the six cases in this series in which amputation was done there is one reported by von Kuttner and Baruch in which the limb was removed under the impression that the artery was thrombosed or severed but the vessel was found to be normal

We are aware that this subject of traumatic segmentary arterial spasm may be more familiar than the literature would indicate. The knowledge that we have gained in our two experiences will be a comforting reassurance to us in our future work

SUMMARY OF PREVIOUSLY REPORTED CASES

A brief summary of the previously reported cases is as follows

CASE 1 (reported by Kroh)—Sex and age unstated. Patient received a revolver wound of the right groin. The femoral artery was exposed at an open operation and a segment of the artery, 5 cm in length, was seen to be contracted to the size of a knitting needle. The exposed artery was watched for five minutes and then it dilated to its normal size. The saphenous vein had been shot across. Recovered.

CASE 2 (reported by Kroh)—Sex and age unstated. Patient was wounded in the femoral region by an infantry shot. The artery was not operated on but the leg was massaged and the femoral pulse was normal in twenty-four hours. Recovered.

CASE 3 (reported by Kroh)—Sex and age unstated. Injury was a gunshot wound in the humerus region. At an open operation the contracted artery was massaged and it dilated in the wound to normal size. Recovered.

CASE 4 (reported by Viannay)—Male, age unstated. Injured by an airplane propeller in the region of the brachial artery. At open operation 5 cm of the clavicle was resected and the sheath of the artery only was opened. Recovered.

CASE 5 (reported by Viannay²⁵)—Male, age unstated. Grenade injury. Axillary artery involved in spasm as seen in open operation. Artery was not disturbed. Recovered.

CASE 6 (reported by Viannay)—Sex and age unstated. Grenade wound in the axillary region. Open operation was performed on the arm but the axillary artery was not disturbed. Recovered.

CASE 7 (reported by Viannay)—Sex and age unstated. Grenade wound. Radial artery involved in spasticity. Open operation and segment of the artery excised. Recovered.

CASE 8 (reported by Viannay)—Male, age unstated. A bullet wound of the left femoral region. Treated by open operation and a segment of the artery was resected, after which the artery bled. Recovered.

CASE 9 (reported by Lacoste and Ferrier)—Boy, aged 14 years. Sustained a subtrochanteric fracture of the femur. Cause unstated. Leg was placed in an extension apparatus. Arteriotomy was performed in three places. Gangrene of the leg and amputation followed. Recovered.

CASE 10 (reported by Fiolle²⁶)—Man aged 22. Received a bullet wound in the femoral region. At open operation massage of the femoral artery failed to cause return of circulation. Segment of artery was excised. Died.

CASE 11 (reported by Soubeyran and Michon)—Man, aged 22. Infantry shot of the femoral region. Femoral artery involved. At operation only the artery was exposed. For a year following the patient suffered from a neuralgia.

CASE 12 (reported by Ducastaing)—Male, age unstated. Grenade wound of the thigh. The foot was cold, insensitive, and could not be moved. The patient was in shock. Ten

hours after injury, wound excision was performed in Scarpa's triangle. No pulse was present in the femoral artery, the sheath of which was opened. After hot serum irrigation the pulse was palpable. General condition did not improve and the patient died.

CASE 13 (reported by Ducastaing)—Male, age unstated. Received a grenade wound of the lower third of the upper arm with a fracture of the humerus. Radial pulse was absent. Operated on thirteen hours after injury. The vessel wall was intact. Foreign body removed. Artery irrigated with hot serum and almost instantly pulsation began. Recovered.

CASE 14 (reported by Ducastaing)—Male, age unstated. Received a grenade wound of the inner portion of the lower third of the thigh. Operation ten hours after injury. The popliteal artery was intact and not pulsating. After serum irrigation the pulse was present. Recovered.

CASE 15 (reported by Ducastaing)—Male, age unstated. Patient received a bullet wound of the inner side of the left upper arm. Tourniquet had been applied for six hours. Operated on eight hours after injury. Large hematoma present. No pulsation in the brachial artery but when the muscular branches of the artery were incised there was continuous bleeding. Artery was ligated with hot serum and pulsation returned. Recovered.

CASE 16 (reported by Maury and Daban²⁷)—Man, aged 33. Small grenade wound of posterior median side of lower part of the right upper arm. Humerus was fractured. At open operation the brachial artery pulsed and had a normal caliber in the upper wound but distally a segment 3 cm was filiform. In the contracted region the artery was hard. Artery not incised or disturbed. Recovered.

CASE 17 (reported by Soubeyran)—Male, age unstated. Had multiple grenade wounds of the extremities, but a wound of the right external malleolus was of special interest. At open operation a small projectile was found behind the achilles tendon and the posterior tibial artery was found contracted. Hot serum irrigation did not cause a return of circulation and 3 cm of artery was resected. No thrombus was present in the resected portion but two tiny openings were found in the artery wall. Recovered.

CASE 18 (reported by Abadie²⁷)—Details unstated.

CASE 19 (reported by Delbet²⁸)—Details unstated.

CASE 20 (reported by Tuffier²⁹)—Female, aged unstated. Spasm of the radial artery resulted from opening the artery for a transfusion. No special treatment employed. Recovered.

CASE 21 (reported by von Kuttner and Baruch)—Male, age unstated. Injured by a hand grenade. Had a marked hemorrhage and was in shock. Multiple injuries of the lower extremities and buttock. Operated on four hours after the injury under ether. Posterior tibial artery found contracted and 2.5 cm of the artery was resected. The resected portion was found to be normal and no thrombosis was present. Recovered.

CASE 22 (reported by von Kuttner and Baruch)—Male, age unstated. Grenade wound of the upper leg. The leg was livid in color but voluntary motion was present. Under ether anesthesia five hours after injury it was found that the femoral artery did not pulsate and was contracted a distance of 2.5 cm. Three hours after operation the pulse was normal but again disappeared, then appeared and disappeared again and finally became normal. Recovered.

CASE 23 (reported by von Kuttner and Baruch)—Male, age unstated. Grenade wound of the arm and numerous other places on the body. The brachial artery was spastic. The median nerve was lacerated. The artery was exposed but not operated on and the following day the pulse was normal. Recovered.

CASE 24 (reported by von Kuttner and Baruch)—Male, age unstated. Bullet wound of the left upper arm. Radial pulse

24 Hermann L. G. and Reid M. R. Passive Vascular Exercise. *Arch. Surg.* 29: 697-704 (Nov.) 1934. Reid, M. R. Diagnosis and Treatment of Peripheral Vascular Disease, *Am. J. Surg.* 24: 11-35 (April) 1934.
25 Fiolle J. L'inhibition segmentaire des arteres dans les plaies de guerre (Rapport de P. Duval) *Bull. et mem. Soc. de chir. de Paris* 44: 996-1002 (June 5) 1918.

26 Maury E. and Daban E. Un cas d'inhibition segmentaire traumatique de l'artere humerale. *Bull. et mem. Soc. de chir. de Paris* 45: 604-611 (April 2) 1919.

27 Abadie, quoted by von Kuttner and Baruch.
28 Delbet P. Un cas de segmentaire traumatique de l'artere humerale. *Bull. et mem. Soc. de chir. de Paris* 45: 609-610 (April 2) 1919.

29 Tuffier. Un cas de segmentaire traumatique de l'artere humerale. *Bull. et mem. Soc. de chir. de Paris* 45: 610 (April 2) 1919.

absent Open operation Brachial artery exposed but not operated on Recovered.

CASE 25 (reported by von Kuttner and Baruch)—Sex and age unstated Machine gun injury of the knee region. There were symptoms of arterial occlusion and the popliteal artery was thought to be in spasm The leg was not operated on but was conservatively treated by elevation and warm dressings Recovered

CASE 26 (reported by von Kuttner and Baruch)—Sex and age unstated Bullet wound of the upper leg Pulse absent in the dorsalis pedis and tibialis posterior Patient in shock. The leg was not operated on but was treated by elevation of the leg and a Volkmann's splint Recovered

CASE 27 (reported by von Kuttner and Baruch)—Male, age unstated Grenade wound of the right knee region Beginning gangrene after sixteen hours Popliteal artery was involved in spasm and an amputation was performed at the knee To his (Baruch's) great surprise, the artery, vein, and nerve were intact Final result unstated

CASE 28 (reported by von Kuttner and Baruch)—Male, age unstated Wounded by an infantry bullet in the region of the right sternocleidomastoideus Operated on six hours after injury and the carotid artery had a collar-like spastic area 3 cm long, the size of a goose quill Recovered

CASE 29 (reported by Reichle)—Young man Sustained a fractured femur in a railroad accident Right femoral artery exposed without further operative procedure Recovered

CASE 30 (reported by Reichle)—Male, age unstated. Had a gunshot wound which fractured the femur At operation a waistlike narrowing of the femoral artery was seen Gangrene of the leg and amputation followed Final result unstated.

CASE 31 (reported by Gallo and Calcagno³⁰)—Boy, aged 8 years Fell on left elbow, fracturing the humerus Operative exposure of the brachial artery Artery punctured with needle and serum injected into the artery Recovered

CASE 32 (reported by Winterstein)—Man, aged 54 Fell 3 meters Brachial artery spastic. Treated conservatively without operation Recovered

CASE 33 (reported by Winterstein)—Girl, aged 10 years Run over by an automobile. At open operation the femoral artery was incised and then sutured Recovered

CASE 34 (reported by Winterstein)—Man, aged 43 Was kicked by a horse Operative exposure of the external iliac artery showed it to be in segmentary spasm Artery not incised Treated by elevation of the leg Recovered

CASE 35 (reported by Frassi³¹)—Male, age unstated Grenade wound of the right popliteal region Lost all feeling from the knee down, soon after the injury Under ether anesthesia the popliteal artery was exposed and found to be in spasm On massage of the artery pulsation returned Gangrene of the leg followed, with amputation at the middle third of the thigh Recovered

CASE 36 (reported by Frassi)—Male, age unstated Injured by a bomb explosion causing multiple wounds of the face and ocular bulbs, fracture of the right radius and tibia, and articular lesion of the right knee. Radial pulse was absent At open operation the brachial artery was found to be spastic. Massage of the artery and irrigation with dilute solution of sodium hypochlorite failed to cause a return of pulsation Suppuration of the forearm occurred, necessitating amputation of the arm at its middle third Final result unstated

CASE 37 (reported by Finaly)—Woman, aged 19 Revolver shot of the right upper leg The pulse distal to the wound was absent for twenty-four hours and the femoral artery was spastic The bullet was removed at operation, but the femoral artery was not disturbed. Recovered

CASE 38 (reported by Finaly)—Youth, aged 19 years, a mine worker Received a lacerated wound of the upper leg The pulse distal to the wound was absent Femoral artery involved in spasm Gangrene of the leg extending above the knee required amputation Final result unstated

CASE 39 (reported by Finaly)—Youth, aged 17 years, a mine worker Received a wound of the right leg and abdomen with tearing of the bowel as the result of being crushed between two mine wagons Intestine resected. Femoral artery thought to be involved in spasm but leg not operated on. Toes became gangrenous Final result unstated

CASE 40 (reported by Farani)—Sex and age unstated Open fracture of the femur with partial crushing of the soft parts of the inferior third of the thigh Pulsations of the foot and tibial regions absent After careful examination of the injured region the author was convinced that there were no actual lesions of the tibial vessels Conservatively treated Recovered

CASE 41 (reported by Farani)—Sex and age unstated. Had an abdominal traumatism and gunshot wound of the upper third of the arm The radial artery did not pulsate. The distal arm showed a temperature lower than its fellow The author was convinced that there was no important arterial lesion and that the brachial artery was involved in spasm. Arm immobilized only Recovered.

CASE 42 (reported by Farani)—Sex and age unstated Had a comminuted fracture of the lower third of the forearm with crushed soft parts Radial pulse absent after the fracture. The author took the risk of thinking that there was no arterial lesion and treated the case without operation and he merely treated it as an open fracture Recovered

122 South Michigan Avenue

A NEW AMPUTATION IN THE LOWER THIRD OF THE THIGH

C. LATIMER CALLANDER, M.D.
SAN FRANCISCO

This description of an amputation through the distal extremity of the femur records a sufficient number of novel features to justify its report as a new operation

The essential details of the operation in summary are as follows The anterior flap includes the soft tissues of the upper part of the leg as far as the level of the tibial tuberosity, while the posterior flap is a little longer and extends well down on the gastrocnemius muscle The popliteal vessels and nerves are ligated through an amuscular and avascular cleavage plane on the medial aspect of the low thigh All the hamstring muscles are severed at their tendinous insertions on the tibia, and the femur is sectioned in the condylar flare, just proximal to the adductor tubercle The patella is dissected from the anterior flap from the joint side, leaving the rectus femoris tendon in the floor of the patellar fossa to act as an end-bearing buffer for the femur No coapting primary sutures are used throughout the operation save four to six skin clips or sutures, which hold the flaps roughly in position As the edges of the flaps unite, the posterior flap retracts gradually but very extensively until the femur occupies the patellar fossa snugly, and the suture line is located well up behind the stump end

The advantages this operation offers over other lower third thigh amputations, including the Gritti-Stokes operation, and the simplicity of the procedure warrant a detailed description of the operative technique and an analysis of the results thus far obtained

After the operation has been described in detail, a number of considerations of major interest in amputations in the lower third of the femur in general will be taken up Features of this operation will be con-

30 Gallo A. G. and Calcagno B. N. Sobre un caso de estupor arterial traumático. *Semana méd.* 28: 238-240 (Aug. 3) 1922. Ueber einen Fall von traumatischem Arterienverschluss. *ref. Ztschr. f. Chir.* 20: 75-79, 1923.

31 Frassi L. L'innibizione segmentaria delle arterie secondaria a ferita. *Osp. maggiore* 8: 65-71, 1920.

The author is indebted to Dr. J. B. de C. Saunders for cooperation in the preparation of this paper.

From the Surgical Service of Dr. Harold Brunn in the University of California Division of the San Francisco Hospital Unit of the San Francisco Department of Health, Dr. J. G. Geiger, director.

trasted with those of the routine amputations of the thigh near this level, and an attempt will be made to evaluate the differences evident from this contrast

DESCRIPTION OF OPERATION

The diagrams illustrate the stages of this amputation in the lower left thigh. The patient is placed in the

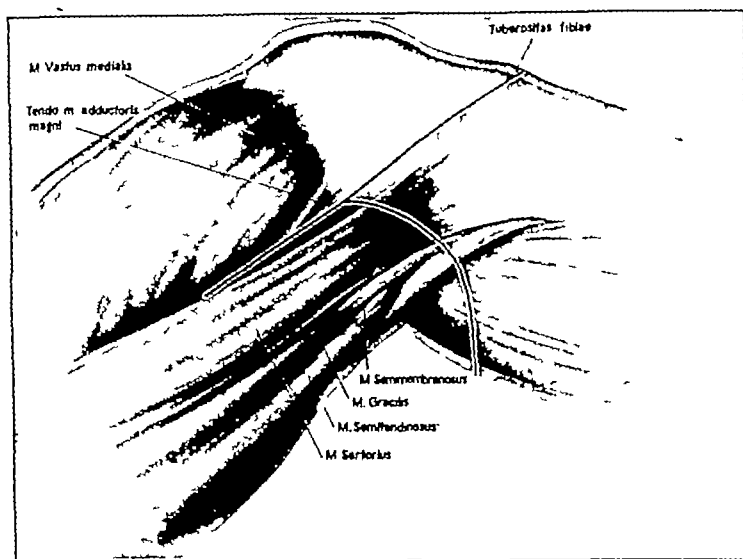


Fig. 1—Medial surface of left thigh and knee. Skin incisions on medial side of the low thigh and knee marking long anterior and posterior flaps. Attention is directed to the amuscular and avascular interspace between the vastus medialis and sartorius muscles. Note that the flaps for this low thigh amputation are derived from the soft parts of the leg.

dorsal decubitus position, the knee of the diseased extremity is flexed slightly, and the leg is elevated a little above the horizontal on one or two sandbags. No tourniquet is applied. The surgeon stands on the side opposite the affected extremity and faces the medial aspect of the thigh and knee to be operated on. He maintains this position throughout the operation because the essential steps are directed through a medial approach to the popliteal space. From this position the operative work on the lateral part of the low thigh and knee are accomplished readily by rotating the knee medially.

The skin incisions (figs 1 and 2) outlining the slightly unequal anterior and posterior flaps are at the same level as the incisions that sever all the deeper soft parts. The incision on the medial aspect of the thigh begins at a point three fingerbreadths proximal to the most prominent part of the medial femoral condyle (fig 1) and runs horizontally distally in the palpable groove between the vastus medialis and the sartorius muscles. With the knee in partial flexion this groove can be defined readily. After the incision has been deepened to the enveloping or deep fascia of the thigh the adductor tubercle of the medial femoral condyle and the tendon of the adductor magnus muscle, which inserts on it, can be palpated. The skin incision continues distally over the medial epicondyle, sweeps forward and crosses the anterior surface of the tibia at the anterior tibial tuberosity, the point of insertion of the quadriceps extensor tendon.

The thigh then is rotated medially (1 e., toward the surgeon). The skin incision on the lateral aspect of the leg, as outlined in figure 2, begins at a point three fingerbreadths proximal to the lateral femoral condyle in the palpable groove between the tendon of the tensor fasciae latae (iliotibial tract) and the biceps femoris muscles. The incision must be made very close to the tensor fasciae latae tendon in order to avoid the muscular fibers of the biceps. Continuing distally over the lateral epicondyle, the incision extends forward to meet the medial incision at the anterior tibial tuberosity, thus outlining the anterior flap of the amputation.

Corresponding incisions from each femoral epicondyle are carried obliquely posteriorly and inferiorly until they meet on the calf of the leg at a point a little inferior to the level of the anterior tibial tuberosity. This incision for the posterior flap is deepened to the fascia on the gastrocnemius muscle. Thus are outlined two long amputation flaps, the posterior a little longer than the anterior. Each flap partakes not only of the soft parts of the lower thigh but of a considerable portion of the soft tissue of the leg.

Attention again is directed to the medial aspect of the thigh and knee (fig 3). The horizontal portion of the medial incision, common to the two flaps, 1 e., that portion lying between the vastus medialis and the sartorius muscles, is deepened through the deep fascia of the thigh. Division of this powerful fascial layer, which is the only strong structure in the medial wall of the popliteal fossa at this level, affords ingress to the popliteal space. The left fore-

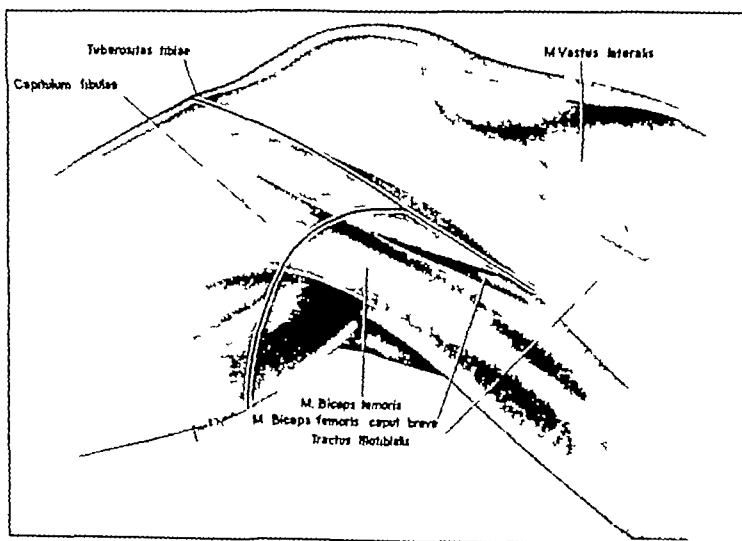


Fig. 2—Lateral surface of left thigh and knee. Skin incisions on lateral side of the low thigh and knee marking long anterior and posterior flaps. Attention is directed to the amuscular and avascular interspace between the tendon of the tensor fasciae latae (iliotibial tract) and the biceps muscles. The biceps muscle is composed of fleshy fibers almost down to its insertion on the head of the fibula.

finger, now inserted shallowly into the popliteal space (inset in figure 3), frees the medial hamstring tendons to their tibial insertions by blunt dissection. At this juncture these tendons are divided in the order named: sartorius, gracilis, semimembranosus and semitendinosus. During this dissection, no fleshy portion of any

of the medial hamstring muscles nor any part of the vastus medialis muscle need be exposed, much less severed. The severed hamstring tendons retract at once into the aponeurotic and areolar tissue of the posterior flap and are not dealt with again. Further exposure is gained by severing the tendon of the adductor magnus

contact with the femur as far down as the level of the adductor tubercle in order that there may be as little dead space as possible between the posterior flap and the femur.

The knee then is extended (fig 6) and the incision marking the distal portion of the anterior flap is deepened through the capsule of the knee joint down to the femoral condyles and to the tibia, thereby severing the quadriceps tendon at its insertion into the tibial tuberosity.

The anterior flap containing the patella is dissected upward off the infrapatellar fat pad and drawn upward on the thigh until the superior synovial recesses of the subquadriceps space are seen (fig 7). The patella is dissected from its sesamoid position in the quadriceps tendon, care being taken to preserve the longitudinally disposed tendon of the rectus femoris muscle, which runs over it (inset, figure 7).

The preservation of this tendon adds materially to the end-bearing capacity of the stump after the cut end of the femur is fitted into the socket from which the patella has been removed.

The synovia on the anterior flap and over the femur proximal to the condyles is not excised.

The femur now is sawed through its cancellous portion just proximal to the adductor tubercle (fig 8). At this level the shaft of the femur has expanded to a size that approximately corresponds to the patellar socket in the quadriceps tendon. The cut end of the femur is rounded with a rasp until no sharp surfaces and no fringes of periosteum remain.

muscle at its attachment to the adductor tubercle. Free access to the vasculoneural contents of the popliteal space thus is afforded. Moderate flexion of the knee relaxes the popliteal vessels and nerves and favors their manipulation. With a finger now inserted more deeply into the popliteal space and kept close to the posterior surface of the femur, the popliteal artery and vein are withdrawn easily to a level flush with, or even outside, the skin incision (fig 4). Here they are clamped, ligated, and divided as near the superior apex of the popliteal space as is convenient. The tibial (internal popliteal) and common peroneal nerves then are drawn readily into the wound as one trunk (inset, figure 4) and are anesthetized, ligated and divided. Each of the components of the nerve bundle is injected with absolute alcohol to prevent neuroma formation, and the stump is allowed to retract into the proximal recess of the popliteal space.

The partly flexed knee now is rotated toward the operator (fig 5), and the lateral longitudinal skin incision is deepened through the deep fascia of the thigh. The incision is carried through the deep fascia as far as the insertion of the biceps muscle on the head of the fibula, where the biceps tendon then is severed. At this stage of the operation the popliteal space may be opened widely from side to side since the essential structures have been divided. Deepening of the incision marking the posterior flap down to the gastrocnemius aponeurosis and clearing from it the areolo-adipose debris free the posterior flap. It is advantageous to leave the fibro-areolar tissue of the popliteal space in

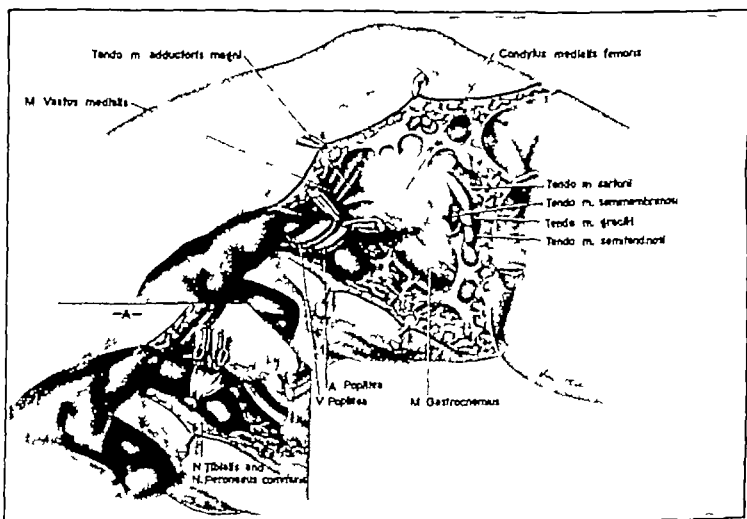


Fig 4—Medial surface of left thigh and knee. Further deepening of the flap incisions on the medial aspect of the knee. The vessels and nerves in the popliteal space are sectioned. The main drawing shows the retraction of hamstring muscles after section at their tendinous insertions on the tibia. The contents of the popliteal space now are widely accessible and the vessels are ligated. The inset demonstrates the method of securing and dividing the tibial and common peroneal nerves.

The two large flaps are inspected now for small bleeding points. These can be ascertained best by sluicing the surfaces of both flaps with large quantities of warm salt solution. This flushing has the additional advantage of washing away small soft tissue and bone

debris. Many small bleeding points may require ligation after this procedure. Inspection of the body of the posterior flap shows no muscle fibers but only areoloidipose tissue and the cut ends of the hamstring tendons. These tendons already are retracted into their aponeurotic beds and are scarcely visible. The flaps

POSTOPERATIVE CONVALESCENCE

After the operation, the stump is wrapped snugly in a gauze roll and the patient is returned to bed. He is able to sit upright in bed in the evening of his operative day and can be placed in a wheel chair during the next day or two. Daily dressings are required because an

abundant serosanguineous oozing between the skin edges may take place for several days in spite of the most meticulous hemostasis. The drainage gradually lessens. The absence of primary suturing, other than that necessary for flap approximation, minimizes the pocketing of fluid accumulation and allows all secretions to escape through the wide intervals between the skin clips. Usually the major oozing stops in from one to three days. When this drainage has ceased, the skin edges between the sutures placed at the time of the operation are approximated carefully by additional skin clips. These clips are applied readily without anesthesia. This procedure, which has been adopted only in the most recent cases, has resulted in complete union of the flap edges within a week. The time of convalescence has been decreased remarkably in this fashion.

As convalescence progresses, the posterior flap retracts gradually until the suture line, now posterior in position, is well proximal to the bone end, occasionally a distance of one or more inches (fig 10). When it is recalled that the suture line at the end of the

operation is an inch or more distal to the bone end, it becomes apparent how extensive is the power of the intact hamstring muscles to retract the posterior flap. In a short time the femur is lodged securely in the patellar fossa, thus assuring great stability to the soft parts of the stump. There is excellent end-bearing because of the presence of the rectus femoris tendon, the elements of the prepatellar bursa, and of tough

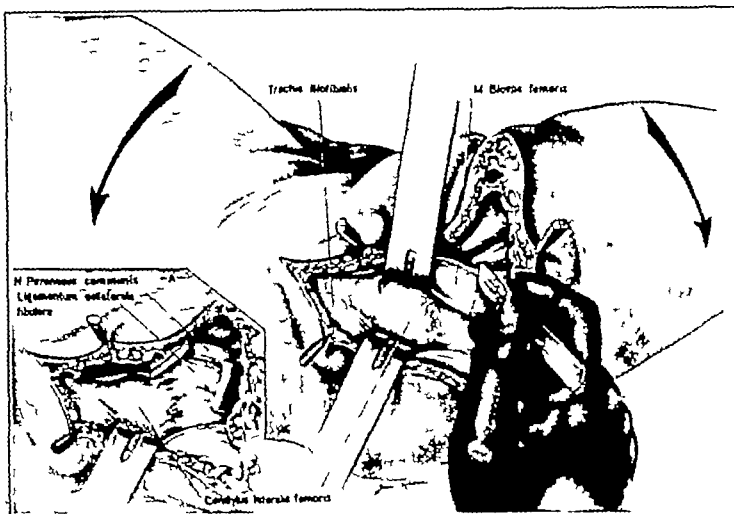


Fig 5—Lateral surface of left thigh and knee (knee rotated medially toward surgeon). Deepening of the flap incisions on the lateral aspect of the knee. Left knee forcibly rotated medially. The interval between the iliotibial tract and the biceps muscle is defined and the biceps is sectioned at its insertion on the head of the fibula. The inset indicates the structures deep to the biceps tendon. The common peroneal nerve already has been sectioned through the medial approach (fig 4).

now are allowed to fall together loosely (inset B, figure 8).

The only coapting suturing during the operation is in the form of not more than four to six clips or sutures placed at such intervals as to keep the flaps in fair apposition (fig 9). When the skin edges are approximated, the aponeurotic edges also lie in contact, mere apposition is sufficient to produce firm union. None of the tendons or aponeuroses of the anterior flap are sutured to the corresponding structures of the posterior flap. In this way no structure is under any tension, and the trauma and consequent pressure necroses resulting from suture of these deeper structures therefore cannot occur. The flaps appear exceedingly long and even extend an inch or more beyond the femur end immediately after they are fashioned. To the surgeon accustomed to the routine type of low third femur amputation, the flaps will appear excessively redundant and clumsy, and he will fear that a bulbous stump-end and large dead spaces will result. He will wonder, too, when he notes how wobbly the femur lies between the flaps, how the femur end will gain contact with the patellar socket and fuse there. During the early days of convalescence, the reason for leaving these flaps under no tension appears.

At the end of the second or third postoperative day and sometimes even within a few hours after the operation, the hamstring muscles severed only at their distal attachment contract to the degree that the skin suture line lies posteriorly placed at about the level of the stump-end, and the femur is felt in the patellar fossa.

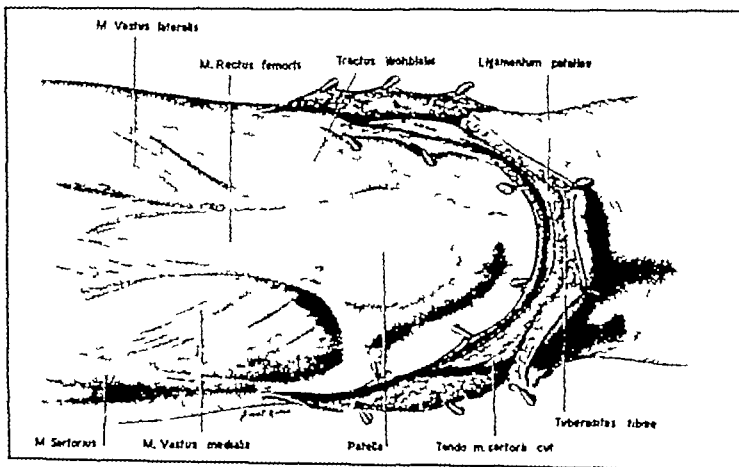


Fig 6—Anterior surface of left thigh and knee. The incision marking the anterior flap is deepened through the knee joint capsule and infrapatellar tendon down to the tibia.

skin over the bone end. The patient can extend his stump powerfully, a requisite in any thigh amputation.

In this series, healing has taken place in four weeks on the average. In the last three cases, in which the skin edges between the primary suture points were approximated secondarily by additional clips, healing was complete at the end of a week.

ANALYSIS AND COMPARISON OF THE FEATURES OF THIS AMPUTATION WITH THOSE OF THE ROUTINE LOW THIGH AND GRITTI-STOKES AMPUTATIONS

Vascular Considerations—Control of Blood Supply
The common use of a tourniquet of one kind or another in thigh amputation should be limited to the very exceptional case. That the pressure consequent on its

nourish the skin and subcutaneous tissue of the upper leg to a degree sufficient to enable upper leg flaps in this thigh amputation to heal readily. Proof of this occurred in five cases of amputation. The popliteal artery was filled with thrombus, did not bleed on section, and therefore could not have furnished blood to the superficial structures about the knee and the upper leg. Nevertheless, the leg flaps, cut as outlined in figures 1 and 2, contained small spurting vessels in their edges, vessels which were derivatives of the profunda arterial tree. In these cases of obliteration of the popliteal artery, the medial and lateral circumflex branches of the profunda anastomosed with the arterial network about the knee and furnished adequate blood supply to the anterior flap in our amputation. The posterior flap is nourished by the terminals of the perforating system of the profunda. The flaps in each of these five cases united readily into strong stumps with no loss of tissue substance along the suture line. Why it is that the profunda artery and its terminals so often remain permeable in obliterating disease of the superficial femoral artery and its tributaries is not known.

Length of Amputation Flaps—It is common knowledge about the routine types of lower third thigh amputations that the premature contraction upward of the posterior flap, actuated by contraction of the hamstring muscles, is one of the usual causes of infection, a danger often leading to reamputation. Extensive retraction of severed hamstring muscles is to be expected when one realizes that all but a part of one of these muscles arise on the pelvis and span

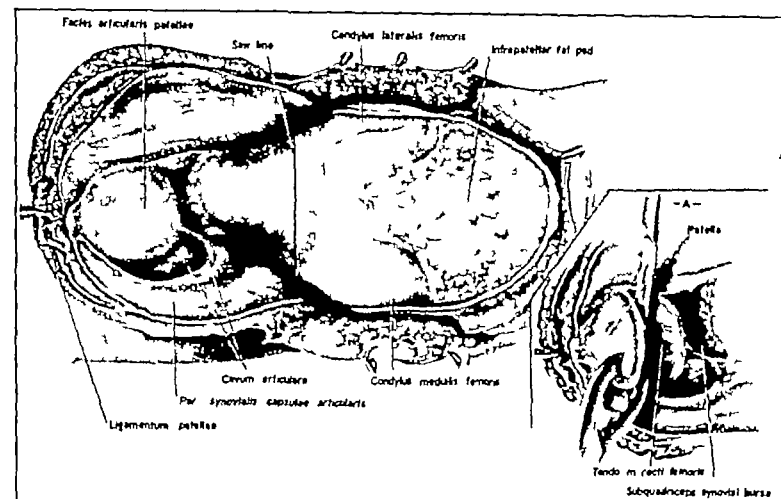


Fig. 7—Anterior surface of left thigh and knee. Upward dissection of the anterior flap and removal of the patella from the joint side. The saw line in the main drawing is well done into the condylar flare. The inset shows the sharp dissection of the patella from its fossa in the quadriceps tendon leaving the rectus femoris tendon intact to act as a buffer for the cut end of the femur.

use may provoke thrombosis in vessels in which none heretofore has been present, and that a greater degree of thrombosis may be caused in a vessel in which a moderate amount already exists, are very real dangers which should contraindicate its use. In altogether too many patients the tourniquet still is advocated and used in the routine type of low thigh and knee amputations.

The common practice of waiting to ligate the popliteal vessels until after any or all of the hamstring muscles are severed in the popliteal space by way of the posterior approach is a clumsy procedure. In addition to the shock attendant on severing large muscles in their fleshy portions, there usually is considerable hemorrhage from their section when the main blood supply as yet has not been controlled. I advocate the medial approach to, and ligation of, the popliteal vessels through the avascular and amuscular space illustrated in figure 4.

Importance of the Profunda Femoris Artery in Regard to the Nourishment of the Amputation Flaps Attention is directed to several points of interest concerning the profunda femoris artery and its terminals. The profunda, practically speaking, is the artery of the tissues of the thigh. With the peripatellar arterial circle, with which it anastomoses, it also can nourish the skin and subcutaneous tissue of the knee and upper part of the leg, certainly for a considerable distance below the joint line. The superficial femoral artery gives off no important branches in the thigh save the *suprema genu* (*anastomotica magna*).

Visual operative evidence repeatedly has demonstrated to me that the profunda artery alone is able to

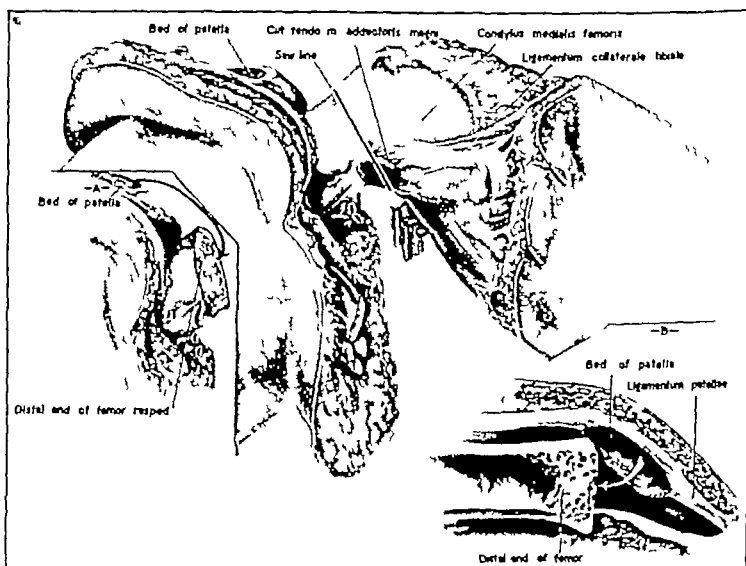


Fig. 8—Medial surface of left thigh and knee. Section of the femur after formation of long anterior and posterior flaps. Inset A the patella fossa is ready to receive the cut end of the femur. Inset B shows the anterior flap loosely approximated to the posterior flap. As the flaps unite and the posterior flap retracts the patellar fossa lodges the femur end.

a practically uninterrupted arc to their insertion on the tibia. Only the short head of the biceps femoris has its origin on the shaft of the femur.

The components of the quadriceps muscle are the essential retractile elements in the anterior flap. All

these components save the rectus femoris, however, arise from the shaft of the femur through a very considerable portion of its extent. Consequently there is only a short span of muscle unattached to the femur which can exert a pull on the quadriceps tendon, whether that tendon is divided in the suprapatellar area as in the routine tendoplastic amputation or in the infrapatellar portion as in the Gritti-Stokes and my own operations. The tensor fasciae latae muscle with its origin on the iliac crest and the dorsum of the ilium near the anterior superior spine is inserted distal to the level of the greater trochanter into the iliotibial tract, a specialized portion of the fascia lata of the thigh. Severance of this tract proximal or distal to the patella does not result in marked retraction of this aponeurotic unit, mainly because of the short span of the muscle bundle that activates it.

As a result, the anterior flap in any thigh amputation retracts very little, while the posterior may retract to an extraordinary degree. In our amputation the tibial attachments of the hamstring tendons and not the muscle bellies are severed, as a result of which all the hamstring contractile elements are in the posterior flap. Consequently a much greater amount of retraction of this flap occurs than in the routine low thigh and Gritti-Stokes operations, in which the hamstring muscles are divided in their fleshy portions. In order to allow retraction to take place without tension, I fashion the anterior as well as the posterior flap from the skin and subcutaneous tissue of the upper part of the leg.

Stump Length and Weight Bearing—Too often the ordinary amputation in the lower third of the femur results in a bone length inadequate for leverage on a prosthesis. Especially is this true when a secondary amputation is required because at the original operation the flaps, the posterior one particularly, were made too short. Sometimes even during the first amputation the femur has to be resawed at a higher level to allow flap approximation.

I find no fault with the length of the stump in a Gritti-Stokes operation. This procedure, however, is difficult technically and is one in which there often is a poor functional result. It is not a simple matter to remove accurately the cartilage-bearing part of the patella in such a manner as to fit the remainder of this bone snugly against the sawed end of the femur, and there acquire bony union. Any leg maker can relate many instances in which the patella has failed to unite with the femur. Even when the soft parts in the amputation heal, the patella, as the result of nonunion, may wobble somewhat in its position on the femur end or may slide to one side or completely off the end of the bone. Even when bony union between the patella and femur occurs, the irregular shape of the patella often precludes functional end-bearing. When infection occurs in the suture line, a result usually of too much tension from too short a posterior flap, union between patella and femur rarely occurs. In my experience in these cases the patella and often a segment of femur are sacrificed when reamputation is resorted to.

In my amputation the femur is sectioned at a constant level, one just proximal to the adductor tubercle, thus affording a stump length equal to that in a Gritti-Stokes amputation. At this level the femur presents a broad weight-bearing area, which is about double that of the femoral shaft and much greater than that of the patellar extremity of a Gritti-Stokes stump. Since the flaps are exceedingly long, they are adequate to cover this femur length and are under no tension.

Should infection occur, it can be eliminated before contraction of the hamstring muscles has shortened the posterior flap to the extent that a resawing of the femur is required. Reamputation has not been necessary in any of my cases.

The patellar socket gradually lodges the femur end in the amputation I have described. Union between the femur end and the rectus femoris tendon, which floors the patellar socket, soon becomes firm and painless. There is no such accuracy of apposition demanded between opposed structures as in the Gritti-Stokes operation, and infection does not vitiate the result.

The classic lower third femur amputation stump often is not end bearing, but the properly made Gritti-Stokes stump sometimes is. The stump in my operation bears weight directly because of its broad bearing surface and the substantial fibrous coverings afforded the femur end. The femur fits closely in the patellar

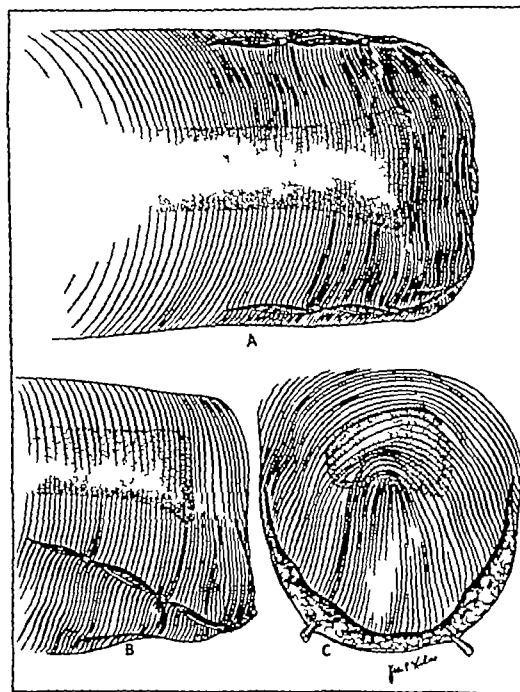


Fig 9—Transparency drawings to show the location and size of the condylar end of the femur in the redundant amputation stump. A is a view of the stump from the front. B is the stump seen from the side. C is the stump viewed from the end before the clips have been placed. The skin clips are the only means of approximating the flaps at the time of operation.

socket against the tendon of the rectus femoris muscle. In addition, the prepatellar bursa and the thick skin over the knee are well adapted to pressure.

The stump in the amputation I am describing and that in the Gritti-Stokes procedure have an important feature in common. This is the slightly bulbous stump end, the result of sectioning the femur within the flare of the condyles. The distal flare of the resulting stump allows the leg maker to fit a prosthesis, the thigh cuff of which grasps the stump above the condylar flare and keeps out loose motion in lifting the leg and moving it backward and forward.

Pyogenic Wound Infection—Most infections in routine lower third and Gritti-Stokes amputation stumps are the result of too great a tension on the suture line. This is caused by making the posterior flap too short. I believe that a posterior flap cut in the popliteal space usually is too short to allow attachment to the anterior flap without considerable tension. If the femur is sec-

tioned in the upper part of its lower third, tendino-muscular flaps can be cut sufficiently long to cover the bone end without serious tension. This does not mean, however, that in the course of the first few post-operative days the suture line in certain instances will not be under sufficient strain to result in necrosis and subsequent infection. This, from a knowledge of the amount of retraction that takes place in the posterior flap in my operation, must occur when the lower limit of the posterior flap extends only to the middle of the popliteal space, as so many illustrations of this operation indicate. I have seen failures to heal on this account in my series of Gritti-Stokes cases. Infection following tension necrosis at the suture line is propagated to the severed fleshy parts of the hamstring muscles. Extensive infection often necessitates a frank open reamputation. When infection occurs in the Gritti-Stokes operation, not only the patella but often a segment of the femur must be sacrificed.

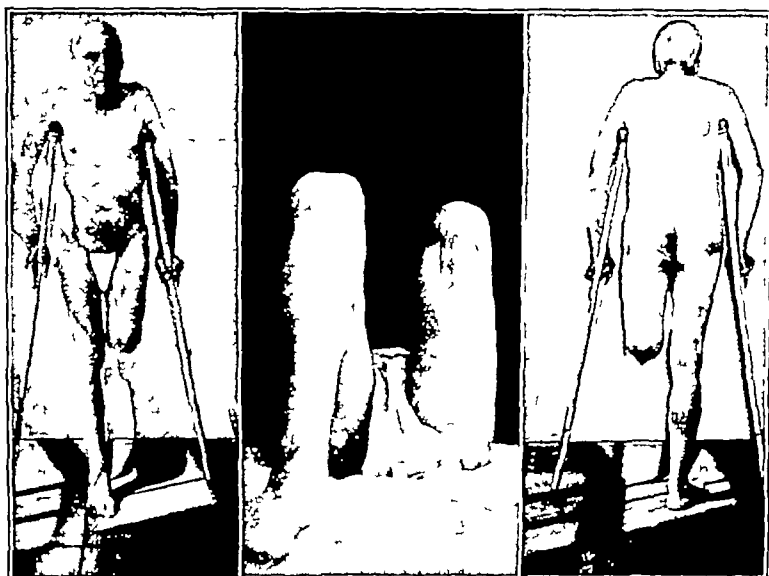


Fig. 10—Anterior posterior and close-up views of amputation stump. The suture line is placed well proximal to the stump end. This patient is now able to walk with a full end bearing prosthesis.

In the usual lower third femur amputations, large *en masse* sutures frequently are used to approximate the flaps. These ligations predispose to necrosis of the included tissue. Dead spaces with no access to the outside may be created, in these spaces, infection often develops. From these infected closed spaces, pus may extend up the connective tissue spaces and muscle bundles of the posterior thigh more readily than out through the tightly closed suture line or through paths created by drains. Drainage material plunged into the depths of the amputation cavity created by suture of the flaps may lead to infection in the deeper tissues.

In my operation, every precaution is taken to insure against infection. First, the posterior flap is cut so long that tension between it and the anterior flap cannot exist. Only late in convalescence is there any tension whatever on the line of union between the two flaps. One of the greatest safeguards against infection in the stump itself and to propagation of infection up the thigh is the section of the hamstring muscles at their tendinous insertions on the tibia. By operating through natural intermuscular cleavage spaces, no hamstring muscle fibers are seen or sectioned. This is equally true of the quadriceps muscle, which is sectioned in its

infrapatellar tendinous portion. The fleshy muscle bellies and their tendons proximal to the point of section thus maintain their normal anatomic relations. They remain surrounded and protected by the enveloping deep fascia of the thigh and popliteal space and by the fibrous inward prolongations from this parent aponeurosis. It is difficult to see how infection can extend up the thigh under these circumstances. Anatomically the popliteal space is a closed cavity, there being no communication with the upper part of the thigh through the vascular ring in the adductor magnus muscle. Since no hamstring muscle belly has been cut in this operation, no muscle planes are left open for upward extension of infection. The anterior flap is not dissected proximally enough to expose muscle bundles. Leaving the synovia on the under surface of the anterior flap and in the subquadriceps bursa interposes a barrier to the upward extension of infection. Removal of the patella after the anterior flap has been turned upward exposes no muscle fibers to infection. In my operation, no area of skin and subcutaneous tissue is dissected from the deep fascia. This insures against the spread of infection up artificial planes.

Another unique safeguard against infection is the absence of suture tension on any structure in the amputation stump. A few skin clips, placed at widely spaced intervals at the cut edges of the flaps, are the only means of flap approximation at the time of operation. Mere contact without suture suffices for union of the aponeurotic elements. The wide intervals in the skin edges left between clips are adequate for the free drainage of tissue juices. The exudation of blood-stained serum may be copious for the first few postoperative days, but it diminishes gradually as convalescence goes on. This postoperative oozing of serum is a safeguard against infection which otherwise might result from contamination of loculated fluid collections. The placing of additional clips between the clips used at the time of operation in order to get better skin approximation is not done until the postoperative oozing has stopped and until it is demonstrated that infection has not taken place.

Gas Bacillus Infection.—In our service in the San Francisco Hospital up to the time of the development of the amputation here described, gas bacillus infection has occurred in thigh amputation stumps of eleven patients out of sixty operated on for arteriosclerotic gangrene. Ten out of eleven of these patients died. Gas bacillus infection occurred seven times in the thigh amputation stumps of thirty-one patients operated on for diabetic gangrene. Five of these patients died. This infection has occurred eighteen times in the stumps of forty-six patients who had thigh amputations for gas bacillus infection in compound fractures and severe lacerations below the knee. Twelve of the eighteen patients died.

Reflection as to the cause of the development of gas bacillus infection in thigh amputation stumps was an important factor leading up to the elaboration of the amputation technic under discussion. The predilection of gas bacilli for muscle tissue, the longitudinal spread of infection up individual muscles and groups of muscles, and the growth of these organisms in the absence

of oxygen are observations too frequently made to be incorrect. In gas bacillus infection it is noteworthy that aponeurotic, tendinous and subcutaneous structures are spared early and sometimes even late in the disease.

As a result of these observations, it seemed that an amputation which would expose no thigh muscles to actual contamination, save in their tendinous insertions, would lessen the probability of complicating gas bacillus disease. In addition, the ideal amputation should have the added feature of being able to be left open. The necessity for open amputation is required when the operation is performed close to the site of infection. By this procedure, anaerobic conditions in the stump are avoided and the danger of upward spread of infection from distal foci is minimized. In the operation under discussion, the flaps are of sufficient length to allow the wound to be packed open over a period of time if necessary without their retracting to a degree that makes later closure by simple approximation impossible.

Recumbent Convalescent Period—In the routine low thigh and Gritti-Stokes amputations, tissues often are on such a degree of tension that it becomes necessary to apply skin traction to relieve the suture line. Skin traction may relieve tension on the skin suture line but has little or no effect on the tautness of the aponeurotic line of closure. Movement of a stump under tension is painful and requires recumbency for a period of days. The patients with our thigh amputation never require skin traction and are able to sit up in bed on the day of their operation and be in a wheel chair the day following amputation. Since there is no tension on the elements of the stump, free movement is comparatively painless. Danger of pneumonia from enforced recumbency is lessened materially.

Operative Shock—Shock from bleeding and from section of the hamstring muscle bellies has occurred in many cases of routine thigh amputation. There is very little intra-operative or postoperative shock from the operation I am describing. This lack of shock I attribute to two factors: control of hemorrhage by early ligation of the popliteal vessels and the severing of muscles only in their tendinous insertions.

Mortality—Mortality from thigh amputation will be decreased very considerably if the technic as outlined is followed meticulously. The factors that lower the mortality rate are: lessened shock from adequate control of blood supply and from section of muscles only in their tendinous insertions, diminished incidence of pneumonia from a lessened period of recumbency, decreased tendency to anaerobic or aerobic infection because no structures are under tension, this being the result of long flaps and little suturing, ready exit for the serum produced in the wound, and the lessened incidence of reamputation, which in itself carries a considerable death rate.

Thus far fourteen amputations have been performed according to this method. The majority of these patients were over 70 years of age. One has died, a mortality of about 7 per cent. This man was 84 years of age and died eleven days after his operation from a coincidental pneumonia. His amputation was the second in the series and at the time of his operation I did not know that I could get the patients up almost immediately. It is likely that his pneumonia could have been averted by the process of getting him into a wheel chair on the second postoperative day, the procedure I adopted in all later cases. His amputation

wound was fairly clean and had united partially. In thirteen of these fourteen cases amputation was done for arteriosclerotic or for diabetic gangrene. One amputation was done for intractable compound fracture near the knee.

Mortality statistics of thigh amputations vary widely. Much depends on the condition of the patient. The best of the larger series show a death rate of 15 per cent, while the series in the city hospitals and relief homes show much higher figures. Prior to the development of this operation, the mortality of thigh amputations in our service in the San Francisco City Hospital exceeded 50 per cent.

450 Sutter Street

COMMUNUTED COLLES' FRACTURES IN ELDERLY PATIENTS

METHODS OF TREATMENT AND END RESULTS IN THIRTY CASES

G E HAGGART, MD
BOSTON

The treatment of uncomplicated Colles' fracture is now well recognized. While the methods employed by different operators reveal many variations in procedure, the underlying principles are quite similar. However, in comminuted Colles' fracture, especially when occurring in elderly patients, it is believed that the results



Fig. 1—Sugar tong plaster splint removed from arm (reprinted from *New England Journal of Medicine*.)

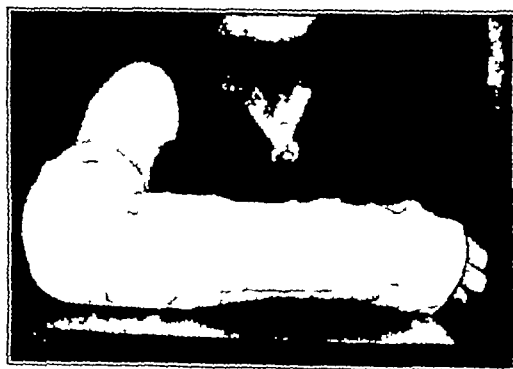


Fig. 2 (case 2)—Appearance of 'sugar tong' plaster splint applied.

can be greatly improved, particularly by longer splintage than is usually employed, and also by attention to certain details as herein described. In a previous communication a method of treatment for this fracture was presented with particular emphasis on the duration of splintage, which in these older patients averaged six

From the Department of Bone and Joint Surgery, Lahey Clinic.
Read before the Section on Orthopedic Surgery at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.

weeks as compared with a total of from two to three weeks for similar injuries in younger adults

The present paper is a report of the results obtained in the treatment of thirty elderly patients, aged from 58 to 70, with comminuted Colles' fracture. To illustrate the significance of prolonged splintage, properly applied, as well as the importance of fracture observa-

ticularly prone to occur at the dorsal fracture line in the radius where the distal dorsal end of the proximal radial fragment tends to absorb. Hence, bone repair is often so far from complete that following the usual time of splintage—that is, from two to three weeks—a partial to complete recurrence of the deformity takes place on resumption of the use of the hand, notably the act of dorsiflexion.

3 It is often necessary to hold the hand in palmar flexion and ulnar deviation in order to prevent displacement of the comminuted radial fragments. Fluoroscopic vision of the fracture will determine whether this

*Summary End Results in Thirty Elderly Patients with Comminuted Colles Fracture One Year Follow-Up**

| | Average Duration of Splintage Weeks | Type of Splint | | | Reduction Visualized Under Fluoroscope | Anatomic Result | | | Functional Result | | |
|---------------------|-------------------------------------|----------------|----------|-----------|--|-----------------|----------|-----|-------------------|----------|-----|
| | | Posterior | Anterior | Posterior | | Good | Moderate | Bad | Good | Moderate | Bad |
| Group 1 15 cases | 3½ | 4 | 7 | 4 | 0 | 5 | 7 | 3 | 6 | 8 | 1 |
| Group 2 15 cases | 6 | 0 | 0 | 15 | 15 | 12 | 3 | 0 | 10 | 5 | 0 |

* Good result including perfect within 10% normal moderate result able to do original work or activities but with slight subjective or objective defect, from 70 to 90% normal bad result unable to do original work with pain and deformity from 60 to 70% normal

position is indicated. To maintenance of this flexed wrist position is ascribed the occurrence of flexor muscle contracture following removal of the splint. This complication was not observed in the cases in group 2, for, with the fracture well healed and fol-

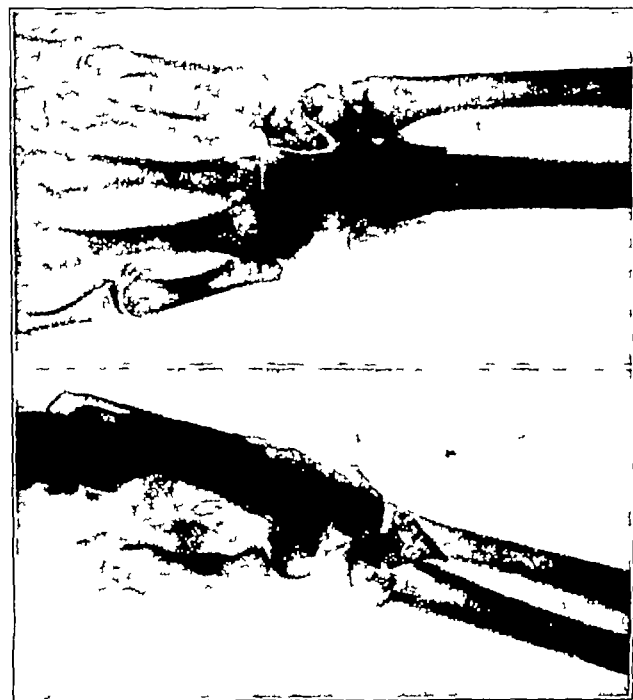


Fig 3 (case 2)—Roentgen appearance on admission of comminuted Colles fracture in woman aged 68. Observe marked displacement of radio-ulnar joint

tion under the fluoroscope, these thirty cases are divided into two groups: group 1, fifteen cases in which posterior or anterior and posterior forearm splints were applied for an average of three and a half weeks; group 2, fifteen cases wherein the fracture was completely immobilized by means of the sugar tong plaster splint for an average of six weeks. All fractures in the latter group were reduced and the position then checked by fluoroscopic vision. The results in the second group of cases were definitely better than those in group 1, as shown in the accompanying table.

A survey of these cases indicates that comminuted Colles' fracture in elderly patients should be treated as a distinct group compared with similar fractures in younger adults. The following observations are significant:

1 Owing to the relatively brittle avascular bones of elderly individuals, comminution of fragments is more frequently observed at the time of reduction. Such comminution may not be evident in a preoperative roentgenogram.

2 Bony union in these patients is delayed as compared with the same fracture in younger adults. In some elderly patients complete bone repair may not occur even though the fracture is perfectly reduced. Magnuson¹ believes that this is due to disintegration of bone cells at the end of each fragment with consequent loss of bone substance. Delay in healing is par-

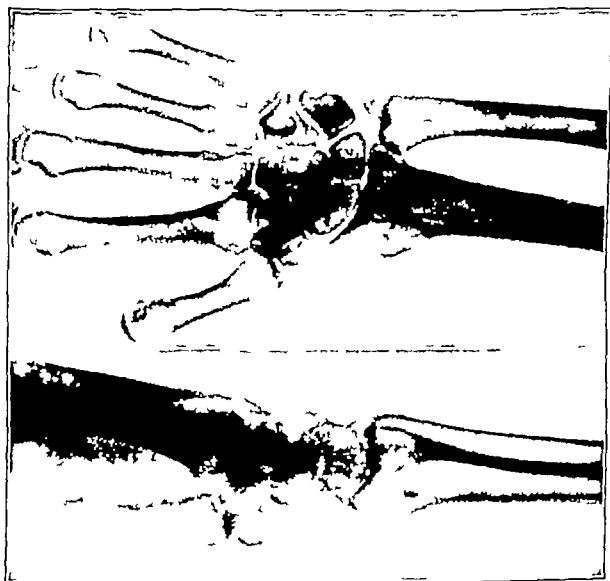


Fig 4 (case 2)—Roentgen appearance one year and three months after admission. Normal finger and wrist motion.

lowing the institution of active exercises and intensive massage, all patients in this group rapidly regained active dorsiflexion of the hand. In three patients of group 1, who were splinted an average of three and a half weeks, and in one patient splinted five weeks, the return of function at the wrist was impaired because of partial recurrence of the deformity owing to resumption of active motion when bone repair was not complete.

4 To secure satisfactory alignment in these comminuted fractures and to determine the most favorable position in which to hold the fragments, reduction under the fluoroscope is particularly helpful. Such visualization of the fracture is indeed essential to decide whether palmar flexion of the hand is necessary for holding the fragments. Since the adoption of this technic for all cases of comminuted radial fractures (group 2 cases), the average amount of palmar flexion of the hand has been between 10 and 20 degrees. In

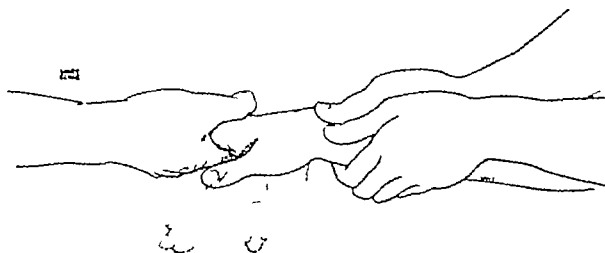


Fig 5—Molding radial fragments into alignment, traction maintained after first breaking up impaction by manipulation (reprinted from New England Journal of Medicine²)

six cases the hand was placed in the midposition, as under the fluoroscope the fragments were found to remain in excellent alignment. Obviously with this relatively slight degree of wrist flexion muscle contraction is not prone to occur, even though the part is splinted an average of six weeks.

TECHNIC OF REDUCTION OF COMMINUTED COLLES' FRACTURES

The following procedure was employed in all the group 2 cases and in six of the patients classified in group 1. This technic is the method now utilized at the Lahey Clinic in reduction of all Colles' fractures.

Anesthesia—These fractures are most satisfactorily reduced under a general anesthetic. In our hands, local anesthesia for comminuted Colles' fractures has not been satisfactory. Blocking of nerve trunks with procaine hydrochloride at the elbow or shoulder may be considered if general narcosis is contraindicated.

At the present time these elderly patients are given either tribrom-ethanol anesthesia, an average of 70 mg per kilogram of body weight, or, in cases in which a rapid uncomplicated reduction is anticipated, intravenous N-methyl-cyclohexenylmethylmalonylurea sodium is employed. Reinforcement with nitrous oxide (ethylene is not used in the fluoroscopic room) is rarely necessary with tribrom-ethanol but may be indicated following N-methyl-cyclohexenylmethylmalonylurea. Tribrom-ethanol anesthesia has been particularly satisfactory because of the adequate relaxation, absence of postoperative nausea and vomiting, and the fact that in the dark fluoroscopy room omission of anesthesia apparatus is appreciated.

Reduction—A wide strap or band is passed about the midarm and tied to the table, thus furnishes a fixed point against which the operator can maintain steady traction and yet have complete control of the hands, wrists and forearm. Impaction of the radial fragments is first broken up by manipulation and then, with traction maintained the fragments are molded into alignment by firm pressure of the operator's thumb passing distally over the dorsum of the patient's wrist (fig 5). This maneuver brings the patient's hand into volar flexion, thus fixing the reduced radial fragments in position. If necessary, the fragments are aligned by slight ulnar deviation of the hand.

Fluoroscopic observation of the reduction is obtained as indicated. It is particularly helpful in checking the anatomic relations of the radiocarpal and distal radioulnar joints. To determine the position of the hand that best maintains the alignment of the fragments and to make certain of resumption of a normal joint relationship, fluoroscopic vision is essential. With this position decided on, it is then held by the operator, and an assistant applies the "sugar tong" plaster splint.

Splint—The "sugar tong" plaster splint (fig 1) originally devised by Simpson, is one of the most efficient and at the same time simplest appliances that can be utilized in fractures of the forearm. The splint consists of a plaster-of-paris bandage reverse, covered on one side by cotton flannel. The length of the splint is determined by the distance from the knuckles up the dorsal forearm, around the elbow and down the volar surface of the forearm, to the base of the fingers. Trimmed at the wrist so that the plaster edges will not overlap and cut out over the thenar eminence, the splint, after having been well rubbed but while still moist, is applied to the elbow, forearm, wrist and hand and bandaged snugly in place with a gauze bandage (fig 2).

It is particularly important to note that the respective ends of the plaster terminate at the knuckles on the dorsum and just proximal to the base of the fingers on the volar surface of the hand (fig 6). When properly applied, this splint permits the patient complete normal range of flexion-extension in all the interphalangeal and metacarpophalangeal joints. In addition to anterior-posterior immobilization of the radius and ulna, by passing around the elbow the splint also prevents pronation and supination, an especially important stabilization when dealing with a comminuted Colles' fracture.

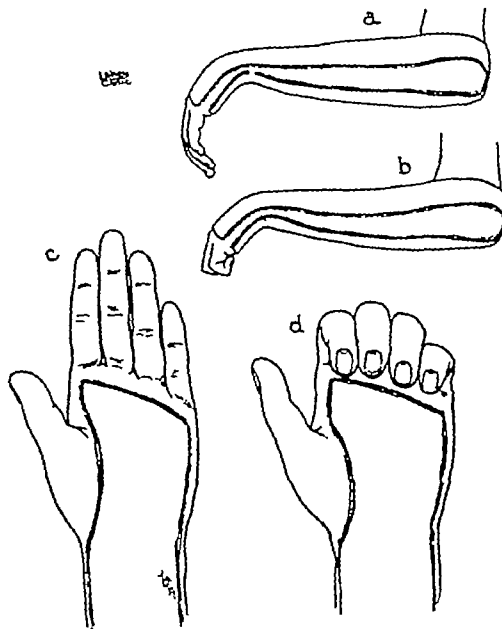


Fig 6—To illustrate correct method of application of "sugar tong" plaster splint. Normal range of motion in the interphalangeal and metacarpophalangeal joints, elbow joint from 30 to 40 degrees of flexion-extension, absence of pronation or supination of forearm is essential to prevent displacement of comminuted radial fragments.

Motion of the elbow is not completely limited, as the appliance permits an average total range of from 30 to 40 degrees of flexion-extension of the elbow joints.

In these comminuted fractures in elderly people, still further swelling of the soft parts nearly always occurs after the manipulation and reduction of the fracture.

This is particularly true if some time has elapsed before treatment is instituted. If circulatory interference develops as indicated by the presence of pain and edema of the fingers, the gauze bandage is cut between the two arms of the splint and a fresh bandage put on without disturbing the previous one. Once the swelling begins to subside, the gauze bandage is again cut and, with the splint firmly held by an assistant, another bandage is snugly applied. By these maneuvers the circulation of the hand and forearm is controlled and yet no disturbance results in the alignment of the bone fragments.

Postoperative Course—After roentgenograms confirm a satisfactory position of the fragments and show the restoration of normal radiocarpal and distal radio-ulnar joint relationship, the patients are instructed first to use the fingers constantly not only to move the joints actively through their maximum range fifty times daily but at all times to employ the fingers as nearly as possible as in normal daily use, secondly, to abduct the entire arm over the head a minimum of six to eight times a day. The latter exercise prevents loss of shoulder joint function, which is so prone to occur if the arm is held constantly at the side of the body. Impairment of shoulder joint motion is particularly apt to follow Colles' fracture, since falls on the outstretched hand frequently cause trauma to the tendon of the supraspinatus muscle and to the subacromial bursa.

Removal of the Splint—It is my belief that in these comminuted Colles' fractures the best results are secured by maintaining the original position and splint a minimum of from five to seven weeks. In the group 2 cases the average was six weeks. This is directly contrary to my treatment of uncomplicated Colles' fractures in younger adults, in which the bandage is cut down in from seven to ten days, with the dorsal "tong" sprung open and early massage instituted. In young people, active motion can be allowed in from ten days to two weeks and all splintage removed in from two to three weeks.

In the fifteen patients classified under group 2, the foregoing plan was carried out with the result that in each instance the patient secured union of the fragments in the position in which they were placed at the time of the reduction. None of these patients had flexion contractures of the muscles of the forearm. All presented a range of motion in the finger joints equal to that present before the fracture, and in six instances this range of motion in the fingers had been appreciably increased. In this connection it is believed that, regardless of the degree of arthritic change already present in the interphalangeal joints, fracture of the radius need not and should not be a factor in further progression of this very disabling arthritis.

The decision was reached to splint these patients an average time of six weeks, following the observation that patients did not develop contractures of the flexor group of muscles of the forearm, and because a dorsal tilt of the articular surface of the radius recurred in patients splinted as long as four and in one instance five weeks. The history of the latter individual is particularly instructive (case 1). These data may be compared with those of case 2, in which splinting was maintained for six weeks.

CASE 1—A woman, aged 70, unmarried, was admitted to the clinic three hours after a heavy fall down steps, striking on the outstretched hand with resulting complete disability of the affected extremity. The extensive comminution later found on manipulation was not evident in the roentgenograms.

Reduction was performed and checked under the fluoroscope. Normal anatomic relationship of the radiocarpal and distal radio-ulnar joints and normal alignment of radial fragments resulted. After five weeks, further roentgen study revealed maintenance of reduction and showed evidence of new bone proliferation. The splint was removed and massage and active exercises were instituted. The range of motion at the wrist progressively increased. The patient had no symptoms and in the eight weeks after operation declared that she had a normal hand and wrist joint. Examination revealed volar flexion of the hand to a right angle. Dorsiflexion was 60 degrees (now increased to 90 degrees one year after injury). Radial and ulnar flexions were normal as compared with the noninjured side. Forearm pronation was normal, supination within 10 degrees of normal (still lacks 5 degrees of complete supination). Roentgenograms at this time, however, revealed a partial recurrence of the original deformity, although, fortunately, there was no tilt of the radial articular surface.

Comment—A good functional, moderate anatomic wrist resulted in the patient, who was poorly muscled and anemic. It is believed that the anatomic result would have been better had the splint been left on from six to seven, instead of five, weeks. Compare with

CASE 2—Mrs. M. M., aged 68, a housewife, was admitted to the clinic, Feb. 13, 1934, two hours after a heavy fall on the outstretched right hand. Figure 3 was taken on admission and revealed a comminuted fracture of the radius, with posterior displacement and rotation of the distal fragment. There was dislocation of the radio-ulnar joint. Marked comminution was evident at the time of reduction. Figure 2 shows the arm in the "sugar tong" plaster splint. A check up roentgenogram (fig. 4) was taken May 20, 1935, one year and three months following injury. On clinical examination the patient had normal motion in all directions at the wrist and of the fingers.

When the procedure described was instituted three years ago I² was unaware that Platt³ of Manchester, England, had advised five weeks of immobilization for Colles' fracture with displacement. In other papers consulted the average duration of splintage was from three to three and one-half weeks. It is believed that in the type of case here reported immobilization should average six weeks, but that in younger adults with "displaced" Colles' fracture an average of from three to four weeks in splints is sufficient.

TREATMENT OF DISABLING, OLD, UNREDUCED COLLES' FRACTURE

The comparatively excellent results obtained in these difficult cases through the simple operation described by Darrach,⁴ has not been sufficiently recognized. Symptoms are chiefly due to the disturbance in relationship of the distal radio-ulnar joint. A traumatic arthritis develops and with weakness of the wrist causes marked disability. Darrach advises subperiosteal resection of the lower 3 or 4 cm. of ulna. The styloid process is not removed.

I have operated on three such patients admitted to the clinic one year, ten months and eight months, respectively, following fracture. The results were most satisfactory.

SUMMARY

1 Comminuted Colles' fractures are of relatively frequent occurrence in elderly patients. The comminution appears to be due to the presence of brittle avascular bone.

2 Prompt reduction of the fracture is imperative.

3 Reduction should be carried out under general anesthesia, tribrom-ethanol preferred, and then visualized under the fluoroscope.

² Haggart, G. E. The Treatment of Comminuted Colles' Fracture in Elderly Patients. *New England J. Med.* 209: 1140 (Dec. 7) 1933.
³ Platt, Harry. Colles' Fracture. *Brit. M. J.* 2: 288 (Aug. 13) 1932.
⁴ Darrach, William. Fractures of the Lower Extremity of the Radius. *J. A. M. A.* 89: 1683 (Nov. 12) 1927.

4 It is most important that the dorsal tilt of the radial articular surface be corrected and that the normal relationship of the distal radial ulnar joint be reestablished

5 There are pronounced advantages of the so-called sugar tong (Simpson) plaster splint

6 Because of the tendency to recurrence of the deformity of the distal end of the radius in these elderly patients, owing to delayed bone repair, it is believed that the extremity should be continuously immobilized in the "sugar tong" plaster splint for a minimum of from five to seven weeks. The splint is adjusted as indicated, unless there originally was marked swelling, this adjustment does not require removal of the splint

7 Flexion contracture of the hand did not occur in the patients treated by this method

8 Free finger joint motion is necessary, a range of motion allowed by careful application of the splint. Daily complete arm abduction is of advantage in avoiding limitation of shoulder joint motion

9 Nonunion of the ulnar styloid, following fracture, was not a significant cause of symptoms

10 With this procedure, followed by intensive massage, heat and active exercise, a good anatomic and a good functional result was obtained in twelve and in ten patients, respectively, in a group of fifteen (group 2) as compared with five good anatomic and six good functional results in a similar group of fifteen patients (group 1) who were splinted an average of three and a half weeks

605 Commonwealth Avenue.

ABSTRACT OF DISCUSSION

DR. W. BARNETT OWEN, Louisville, Ky. Comminuted Colles' fractures in old people have been the source of much worry to the surgeon and pain and disability to the patient. All have seen the type of case following a Colles' fracture, in which loss of function, swelling of the fingers and painful motion of the wrist have occurred. In a very large proportion of cases a deformity has resulted from absorption of the distal fragments of the radius. However, many times, when some deformity of the wrist has resulted, there has been good restoration of function of the hand and arm. Dr. Haggart's conclusion that it is most important that the dorsal tilt of the radial articular surface be corrected and that the normal relationship of the distal radio-ulnar joint be reestablished is one of the most important statements he has made. To produce this situation, it is obvious that the proper reduction of the fracture primarily, must be accomplished. It has been my custom to place the wrist in palmar flexion after reduction and to apply a dorsal splint of plaster, usually a nonpadded cast is to be preferred. The gripping power of the fingers should not be interfered with. Drop wrist can be easily and safely corrected at the end of about ten days, without disturbing the broken fragments of the radius. Early and frequent inspection and application of heat and light massage are most helpful. The type of anesthetic used to accomplish reduction is a matter of election. I prefer a general anesthetic.

DR. WILLIS C. CAMPBELL, Memphis, Tenn. I have reviewed forty five cases of elderly persons with Colles' fracture. This is a terminal fracture and all terminal fractures are delayed to some extent particularly in old persons. In all fractures of the neck and femur, and even of the external condyle of the humerus in children, nonunion occurs if they are not in perfect apposition. I think that the fluoroscope is a dangerous method and I speak from personal experience. Many of my confreres have suffered afterward. However roentgenography should be employed in all cases of Colles' fracture during the course of the operation. This can be accomplished by roentgenograms, rapidly developed, and the same results can be obtained. I

have not seen any great amount of delay of union in these cases, if reduction was accomplished. I believe that the reason shortening occurs in some of these cases is absorption of the rather atrophic bone afterward. In some of the cases, regardless of what is done, some shortening of the wrist will occur. The flexed position should not be maintained over a long period of time in elderly patients. I apply plaster-of-paris splints next to the skin and have been able to immobilize the fracture quite satisfactorily after reduction. The bad results are due to the fact that Colles' fractures are not given subsequent roentgen study. Roentgenograms should be made at the end of one week. If the fracture is in good position at that time, it will be maintained. I have had a number of fractures that showed some tilting at the end of the week, at which time they could be easily corrected. If this is carried out, the end result will be good. At the end of three weeks another roentgenogram should confirm the position. In elderly persons I remove the posterior portion of the splint and give massage with no motion for six weeks, except in the fingers. In young persons it makes no difference whether or not the splint is removed, because the complications of edema and swelling that occur in adults are lacking and excellent results may be obtained in practically all young persons. The results Dr. Haggart has shown are excellent. I believe that results are not as good in elderly persons as in the young. I know that I have seen some cases of my own at a later time when there has been some shortening of the radius, but on the whole the results are good. Strong traction should be made on the thumb. The reduction is made in the usual manner, but, if strong traction is made on the thumb, many of these radii can be elongated to their normal position and the anatomic landmarks restored.

DR. ROBERT H. KENNEDY, New York. Patients with Colles' fractures are treated by orthopedic surgeons, general surgeons and general practitioners throughout the country. The results are nothing to boast of, whichever group carries out the treatment. The results are comparable to the amount of interest the doctor has in this particular lesion. The public has not learned that many fractures can be treated in such a way that permanent deformity and permanent functional loss are not necessary. Many doctors have the same defeatist attitude. There is no excuse for ever attempting to reduce any Colles' fracture without an anesthetic, unless facilities for it absolutely cannot be obtained within twelve hours. This is not a question of the possibility of obtaining reduction or the ability of the patient to stand pain, but of assurance that no further damage to tissue will be caused by the reduction. I have found the use of local anesthesia quite satisfactory in elderly patients. Too commonly it is stated that at the person's advanced age the result will be good enough without any reduction. A doctor who gives this advice is not granting his patient the advantage of present-day knowledge of treatment. Anything short of a 10 to 15 degree anterior facing of the lower articular surface of the radius means permanent disability and anything short of complete reduction of the dislocation of the inferior radio-ulnar articulation means constant pain on rotation. I do not mean that these replacements can always be obtained, but I do mean that it is inexcusable not to try. I am frequently surprised to find how simple the reduction is in a case I am tempted to sidestep. Even when the patient is seen a week after the fracture occurred, one should not be satisfied without attempting reduction under complete anesthesia. Either doctors must learn to read their roentgenograms or they must insist that roentgenologists give more detailed reports in the instance of Colles' fractures. A typewritten report of "satisfactory reduction" means nothing. I believe that the only satisfactory reduction is 100 per cent perfect, but, as I said many surgeons believe that no attempt at reduction is satisfactory. Roentgenologists can be as variable in their interpretation of the word satisfactory. I have been given this report many times when analysis of the roentgenogram shows a position that will result in permanent disability and constant pain. The doctor giving treatment should analyze his own roentgenograms, but, if he does not do this, he should employ a roentgenologist who reports on fractures in mathematical terms of angles, axes and apposition. Roentgenologists should not be expected to have as much knowledge of fractures and as much interest in them as physicians. I cannot agree with the general use of the fluoroscope

while reducing Colles' fractures. It entails too much danger to the surgeon who does it frequently.

DR. ROLAND HAMMOND, Providence, R. I. In treating comminuted Colles' fracture in elderly patients, there are two deformities to overcome. First, one must restore the radial styloid to its proper position, and the ulnar styloid must be brought up. In my experience, unless those fractures are held in absolute position for from a week to ten days, one will have a gradual molding back into deformity. For that reason I have found the sugar tong splint unsatisfactory. I apply a circular plaster bandage from above the elbow to the knuckle joints, but I do more than simply flex the wrist or bring it into ulnar deviation, I put a little twist into it so that the ulnar styloid comes up. That absolutely maintains the radial styloid in position and reduces most of the deformity. The cast should not be left on for more than a week or ten days. At that time it is surprising what amount of firmness has been obtained in the fracture and one may then go to wooden removable splints with the assurance that the fracture will remain in position. The difficulty is reading the roentgenograms afterward with the wrist in this twisted position, but one soon learns to do it.

DR. G. E. HAGGART, Boston. What Drs. Kennedy and Campbell have said is correct. I didn't mean to imply that I reduced them under the fluoroscope all the time. The point they bring out is that the quick-snap roentgenograms will even do away with that. My point is that one should have vision of the fracture immediately following reduction at the time one puts the splint on and then check it with the plate. I feel that in the comminuted type of fracture in elderly patients, if one can prevent pronation and supination, it will help in maintaining the position one secures. The principle of no reduction is decidedly pernicious and any one should have the opportunity of treatment. As to Dr. Hammond's remarks, I am a little unhappy about softened plaster. In this type of splint, one can control it and adjust it to fit the degree of circulatory change much more satisfactorily than with the other splint.

Clinical Notes, Suggestions and New Instruments

SPONTANEOUS INTRAPERITONEAL RUPTURE OF THE NORMAL URINARY BLADDER

ROGER W. BARNES, M.D., and A. A. STEELE, M.D.
LOS ANGELES

Rupture of the urinary bladder without trauma and without a predisposing pathologic condition is sufficiently rare to justify the report of a case.

L. F., a man, Spanish, aged 34, entered the hospital the evening of Aug. 3, 1935. About eighteen hours before, while straining to void, he had a sudden severe pain in the lower part of the abdomen, which caused him to faint. He had been playing cards for four hours and had not voided during that time. A high-ball was taken before dinner, otherwise there had been no ingestion of liquor. This was corroborated by others present at the time, as was also his statement of having had no injury. Previous to this his health was excellent, and he had never had any genito-urinary symptoms.

A physician was called, and because of the complete absence of any previous or present genito-urinary symptoms the patient was kept under observation and treated palliatively. Fifteen hours later he felt the desire to void and passed only a small amount of blood. He was immediately sent to the hospital.

The patient was well developed and well nourished. He complained of extreme pain in the lower part of the abdomen. This was found to be rigid and somewhat tender. Three hundred and fifty cubic centimeters of bloody urine was obtained by catheterization. Otherwise the examination was essentially negative.

A roentgenogram of the urinary tract showed a shadow in the region of the lower end of the right ureter, very suggestive

of a calculus. A tentative diagnosis of ureteral calculus was made, and cystoscopic examination advised.

A No. 24 cystoscope was passed very easily and the bladder was found to contain numerous large blood clots. When these were evacuated through the cystoscope, the bleeding point was visualized in the dome of the bladder. Closer inspection revealed a ragged tear in the bladder mucosa at this point, and a diagnosis of intraperitoneal rupture of the bladder was made. The bladder was otherwise entirely normal. There was no evidence of obstruction at the bladder neck, no ulceration of the mucosa and no trabeculation. A No. 9 bougie met no obstruction when passed 30 cm. up the right ureter. A cystogram showed the characteristic ill defined outline of the fundus of the bladder, and diffusion of the cystographic fluid through out the lower part of the abdomen confirmed the diagnosis.

A laparotomy was done immediately, and when the peritoneum was opened a large amount of bloody fluid was found free in the peritoneal cavity. When this was aspirated, a ragged opening into which three fingers could be inserted was found extending from the peritoneal cavity to the bladder, situated just to the right of the midline in the posterosuperior portion of the bladder. No other intraperitoneal injury or abnormality was found. The tear was sutured in two layers with No. 2, forty-day chromic catgut, a stab wound was made through the abdominal wall on the right side, two rubber tissue drains were inserted to the site of the rupture, and the peritoneum was closed. The bladder was then opened extraperitoneally. Its interior was examined and found to be normal except for the tear that had just been sutured. A suprapubic catheter was fastened into place by a purse-string suture, and the abdominal incision was closed.

Following the operation the patient had considerable abdominal distention from intestinal gas, which was fairly well controlled by the Levine tube and gas enemas. Otherwise his convalescence was uneventful, the suprapubic catheter being removed on the ninth postoperative day and a urethral catheter inserted. The suprapubic opening healed rapidly and remained closed after the urethral catheter was removed on the thirteenth postoperative day. He left the hospital in good condition on the fifteenth postoperative day.

Stone,¹ in 1931, reported two cases of so-called spontaneous rupture of the bladder, gave an excellent review of the literature, and summarized the cases reported before that time. He found forty-two cases, in twenty-one of which there was no lesion in the bladder. The probable cause of rupture in these twenty-one cases was as follows: manual expression of placenta, one, during labor, five, attempted micturition during acute retention (cause of retention not given), six, intoxication without trauma (?), three, straining at stool, three, sudden lifting of weight, three.

Since 1931 there have been three cases² of so-called spontaneous rupture of the bladder reported: one in a woman with chronic retention and overflow (no cause of retention found), one a tuberculous bladder, and one a subacute retention due to gonococcal urethritis. In each of these, pathologic changes in the bladder or urethra preceded the rupture.

In the case reported there had been no previous genito-urinary symptoms. There was no pathologic condition in the bladder in the urethra or at the bladder neck, and previous ingestion of liquor had not been sufficient to cause intoxication. No history of trauma could be obtained. It is probable that the distended bladder produced sufficient edema about the bladder neck to cause some obstruction and, when the patient strained to void, the intravesical pressure was sufficient to cause the rupture. This case makes a total of twenty-two cases of spontaneous rupture of a normal bladder that have been reported. Even though it is rare, the condition should be considered in any case presenting the symptom of sudden severe pain in the lower part of the abdomen.

947 West Eighth Street

1 Stone, Eric. Spontaneous Rupture of the Urinary Bladder. Arch. Surg. 23: 129 (July) 1931.
2 Alton, B. H. Spontaneous Intraperitoneal Rupture of a Tuberculous Bladder. New England J. Med. 205: 1177 (Dec. 17) 1931.
Chi Chang Ken. Spontaneous Rupture of the Urinary Bladder. Chinese M. J. 48: 69 (Jan.) 1932.
Jones, Arthur. Spontaneous Rupture Intra-peritoneally of the Urinary Bladder. New England J. Med. 210: 1262 (June 14) 1934.

COMPLICATIONS FOLLOWING USE OF SACCHARIN
AND ETHER AS A CIRCULATION TIME TEST

HARRY D LEINOFF M.D NEW YORK

In 1933 soluble saccharin (sodium orthosulphumbenzoate) was introduced by Fishberg and his associates¹ as a means for measuring the circulation time. A year later Hitzig² introduced ether to measure the efficiency of the right heart. The combination of these two methods has been popularly designated as the saccharin ether test for circulation time. In both of these communications the authors stress the safety and lack of both local and systemic reactions. It is my purpose to report two serious accidents following the use of this test.

TECHNIC

Saccharin Method Three grams of soluble saccharin is placed in a dry tube and autoclaved for ten minutes, then 3 cc of sterile triple distilled water is added and the mixture is gently heated until the solution is completed. This is allowed to cool and 25 cc is injected intravenously through a number 19 gage needle as rapidly as feasible. The time necessary for the saccharin to travel from the site of injection to the tongue is measured. This is called the arm to tongue time and is normally from eight to sixteen seconds.

Ether Method Two and five-tenths cubic centimeters of a 10 per cent ether in saline solution is injected intravenously and the time interval between the moment of injection and the appearance of ether on the patient's breath is measured.

REPORT OF CASES

CASE 1—L B, a white woman, aged 31, was admitted, April 13, 1935, with a diagnosis of acute catarrhal jaundice. Three days later circulation time studies were done. The arm to lung (ether test) was 68 seconds unfortunately the patient moved her arm during the saccharin test and some of the solution infiltrated the perivascular tissue. She immediately complained of a very sharp pain and the injection was stopped. The antecubital space showed an infiltration and a dark bluish discoloration. The arm was treated with hot moist dressings and improved clinically in a few days. Though the patient still complained of some pain in her arm she was discharged, April 24. At this time the involved area was tender and covered with a very dark, dry bluish scab. At no time did the patient have any fever. A few days later the infiltrated area became very painful and swollen, with red streaks extending up into the arm and down into the forearm associated with an axillary lymphadenitis. The temperature ranged from 101 to 103.5 F. The involved area was incised and drained a gelatinous material for ten days. Complete healing took place in about four weeks.

CASE 2—F G a white man, aged 32 was admitted April 17, 1935, with a diagnosis of bronchial asthma. The patient was discharged twelve days later with no improvement in the condition. May 9, on readmission he complained of a severe asthmatic attack of three days duration, during which time he had been unable to obtain any relief. The examination of the patient showed a typical asthmatic chest, a right frontal sinusitis and an eosinophilia of 23 per cent. May 15 it was decided to do circulation-time studies in order to rule out a possible cardiac origin for the asthma as suggested by Blumgart.³ Immediately preceding the tests the patient was examined. The lungs revealed typical signs of asthma, the heart sounds were distant, the blood pressure was 100 systolic, 82 diastolic and the pulse rate 84. The saccharin solution was injected giving a time of sixteen seconds which corresponded to the upper limits of normal. The ether solution was now injected, and immediately the patient began to cough and experience great difficulty in breathing. He became markedly cyanotic, the chest was fixed in expiration and the pulse rate became extremely rapid and thready. The chest revealed barely audible heart sounds and the respiratory murmur was inaudible with occa-

sional dry rales. In spite of all emergency therapy used at the time, such as epinephrine intravenously and intracardially, the patient died. A postmortem examination was not obtained. The ether time in this case was normal.

COMMENT

Because of the simplicity of the test and the ease with which it can be done by every one, I think that a word of warning should be sounded in reference to the possible complications.

In the first case there can be no doubt that the perivascular infiltration of saccharin produced an atypical inflammation that lasted five weeks. The character of the discharge was distinctly different from the usual collection of pus suggesting a chemical type of irritation. It is possible that the jaundice in this case contributed toward the atypical reaction of the tissues. However in some of the other cases in which infiltration of saccharin took place no deleterious effects were noted.

In discussing the second case very little can be said from a dogmatic point of view. The cause and effect were too closely related to each other to leave any doubt about the part that the test played in the production of this patient's death. I do not think that the test in itself caused the patient's death, but certainly it was the precipitating factor in an already extremely hypersensitive individual. Immediately after this incident the entire batch of materials that had been used was injected into a cat in the physiology laboratory to determine whether any toxic results could be obtained. No abnormal effects resulted.

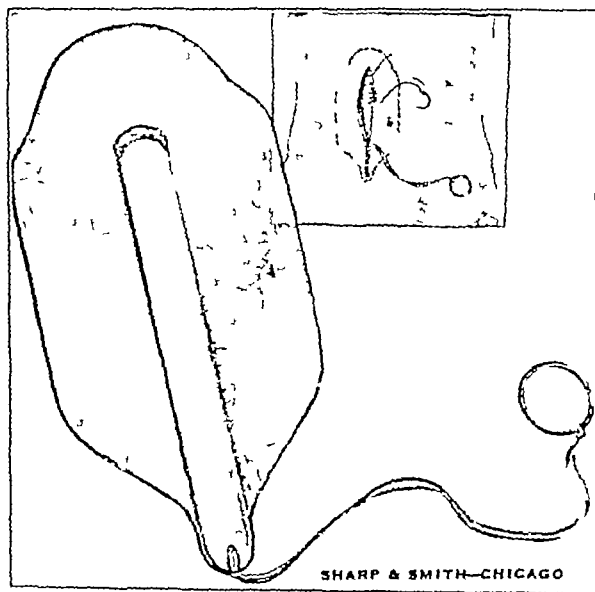
2021 Grand Concourse.

VISCERA RETAINER

R W McNEALY M.D CHICAGO

The experience of many surgeons teaches that it is often more difficult to close the abdomen of an obese or muscular patient than it is to perform the preceding steps of the operation. If the patient takes a poor anesthesia and is inclined to strain or breathe irregularly, the difficulties of closure will be increased.

Many ingenious instruments have been devised to help retain the viscera beneath the level of the edges of the peritoneum



A steel reinforced soft rubber viscera retainer

during the course of parietal closure. If such instruments are to be wide enough to offer any material aid they are usually awkward to remove when the peritoneum is closed very far. If lap pads are used to retain the omentum and intestine, their extraction is often accomplished with considerable tugging, and the intestine or omental tags are pulled through the opening.

The instrument that I have devised and used for some time has the general shape of a sole fish. It is made of soft Para rubber of about 3 mm thickness and has a central reinforce-

From the Department of Medicine, New York Homeopathic Medical School and Flower Hospital, service of Dr. P. J. R. Schmahel.

1. Fishberg, A. M., Hitzig, W. M., and King, F. W. Proc. Soc. Exper. Biol. & Med. 30: 651-652 (Feb.) 1933.

2. Hitzig, W. M. Proc. Soc. Exper. Biol. & Med. 31: 935-938 (May) 1934.

3. Blumgart, H. L. Medicine 10: 1 (Feb.) 1931.

ment of flat steel of about 1.5 mm thickness, which runs from one end to within 5 cm of the other. This piece of steel is 2 cm wide and has an eye in the forward end through which braided silk is passed.

The central stay reinforcement usually is passed beyond each end of the peritoneal opening and the soft rubber sides spread out beneath the peritoneum to prevent the omentum and intestine from escaping. The braided silk cord with a ring attached protrudes through the lower end of the wound. This retainer can be left in the abdomen until the opening is sutured to within 3 cm of its end, when the braided silk can be used to slip the eye of the retainer into the wound. The soft rubber sides will fold on the central steel reinforcement and permit of easy removal. The moist rubber surfaces will not drag on intestine or omentum. The advantages of the instrument may be summarized as follows:

- 1 It is easily sterilized
 - 2 It can be inserted readily and easily removed
 - 3 It does not scrape the peritoneal surfaces
 - 4 It efficiently retains omentum and viscera during the difficult periods in the closure of the peritoneum
- 30 North Michigan Avenue

Special Articles

RECENT ADVANCES IN ENDOCRINOLOGY

RELATION TO INTERPRETATION AND UNDER-
STANDING OF COMMON SYMPTOMS

CLINICAL LECTURE AT ATLANTIC CITY
SESSION

DAVID PRESWICK BARR, M.D.
ST. LOUIS

It requires no wide acquaintance with endocrinology to realize that the practical application of organotherapy has lagged far behind advances in anatomic and physiologic knowledge. Although medication with thyroid and insulin and even with epinephrine and solution of posterior pituitary has been conspicuously successful, the clinical use of more recently discovered substances, such as parathyroid extract, adrenal cortex extract, estrogenic substance and anterior pituitary-like principle from the urine of pregnancy, is restricted and sometimes disappointing. Many preparations, such as the active principle of the corpus luteum, the testicular hormones and the growth, thyrotropic and adrenotropic fractions of the hypophysis, while capable of causing predictable effects in experimental animals, have had for one reason or another limited application in the treatment of disease. If specific therapy were the sole aim of the study of glands of internal secretion, there might be some reason for discouragement on the part of practitioners. It is apparent, however, that the significance of endocrinologic research cannot be measured by this criterion alone and that it must be judged also by the light which investigation has shed on the understanding of disease in general. With increasing knowledge of the hormones, many common symptoms and maladies have acquired new interest. Ideas concerning pathogenesis have been transformed and previously unrecognized interrelationships have been revealed. It is with this aspect of the recent developments in endocrinology that I am concerned here.

From the Department of Medicine, Washington University School of Medicine and the Barnes Hospital.

Read before the General Scientific Meeting at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1935.

Needless to say, a thorough survey will not be possible. Already the glands of internal secretion are known to affect the most diverse clinical conditions. Adiposity, hypertrichosis, abnormal pigmentation, hypertension, menstrual disorders, disturbances in carbohydrate metabolism, decalcification of the skeleton and polycythemia are only a few of the pathologic states in which endocrine influences can be demonstrated. From this vast array of possible subjects I have chosen to consider only three and shall limit my discussion to the influence which newer knowledge of the glands of internal secretion has had on the concepts of hypertension, obesity and disturbances in carbohydrate metabolism. The reasons for selecting these particular conditions are, first, that they are extremely common disorders and form a part of the experience of every practitioner, second, they are to some extent interrelated and, lastly, much attention has been given of late to the possibility of their surgical or roentgenologic treatment.

HYPERTENSION

Experience has taught that hypertension must be regarded as a symptom rather than as a disease. The lability and variability of the blood pressure, apparent under physiologic states of exertion and emotion, are more evident in association with pathologic states. It accompanies such different conditions as increased intracranial pressure, thyrotoxicosis, eclampsia and glomerular nephritis. In so-called malignant hypertension the association with arteriolar sclerosis is so early as to suggest the possibility that the high blood pressure is actually caused by primary disease of the blood vessels. While these and other factors are known to contribute to elevated pressure, hypertension is most often encountered in the condition that has been called hyperpiesis, or essential hypertension, a form in which the etiology is almost entirely unknown and in which early correlated anatomic lesions cannot be demonstrated. The realization that essential hypertension tends to be familial and to a certain extent hereditary does not explain its mechanism, and it is in this type of high blood pressure that the hope of demonstrating some relatively simple endocrine factors has long been entertained.

When epinephrine, the pressor substance of the adrenal medulla, was discovered it was immediately supposed, and quite naturally, that clinical disturbances in the level of blood pressure might be explained by its excessive or defective secretion or by an abnormal response of the hypertensive individual to its physiologic effect. The idea was strengthened by the claim, not well substantiated, that the adrenal medulla is hypertrophied in hypertension,¹ and by the disclosure that epinephrine produces hyperglycemia and glycosuria,² signs not infrequently encountered in association with clinical hypertension.³ In spite of this theoretical probability, efforts to prove that the usual case of high blood pressure is dependent on abnormal relations to epinephrine have in general been disappointing.

The detection of the pressor substance in the blood stream offers great difficulties because of its extreme dilution. In the adrenal vein it has been found in

¹ Goldzieher, M. A. *The Adrenals: Their Physiology, Pathology and Diseases*. New York, Macmillan Company, 1929.

² Blum, F. Ueber Nebennierendiabetes. *Deutsches Arch. f. klin. Med.* 71: 146, 1901. Cori, C. F., and Cori, G. T. The Mechanism of Epinephrine Action. II. The Influence of Epinephrine and Insulin on the Carbohydrate Metabolism of Rats in the Postabsorptive State. *J. Biol. Chem.* 79: 321 (Sept.) 1928.

³ Wiechmann, Ernst. Hypertension und Blutzucker. *Deutsches Arch. f. klin. Med.* 161: 92 (Aug.) 1928.

amounts corresponding to not more than one part in 360,000, which indicates that in the general circulation it might reach dilutions of 1 100,000,000,⁴ an amount so small that present chemical tests are not applicable, and even the extremely delicate physiologic methods are insufficient for quantitative estimations. Under such circumstances reliable comparisons between normal and pathologic individuals are not to be expected, and actual efforts to demonstrate increased amounts of epinephrine in the circulating blood of hypertensive subjects have led to conflicting results.⁵ Similarly, efforts to show that patients with high blood pressure are unduly sensitive to epinephrine have been unsuccessful, and there is at present no convincing evidence that the vascular system of such subjects responds abnormally to the pressor substance from the adrenal.⁶

It should be added that many physiologists have been opposed to the view that epinephrine is responsible for the maintenance of normal blood pressure or for the production of continued elevation. Cannon⁷ indeed believes that there is no sustained discharge of epinephrine but that it is a part of a supplementary mechanism which becomes active only in emergency.

In spite of such adverse opinion the possibility that excessive amounts of epinephrine produced in the body may cause temporary or even permanent high blood pressure has been established through study of paragangliomas, tumors derived from the chromaffin system and from those cells known to be active in the usual elaboration of epinephrine. In a number of instances such tumors have been accompanied by paroxysmal attacks of excessively high blood pressure.⁸ Sudden elevation of systolic pressure from normal to 300 or more with corresponding changes in diastolic have been observed and have been accompanied by colicky pain, anginoid attacks, mydriasis, dyspnea, pallor, glycosuria and hyperglycemia, symptoms which may be seen following the therapeutic injection of epinephrine in sensitive individuals. Analyses have shown that the tumors contain variable and at times extremely large amounts of epinephrine. Kalk,⁹ using both chemical and physiologic methods, found from 375 to 500 mg of the substance in the tumor on which he reported. When it is remembered that the amount of epinephrine which Schmorl¹⁰ found in two normal adrenals was only 4.22 mg, and when it is recalled how small an intravenous dose of epinephrine is necessary to produce a rise in blood pressure, the enormity of such values is readily appreciated. In one case Ernould and Picard¹¹ believed that they could demonstrate an increased amount of epinephrine in the circulating blood.

While in the early stages of paragangliomas the symptoms and the elevation in blood pressure are paroxysmal, continuance of the cause may result in permanent hypertension, and autopsy may reveal in the kidneys, retinal vessels and elsewhere changes that are scarcely distinguishable from those of essential hypertension.¹² As is well known, removal of a paraganglioma in the earlier stage of its development may result in establishment of completely normal blood pressure and permanent cure.¹²

Study of these chromaffin tumors does not necessarily lead to the inference that cases of essential hypertension are due to excessive epinephrine. It does demonstrate that a picture clinically and pathologically quite similar may be produced by an excess of epinephrine arising in the chromaffin system of the affected individual.

Paragangliomas are not the only tumors of the adrenals in which elevated blood pressure has been observed. It has also been seen with cortical tumors and with hyperplasia of cortical cells.¹³ Clinically many of these tumors have been accompanied by hirsutism, amenorrhea, obesity and other symptoms now recognized as typical of the adrenocortical syndrome. Although in one such case Langeron, Paget and Loheac¹⁴ found a great increase in the epinephrine content of the tumor tissue, in another only a trace was present. In spite of the fact that lesions have not often been of such a nature as to indicate direct involvement of the medulla, the blood pressure has been consistently elevated. In its character, however, it differs from hypertension associated with paraganglioma. Ordinarily the elevation is not extreme, the systolic pressure varying from 140 to 180, the diastolic from 95 to 120. There are no paroxysmal attacks, and diurnal variations in the blood pressure, while present, are not striking. In several cases the removal of tumors has been accompanied by a fall in blood pressure to normal levels.¹⁵

The association of high blood pressure with adrenal cortical tumors is of special interest in connection with the recent observation of Cushing¹⁶ on the functions of the basophil cells of the hypophysis. As is now well known, the relatively rare adenomas of the basophil cells of the pituitary have been in a surprising number of instances associated with a syndrome which is almost, if not quite, indistinguishable from that which has been ascribed to adrenal cortical tumors. In addition to the hirsutism, obesity, menstrual disturbances and other features, hypertension of about the same level and character is an almost constant feature.

Cushing has laid great emphasis on reasons for considering that the basophil cells may be in some degree responsible for the hypertension.¹⁷ The logical steps in such reasoning may be outlined. Solution of posterior pituitary, the substance extractable from the posterior lobe, is capable of producing elevation in blood pressure

4 de Wesselow O. L. V. Arterial Hypertension. *Lancet* 2 636 (Sept 22) 1934.

5 (a) Kuré K, Nakaya T, Murakami S and Okinaka S. Hyperadrenalinämie bei essentieller Hypertonie und ihre Behandlung durch Atropin. *Klin. Wchnschr* 12:454 (March 25) 1933. (b) Brandt F and Katz G. Ueber den Nachweis von Adrenalinsekretion beim Menschen. *Ztschr f klin Med* 123 23 1933. de Wesselow.⁴

6 Klyn Eskin. *Die Hypertoniekrankheiten* ed 2. Berlin Julius Springer 1930.

7 Cannon W. B. Studies on the Conditions of Activity in Endocrine Organs. XVII. Evidence That Medullary Secretion Is Not Continuous. *Am J Physiol* 8:8:447 (Oct.) 1931.

8 Collier F. A. Field Henry Jr and Durant T. M. Chromaffin Cell Tumor Causing Paroxysmal Hypertension Relieved by Operation. *Arch Surg* 28 1136 (June) 1934. Pincoffs M. C. Medullary Tumors of the Adrenal Glands read before the American College of Physicians April 30 1935.

9 Kalk H. Paroxysmale Hypertension. *Klin Wchnschr* 13 613 (April 28) 1934.

10 Schmorl quoted by Kalk.⁹

11 Ernould H., and Picard, E. Un cas de sympathome sympathogique avec hypertension artérielle paroxystique. *Rev belge sc. méd* 6 223 (March) 1934.

12 Collier Field and Durant.⁸ Pincoffs.⁵ Bauer J and Leriche R. Zur Klinik und Therapie des Paraganglioms. *Adrenalogie*. Hochdruck kranken. *Wien klin Wchnschr* 47 1224 (Oct 12) 1934.

13 Walters Walzman Wilder R. M. and Kepler E. J. Suprarenal Cortical Syndrome with Presentation of Ten Cases. *Ann Surg* 100 670 (Oct.) 1934.

14 Langeron L, Paget M. and Loheac, P. Dosage de l'adrénaline dans trois cas de tumeurs surrénales. Rapports avec la structure histologique de la tumeur et la tension artérielle du malade. *Compt rend. Soc. de biol* 100 873 (April 8) 1929.

15 Walters Wilder and Kepler.¹³ Murray C. G. and Simpson, G. S. A Case of Virilism Due to an Adrenal Cortical Hypernephroma. *Lancet* 2:745 (Oct 8) 1927.

16 Cushing Harvey. The Basophil Adenomas of the Pituitary Body and Their Clinical Manifestations (Pituitary Basophilism). *Bull Johns Hopkins Hosp* 60 137 (March) 1932.

17 Cushing Harvey. Hyperactivation of the Neurohypophysis as the Pathological Basis of Eclampsia and Other Hypertensive States. *Am J Path.* 10 145 (March) 1934.

somewhat less dramatic but considerably more prolonged than that following epinephrine. Although this substance is stored in the posterior lobe and can be extracted from it, there is much reason for the belief that it is not formed in the cells of the nervous tissue constituting the substance of the posterior portion of the hypophysis. It seems more likely that it is a secretion of the cells of the pars intermedia which are basophilic in their staining reaction and are distinguishable with difficulty from the basophil cells of the anterior lobe and from those found in basophilic adenoma. Such cells are not always confined to the pars intermedia but may wander out into the posterior lobe, where they are seen as collections of cells still receptive to the basic dyes. Cushing emphasized the increased invasion of the posterior lobe by such cells in hypertensive and in eclamptic individuals and has suggested that both the proliferation of cells and the invasion of the posterior lobe may be significant in the etiology of elevated blood pressure. This fascinating hypothesis has stimulated much thought and work but is still open to question. Study of a larger number of hypophyses by many observers has led to the impression that the number of basophilic cells increases with the age of the individual, that they are greater in number in hypersthenic than in asthenic individuals, thus in general tending to show predilection for the type of patient statistically most likely to have high blood pressure, and that they tend to accumulate to a greater extent in the posterior lobe in hypertensive individuals.¹⁸ It has also become evident, however, that such cells may not be demonstrable in some cases with excessively high pressure and may on the contrary be seen in young individuals whose blood pressure has been normal.¹⁹

The trend of recent work has supported the contention that anatomic lesions of both the adrenals and the pituitary may be coincident with and possibly responsible for considerable changes in blood pressure and that the associated lesions are not limited to the medulla of the adrenal, the supposed source of epinephrine, or to the posterior hypophysis, where the active substance, solution of posterior pituitary, is stored, but that they may also occur in the adrenal cortex and in the basophil cells of the anterior hypophysis. While it by no means follows that ordinary cases of hypertension are dependent on similar changes, the possibility of adrenal and hypophyseal participation is established.

OBESITY

Less perhaps can be said of the effect of recent endocrine developments on our understanding of obesity. Clinical and laboratory experience has demonstrated that although such factors as lack of exercise and excessive consumption of food are of great importance in the production of adiposity, they are not sufficient to permit great fat accumulation in all individuals. That excessive obesity is familial and to a certain extent hereditary does not explain the mechanism of fat deposition. For many years there has been an effort to attribute excessive obesity, whether familial or otherwise, to endocrine dysfunction. Classification has usually been attempted on the basis of the distribution of fat, which varies widely in obese subjects. Emphasis

has been placed on the occurrence of excessive trochanteric fat as an expression of hypogonadism, and of fat accumulation in the supraclavicular regions and about the wrists and ankles as evidence of lowered thyroid function. Subcutaneous deposits about the hips, thighs, the mons and the lower part of the abdomen, the so-called girdle obesity, has been considered as evidence of pituitary insufficiency.²⁰ Although interest in these classifications has not lessened, it is now recognized that some of the conclusions were in part premature. Even the conception of hypophyseal obesity has undergone considerable change. The basis for attributing girdle obesity to pituitary insufficiency arose from the study of Froehlich's syndrome. Froehlich's original case was attributed to a pituitary tumor,²¹ and apparent confirmation of such an association was obtained from many reports of similar symptoms developing in patients who suffered from pituitary lesions. As other cases of the adipose genital syndrome accumulated, however, it became evident that the same clinical picture could arise with extrasellar tumors and that it was not unusual to see cases in which the hypophysis was entirely uninvolved.²² More commonly lesions are found in the region of the hypothalamus, and, even in those cases in which the hypophysis is primarily affected, pressure or invasion of the hypothalamus is excluded with difficulty.

In experiments with rats, Philip Smith²³ was able to show that complete removal of the hypophysis without injury to the adjoining nervous tissue caused no adiposity. On the other hand, chemical damage to the hypothalamus with no injury to the hypophysis resulted in marked accumulation of fat. While these beautiful observations of Smith are usually considered decisive in disproving the primary importance of the pituitary gland in the causation of the Froehlich type of obesity, they have not discouraged the effort to associate the distribution of fat with endocrine disorders.

Cushing's study of the clinical symptoms accompanying basophil tumors of the hypophysis has emphasized the so-called buffalo type of obesity, a distribution characterized by accumulation of fat on the face, neck and trunk, with relative slenderness of both arms and legs. It is often accompanied by the appearance of large red striae on the abdomen and on the upper portion of the thighs and is not infrequently painful.¹⁸ It has also been seen in typical form in the presence of adrenocortical tumors.¹³

While this curious and characteristic distribution of fat is perhaps the most convincing evidence of endocrine influence thus far available, it is not yet clear whether the picture is to be ascribed primarily to pituitary or to adrenal influence. The recent experiments of Thompson and Cushing²⁴ are of great interest. Because of the supposed relationship between the basophil cells and the sex stimulating hormones of the hypophysis, they conceived the idea that the long continued injection of active gonadotropic hormones into young animals might produce some of the symp-

20 Engelbach, William. *Endocrine Medicine*, Springfield Ill., Charles C. Thomas, 1932.

21 Froehlich, A. *Wien klin Rundschau* 15:883, 1901. Major R. H. *Classic Descriptions of Disease*, Springfield Ill., Charles C. Thomas, 1932, p. 269.

22 Borchardt, L. *Ueber zerebrohypophysäre Fettsucht*. *Endokrinologie* 10:250, 1932. Malsisch, R. M. *Zur Pathogenese der adiposo-genital Dystrophie*. *Arch. f. Psychiat* 89:34, 1933.

23 Smith, P. E. *The Disabilities Caused by Hypophysectomy and Their Repair*. *The Tuberal (Hypothalamic) Syndrome in the Rat*. *J. A. M. A.* 88:158 (Jan 15) 1927.

24 Thompson, K. W., and Cushing, Harvey. *Experimental Pituitary Basophilism*. *Proc. Roy. Soc. London* s. B 115:88 (May 1) 1934.

18 Kraus, E. J. and Traube, O. *Ueber die Bedeutung der basophilen Zellen der menschlichen Hypophyse*. *Virchows Arch. f. path. Anat.* 268:315, 1928.

19 Smith, M. and Kunkel, P. Personal communication to the author.

toms observed with basophilic tumors. The injected animals were retarded in skeletal development and became both adipose and plethoric.

DISTURBANCES IN CARBOHYDRATE METABOLISM

With the discovery of insulin and the demonstration of the rôle played by the islands of Langerhans in its production, the view previously held that diabetes is dependent on disease of the pancreas was apparently confirmed. The nature of diabetes could be redefined as a condition dependent on disease involving the islands of Langerhans and on the deprivation of insulin.²⁵

Although this view has been widely accepted, it does not explain with entire satisfaction some clinical and experimental observations. Pathologic studies of the pancreas in ordinary diabetes have failed to demonstrate constant lesions. In his study of the pancreas in nondiabetic patients, Warren²⁶ showed that practically any lesion found in the pancreas of diabetic patients could be duplicated in nondiabetic patients and concluded that it was impossible to diagnose the presence or absence of diabetes from a study of the pancreas. Even in cases in which death has resulted from the severity of the diabetes the islands of Langerhans may deviate but little from the normal, and it would appear that the anatomic mechanism for the production of insulin is well preserved.

Another difficulty has arisen from the study of insulin resistance and insulin sensitivity. Even in the early days of the use of insulin cases were encountered in which unusually large doses were required. Time has added a great number, and it is now recognized that in the presence of infection, in some cases of hyperthyroidism,²⁷ in hemochromatosis,²⁸ in hepatic disorders and in the presence of some forms of pituitary disease²⁹ the effectiveness of a given dose of insulin may be greatly decreased.³⁰ Such insulin resistant cases have also been encountered in the absence of these obvious factors. Other cases have shown an abnormal sensitiveness to insulin in that slight excess of the dosage required to control the diabetic condition produces hypoglycemia and its accompanying symptoms. It has been shown that the amount of insulin necessary to cause a fall in blood sugar varies widely both in diabetic and in nondiabetic patients. Doses of 0.001 unit per kilogram have been sufficient in some cases, while in others as much as 0.5 unit per kilogram was necessary.³¹ Such observations clearly indicate that there is no definite or constant relationship between the amount of insulin and the amount of carbohydrate which it will cause to be utilized. They suggest that there might be some contraregulatory mechanism capable of neutralizing the effect of insulin.

Recent work has thrown much light on this possibility and has indicated that both the pituitary and the

adrenals are concerned with the activity of insulin and with the severity or mildness of diabetes.

Glycosuria is a symptom in about 25 per cent of the cases of acromegaly.³² One half of the cases of basophilic tumors of the hypophysis have exhibited diabetes. On the other hand, certain cases of lowered pituitary function, such as Simmonds' disease, have shown a high tolerance for carbohydrate and at the same time an extraordinary sensitiveness to insulin.³³

The experiments of Houssay,³⁴ which were repeated by Barnes and others,³⁵ have been of crucial importance. It was found that hypophysectomy in animals from which the pancreas had been completely removed lessened the degree of glycosuria and hyperglycemia and at the same time induced a state of sensitiveness to insulin so great that the administration of one unit might be sufficient to produce hypoglycemic convulsions. In Barnes's dog no spontaneous glycosuria appeared during many weeks of observation, a high sugar tolerance being the only evidence of the loss of pancreas and of the diabetic state. On the other hand, injections of extracts of pituitary, containing the so-called diabetogenic principle produced glycosuria. In Long's depancreatized and hypophysectomized cats, such extracts were capable of causing excessive glycosuria, hyperglycemia, ketosis, coma and death.

A conclusion drawn from such experiments has been that the pituitary contains a principle which lessens the effectiveness of insulin and that the absence of this principle following hypophysectomy renders the animal sensitive even to very small amounts of the pancreatic substance.

Still more informing are the recent experiments of Long³⁶ and his collaborators. After overcoming enormous technical difficulties they are now able to prepare cats from which both the pancreas and the two adrenals have been removed. With minor variations the effect is the same as in the Houssay dogs. There is marked lessening of the severity of the diabetes and, if an active suprarenal cortical extract is given, a great prolongation of life. One important difference has been noted between Houssay's dogs and Long's cats. The adrenalectomized and depancreatized animal does not respond even to large doses of a pituitary extract that causes fatal ketosis in the hypophysectomized and pancreatectomized animals.

The natural conclusion to draw from these experiments is that action of the anterior pituitary substance is possible only through the mediation of the adrenals. Removal either of the pituitary or of the adrenal glands will lessen the severity of the diabetes and produce sensitiveness to insulin. The protection against pancreatectomy is removed by injection of solution of pituitary when the adrenals are present but is not altered when they have been removed.

One surprising outcome of Long's work is that adrenal cortex extract, the active principle of the

25 Joslin E P. *The Treatment of Diabetes Mellitus*. Philadelphia Lea & Febiger 1928.

26 Warren Shields. *The Pathology of the Pancreas in Nondiabetic Persons*. Arch. Int. Med. 44: 663 (Nov.) 1927.

27 Strauss H. Ueber Insulin resistente Diabetiker. Klin. Wchnschr. 4: 491 (March 12) 1925.

28 Root H F. Insulin Resistance and Bronze Diabetes. New England J. Med. 201: 201 (Aug. 1) 1929. Stetson R P and Peters J P. Carbohydrate Metabolism in a Case of Hemochromatosis. Arch. Int. Med. 50: 226 (Aug.) 1932.

29 Labbé M, Escalier A and Dreyfus Gilbert. Acromégalie et diabète. Ann. de méd. 29: 222 (March) 1931.

30 Rathery Rudolf, Thoyer and Villiere. Insuline resistance dans le diabète. Bull. et mém. Soc. méd. des hôp. de Paris 53: 1086 (July 22) 1929. MacBryde C M. Insulin Resistance in Diabetes Mellitus. Arch. Int. Med. 52: 932 (Dec.) 1933.

31 Bauer J and Monguió J. Ueber den Schwellenwert des Insulins. Ztschr. f. klin. Med. 121: 476 1932.

32 Cushing Harvey and Davidoff L M. *Pathological Findings in Four Cases of Acromegaly with a Discussion of Their Significance*. Monograph of Rockefeller Institute for Medical Research 1927 number 22, p. 85.

33 Lucke H. Hypophysäre Magersucht und Insulin. Klin. Wchnschr. 11: 1988 (Nov. 26) 1932.

34 Houssay B A and Biassotti A. The Hypophysis, Carbohydrate Metabolism and Diabetes. Endocrinology 15: 511 (Nov. Dec.) 1931.

35 Barnes B O and Regan J F. The Relation of the Anterior Pituitary to Carbohydrate Metabolism. Endocrinology 17: 522 (Sept. Oct.) 1933.

36 Long C N H and Lukens F D W. Observations on Adrenalectomized Depancreatized Cats. Science 79: 569 (June) 1934. Observations upon Hypophysectomized Depancreatized Cats. Proc. Soc. Exper. Biol. & Med. 32: 326 (Nov.) 1934. Observations on a Dog Maintained for Five Weeks Without Adrenals or Pancreas. ibid. 32: 392 (Nov.) 1934.

adrenal cortex, while capable of prolonging the life of the adrenalectomized animals and of protecting them from the usual concomitants of adrenal insufficiency, will not confer on them the power of reacting to the pituitary principle

One other result of Long's important experiment should be noted. It is well recognized that epinephrine, the product of adrenal development, acts as an antagonist to insulin. Simultaneous injections of epinephrine and insulin show opposite effects on the level of blood sugar. It would therefore be a reasonable inference that the increased sensitivity to insulin and other effects which are seen to follow adrenalectomy might be attributed to the absence or diminution of epinephrine. Long's experiments indicate that this is not the correct explanation. Animals from which one entire adrenal and the medulla of the other have been removed are not protected against pancreatectomy or the hyperglycemia and ketosis that follow. Apparently this is strong evidence that the cortex of the adrenal is an active factor in carbohydrate metabolism.³⁷

From such observations it is clear that disease of the pancreas is not the only influence in the clinical conditions of diabetes and hyperinsulinism. Experimental evidence indicates a possible mechanism by which clinical cases of insulin sensitivity and resistance might be explained. It appears that a state closely simulating clinical diabetes or the opposite condition of hyperinsulinism might arise from factors other than disease of the pancreas and might be attributed either to abnormal resistance or to abnormal sensitivity to the product of the pancreatic islets.

THE OCCURRENCE OF ANATOMIC AND FUNCTIONAL DISEASE

All the conditions that have been discussed may accompany and, under some circumstances, seem to be at least in part dependent on organic disease of the pituitary or of the adrenals. Hypertension may be a feature of pituitary basophil tumors, of cortical tumors of the adrenal and in its paroxysmal form of paragangliomas of the medulla. The buffalo type of obesity is encountered with both basophil and adrenal tumors. Diabetes and even more often hyperglycemia and demonstrable disturbances in carbohydrate storage are accompaniments both of acromegaly and of Cushing's disease and have also been reported with adrenocortical tumors. Hypoglycemia has been seen in association with destruction of the hypophysis, and insulin sensitiveness characterizes pituitary cachexia and hypophysectomy. That these common conditions may be associated with anatomic endocrine disease has thus been conclusively demonstrated. The fact remains, however, that the great majority of cases of hypertension, obesity, diabetes and hypoglycemia display no clinical evidence either of pituitary or of adrenal disease. It might be claimed, therefore, that although the exceptional case may be ascribable to endocrine factors, the usual picture has nothing to do with them. Before accepting such a contention as final it is important to consider some of the factors involved. Clinically the means of recognizing pituitary and adrenal disease are extremely crude. Roentgen examinations of the skull, study of the visual fields, the search for neighborhood symptoms, and roentgenograms of the upper part of the abdomen are feeble diagnostic methods for

determining even gross anatomic defects. More and more evidence is accumulating that for overfunctioning of a gland of internal secretion a tumor is not necessary. In the thyroid,³⁸ parathyroid³⁹ and pancreas⁴⁰ it has been repeatedly demonstrated that hyperplasia not always grossly perceptible may produce symptoms referable to oversecretion. Already this is apparent in the studies that have been made in regard to the adrenal and is suspected from studies of the pituitary. Furthermore, it must be remembered that the condition of no gland is static and that some and presumably all are constantly adapting themselves to changing conditions of internal and external environment. Recent studies of the thyroid gland have shown how labile it is from an anatomic standpoint and how easily it is affected by a great number of different circumstances.³⁹ One of the best examples of anatomic and physiologic adaptation is encountered in the study of interrelations between the hypophysis and the ovaries. At puberty, during the menstrual cycles, during pregnancy and lactation, and at the menopause these organs are undergoing constant changes which are morphologically recognizable and which have been established more recently by functional and hormone studies.⁴¹ In these relationships, moreover, temporary imbalance is demonstrable and not infrequent. Disturbances in the amount or in the timing of anatomic and functional changes may lead to clinical disease such as the anovulatory type of menstruation, to amenorrhea, to the complicated symptomatology of the menopause, or to delayed lactation. The time is past, therefore, when the participation of glands of internal secretion in pictures of disease can be judged solely by demonstrable anatomic changes. The possibility cannot be denied that the pituitary, the adrenals and perhaps other glands as well are involved not only in the rare case presenting a demonstrable tumor but in all cases of essential hypertension, upper body obesity and diabetes.

The clinical recognition of pituitary basophilism or of the adrenocortical syndrome does not depend on any single manifestation but on a combination of symptoms: hypertrichosis, amenorrhea, obesity of the upper body type, high blood pressure, disturbances in carbohydrate metabolism, sometimes decalcification of the skeleton and polycythemia. With our present experience such an association of symptoms in advanced form would appear to be unmistakable evidence of adrenal or of pituitary disease or of both. Such an assumption has in many instances led to the demonstration of a tumor or of significant hyperplasia and in some cases has resulted in surgical removal and dramatic cure. The symptoms themselves are among those most frequently encountered in clinical medicine. Moreover, they are often seen together in the same individual. Common associations are hirsutism, particularly of the face and chin, in plethoric obese women, obesity accompanied by long periods of amenorrhea, the diabetes of bearded women, obesity with hypertension, obesity accompanied

38 Rienhoff W F Jr. A New Conception of Some Morbid Changes Occurring in Diseases of the Thyroid Gland Based on Experimental Studies of the Normal Gland and the Thyroid in Exophthalmic Goiter. *Medicine* 10:257 (Sept.) 1931.

39 Albright Fuller Churchill E D and Castleman B. Hyperparathyroidism Due to a Diffuse Hyperplasia of All Parathyroid Glands Rather Than to a Parathyroid Adenoma of One Gland. *Proc. Soc. Clin. Invest.* 1934.

40 Graham E. A. and Womack, N. A. The Application of Surgery to the Hypoglycemic State Due to Islet Tumors of the Pancreas and to Other Conditions. *Surg. Gynec.* 56:728 (April) 1933.

41 Nelson, W. O. Concerning the Anterior Pituitary Gonadal Interrelations. *Endocrinology* 19:187 (March-April) 1935.

by a prediabetic state or by frank diabetes, and finally obesity with both hypertension and hyperglycemia

With the consideration of such pictures of disease, the practical aspect of the subject under discussion in this paper becomes apparent. There seems to be no sharp dividing line between the obvious adrenal and pituitary syndromes and those which reveal combinations of two or more of the characteristic symptoms. For any physician who has permitted himself to become fully aware of the recent advances in pituitary and adrenal physiology, the temptation is great to consider all these conditions in the same category and to adopt for the mild cases the same therapeutic approach that has proved successful in the more advanced.

The importance of establishing criteria by which a separation can be made is indicated by the emphasis recently given to various surgical and radiologic procedures suggested for the treatment of these conditions. Irradiation of the pituitary region has been suggested not only for the control of pituitary basophilism⁴⁰ but also for hypertension⁴². Subtotal adrenalectomy has been advocated in the treatment of hypertension⁴³. Denervation of the adrenals,⁴⁴ section of splanchnic nerves and section of the anterior roots of spinal nerves,⁴⁵ although based on somewhat different conceptions, have as part of their rationale the hope of controlling excessive adrenal activity.

The fundamental soundness of considering ordinary cases of hypertension, obesity and diabetes as possibly related to disturbed pituitary and adrenal function should not blind one to the fact that this is as yet only a hypothesis dependent for its validity in large part on analogy and circumstantial evidence. It must not be forgotten that the present surgical and roentgenologic approach in therapy is experimental and accompanied by no small dangers. To proceed wisely in such a situation requires sound knowledge of existing facts, caution and conservatism in the clinical application of laboratory evidence and perhaps, above all, a mind open and prepared for the advances that will doubtless be made in the next few years.

SUMMARY

Advances in the study of glands of internal secretion cannot be judged solely or chiefly by the extent to which they lead to successful organotherapy but more by the profound influence they have on the understanding and interpretation of common symptoms. Consideration of their relation to hypertension, obesity and disturbances in carbohydrate metabolism is of especial importance because of the frequency of such manifestations, because they are often encountered in the same individual and because in certain striking instances they are directly attributable to pathologic changes in the hypophysis or the adrenals. Although participation of these and other glands of internal secretion must be suspected in many cases of high blood pressure, obesity and diabetes, caution is necessary lest the newer knowledge be applied prematurely and too extensively in surgical and radiologic treatment.

600 South Kingshighway

42 Hutton, J. H. *Treatment with X-ray (Irradiation of Pituitary and Adrenals)*. Illinois M. J. 66:120 (Aug.) 1934.

43 DeCourcy, J. L. DeCourcy, Carroll and Thuss, Otto. *Subtotal Bilateral Suprarenalectomy for Hypersuprarenalism (Essential Hypertension)*. J. A. M. A. 102:1118 (April 7) 1934.

44 Crile, George. *Indications and Contraindications for Denervation of the Adrenal Glands*. Ann. Surg. 100:667 (Oct.) 1934.

45 Adson, A. W. and Brown, G. E. *Malignant Hypertension. Report of Case Treated by Bilateral Section of Anterior Spinal Nerve Roots from Sixth Thoracic to Second Lumbar Inclusive*. J. A. M. A. 102:1115 (April 7) 1934.

NONSPECIFIC PROTEINS

A NUMBER OF FIRMS ARE ADVERTISING NONSPECIFIC PROTEIN PREPARATIONS UNDER PROPRIETARY AND SOMETIMES MEANINGLESS NAMES. RELATIVELY FEW OF THESE PREPARATIONS HAVE BEEN SUBMITTED TO THE COUNCIL ON PHARMACY AND CHEMISTRY AND NO PROPRIETARY NON-SPECIFIC PROTEIN PREPARATION HAS BEEN ACCEPTED FOR INCLUSION IN NEW AND NONOFFICIAL REMEDIES. BELIEVING THAT PHYSICIANS DESIRE A MORE EXTENSIVE PRESENTATION OF INFORMATION CONCERNING NON-SPECIFIC PROTEIN PREPARATIONS THE COUNCIL ON PHARMACY AND CHEMISTRY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REVIEW. IN ADOPTING THIS REPORT THE COUNCIL EXPRESSES APPRECIATION TO THE AUTHORS OF THESE ARTICLES: DR. RUSSELL L. CECIL AND LUDVIG HEKTOEN.

PAUL NICHOLAS LEECH, Secretary

THE REACTIONS TO THE NONSPECIFIC PROTEIN TREATMENT OF INFECTIOUS DISEASES

LUDVIG HEKTOEN, M.D.
CHICAGO

The writings about the effects of nonspecific protein treatment, therapeutic and otherwise, have been reviewed by others¹ and are considered in the article by Cecil, which follows. Hence this literature will not be considered in detail here. As used in this article the term nonspecific protein refers to proteins of different antigenic and other properties than the microbes concerned in the diseases subjected to the treatment.

The usual obvious effects of the intravenous injection of foreign proteins of any kind are chill, fever, headache, and gastro-intestinal and other disturbances. These effects are dependent on and associated with humoral and cellular changes of complex nature. In its typical form the protein reaction reaches its height a few hours after the injection, and in infectious states the subsidence of the reaction may be followed by clinical improvement. The benefit seems to bear some relation to the general reaction and fever, the higher the fever, the better may be the results. Depending on the kind and on the quantity of protein injected as well as on the patient and his disease, the effects of such injections are subject to much variation. Whether there are any true qualitative differences in the reactions under different conditions has not been determined. The acute protein reaction resembles the immediate reactive response to acute infection in which foreign proteins enter the body in the form of infectious microbes.

Can the acute protein reaction and its results be explained by the operations of some single, central mechanism? At present the nearest we can come to any explanation seems to be to assume that as the foreign proteins mix with the fluids of the body and are taken up by cells, especially in the reticulo-endothelial system, humoral and intracellular processes result, the products of which affect the entire organism in a characteristic but complex fashion. The ensuing phenomena are partly evanescent, partly more or less permanent. Weichardt has advanced the view that these phenomena are the expression of a general stimulation of cellular activities. Certain phases of the protein reaction may be considered briefly.

A prompt but evanescent effect is exercised on the autonomic or sympathetic nervous system. In the

From the John McCormack Institute for Infectious Diseases.
1 Petersen, W. F. *Protein Therapy and Nonspecific Resistance, The Newer Knowledge of Bacteriology and Immunology*, edited by Edwin O. Jordan and I. S. Falk, Chicago, University of Chicago Press, 1928, p. 1086.
Miller, J. L. *Nonspecific Therapy*. Medicine 6:513 (Dec.) 1927.
Weichardt, J. W. *Unspezifische Immunisierung*, in *Handbuch der pathogenen Mikroorganismen* edited by W. Kolle, R. Krause and P. Uhlenhuth ed. 3. Jena, Gustav Fischer 1:1147, 1929.

splanchnic area vascular dilatation associated with secretory stimulations develops at the same time as peripheral vessels are contracted, hence the chill. Before long this action on the vessels is reversed and then comes the reestablishment of the normal state. The substance or substances that cause these vascular phenomena have not been determined. The fever indicates a simultaneous increase in chemical activities. At first there develops a peripheral leukopenia, which is succeeded by leukocytosis as the acute reaction subsides. Whether the leukocytes now have a greater phagocytic power than normally does not seem to have been determined, but generally leukocytosis is regarded as an anti-infectious reaction. Of other changes in the blood may be mentioned increase in proteolytic and lipolytic enzymes, diminution and then increase in fibrinogen and complement, lessening in the colloidal stability of the plasma, and increase in nonprotein nitrogen.

The capillary walls and the reticulo-endothelial system are believed to be the sites of important processes in nonspecific treatment. A temporary increase in phagocytic activity and in permeability is assumed. Local edema results and substances accumulate that may destroy bacteria and toxic substances. It is probable that the products of the breakdown of free and ingested foreign proteins and other substances may have marked local and general effects. Substances with vasodilator actions, such as histamine and choline, as well as products with other effects may be liberated from the tissues. Histamine causes vascular reactions like those that result from injury to tissues. The focal reactions in nonspecific protein treatment may depend more or less on such processes.

Intravenous injection of foreign proteins may give rise to acute reactions in existing inflammatory areas, especially those of infectious origin. Such reactions may develop in localizations of the particular infection under treatment as well as in other processes even when unsuspected and latent. These focal reactions indicate that inflammatory tissues are sensitive to the effects of the protein injection. The vessels may be more or less dilated beforehand, reticulo-endothelial and other cells may be abnormally active and even specifically sensitive or allergic. The conditions for rapid diffusions and consequent interactions are favorable. These focal reactions may be interpreted as the outcome of nonspecific and of specific (allergic) processes. The local result may be healing with or without disintegration of tissue. In acute reactions in infectious foci, antigenic substances may be liberated to stimulate the production of antibodies and other specific anti-infectious processes. Rarely the flare-ups may result in untoward complications of protein treatment. Hench² has described an instructive series of cases of this nature, including such conditions as appendicitis, cholecystitis, iritis and pericarditis.

Whether the normal antibodies and other microbicidal substances in the blood are increased in nonspecific protein treatment has not been determined. From the results of experiments on animals it has been inferred that in infectious conditions nonspecific proteins may stimulate renewed formation of specific antibodies, but here again no positive statements are warranted because adequate observations on patients in the course of treatment do not seem to have been made.

This statement is true even of typhoid, which has yielded the most striking results of the acute infectious

diseases subjected to intravenous protein injections, specific as well as nonspecific. It is said that one third of patients with typhoid so treated recover by crisis, that one third are improved, and that in one third the treatment is without apparent curative effect. No complete explanation can be offered for these differences in results. As the main localizations of typhoid are in the splanchnic lymphatic apparatus, they are involved directly in the reactions following the protein injection, but whether the curative effects are caused by the sudden stimulation of specific antityphoidal processes, by increase in enzyme actions, by the activities of new leukocytes or by combinations of these processes are questions one cannot answer. Detailed observations are needed on patients under different forms of protein treatment. It has not been determined whether the treatment of typhoid with nonspecific proteins gives the same results as treatment with specific proteins, that is, vaccines of typhoid bacilli or of closely related bacteria. Neither has it been determined whether there is more production of specific antibodies on the injection of specific than on the injection of nonspecific proteins in typhoid.

The nonspecific proteins—serum, milk, vaccines—used in treatment are in themselves antigenic and may call forth homologous or specific antibodies, which however would not be expected to exercise any therapeutic effect as such under the conditions in hand. But, as stated before, the injection of new antigen may stimulate renewed production of antibodies against the antigen or antigens of previous immunizations. This is the so-called anamnestic reaction—the previous process is recalled into action. This phenomenon shows that immunization has a lasting effect on the organism. It seems as if antigen enters and remains in the cells in which antibodies are synthesized. Probably the first to point this out were Salmonsens and Madsen³ in their studies of the reproduction of diphtheria antitoxin after large losses of blood. They said that this reproduction results from the acquirement by certain cells of a new and lasting secretory power under the influence of the toxin. It should be remembered then that the therapeutic use of protein may give rise to more or less permanent sensitizations, that the effects of antigenic proteins are more permanent than the effects of pharmacologic agents, and that the body can produce many different antibodies—carry many different sensitizations—at the same time.

There is no evidence that nonantigenic substances can initiate *de novo* the production of antibodies, but in animal experiments it has been found that certain nonantigenic substances (e.g., pilocarpine, metallic salts) may increase the concentration of antibodies in the blood in the early stages of formation as well as induce secondary rises after the apex of the antibody curve in the blood has been passed. It is perhaps doubtful whether these effects are due to stimulation of production or to mobilization of existing antibodies. In the acute protein reaction, substances may arise which can act like pilocarpine in animal immunization.

In view of all the possibilities referred to in the foregoing, it seems fully warranted to interpret the effects of nonspecific proteins in infectious diseases as the results of the activation of nonspecific as well as specific anti-infectious processes. Much further study, especially of the changes in the human body, is needed.

2 Hench P S. Usual and Unusual Reactions to Protein (Fever) Therapy. Arch. Int. Med. 49:1 (Jan) 1932.

3 Salmonsens C J and Madsen T. Om Gendannelse af antitoxisk Substans efter store Blodudtømmelser. Kgl. Danske Videnskabernes Selskabs Forhandlingar 1898 p. 227.

to give a clearer insight into the intimate nature of these processes as they occur under various conditions. There can be no doubt that the scope and nature of the reactions to injected proteins in infectious states depend in large measure on the circumstance that the tissues of the patients have been stimulated and sensitized by infectious and antigenic substances. So far but little advantage has been taken of the opportunities to make careful and detailed studies on patients in the course of treatment. To understand better the reactions to different nonspecific proteins in infections, analysis is needed also of the effects caused by such proteins in apparent good general health. And comprehensive observations are indicated on animal diseases that correspond as much as possible to the human diseases subjected to nonspecific protein treatment.

Therapeutics

THE THERAPEUTICS OF THE COOK COUNTY HOSPITAL

EDITED BY BERNARD FANTUS, M.D.
CHICAGO

NOTE.—In their elaboration these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics Dr. Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. The articles will be continued from time to time in these columns. When completed, the series will be published in book form.—Ed

THE THERAPY OF INJURIES TO LARGE BLOOD VESSELS

IN COLLABORATION WITH DR. RAYMOND
W. MCNEALY

In injuries involving the large vessels, dramatic onset and rapid development of the clinical climax which places the patient's life or limb in jeopardy demands immediate, decisive and correct treatment. The indications are hemostasis, care of complicating injuries, maintenance of life, maintenance of distal circulation and appropriate after-care.

HEMOSTASIS

Temporary Hemostasis—(a) **Constriction of Limb Above the Wound (Esmarch Bandage)**. When a wound is bleeding in jets, pressure should be applied above, not to the wound itself. Immediate help should be rendered in these emergencies, at the scene of the accident, by some one who at once with both hands grasps and squeezes the entire circumference of the limb while some one else ties any available thick cord or other fabric around the limb, slips any available rod under the knot, and by means of the rod twists the knot until the bleeding is checked. When any foreign body of considerable size has been driven into a wound, this body should be left in place as its forcible removal may start a fatal hemorrhage. Indeed, the rule should be given the public "Do not touch the wound." A general knowledge of these two principles might save many a life.

The surgeon performs essentially the same service by compressing the principal artery of the limb above the wound at the point of election and then applying a

tourniquet. Esmarch long ago emphasized certain principles in the application of tourniquets which should be kept in mind. 1 Elevation of the extremity before application assists in hemostasis. 2 The tourniquet should never be applied to the lower part of the leg or to the forearm, because the blood vessels escape compression between the two bones of the part. 3 The tourniquet should be applied to the adductor side first, to secure immediate arterial occlusion without marked venous congestion. 4 Caution must be exercised to prevent sudden flexion or extension of the limb after the viselike constricting tourniquet has been applied. 5 The tourniquet should not be applied in successive overlying loops, because each loop then exaggerates the constriction of the preceding one. An interval should be allowed between the loops. 6 The tourniquet should not be left on any longer than is absolutely necessary.

The most common error in putting on a tourniquet is applying it with force less than that of the systolic blood pressure. This permits serious congestion distally and aggravates the bleeding. A frequent cause for this error is that the tourniquet is applied while the patient is in shock and when only a light constriction suffices to stop the bleeding. In the first reaction after shock the systolic pressure rises above that of the constricting tourniquet, which then becomes actually detrimental in the control of hemorrhage. Some reservation must be made in both the force and the duration of application of the tourniquet in individuals with diseased arteries. Inordinate pressure may rupture the intima of sclerotic arteries and result in local thrombosis. Prolonged constriction of these vessels may also lead to distal thrombosis, with similar disastrous consequences to the limb.

(b) Direct Aseptic Compression (Tamponade)

This is an additional recourse available to the surgeon, which becomes especially important in locations that do not admit of the application of a tourniquet, such as the neck, the trunk and the immediate roots of the limbs.

A series of ingenious methods of arterial control has been developed. In each location, surgeons have taken full advantage of local anatomic conditions to devise easier and more reliable methods of controlling hemorrhage. These include such maneuvers as the intercostal plug in intercostal hemorrhage, pneumothorax in wounds of the pulmonary vessels, the rectal tampon and the spring and elastic compressors. Full advantage is also taken of all direct compressions, especially those which utilize adjacent bony prominences against which the compression can be made, and of the assistance which simple elevation renders.

Concealed hemorrhage, in the absence of profuse external hemorrhage, may be of sufficient severity even to endanger life. The gravity of hemothorax or hemoperitoneum is apparent, but the dangers attending interstitial hemorrhages are not sufficiently appreciated. Large quantities of blood plasma may be lost from the physiologic circuit into the loose tissues of the groin or the axilla, without blood leaving the body. A serious isolation of formed elements from the blood stream occurs in interstitial hemorrhages accompanying injuries to large vessels. The fluid elements are quickly absorbed leaving more space for packing and concentration of formed elements. An interstitial hematoma of 1 liter may actually represent a blood loss of 2 liters. These situations demand intervention with almost as much urgency as does profuse external

hemorrhage These local interstitial losses of blood can usually be stopped by direct compression or by tourniquet application, if the site is suitable, in exactly the same manner as is profuse external hemorrhage

In many cases the external hemorrhage is quickly and easily controlled or the hemorrhage, if concealed, checked in extent before there is any primary dangerous loss of blood These cases must not be dropped from careful observation, because in some the improvement of circulatory activity precipitates recurrent hemorrhage or extension of the hematoma, which eventually, though insidiously, is as dangerous to life and limb as was the initial acute profuse hemorrhage The extrusion of consecutive clots from an open wound or the intermittent progressive extension (not migration) of a hematoma demands immediate intervention before serious secondary accidents develop These signs mean that one of the larger arteries has been injured, and for such injury there is only one remedy direct stopping of the leak by either suture or ligation of the bleeding vessel In such cases one should rarely rely on tamponade or the hope that a clot will be formed sufficiently firm to stop the hemorrhage

At the bedside of every patient liable to secondary hemorrhage from an injured limb there should hang a rubber tube to be used by the nurse as a tourniquet the moment such hemorrhage is discovered and even before the doctor is notified

In locations where proximal constriction is impossible, direct pressure to the bleeding vessel should be applied by the nurse either by means of a sterile dressing or, in extreme emergency, even by grasping and tightly squeezing the wound with hand or, this failing, by plugging the hole in the vessel wall with the bare fingers until the doctor can be summoned

The latter may rapidly insert a hemostat or stuff the largest possible tampon into the wound, temporarily closing it with a few deep sutures so as to permit adequate preparation for operation and the induction of anesthesia

Permanent Hemostasis—This demands, first of all, asepsis When life is at stake, when it seems that the patient is bleeding to death before one's eyes, the immediate stopping of the hemorrhage takes precedence over all other considerations The moment the vital necessity has been taken care of, there should be no further precipitate action Now all the requirements of surgical asepsis must be fully met, for infection makes permanent hemostasis illusory, the sloughing of perivascular and vascular tissue leading to repeated and disastrous secondary hemorrhages

If it is decided that the vessel involved is small and unimportant and that operative intervention may not be necessary, the wound is loosely sutured and kept under close watch until all danger of hemorrhage or of spreading infection has passed If it should be felt, however, that an important vessel is involved, there should be no temporizing with packing or continued direct compression, even though the wound is small and apparently clean These measures only prevent the free drainage from the wound of foreign and occultly infected material They expose the patient to the possibility of repeated secondary hemorrhages by exaggerating and complementing what may originally have been only a minimal contamination In such cases the vessel should be first controlled by provisional occlusion and then exposed freely, the original accidental wound being avoided as far as possible The

final restorative or obliterative management of the vessel wound is then accomplished according to the indications discussed later

In doubtful cases, when the size of the vessel is not known but there are minimal soft tissue injuries and there is no gross contamination or infection, the wound is left unsutured and carefully watched At the first evidence of recurrent bleeding, clot extrusion or developing infection, surgical intervention is demanded If the indication for intervention is recurrent external bleeding or extending hematoma or progressive clot extrusion, the surgical approach may be made as in the preceding type of case If the indication is infection only, the situation is met by simple adequate drainage of the infected region

The most harrowing situations in blood vessel surgery are those in which infection is accompanied by secondary hemorrhage In these cases the problem of stopping further secondary hemorrhage is even more important than that of preventing gangrene Too often temporizing measures are hazarded to preserve circulation in the limb at the cost of the patient's life by hemorrhage from failure to secure decisive control of the vessel The majority of mistakes in handling such problems occur when an attempt is made to ligate the bleeding vessel by approach through the original infected wound

For permanent hemostasis it is necessary to choose between (a) ligation at a distance, (b) direct ligation and (c) blood vessel repair

(a) Ligation at a distance should be undertaken in all cases of secondary hemorrhage with infection and in all cases with extensive injuries to the soft parts or with evident gross contamination, for in these a moderate or even severe infection can usually be anticipated Such cases should therefore be handled just as if they were already infected and recurrently bleeding In deep, profusely bleeding wounds, much time and often much blood is lost in attempts to find and ligate the bleeding vessel In such cases the wound would have to be much enlarged, as it is difficult to recognize the landmarks in an area infiltrated with blood It may be the better plan therefore to expose the main trunk higher up and ligate it in continuity

While the technic of the classic ligation of the various large blood vessels cannot be discussed here in detail, certain general principles may be emphasized It is highly desirable to secure a diminution of the intraluminal pressure against which the ligation has otherwise to be tightened by temporary proximal compression of the vessel while the ligation is being drawn into place This reduces the force and crushing that is otherwise necessary to bring the vessel walls into apposition A double thread of coarse silk is then passed under the artery and the first thread is tightened slowly and steadily and knotted Then, just above and close to it, the second thread is placed in the same manner

(b) Direct ligation of the bleeding vessel becomes necessary when conditions prevent proximal ligation, as, for example, at the immediate root of an extremity or the base of the neck or where the collateral circulation is so rich as to allow continued hemorrhage, as in the hand, foot, head or neck It should also be undertaken even after ligation at a distance has been accomplished, in order to avoid secondary hemorrhage

The original wound should now be opened up freely, cleansed, and the ends of the divided vessels caught up and tied above as well as below the point of injury

When oozing of blood from a deep wound is so profuse that it may be impossible to recognize the structures at the bottom, one may, to save blood, plug the cavity firmly with sterile gauze and then, as soon as the bleeding has been controlled, gradually raise the tampon, a small portion at a time, applying forceps to each bleeding point as it is exposed.

Neither forceps pressure nor ligation should ever be applied to tissue *en masse*, but only directly to the bleeding vessels, so as not to injure accompanying veins or nerves.

When there is infection in situations in which ligation at a distance is impossible, an incision is made over the bleeding vessel, the original wound being avoided as far as possible, and, with a minimum of dissection, the vessel is exposed and controlled. Its division is completed if necessary and the ends are closed by nonabsorbable suture. The incision is left freely open. The infected area is then freely incised to provide adequate drainage, and great care is exercised to expose every ramification of the spread of the infection. The importance under these conditions of completing the division of the vessel, as well as the importance of minimizing the dissection and the use of nonabsorbable ligature, must be emphasized.

While it is true that, as a general proposition, only absorbable suture material should be used in the presence of infection, in vascular surgery the presence of infection is the one condition that demands the use of nonabsorbable suture material, as only on it can sufficient reliance be placed. Infection prevents or delays the occlusive sealing of vessel walls. Occlusive thrombi are readily liquefied and there is urgent necessity for prolonged artificial occlusion by the ligature. Catgut with its uncertain absorbability cannot be relied on in these situations. Silk or linen must be used. This suggestion is not antagonistic to the doctrine that infected fields do not tolerate nonabsorbable suture material. This teaching applies only to situations in which the nonabsorbable material is buried within the wound. The condition which answers the objection to the use of silk or linen as ligature or suture material in infected vessel wounds is that these wounds be left widely open, just as Pare's amputation wounds were left widely open. For small vessels, fine silk ligature will serve. For larger vessels it is better policy to use thick ligature material, because this insures broad apposition with less devitalizing compression. Abernethy says "When an artery is tied with a thick ligature, the compression made by it is not so great as to produce a speedy mortification and separation of the end of the vessel so that the ligature remains in general a fortnight before it is detached and therefore time is allowed for the consolidation of the sides of the vessel prior to the separation." Simple ligature is often adequate. However, the advantage of ligature by transfixion is, in general, obvious.

Either ligature or transfixion is applicable only when a material segment of the artery is exposed and sufficiently free from adjacent important structures. When the dissection necessary to obtain this vessel exposure would invite extension of the infection or jeopardize adjacent structures, another of the later developments of vessel technic should be utilized—closure of the divided vessel ends by suture. This suture carefully avoids all perivascular structures.

The proper management of the accompanying undamaged veins is still in question. Previous to 1913 it was a rather well founded idea that in wounds of

large arteries the concomitant ligation of the accompanying vein led to gangrene of that extremity more frequently than did ligation of the artery alone. In 1913 the attention of the British surgeon Makins was called to the fact that, in the treatment of arteriovenous aneurysms, fewer cases of gangrene developed when the vein also was ligated than when only the artery was occluded. The studies of Oppel, Wieting, Holman and Edwards, and Brooks and Martin confirmed the observation that simultaneous vein ligation would be of considerable value in reducing the frequency of gangrene when the artery had been or had to be obliterated. This conclusion has been almost universally accepted, although the mechanism whereby gangrene is diminished is still in dispute. Wilson summarizes the theories propounded as follows:

1 Ligation of the vein restores the "balance of the circulation." This implies a belief that in occlusion of the artery alone the capacious main vein affords a too ready outlet for the diminished quantity of blood reaching the part below the occlusion. The blood tends to supply mainly the proximal tissues of this part and is not dispersed to the distal tissues. There is thus a condition of unbalance between inflow and outflow which, it is claimed, can be corrected by venous occlusion. A closely allied idea is that venous ligation keeps the blood in longer contact with the tissues, which are presumably enabled thus to extract more oxygen from it.

2 The theory has been formulated by Brooks of a more homogeneous distribution of the arterial blood. The main favorable influence according to him is the raised intravascular pressure, which serves to keep the capillaries patent in areas in which they would otherwise collapse, and this distributes the arterial blood more uniformly throughout the tissues.

3 The theory of the development of a "richer collateral bed" is the conclusion from certain injection experiments.

4 The theory of "masked sympathectomy" has been advanced by Leriche and Fontaine. They believe that the initial rise of arterial pressure in the limb after venous ligation is associated with a transient peripheral vasoconstriction, which is succeeded in some minutes by active vasodilatation and that these effects are produced by reflex action along sympathetic nerve fibers.

The results of Wilson's own experimental studies are not in accord with the previous experimental work on the subject. They do not support the current belief that ligation of the main vein diminishes the incidence of gangrene which follows ligation of the main artery. His results may possibly lead back to the older views, which encouraged preservation of the concomitant vein. These conflicting views from reliable sources make it inadvisable to take an arbitrary stand in this question until more evidence has been accumulated.

(c) With regard to blood vessel repair, in unimportant vessels or when collateral circulation is abundant it is better not to indulge in reparative methods. A simple obliterative method should then be used. At any point, in the presence of infection or of diseased vessel tissue, reparative suture should not be used. Thrombosis practically always follows and vitiates the purpose of the reparative surgery. The added manipulation required for the reparative suture only serves to aggravate the infection. It is much safer under these circumstances to resort at once, even with major vessels, to obliterative control, although one knowingly faces the possibility of subsequent gangrene.

In case of a small wound or perforation of the major vessel and when asepsis is possible, reparative suture is the method of choice. This is particularly the case in those locations in which gangrene is more likely to occur than in others. Thus, gangrene is much more likely to occur after main trunk injuries of the lower extremity and is rare after comparable injuries in the upper extremity. The most vulnerable sites of all are above the profunda branch of the femoral artery, in the popliteal region, and above the profunda branch of the brachial artery. In these locations especially are reparative methods desirable.

In cases in which the penetrating or incised wound is sharply cut and circumscribed, with no evident gross contamination, and especially when the wound edges have been freely washed by the outflow of blood, the danger of infection is usually slight. Restorative sutures are put in with the simplest possible technic and the least amount of manipulation, after the lumen of the artery has been temporarily occluded above and below the injury. If the wound in the vessel is uneven, its edges are freshened before suture. In small lateral wounds the continuous cross suture of fine silk is applied with closely set stitches, perforation of the intima being avoided as far as possible. The external coat is then brought together by a second continuous suture in an endeavor to secure a blood-tight closure without undue encroachment on the caliber of the vessel.

If the lateral wound exceeds two thirds of the circumference of the vessel, the accepted policy is to complete the division of the vessel, to freshen the ends and to perform an end-to-end anastomosis. If the resection required exceeds three-fourths inch, in most situations it will be impossible to effect a direct anastomosis without excessive tension. This can be obviated only by the insertion of a vein transplant or by using a Tuffier¹ tube. These may carry the main blood flow for a sufficient period of time to allow the adequate development of collaterals, but these are very hazardous procedures.

CARE OF COMPLICATING INJURIES

In wounds of large blood vessels, surgical management should be concentrated primarily on the care of the blood vessel wound. The care of concomitant injuries to tendons, nerves and bones should usually be relegated as much as they safely can be to a later period. When the management of the blood vessel wound requires obliteration of its lumen, the acute deficiency in blood supply makes the success of primary nerve or tendon suture dubious. When the blood vessel lumen is restored or reconstructed by suture, further extensive manipulation in the vicinity, in an effort to resuture the soft tissues accurately, jeopardizes the vessel repair on which the success of the whole operation primarily depends.

Such wounds should be sutured but loosely if at all. A common error is the accurate suture of the overlying tissues in ignorance of the vessel wound and the sealing in of foreign material, blood coagulum and whatever bacteria were included, to play secondary havoc with the vessel. The procedure to be followed in these cases depends on the size and importance of the vessel implicated. An estimate of the importance of the vessel injured may be obtained from the amount and force of the hemorrhage sustained before the temporary artificial control was applied. The points of entrance and

exit and the probable path of a missile are also of some value, but they may be very misleading because of the erratic course which missiles often take between muscle and fascial planes.

Drains are rarely indicated in the management of vessel wounds. If suture or ligation has been done in a clean wound, drains not only withdraw the plastic exudate necessary for rapid healing but invite infection from the surface. If the wound is infected or contaminated, it should be left widely open. In these cases, drainage with closure is a compromise measure which ensnares only those who have not seen the disastrous consequences of this procedure. In case of doubt, it is much better to leave the wound widely open.

MAINTENANCE OF LIFE

Under conditions ideal for the management of these desperate cases, one should almost always include preoperative blood transfusion. This condition, however, is not frequently fulfilled. Compatible donors are often not immediately available. In cases in which a tourniquet has been applied to an extremity, the delay attending the selection of a donor and the administration of blood, coupled with the time necessarily consumed in the definitive operation, may exceed the period during which the limb can safely tolerate a deprivation of circulating blood. In locations where hemostasis is effected by direct compression rather than by application of a tourniquet, more time may be available for selection of a donor and blood transfusion. In every instance, if blood transfusion is not available, intravenous injection of physiologic solution of sodium chloride or acacia solution should be administered before or during the operation. In addition, in the desperate cases, full advantage should be taken of the effect of autotransfusion by bandaging the limbs.

A prophylactic dose of tetanus antitoxin (1,500 units) should not be omitted.

MAINTENANCE OF DISTAL CIRCULATION

The fourth factor for consideration in vessel wounds is the actual or potential damage to the circulation distal to the point of injury. The actual damage is that directly sustained through the trauma. The potential damage is measured by two factors. First is that which may be added by an increasing hematoma which shuts off the collateral supply. Second is that which is determined by the surgical sacrifice of vessel lumen incidental to the operative intervention. The viability of the part supplied by the injured vessel depends on the summation of these three factors. To estimate them one must know the importance of the vessel trunk injured to the life of the part it supplied, the abundance of the collateral circulation present to take its place, the extent of the direct damage to the vessel, the amount of hematoma pressure and the limits of effective surgical intervention imposed by destruction of tissue and concomitant infection or disease.

The preoperative status of the circulation distal to the point of injury can sometimes be determined by careful palpation or by the Pachon oscillometer. In the presence of alarming hemorrhage, however, this determination must wait on the control of the bleeding. In the extremities it can then be determined only during the first part of the operation, when provisional control has been substituted for the tourniquet. The provisional control is cautiously released and the amount of impairment of distal circulation is ascertained. From this apparent impairment must be sub-

¹ Klotz, O., Permar, H. H. and Guthrie, C. C. End Results of Arterial Transplants. *Ann. Surg.* 78: 305 (Sept.) 1923.

tracted the factor of arterial spasm, which may be present in greater or lesser degree after vessel injuries or temporary constriction of the afferent circulation.

The final result of the management of acute vessel injuries requires not only the control of hemorrhage and of infection and the reduction to a practical minimum of the amount of vascular loss but the maintenance also of the life of the part supplied by the vessel involved. In many cases the amount of vessel substance that is lost or must be sacrificed to save the patient from fatal hemorrhage or infection is more than the limb can spare. Survival of the part is then secured only by the rapid and abundant development of collateral channels. Successful results were obtained in blood vessel surgery long before the importance of this collateral circulation was recognized. Even today in many cases in which some intricate method of vessel wound management is instituted, success is obtained not by virtue of the ingenuity of the surgical procedure but by the incidental generous development of collateral vascular channels.

The most recent major contribution to blood vessel surgery is the recognition of the importance of the collateral flow, and the discovery of methods that stimulate collateral blood vessel development to its greatest possible maximum. All adjuvants to the development of collaterals such as postural exercises, intermittent application of heat, passive vascular exercise by positive and negative pressures, intermittent venous congestion, or vasoconstrictor paralysis by nerve block are recommended as elective features of the postoperative program. Active encouragement in the use of these methods will reduce the percentage of postoperative gangrene and improve results to some extent.

POSTOPERATIVE CARE

While much depends on a nice choice of operative procedure in the care of the vessel wound and adjacent parts, too often the advantages thereby gained are promptly lost by injudicious postoperative care. In clean cases the details of postoperative care are designed to maintain the part in a physiologic norm. Both extremes of management, varying from unrestricted activity to the rigid immobilization and encasement that were so popular a generation ago, are to be avoided.

The part is kept in a comfortable position and a small amount of activity is encouraged. In the extremities this activity should be confined to the small acral muscles. It should not include gross movements of flexion and extension which puts a dangerous strain on suture lines and invites the loosening of emboli. The maximum benefits are gained when movements are not pushed to the point of fatigue. The part is protected from decubital pressure, especially over the bony prominences. It is kept warm, but extreme caution is exercised to avoid burning or maceration. The deficient blood supply lowers the resistance of the tissues to thermic insults.

In the infected cases, dependent and adequate drainage must be maintained. Full advantage is taken of the position in which the part is placed to maintain dependent drainage. Warm, moist dressings are used sparingly because the heat is difficult to stabilize, the moisture leads to maceration, and the dressing as a whole serves to obstruct free drainage. Frequent irrigation or treatment with dilute solution of sodium hypochlorite is much more advisable.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH Secretary

ALLERGENIC EXTRACTS-MULFORD — Liquids obtained by extracting the protein of substances believed to be the cause of specific sensitization.

Actions and Uses — See general article Allergic Protein Preparations, New and Nonofficial Remedies, 1935, page 25.

Dosage — See general article Allergic Protein Preparations, New and Nonofficial Remedies, 1935, page 25.

Allergenic Extracts-Mulford are marketed in 2 cc ampule vials containing 1,500 protein units per cubic centimeter, except allergenic preparations marked (*), which contain 100 protein units per cubic centimeter.

Manufactured by Sharp & Dohme Philadelphia and Baltimore No U S patent or trademark.

Almond Allergenic Extract Mulford¹ Apple Allergenic Extract Mulford² Apricot Allergenic Extract Mulford² Artichoke Allergenic Extract Mulford² Asparagus Allergenic Extract Mulford² Banana Allergenic Extract Mulford² Barley Allergenic Extract Mulford² Bass (Sea) Allergenic Extract Mulford² Bean (Kidney) Allergenic Extract Mulford² Bean (Lima) Allergenic Extract Mulford² Bean (Navy) Allergenic Extract Mulford² Bean (Soy) Allergenic Extract Mulford² Bean (String) Allergenic Extract Mulford² Beef Allergenic Extract Mulford² Beet Allergenic Extract Mulford² Blackberry Allergenic Extract Mulford² Bluefish Allergenic Extract Mulford² Brazilnut Allergenic Extract Mulford² Brussels Sprouts Allergenic Extract Mulford² Buckwheat Allergenic Extract Mulford² Butternut Allergenic Extract Mulford² Cabbage Allergenic Extract Mulford² Cantaloupe Allergenic Extract Mulford² Carp Allergenic Extract Mulford² Carrot Allergenic Extract Mulford² Cawflower Allergenic Extract Mulford² Celery Allergenic Extract Mulford² Cheese (American) Allergenic Extract Mulford² Cheese (Swiss) Allergenic Extract Mulford² Cherry Allergenic Extract Mulford² Chestnut Allergenic Extract Mulford² Chicken Allergenic Extract Mulford² Cinnamon Allergenic Extract Mulford² Clam Allergenic Extract Mulford² Clove Allergenic Extract Mulford² Cocoa Allergenic Extract Mulford² Coconut Allergenic Extract Mulford² Codfish Allergenic Extract Mulford² Coffee Allergenic Extract Mulford² Corn Allergenic Extract Mulford² Crab Allergenic Extract Mulford² Cranberry Allergenic Extract Mulford² Cucumber Allergenic Extract Mulford² Duck Allergenic Extract Mulford² Egg Plant Allergenic Extract Mulford² *Egg White Allergenic Extract Mulford² *Egg (Whole) Allergenic Extract Mulford² *Egg Yolk Allergenic Extract Mulford² Fig Allergenic Extract Mulford² Garlic Allergenic Extract Mulford² *Ginger Allergenic Extract Mulford² Goose Allergenic Extract Mulford² Grape Allergenic Extract Mulford² Grapefruit Allergenic Extract Mulford² Haddock Allergenic Extract Mulford² Halibut Allergenic Extract Mulford² Herring Allergenic Extract Mulford² Hickory Nut Allergenic Extract Mulford² Honey Dew Allergenic Extract Mulford² Huckleberry Allergenic Extract Mulford² *Lactalbumen Allergenic Extract Mulford² Lamb Allergenic Extract Mulford² Lemon Allergenic Extract Mulford² Lentil Allergenic Extract Mulford² Lettuce Allergenic Extract Mulford² Lobster Allergenic Extract Mulford² Mackerel Allergenic Extract Mulford² *Milk (Cow) Allergenic Extract Mulford² Mushrooms Allergenic Extract Mulford² *Mustard Allergenic Extract Mulford² Nutmeg Allergenic Extract Mulford² Oats Allergenic Extract Mulford² Okra Allergenic Extract Mulford² Olive Allergenic Extract Mulford² Onion Allergenic Extract Mulford² Orange Allergenic Extract Mulford² Oyster Allergenic Extract Mulford² Parsley Allergenic Extract Mulford² Parsnip Allergenic Extract Mulford² Paprika Allergenic Extract Mulford² Pea (Green) Allergenic Extract Mulford² Pea (Black Eyed) Allergenic Extract Mulford² Peach Allergenic Extract Mulford² Peanut Allergenic Extract Mulford² Pear Allergenic Extract Mulford² Pecan Allergenic Extract Mulford² *Pepper (Black) Allergenic Extract Mulford² Pepper (Red) Allergenic Extract Mulford² Pepper (Sweet) Allergenic Extract Mulford² Perch Allergenic Extract Mulford² Pineapple Allergenic Extract Mulford² Plum Allergenic Extract Mulford² Pork Allergenic Extract Mulford² Potato (White) Allergenic Extract Mulford² Potato (Sweet) Allergenic Extract Mulford² Prune Allergenic Extract Mulford² Pumpkin Allergenic Extract Mulford² Radish Allergenic Extract Mulford² Raisin Allergenic Extract Mulford² Raspberry Allergenic Extract Mulford² Rhubarb Allergenic Extract Mulford² Rice Allergenic Extract Mulford² Rye Allergenic Extract Mulford² Salmon Allergenic Extract Mulford² Scallop Allergenic Extract Mulford² Shad Allergenic Extract Mulford² Shad Roe Allergenic Extract Mulford² Shrimp Allergenic Extract Mulford² Smelt Allergenic Extract Mulford² Sole Allergenic Extract Mulford² Spinach Allergenic Extract Mulford² Squash Allergenic Extract Mulford² Strawberry Allergenic Extract Mulford² Swiss Chard Allergenic Extract Mulford² Tea Allergenic Extract Mulford² Tomato Allergenic Extract Mulford² Trout (Sea) Allergenic Extract Mulford² Tuna Fish Allergenic Extract Mulford² Turkey Allergenic Extract Mulford² Turnip Allergenic Extract Mulford² Vanilla Allergenic Extract Mulford² *Walnut (Black) Allergenic Extract Mulford² *Walnut (English) Allergenic Extract Mulford² *Watermelon Allergenic Extract Mulford² *Wheat Allergenic Extract Mulford² Yeast Allergenic Extract Mulford² *Camel Hair Allergenic Extract Mulford² *Cat Hair Allergenic Extract Mulford² *Cattle Dander Allergenic Extract Mulford² *Chicken Feathers Allergenic

Extract Mulford⁴ *Dog Hair Allergic Extract Mulford⁴ *Duck Feathers Allergic Extract Mulford⁴ *Goat Hair Allergic Extract Mulford⁴ *Goose Feathers Allergic Extract Mulford⁴ *Guinea Pig Hair Allergic Extract Mulford⁴ *Hog Hair Allergic Extract Mulford⁴ *Horse Dander Allergic Extract Mulford⁴ *Rabbit Hair Allergic Extract Mulford⁴ *Sheep Wool Allergic Extract Mulford⁴ *Cottonseed Allergic Extract Mulford⁴ *Dust House Allergic Extract Mulford⁴ *Flaxseed Allergic Extract Mulford⁴ *Glue (Fish) Allergic Extract Mulford⁴ *Horse Serum Allergic Extract Mulford⁴ *Kapok Seed Allergic Extract Mulford⁴ *Orris Root Allergic Extract Mulford⁴ *Pyrethrum Allergic Extract Mulford⁴ *Rice Polish Allergic Extract Mulford⁴ *Silk Allergic Extract Mulford⁴ *Tobacco Allergic Extract Mulford⁴

Allergic Extracts-Mulford are prepared by extracting various substances with buffered salt solution consisting of monobasic potassium phosphate (KH_2PO_4) 0.363 Gm, dibasic sodium phosphate (Na_2HPO_4) 1.43 Gm and sodium chloride (NaCl) 5 Gm in 1 liter of distilled water containing 0.4 per cent of phenol.

Products marked 1 are prepared for extraction as follows. The crude material is ground as fine as possible. The powder or flour, is placed in a Buchner funnel and washed with carbon tetrachloride until the washings are clear and colorless. The carbon tetrachloride is removed with ether. The washings are discarded and the residue is dried. The dried residue is extracted under toluene with buffered salt solution from one to three days at room temperature.

Products marked 2 are prepared for extraction as follows. The fruits or vegetables are ground as fine as possible. Buffered salt solution is added to the ground pulp and allowed to extract under toluene from one to three days at room temperature.

Products marked 3 are prepared for extraction as follows. The muscle fibers after the removal of fat and tendons are ground as fine as possible. The ground muscle is washed with toluene until free from fats and oils. The toluene washings are discarded. The ground meat is extracted under toluene with buffered salt solution from one to three days at room temperature.

Products marked 4 are prepared for extraction as follows. The feathers or hair are washed with ether and the suspended particles of dander are collected by filtration. The dried material is extracted under toluene with buffered salt solution from one to three days at room temperature.

Preparations marked 5 are prepared for extraction as follows. The yolk of an egg is separated from the white in a sterile manner. One part of egg white, or egg yolk, is diluted with four parts of sterile buffered salt solution.

Lactalbumen marked 6 is prepared for extraction as follows. The fat from 1 liter of milk is removed by centrifugation. The fat free milk is saturated at 30 C with magnesium sulphate which precipitates the caseinogen and lactoglobulin. The filtrate is acidified with acetic acid so that the content of the acid is 1 per cent. The precipitate is filtered off pressed out and dissolved in water, the solution is neutralized and dialyzed (Practical Organic and Bio Chemistry R H A Plummer p 446).

Milk, marked 7 is prepared for extraction as follows. One liter of fresh nonheated milk from which the fat has been removed by centrifugation is mixed with 3 cc of 1 per cent rennin solution and placed in a water bath at 37 C for one-half hour. The precipitated casein is removed by straining through a sterile towel. The filtrate is neutralized with saturated solution of sodium bicarbonate and sterilized by filtration (J Immunol 15:2 1928).

Dust, marked 8 is prepared for extraction as follows. The dust is washed with ether and extracted under toluene with a mixture of two parts of alkaline extracting fluid (2.5 Gm of sodium bicarbonate and 5 Gm of sodium chloride in 1 liter of distilled water) and one part of buffered salt solution saturated with carbon dioxide. The extract is dialyzed against the same fluid passing carbon dioxide constantly during the period of dialysis. After dialysis, the extract is evaporated (electric fan) and during the process carbon dioxide is kept constantly bubbling through the fluid (J Immunol 15:2 1928).

Horse serum marked 9 is prepared for extraction as follows. Normal horse serum containing 0.4 per cent of phenol as a preservative is used. Glue marked 10 is prepared for extraction as follows. Glue is extracted with buffered salt solution.

Allergic Extracts Mulford are tested and standardized in terms of protein units. The unit is fixed at 0.001 mg of protein. The total nitrogen is determined by the Kjeldahl method. The total nitrogen in milligrams multiplied by 6.25 equals total protein in milligrams. The total protein in milligrams divided by 0.001 equals the total number of protein units.

ACRIFLAVINE BASE (See New and Nonofficial Remedies, 1935, p 185)

Acriflavine Neutral-Calco—A brand of acriflavine base—N N R

Tablets Acriflavine Neutral-Calco $\frac{1}{2}$ grain (uncoated)

SCARLET RED MEDICINAL BIEBRICH (See New and Nonofficial Remedies, 1935, p 180)

Scarlet Red Medicinal Biebrich-Calco—A brand of scarlet red medicinal Biebrich—N N R

IPRAL SODIUM (See THE JOURNAL, June 1, 1935, p 1999)

The following dosage forms have been accepted

Ipral Sodium Tablets $\frac{3}{4}$ grain
Ipral Sodium Tablets 2 grains

ANAEROBIC ANTITOXIN (See New and Nonofficial Remedies, 1935, p 366)

Parke, Davis & Co., Detroit.

Gas-Gangrene Antitoxin (Combined) Refined and Concentrated P D & Co—Also marketed in vials containing 10 000 units of perfringens antitoxin and 10 000 units of vibrio septique antitoxin

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS
RAYMOND HERTWIG Secretary

NOT ACCEPTABLE

GUNZENHAUSER CREAM-NUT BREAD

The Gunzenhauser Bakery, Inc., of Lancaster, Pa., submitted to the Committee on Foods a white bread named Cream Nut Bread and prepared from white flour, water, condensed skim milk, lard, sodium chloride, sucrose, yeast, powdered skim milk, malt extract and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate.

Discussion of Name—The name "Cream-Nut" implies the presence of cream and nuts in substantial quantities in the baking formula and sufficient to give the bread qualities and nutritional values not possessed. Cream and nuts are not ingredients and skim milk is the only milk product constituent. The name therefore is inappropriate and misleading. Food names should truthfully describe foods.

The bakery was advised over a year ago of the Committee's criticisms but as yet has not demonstrated that a change has been made in the product name. This bread, therefore, will not be listed among the Committee's accepted foods.

NOT ACCEPTABLE

ELTOLA DIETETIC LEGUME FLOUR

Manufacturer—Eltola Flour Company, Huntington, W Va.

Description—Powdered legume (Lupinus) flour

Manufacture—Lupinus seeds, a legume product from Palestine, Syria and other tropical countries are cleaned of foreign materials, washed with water, soaked in a solution of sodium bicarbonate and sodium chloride to remove the bitter taste, removed from the solution, spread on tables to dry, ground, sifted to remove the coarse hull material, and packed in wax paper bags in cartons.

Analysis (submitted by manufacturer) —

| | per cent |
|--|----------|
| Moisture | 5.7 |
| Ash | 1.3 |
| Fat (ether extract) | 21.8 |
| Protein (N \times 6.25) | 49.7 |
| Crude fiber | 1.9 |
| Carbohydrates other than crude fiber (by difference) | 19.6 |
| Starch | none |
| Sugar | none |

Calories—47 per gram 133 per ounce

Uselessness as a Special Purpose Food—Eltola Dietetic Legume Flour is manufactured specially for use in diets restricted in dextrose formers. To be eligible for acceptance, such type of flour shall contain dextrose formers yielding dextrose in an amount not greater than 3.3 Gm per hundred cubic centimeters (the dextrose equivalence being computed as the carbohydrate, plus 58 per cent of the protein, plus 10 per cent of the fat content of the food). Dextrose formers of this legume flour, however, yield many times the quantity of dextrose per hundred cubic centimeters that is permissible for acceptance.

There is authoritative evidence that commercially prepared special diabetic foods such as gluten flour are of limited usefulness to the diabetic patient and that the availability of insulin makes them no longer necessary. Artificial substitutes for ordinary foods are not to be favored, it is much better for the diabetic patient to learn how to plan his diet with foods in common use and readily available. The diet should be exactly prescribed in carbohydrate, protein and fat, and total calories.

The designation of a food as a "diabetic food" merely because it is low in carbohydrates is now unwarranted and misleading and gives the erroneous impression either that the food taken in unrestricted quantities in diabetes is harmless or that it has remedial action. Except for the necessity of restricting foods to avoid overstepping the food tolerance, there are no special diabetic nutritional requirements. The exploitation of starch-free or low carbohydrate foods containing an excess of protein

for use by diabetic patients is unwarranted. Protein may be tolerated almost as poorly, if not quite as poorly, as starch in diabetics.

Because Eltola Dietetic Legume Flour is adjudged without usefulness or special adaptability for inclusion in diets restricted in dextrose formers, it will not be listed among the accepted foods of the Committee on Foods.

ACCEPTANCE WITHDRAWN

RY-KRISP

Manufacturer—Ralston Purina Company, St. Louis

Description—Whole rye wafer, flavored with salt.

Analysis (submitted by manufacturer) —

| | per cent |
|--|----------|
| Moisture | 60 |
| Ash (including added salt) | 37 |
| Fat (ether extraction method) | 20 |
| Protein (N X 6.25) | 13.1 |
| Crude fiber | 2.2 |
| Pentosans | 9.8 |
| Available carbohydrate (by difference) | 63.2 |

Calories—3.2 per gram 91 per ounce

Discussion of Advertising—A booklet and leaflet, abounding with feminine sylph-like figures, proclaiming "Sylvia's message" for exercising and giving "Stay-Slim" menus and newspaper advertising contain the following statements:

"Ry Krip is one of my beauty secrets—says (Madam) Sylvia, Hollywood's miracle worker, the world's foremost authority on beauty. No matter what your beauty problems are—dieting to improve or keep your figure need be no hardship—if you'll remember just one simple thing. Eat Ry Krip regularly. These delicious wafers are made simply of flaked whole rye water and salt—nothing to add superfluous fat only wholesome ingredients which keep you fit and regular. They're an ideal 'stay slim' food—filling but not fattening. That's why Ry Krip has been included for years in the diets I've planned for the movie stars. It's really my assistant in helping you attain greater loveliness. You see I know when you eat Ry Krip regularly you don't want starchy, fattening foods—instead you're getting a food which actually helps you to be slim and stay slim—because it helps to keep you fit."

Sylvia knows that these crisp wafers are marvelously good for staying slim as well. If you want a figure like a movie star eat Ry Krip with every meal they learned by actual experience that these crisp delicious wafers actually keep you slim because they keep you fit! See how soon you begin to feel better—and look better too. If you want to have and keep a perfect figure, exercise properly and eat Ry Krip with every meal! Miss Gloria Stuart, Universal star has discovered that Ry Krip is a pleasant aid to keeping her famous figure at its best. Why Ry Krip helps you to stay slim. Nothing to make you fat—only easily digested ingredients which keep you fit and regular. In fact they keep you from wanting starchy fattening foods. That's why they're so perfect with meals—or between meals. Get the habit of nibbling at a Ry Krip wafer when you're hungry. Eat Ry Krip regularly and watch your waistline waste away. It doubles the joy of dad's favorite beverage—and is good for his waistline too. These crisp delicious wafers are more than a perfect Stay Slim food! Children and grown-ups welcome them because their unique flavor doubles the appetite appeal of any food. For health and enjoyment serve Ry Krip with every meal! Get the Hollywood Habit—exercise regularly, eat sensibly use Ry Krip instead of heavy starchy foods—watch your waistline waste away. Remember when Ry Krip is used instead of heavy starchy foods it's easy to transform many of your favorite menus into successful reducing meals. Ry Krip cuts the calories. Follow the Hollywood habit and eat this delicious Ry Krip you'll get a slim figure. Ry Krip is a safe natural aid to reducing and a wholesome healthful food.

Ry-Krip is an entire rye wafer and as such has essentially the same nutritional values as the entire-grain cereals as a class. It provides a moderate quantity of fibrous material for increasing the indigestible bulk in the intestine, thereby contributing to the roughage necessary for normal bowel functioning. The protein is of good grade biologically, but inferior to milk or meat protein. The high available carbohydrate content contributes food energy for supplying physiologic energy needs. Ry-Krip is essentially a carbohydrate food. The advertising falsely portrays Ry-Krip as possessing specific reducing properties. In fact, Ry-Krip is a rich source of food-energy and taken in any quantity very materially raises the caloric value of the diet. No food has specific reducing properties, especially not Ry-Krip. Ry-Krip will contribute to the production of "superfluous fat" when included in any diet providing greater fuel content than required for meeting food-energy needs. It is no more a "stay-slim" food than bread or many other common foods. There is nothing about Ry-Krip

that will alter one's desire for "starchy, fattening foods" as alleged. It is a "starchy food" contrary to allegations.

Advertising making use of alleged or actual statements of movie stars for instructing the public on scientific nutritional questions does not merit recognition. The eating of Ry-Krip will not make one look better, "keep a perfect figure," or make your "waist-line waste away." Ry-Krip will not give "health" as stated and implied.

The advertising is grossly misinformative and misrepresents the food values of Ry-Krip, its role in the diet, and the relation of any one food or the entire diet to the maintenance or reduction of body weight. Advertising such as this destroys confidence in food advertising in general and promotes misleading advertising practices.

Because of the false misleading advertising, acceptance of Ry-Krip has been withdrawn.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG Secretary

- 1 FAULTLESS BRAND GOLDEN SYRUP
- 2 JACK SPRAT BRAND GOLDEN SYRUP
- 3 MARSHALL BRAND GOLDEN SYRUP
- 4 UNCLE WILLIAM BRAND GOLDEN SYRUP

Distributors—2 Jack Sprat Foods, Inc., Marshalltown, Iowa.

3 and 4 Marshall Canning Company, Marshalltown, Iowa.

Packer—Marshall Canning Company, Marshalltown, Iowa.

Description—Table syrup, corn syrup flavored with refiners' syrup.

Manufacture—Corn syrup, water and refiners' syrup are mixed, heated to 71 C and sealed in cans.

Analysis (Submitted by packer) —

| | per cent |
|-----------------------------------|----------|
| Moisture | 25.0 |
| Total solids | 75.0 |
| Ash | 0.5 |
| Fat (ether extract) | 0.0 |
| Protein (N X 6.25) | 0.04 |
| Reducing sugars as dextrose | 38.7 |
| Sucrose (copper reduction method) | 9.0 |
| Dextrins (by difference) | 26.8 |

(No methods are available for accurately determining the composition of syrups of this nature, therefore the foregoing analysis is roughly approximate.)

Calories—3 per gram 85 per ounce

Claims of Packer—Recommended for use as an easily digestible and readily assimilable carbohydrate supplement to milk in infant feeding, and as a syrup for cooking, baking and the table.

MARCO BRAND PINEAPPLE JUICE

Distributor—H. A. Marr Grocery Company, Denver

Manufacturer—Alexander & Baldwin, Ltd., Honolulu, Hawaii

Description—Canned, unsweetened pineapple juice retaining in high degree its natural vitamin C content. Same as Greetings Pineapple Juice (THE JOURNAL, Aug 17, 1935, p 513)

STEWART'S BRAND TOMATO JUICE

Distributor—The Jesse C. Stewart Company, Pittsburgh

Packer—Vincennes Packing Corporation, Vincennes, Ind.

Description—Pasteurized tomato juice with added salt, retains in high degree the natural vitamin content. The same as Alice of Old Vincennes Tomato Juice (THE JOURNAL, Feb 20, 1932 p 640)

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - CHICAGO, ILL.

Cable Address

Medic, Chicago

Subscription price

Seven dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, NOVEMBER 30, 1935

THYROIDECTOMY FOR HEART DISEASE

Surgery applied to a normal organ, with the intention of altering the general physiologic functions of the body so that a condition in a distant and diseased part may be improved, must rest on a solid foundation. Among recent operative procedures of this nature is ablation of the normal thyroid in certain cases of chronic heart disease. The rationale of this measure rests largely on the work of Dr Herman L Blumgart, who in a series of studies beginning in 1925 was able to show a definite relationship between the rate of blood flow and the thyroid function as measured by the basal metabolic rate,¹ the flow being increased in exophthalmic goiter and slowed in myxedema. Blumgart and his co-workers were thus led to suggest that, when the circulation in decompensated heart disease could not be accelerated by digitalis, rest and other appropriate cardiac therapeutic methods, compensation might be achieved by lowering the circulatory demand through thyroidectomy. Such a procedure should decrease the speed of circulation as the demand is diminished by the falling basal metabolic rate. It would be expected that at some point the crippled supply, as measured by the rate of blood flow, would come into equilibrium with the lowered demand imposed by the thyroidectomy and thus compensation would result. Additional evidence of the rationale has been afforded by clinical observations of a number of patients with decompensated heart disease who were entirely, if only temporarily, relieved of their cardiac failure syndrome by subtotal thyroidectomy.

The failure of persistence of lowered metabolism and clinical cardiac improvement following the subtotal operation introduced total thyroidectomy. The first total ablation of the thyroid for chronic heart disease of nonthyrogenous origin seems to have been performed by Dr David D Berlin² on Dec 15, 1932. During the succeeding six months the metabolic rate

of the patient operated on remained persistently low, averaging minus 28 per cent. The patient was also restored to occupational usefulness in spite of three previous years of complete cardiac invalidism. The special surgical precautions and technic of total ablation of the thyroid have been largely developed and are adequately described by Berlin.

The cardiac indications for complete thyroidectomy are still in process of definition. Congestive heart failure in which prolonged medical management has failed to induce satisfactory results has been considered one of the indications. The selection of patients of this group for operation has been recently discussed by Levine and Eppinger.³ There are some obvious contraindications, such as bacterial endocarditis or active rheumatic carditis. Accompanying renal insufficiency, not dependent on simple passive congestion of the kidneys, and cirrhosis of the liver are other contraindications. They feel in general that, if patients with congestive heart failure are selected at all, it should be done without great optimism. With regard to angina pectoris, the criteria of selection seem to be somewhat more definite. Levine and Eppinger, for example, state that a patient should not be subjected to this operation if able to carry on his occupation. Furthermore, if the patient is unable to work but his financial status permits him to lead a life of leisure, provided he is comfortable, operation would not be advised. Thus the economic and social status of the individual constitute an important element in the selection of patients for operation. There is furthermore no evidence as yet to show that the operation prolongs the life of a patient with angina pectoris, and therefore it cannot be recommended with this in view.

The possible harmful effects of complete thyroidectomy have been mentioned in practically all the discussions. The production of postoperative myxedema is an obvious probability but seems relatively immaterial, since it is possible to minimize effects of this nature by administration of small doses of thyroid extract without apparently undoing the results of lowered circulatory demand. The danger of parathyroid tetany has been insignificant. Even the operative mortality has been satisfactorily low, considering the nature of the procedure and the conditions for which it is performed.

The present status has been assessed by Graybiel and White.⁴ "Complete removal of the thyroid in appropriate cases of angina pectoris has been established as a valuable procedure. Criteria for the proper selection of patients cannot be given categorically, the problem is more individual. It may be stated in general terms, however, that this operation may be considered for

1. Cutler E. C. Total Thyroidectomy for Heart Disease, Minnesota Med 18 421 (July) 1935.

2. Berlin D D. Therapeutic Effect of Complete Thyroidectomy on Congestive Heart Failure and Angina Pectoris. Am. J. Surg 21 173 (Aug) 1933.

3. Levine S A and Eppinger E. C. Further Experiences with Total Thyroidectomy in the Treatment of Intractable Heart Disease, Am. Heart J 10 736 (Aug) 1935.

4. Graybiel Ashton and White, P D. Diseases of the Heart. A Review of Contributions Made During 1934. Arch. Int. Med 55:842 (May) 1935.

patients for whom medical treatment is unsatisfactory if a sufficient lowering of the basal metabolic rate can be expected and if the patient's fitness for operation can be proved

It is not possible," they say, "properly to evaluate the treatment of congestive failure by complete removal of the thyroid gland

It has been shown that congestive heart failure can be abolished in at least half the patients operated on, and unquestionably most of these patients showed considerable subjective improvement. However, this does not decide the matter. It must be shown that improvement is sufficiently long lasting. A major procedure like total thyroidectomy must promise a comparatively great reward. Even if this operation is successful it must be remembered that the patient faces congestive failure again in a relatively short time with the reexperiencing of previous events. This involves a consideration not only of the patient's wishes but of far-reaching social and economic factors of which the patient is often the poorest judge."

Further conclusion seems, at the present time, unnecessary except that general application of the operation by those unfamiliar with the selection of patients or the surgical technic would seem wholly inadvisable

FOOD VALUE OF ETHYL ALCOHOL

In considering its use for medical purposes, it should be possible to regard alcohol as one would any other therapeutic agent, uninfluenced by views of the use of alcoholic mixtures as a beverage. Although it cannot be doubted that fluids containing alcohol are toxic under certain conditions of dosage, this is not an argument against their use. Almost all drugs are toxic in doses larger than those used for therapeutic measures. Nevertheless, in considering any substance as a therapeutic agent, its physiologic and toxicologic effects must be kept in mind. This is particularly true with respect to alcohol, which, although supplying energy when oxidized, has certain properties, notably its effects on the central nervous system, that militate against its employment.

The ability of the animal body to absorb and oxidize ingested ethyl alcohol was established early¹. There is much controversy, however, regarding the physiologic value of the energy thus made available. The numerous contributions to the subject of the metabolism of ethyl alcohol indicate that when it is ingested it is absorbed unchanged into the circulation, no digestive or breakdown process occurs in the intestine. The rapid rate of absorption of alcohol from the alimentary tract makes it a readily available source of energy to the organism. The therapeutic value of alcohol in collapse rests largely on this attribute. The oxidation of alcohol undoubtedly releases energy, but it has not

been entirely clear whether the energy liberated is dissipated as heat or is available for physiologic work, thus sparing other food materials such as carbohydrate and fat. Suggestions have been made that alcohol in moderate quantities acts like an equivalent amount of fat and carbohydrate, as the addition of alcohol to an already sufficient diet leads to the deposition of body fat and thus to an increase in body weight. Furthermore, alcohol added to a diet otherwise inadequate immediately diminishes the degree of destruction of body protein.

Notwithstanding some indication in the literature that ethyl alcohol has a measurable food value, the unsatisfactory nature of some of the evidence and the contradictory results have left this problem in a controversial state. This has led Mitchell² to conduct a careful and detailed investigation of this question. The practical importance of the problem becomes self-evident in attempts to evaluate the nutritive quality of alcoholic beverages. The subject takes on additional significance in view of the apparently normal presence of alcohol in body tissues and fluids,³ and its possible significance as an intermediary metabolite in carbohydrate metabolism.⁴ In Mitchell's experiments, pairs of rats were fed equal quantities of a good basal diet, one animal of each pair receiving variable supplements of 95 per cent ethyl alcohol. The nutritive effects of the alcohol were measured by determining the growth rates of pair mates over a number of weeks of the experiment and by investigating the nitrogen and energy contents of the tissues formed from an analysis of the carcasses. The investigation included experiments in which supplements of sucrose replaced supplements of alcohol in order to compare the nutritive effects of these two compounds. The comparative effects of alcohol and sucrose supplements on the digestive processes were also studied by chemical examination of the feces of the experimental animals. In one series of experiments the rats were placed in revolving cages equipped with revolution counters, so that the alcohol supplements could be increased in size only as long as voluntary activity was not depressed. In other studies the animals were confined in small compartments with the view of greatly restricting the energy expended on muscular activity and of minimizing any differential expenditure between test and control rats. Careful evaluation of the experimental conditions and critical analysis of the data obtained demonstrated that the energy of ethyl alcohol is to a large extent available for physiologic purposes. When added to a complete diet, alcohol induces more rapid growth and a greater retention of nitrogen and fat. As compared with a similar supplement of sugar, the energy of an alcohol supplement is only about three fourths as available for

1 Emerson Haven. *Alcohol and Man*. New York, Macmillan Company, 1932. Lusk, Graham. *Science of Nutrition*, ed. 4. Philadelphia W. B. Saunders Company, 1928.

2 Mitchell H. H. *J. Nutrition* **10**: 311 (Sept.) 1935.

3 Gettler A. O., Niederl J. B. and Benedetti Picbler A. A. *J. Am. Chem. Soc.* **54**: 1476 (April) 1932.

4 Shapiro Inez. *J. Biol. Chem.* **108**: 373 (Feb.) 1935.

physiologic purposes, its growth-promoting power is definitely less, though the composition of the new tissues produced is similar in the two instances. Alcohol apparently increased the digestibility of the basal diet, whereas sucrose exerted no appreciable effect in this direction.

These observations of the food value of ethyl alcohol are of considerable interest to the clinician. Although it must be accepted that in recent years the use of alcohol by physicians in the care of their patients has greatly decreased, alcoholic beverages may have a place in rendering more comfortable and peaceful the disturbances of chronic disease and old age. In addition, as a solvent of various medicinal substances alcohol performs a useful function, although the therapeutic rôle in this instance is limited. Even though the uses of alcohol as a therapeutic agent are limited and have largely been replaced by better therapeutic measures, the clear cut establishment of the food value of ethyl alcohol makes available useful information heretofore lacking to the physician.

Current Comment

NONSPECIFIC PROTEIN TREATMENT

In this issue appears the first of two special articles on nonspecific protein treatment, prepared under the auspices of the Council on Pharmacy and Chemistry. Hektoen¹ discusses briefly the nature of the reactions to nonspecific proteins in the treatment of infectious diseases. Next week Cecil² will review experiences and results with this treatment, he shows that modern protein treatment appears to have achieved "a permanent place for itself in modern therapeutics" not only of certain acute and subacute infectious diseases but also in other conditions, notably thrombo-angitis obliterans. To this extent nonspecific protein treatment is a noteworthy achievement in empirical therapeutics of direct interest to the medical practitioner. Both articles point out that the effects of nonspecific proteins in infectious conditions are associated with nonspecific as well as specific anti-infectious processes. Differences in these effects in the same infection and in different infections cannot now be explained satisfactorily. It is evident that much more study of the changes induced by nonspecific proteins in the human body is required in order to obtain more of an insight into the nature and significance of these processes as they occur under various conditions. The opportunities for the investigation of the more intimate nature of the reactions in patients under treatment should not be neglected. In vascular disease, dilatation and release of spasm seem to be responsible for the good effects of protein therapy, but here also is need for closer study. From Cecil's review it appears further that the indications, contraindications and limitations of nonspecific protein

treatment in its present forms are well under way toward fairly definite establishment. Certainly the indiscriminate and offhand use of the treatment is unwarranted and not free from danger.

A NEW SKIN REACTION

Recently Foshay¹ has described a heretofore unrecognized dermal reaction to serum against certain bacterial infections. At the site of the intradermal injection of a small quantity of antiserum a spreading redness develops about a slightly elevated central edema. "The reaction usually appears promptly, within two to four minutes, sometimes less, and rarely not until ten to eleven minutes, and is usually from 3 to 5 cm in diameter at the end of twenty minutes, sometimes larger. It is usually maximal in from twenty to twenty five minutes after injection of the serum, and there is very often an intensification of the reaction after about six hours. Urticaria never occurs at any time, and only very rarely have any of these reactions been accompanied by itching. The erythema, however, is often intense and may spread rapidly. No constitutional symptoms accompany this local reaction. The initial erythema commonly lasts for only half an hour or so and then fades rapidly. This reaction has been seen only when a patient with a given bacterial infection has been skin tested with an antiserum specific for that infection. When individuals exhibit this simple erythematous-edematous reaction to the specific homologous antiserum, control injections of normal serum from the same animal species, and of antisera specific for other infections, made from the same species, elicit no reactions whatever. Hence this E-E [erythematous-edematous] reaction is obviously unrelated to the phenomena of serum protein sensitization." The new reaction has been observed in tularemia, brucellosis, tuberculosis, inguinal lymphogranuloma and typhoid, and in streptococcal, staphylococcal and gonococcal infections, but no definite statements are ventured as yet as to its frequency except that in tularemia it seems to be practically constant. It appears to concern a specific reaction between substances in the antiserum, most likely antibodies, and substances in the skin of the patient, most likely of antigenic nature, and consequently it may prove to be of diagnostic value. In typically positive form as well as when wholly negative the test may serve also to exclude sensitiveness to the antiserum injected. Foshay points out that the reaction has been and may be misinterpreted as a response to serum sensitiveness and thus lead to needless delay and difficulties in the administration of antiserum. He emphasizes that the absence of urticaria clearly distinguishes the new reaction from the reaction to serum sensitiveness. It will be of interest to watch the further developments in connection with this newly described skin phenomenon and, if Foshay's work is confirmed, its occurrence in various diseases, together with its significance and mechanism.

¹ Hektoen, Ludvig. Nonspecific Proteins. The Reactions to the Nonspecific Protein Treatment of Infectious Diseases. *this issue* p. 1765.

² Cecil, R. L. Nonspecific Protein Therapy. *J. A. M. A.* to be published.

¹ Foshay, Lee. Intradermal Antiserum Tests. A Bacterial Specific Response not Dependent on Serum Sensitization but Often Confused with It. *J. Allergy* 6: 360, 1935.

Association News

COMMITTEE TO STUDY CONTRACEPTIVE PRACTICES AND RELATED PROBLEMS

Dr Everett D Plass of Iowa City has been elected to membership on the Committee on Contraceptive Practices and Related Problems instead of Dr James R. McCord of Atlanta, Ga, who declined to serve because of insufficient time to devote to the work of the committee. Dr Carl Henry Davis was elected chairman of the committee. The committee as at present constituted consists of Drs Carl Henry Davis, Milwaukee, chairman, George W Kosmak, New York, W A Coventry, Duluth, Minn., Richard J O'Shea, Seattle, John Rock, Boston, Willard Richardson Cooke, Galveston, Texas, and Everett D Plass, Iowa City, with Drs James R. Bloss and W C. Woodward, ex officio

RADIO BROADCASTS

The American Medical Association broadcasts over the Blue network and certain additional stations of the National Broadcasting Company at 5 p m eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time) each Tuesday, presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers a toast "Ladies and gentlemen, your health!" The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

The next three programs are as follows

- December 3 Tuberculosis Morris Fishbein MD
- December 10 Hunting Accidents Morris Fishbein MD
- December 17 Animal Diseases in Man, W W Bauer, MD

This program is broadcast also on the short waves through KDKA, Pittsburgh, over station W8XX, 11,870 and 12,210 kilocycles

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH ETC.)

CALIFORNIA

"Science Edits the News"—At the request of Station KYA, the San Francisco County Medical Society now broadcasts exclusively over that station a program entitled "Science Edits the News." Before the first of the year the station is expected to increase its power to give the program full Pacific Coast coverage. The chief purpose of the program is to give the public facts in an ethical manner concerning newspaper items related to medicine and its allied sciences. It will be presented each Tuesday from 6 to 6 15 p m until further notice.

Group Insurance Against Malpractice—The report of a committee appointed several months ago to investigate proposals of group malpractice insurance for members of the Los Angeles County Medical Association was accepted by the board of councilors, November 4. The report recommended that the association take steps to secure group insurance against malpractice and form a permanent committee on malpractice and expert testimony. It was further suggested that the council recommend to the board of trustees such increase in the annual dues as is necessary to finance a group policy.

Deaths from Poison in Baking Soda—Three deaths in San Francisco have been attributed to poisoned baking soda, according to a warning broadcast over the radio, November

19, by Dr Jacob C Geiger, city health officer. Seventeen other persons in the city were reported to be violently ill when they ate food in which the soda was used or partook of it for medical purposes, it was stated. These cases were all traced to salvaged sodium bicarbonate sold retail by one store. Apparently salvage agents sold six barrels, and at least one barrel contained sodium fluoride, which mixed with the soda. Arsenic also was found in some samples analyzed, but its source as yet remains unexplained.

Society News—At a meeting of the Los Angeles Society of Ophthalmology and Otolaryngology, November 25, a symposium on corneal ulcer was presented by Drs Melvorton E. Trainor, William A Boyce and Alexander Ray Irvine.—The Los Angeles Society for Neurology and Psychiatry was addressed, November 20, by Bennett M Allen, PhD, and Lawrence Gahagan, PhD, both of the University of California, Los Angeles, on "Experiments with the Hypophysis" and "Intelligence and Personality Studies in Epileptic Children," respectively.—Dr Bruce M Stephens, Alameda, discussed "Emergency Treatment in Common Eye Disorders" before the Alameda County Medical Association, November 18, and Dr Theodore C Lawson, Oakland, "Carcinoma of the Colon and Rectum"—At a meeting of the Sonoma County Medical Society in Santa Rosa, October 20, speakers included Dr William B Faulkner Jr, San Francisco, on surgery of the chest.—Dr Henry Schmitz, Chicago, presented a paper before the Los Angeles County Medical Association, November 7, entitled "How May the Prognosis and Curability of Cancer Be Improved?"

COLORADO

Personal—Dr Marion F Haralson, senior surgeon, U S Public Health Service, is now acting secretary of the Colorado State Board of Health, in the absence of Dr Roy L Cleere, Denver, who is at the School of Health Administration of Johns Hopkins University, Baltimore, for a year's study.

Society News—At a meeting of the Crowley County Medical Society, October 11, in Ordway, speakers were Drs John V Ambler, Denver, and William C Service, Colorado Springs on "Acneiform Eruptions" and "Eczema, Hay Fever and Asthma," respectively.—A symposium on tuberculosis was presented before the Garfield County Medical Society in Glenwood Springs, October 21, by Drs George P Bailey, Edgewater, and John Zarit, Denver.—Dr George K Cotton, Denver, discussed "Internal Derangements of the Knee Joint" before the Larimer County Medical Society in Fort Collins, October 2.—The Mesa County Medical Society devoted its meeting in Grand Junction, October 15, to a symposium presented by the team representing the committee on tuberculosis education of the state medical society, speakers were Drs Charles O Giese and John B Crouch, Colorado Springs.—Dr Cyrus W Anderson, Denver, delivered a paper and showed a motion picture on "Physiology of Fertilization in the Human Female" before the Pueblo County Medical Society in Pueblo, October 15.—At a meeting of the Otero County Medical Society in October, Dr Harold R McKeen, Denver, discussed "Fractures In and Around the Elbow" and Dr Atha Thomas, Denver, "Fractures of the Ankle."

ILLINOIS

Malaria Control Program.—Work was recently started on a program of malaria control in southern Illinois, where the disease is widely prevalent, according to the state health department. This is a WPA project, under direct supervision of the health department. Swampy areas in the malaria infected territory will be drained and the banks of lakes, streams and other natural bodies of water will be cleared to dry up mosquito breeding places and to make practicable the use of oil and minnows in controlling the propagation of insects.

Southern Illinois Meeting—The sixty-first annual meeting of the Southern Illinois Medical Association convened in Belleville, November 7-8. Speakers included the following

- Dr William E. Leighton, St Louis, Division of the Anterolateral Tracts of the Spinal Cord for Relief of Pain
- Drs Albert B McQuillan and Wendell Stewart, East St. Louis, Calcification of the Collateral Ligaments of the Knee
- Dr Charles Hugh Neilson, St. Louis, Effect of the Weather on Human Conduct and Disease.
- Dr Charles B Reed, Chicago, The Social Security Act and the Doctors
- Dr John W Thompson Jr., St. Louis, Pyloroplasty in the Treatment of Duodenal Ulcer
- Dr Frank P McValley, St Louis, The Obstetrics of General Practice.

Dr James S Templeton, Pinckneyville, was named president at this session and Dr Harvey Felts, Marion, secretary

Chicago

Society News—The Chicago Orthopedic Society was addressed, November 8, by Dr Hiram Winnett Orr, Lincoln, Neb., on "Best Methods of Reduction and Fixation in Open Infected Fractures", Stewart H Crossland, Gary, Ind., "Acute Suppurative Arthritis," and Mrs Davis G McCarn, "The Work of the Illinois Society for Mental Hygiene"—The North Side Branch of the Chicago Medical Society was addressed, November 7, by Surg Gen. Charles R. Reynolds and Dr Raymond O Dart, assistant curator, Army Medical Museum, Washington, D C., on "Employment of the Medical and Allied Professions of the Military Service in a National Emergency" and "Scientific Research in the United States Army," respectively—A symposium on obstetrics was presented before the Chicago Medical Society, November 20, speakers included Drs Stewart H Clifford, Boston, and, from Chicago, Philip A Daly, Frederick H Falls, Edward D Allen and Eugene Cary

The Late Dr LeCount Donor of Capps Prize—At the meeting of the board of governors of the Institute of Medicine of Chicago, October 22, it was unanimously voted to enroll the late Dr Edwin R. LeCount as a benefactor of the institute in recognition of his gift in 1931 of \$10,000 for a trust fund to bear the name of Dr Joseph Almarin Capps. The income was to be used to establish an annual prize for the most meritorious investigation in medicine in Chicago completed within two years after graduation by a graduate of a medical school in Chicago. The donor of the fund has until this time remained anonymous. Four prizes of \$500 each have been awarded since the fund was established. Dr LeCount was professor of pathology in Rush Medical College from 1892 until his death. He was a member of the House of Delegates of the American Medical Association in 1903 and served as chairman of the Section on Pathology and Physiology in 1920-1921. Dr Capps is clinical professor of medicine at the Division of Biological Sciences, University of Chicago.

Maximum Sentence Imposed on Barron—Kenneth Barron, operator of the Madison-Western Clinic, 2418 Madison Street, was sentenced to one year in the county jail and fined \$500, November 14, by Municipal Judge Erwin J Hasten, who found him guilty of practicing medicine without a license, newspapers reported. The penalty is the maximum on this charge. Barron's motion for a new trial was overruled, but the judge granted him a stay of mitimus for sixty days to allow time for an appeal. His bond was increased from \$2,000 to \$5,000 on recommendation of Assistant State's Attorney Sheer, prosecutor in the case. When he was unable to supply this bond, Barron, who is a former barber, went to jail. In imposing sentence, Judge Hasten said "Quack doctors are death dealers and a menace to the reputable medical profession. In reality, they prevent ignorant, gullible persons from getting the services of competent physicians. Instead of healers they become killers indirectly." The Madison-Western Clinic advertised its cut-rate prices in various newspapers. It was admitted that one death occurred at the clinic—a woman died during a tonsillectomy. This evidence was ruled out by Judge Hasten because it was barred by the statute of limitations, eighteen months having elapsed between the performance of the operation that caused the death and the filing of the complaint on October 8. A second charge against Barron, that of operating a clinic without a license for practicing medicine, was continued until November 21. It was Judge Hasten who a few months ago imposed a maximum sentence on an illegal practitioner, Raphael Lee (THE JOURNAL, June 22, p 2272).

IOWA

Carbon Monoxide Responsible for Twenty Deaths—Accidental poisoning attributed to carbon monoxide caused twenty deaths in Iowa during 1934, according to the state department of health. Ten of the deaths were caused by exhaust gas from automobiles, five fatalities taking place in home garages. The state department emphasizes in its bulletin that carbon monoxide poisoning constitutes a serious health problem. In poorly ventilated public garages, concentration of the gas may reach the dangerous level of 10 parts per 10,000 parts of air near the exhausts of cars which are kept running. In a street with heavy traffic, the concentration may exceed 1 part per 10,000 parts of air.

Society News—Dr William W Bauer, Chicago, addressed a joint meeting of the Wapello County Medical Society and the Kiwanis and Rotary clubs November 4, in Ottumwa on "Health Education versus Health Racketeering"—The Iowa Society for Crippled Children was organized at a meeting, November 1, in Des Moines, Gerald Hunt, Gutenberg, past district governor of Rotary International, was named temporary

president, and Miss Bess Johnson, principal of Smouse School, Des Moines, temporary executive secretary—Dr Arthur E. Hertzler, Halstead, Kan., will discuss "Diagnosis and Treatment of Uterine Hemorrhages" before the Linn County Medical Society in Cedar Rapids, December 12.

MAINE

Society News—Speakers before the Aroostook County Medical Society at Mars Hill, October 22, included Drs Oscar Norell, Caribou, "Our Present Organization and the Health Insurance Problem" and William B Grow, Presque Isle, "State Medicine of Great Britain."—Dr Siegfried Thannhauser, Boston, addressed the Oxford County Medical Society in Bethel, October 15, on functional tests of the liver and dietetic treatment of liver diseases.

MASSACHUSETTS

Fifth Medical Pageant—The fifth medical historical pageant was presented by students of Tufts College Medical School at the Boston Medical Library, November 18, under the auspices of the Boston Medical History Club. A display of manuscripts and books dealing with the characters in the play was arranged by James F Ballard, director of the library. The theme of the pageant was the "Story of Early Medicine in Massachusetts," divided into three epochs: the Colonial (1620-1700), the Pre-Revolutionary period (1700-1775), and the Post-Revolutionary period (1775-1846).

Opposition to Sale of Strychnine—The Massachusetts Medico-Legal Society adopted a resolution, October 2, discountenancing the sale or dispensing of strychnine in any form that covers or conceals its taste or in a container that is not clearly labeled as to name, amount in each dose, warning of "poisoning" if dosage is exceeded, and treatment if excess is accidentally taken. The society took this action in view of the many fatalities that have occurred among children who have been attracted to the candied coatings of the drug, either by itself or incorporated with other drugs in laxative and tonic tablets.

MICHIGAN

Coldwater School Becomes "Children's Village"—The Michigan Children's Village for care of children of the higher grades of mental deficiency has been established at Coldwater, occupying buildings formerly used by the Michigan State Public School. While these children will be gradually moved from the Michigan State Home and Training School at Lapeer, the village is not a branch of this institution, but a separate state organization. Recent legislation provided for the establishment of the Michigan Children's Institute at Ann Arbor to be used as a receiving home for dependent and neglected children formerly maintained at the Michigan State Public School. The institute will care for these children until private homes are found for them. Ann Arbor was selected because the University Hospital can give the medical and psychologic examinations necessary for successful placement. The children's village is expected ultimately to shelter between 300 and 400 mentally deficient children, while the institute will maintain quarters for only about thirty of the dependent children. Dr Harry A. Schneider, formerly assistant superintendent of the Michigan Home and Training School at Lapeer, has been appointed superintendent of the Michigan Children's Village.

MISSOURI

Society News—Dr Walter Freeman, Washington, D C., discussed "The Organs of the Endocrine System and Their Relation to Personality" before the Jackson County Medical Society, Kansas City, November 19—A symposium on gastrointestinal diseases was presented before the St. Louis Medical Society, November 5, by Drs Frank D Gorham, Joseph W Larimore, Leroy Sante and Louis Rasseur. At a meeting, November 12, Dr Adrien S Bleyer discussed "The Role of the Parasympathetic Nervous System in True Enuresis," and H Tsuchiya, Sc.D., "Intestinal Parasitism."

Tuberculosis Conferences—The health division of the department of public welfare of St. Louis announces the fourth annual series of tuberculosis conferences, the first of which, December 5, will be devoted to a symposium on the diagnosis of tuberculosis. The second, December 9, will be given over to demonstrations in health centers. A symposium on tuberculosis will make up the third conference, December 12, and the last will be a demonstration clinic at Koch Hospital, December 16. Announcement is also made of a course in maternal hygiene, to be held December 4, 11 and 18, and one on child hygiene, December 3, 6 and 10.

NEVADA

State Medical Meeting and Election—Dr Charles E. Secor, Elko, was chosen president elect of the Nevada State Medical Association at the annual meeting in Elko, October 25-26, and Dr Richard O. Schofield, Boulder City, was installed as president. Dr Horace J. Brown, Reno, was reelected secretary, and Reno was chosen for the meeting place in September 1936. The program was as follows:

Dr Lorenzo Dow Inskeep, Medford, Ore., *Etiologic Factors in Epilepsy and Their Treatment*
Dr Clarence Eliot Snow, Salt Lake City, *Branchial Cysts and Lateral Cervical Fistulae*
Dr Edward S. Pomeroy, Salt Lake City, *True Status of Electro-removal of the Prostate with the Endoscope*
Dr Charles W. Mayo, Rochester, Minn., *Unilateral and Bilateral Hernia: A Comparative Study of Postoperative Complications*
Dr Alfred W. Adson, Rochester, Minn., *Treatment of Dysmenorrhea*
Dr George A. Cochran, Salt Lake City, *Medical Management of Peptic Ulcer*
Dr Ralph C. Pendleton, Salt Lake City, *Treatment of Major Burns*
Dr John A. Fuller, Reno, *Common Eye Affections*

NEW JERSEY

The Harrison S. Martland Lecture—The Essex County Anatomical and Pathological Society has initiated a yearly lecture in honor of Dr Harrison S. Martland, medical examiner of Essex County and associate professor of forensic medicine at New York University College of Medicine. The first Harrison S. Martland Lecture will be given December 14 at the Academy of Medicine of Northern New Jersey, Newark, by Dr George H. Whipple, dean, University of Rochester School of Medicine and Dentistry, Rochester, N. Y., on "Problems in Anemia." Dr Whipple will be introduced by Dr Emanuel Libman, New York.

NEW YORK

Low Maternal Mortality Rate—Recent figures compiled by the state department of health show that the maternal mortality rate in New York in 1934 (50.6 per 10,000 total births) was the lowest ever recorded except in 1916. The 1933 rate was 60.9. The greatest decrease took place in New York City and a slight increase appeared in rural areas. There were 979 deaths in the entire state, compared with 1,190 in 1933. In 1934 there was an increase in deaths from puerperal hemorrhage and toxemias of pregnancy, but those from other puerperal causes were the lowest in several years.

New York City

Queens General Hospital Opened—The first municipal hospital in the Borough of Queens, the Queens General Hospital, was opened, October 30, with a ceremony at which Mayor La Guardia was the principal speaker. The 600 bed institution was begun in 1931. PWA grants amounting to \$800,000 were made available late in 1934 for the installation of plumbing and equipment. The entire cost of the plant was \$3,845,000. A comprehensive clinical organization has been set up. It has a visiting staff of 234 and thirty-seven interns and residents. Dr Carl Boettiger is president of the medical board and Dr Marcus D. Kogel, formerly medical superintendent of Cumberland Hospital, is medical superintendent.

OREGON

Firm Attempts to Dupe Physicians—The Portland Better Business Bureau has issued a report on the "W. B. Mayo Laboratories," which recently appeared in Oregon, apparently from California. It advertises a nostrum known as "Dr. W. B. Mayo's Formula" for overacidity. The attention of the bureau was directed to the concern whose address is given as Medford, by an advertisement in Portland newspapers asking for men to represent a "nationally known corporation." Men who answered the advertisement were offered positions to call on physicians as representatives of a pharmaceutical firm. The salesman's job was to induce the physician to become a consultant for the firm and pay it \$200. In return for this investment, the consultant would receive a proportionate part of 5 per cent of the profits of the company in the state; the bureau points out that, if 5,000 physicians contributed and the firm sold \$1,000,000 worth of products in a year, it would still take twenty years for the physician to get his money back. It was also represented that the physician would receive patients attracted through a radio program. According to the Better Business Bureau of Los Angeles, where the concern appears to have an office at 3733 Wilshire Boulevard, the firm plans to spend \$1,000,000 in radio advertising in which it will be stated that "the W. B. Mayo Laboratories will gladly suggest a reputable physician in your community." Of course the physician would be one who had invested \$200 in the business; the report points out. According to records of the American Medical Association, Woodward Bruce Mayo was born in Salt Lake City in

1891 and holds a diploma issued by Loyola University School of Medicine, Chicago, in 1917. He was licensed to practice in California in 1921 and his license was revoked in 1931 following a hearing on charges based on an illegal operation. His license was restored Feb. 27, 1933, and he was placed on probation for five years. Last February he was brought before the California board of medical examiners and it was decided that he should be cited to appear at the board's July meeting to show cause why his license should not be revoked again. In the meantime he disappeared from California. The Portland bureau adds that the concern failed to file a report and pay a license fee to the state corporation department for the fiscal year ended June 30.

PENNSYLVANIA

Graduate Assembly—The Montour County Medical Society presented its first graduate assembly for the winter season at Geisinger Memorial Hospital, Danville, November 15. Guest speakers were Drs. Russell L. Cecil, New York, on "Types of Pneumonia and Their Treatment by Serum" and "Etiology and Treatment of Chronic Arthritis," and Vaughn C. Garner, Philadelphia, on "Some Common Dermatological Problems" and "Diagnosis and Treatment of Early Syphilis."

Philadelphia

Women's Conference on Cancer Research—The Woman's Auxiliary of the Lankenau Hospital Research Institute for the Promotion of Cancer Research held its third annual conference on research in cancer, November 12, at the Century Club. Dr. Francis Carter Wood, New York, spoke on "What Progress in Cancer Research?" Mrs. Marjorie B. Illig, representing the American Society for the Control of Cancer, New York, "The Challenge of the Day," Mrs. John J. H. Phillips, chairman of the division of public health, State Federation of Pennsylvania Women, "Local Signs of Progress in Cancer Control," and Dr. Stanley P. Reimann, director of the Lankenau Hospital Research Institute, "Cancer Prevention."

Society News—Dr. John L. Rice, health commissioner of New York City, delivered the James M. Anders Lecture of the College of Physicians of Philadelphia, November 6; his subject was "Looking at Tuberculosis, Cancer, Diabetes, Heart Disease and Syphilis from the Public Health Point of View."—A symposium on pulmonary disease was presented before the Philadelphia County Medical Society, November 27, by Drs. Claude P. Brown, Isadore Kaufman, Eugene P. Pendergrass and Gabriel Tucker.—Speakers at a meeting of the Philadelphia Pediatric Society, November 12, were Drs. Robert T. Devereux, West Chester, "The Use of Liver Extract in the Treatment of Infection," Herman Gold, Chester, "Studies on Whooping Cough Prophylactic Immunization," and Sidney Weiss, "Enuresis: A Statistical and Analytic Study."—Dr. Jean R. Oliver, Brooklyn, addressed the Pathological Society of Philadelphia, November 14, on "The Abnormal Nephron of Chronic Hemorrhagic Bright's Disease."—Dr. Warren T. Vaughan, Richmond, Va., will address a joint meeting of the North End Medical Society and the North Branch of the Philadelphia County Medical Society, December 19, on "Methods in the Study and Treatment of Food Allergy."

Pittsburgh

Society News—Externs of Western Pennsylvania Hospital held their third annual reunion at the hospital in October. Dr. George P. Muller, Philadelphia, gave the principal address on proper uses and types of anesthesia.—Drs. John W. Shirer and George J. Wright addressed the Pittsburgh Academy of Medicine, November 12, on "Hyperthyroidism—Other Factors in Its Interpretation" and "Multiple Sclerosis Syndromes" respectively.—Speakers at a meeting of the Allegheny County Medical Society, Pittsburgh, November 19, were Drs. Ralph R. Mellon on "Bacteriology of Common Colds," Ehrhardt Ruedemann, "Sinus Ear and Mastoid Infections Following Common Colds," and Charles J. Bowen, "Treatment of Common Colds," and Carlton E. Brown, Sc.D., of the U. S. Bureau of Mines, "Dust Respirators." The bureau of mines sponsored a scientific exhibit.

VIRGINIA

Society Elections—The Virginia Pediatric Society at a meeting in conjunction with the annual meeting of the Medical Society of Virginia in Norfolk, October 15-17, reorganized and elected the following officers: Drs. Basil B. Jones, president, John S. Weitzel, vice president, and W. Ambrose McGee, secretary, all of Richmond. The Virginia Urological Society met at the same time and elected the following officers: Drs. Joseph F. Geisinger, Richmond, president; Charles J. Devine, Norfolk, vice president, and Linwood D. Keyser, Roanoke, secretary.

WISCONSIN

Society News—Mr J George Crownhart, executive secretary of the State Medical Society of Wisconsin, addressed a joint meeting of the Racine and Kenosha county medical societies in Kenosha, October 29, on state medicine and health insurance.—Dr Cleveland J White, Chicago, addressed the Fond du Lac County Medical Society, Fond du Lac, in October, on diseases of the skin, with special reference to ringworm, acne, impetigo and eczema.—Speakers before a meeting of the ninth councilor district of the State Medical Society of Wisconsin in Wausau, October 30, were Drs John S Lundy, Rochester, Minn, on anesthesia, Walter C Frenzel, Wausau, dextrose and its uses, and Gregory G Shields, Abbottsford, trichinosis.—The Milwaukee Neuropsychiatric Society visited Madison for a meeting, October 31, speakers were members of the faculty of the University of Wisconsin Michael F Guyer, Ph D, on "The Human Constitution as the Biologist Sees It", Dr Elmer L Sevringhaus, "The Present Status of the Endocrine Glands," and Dr William A Mowry, "Allergy and the Central Nervous System"—The Milwaukee Society of Chemical Surgery met, November 26, to hear the following speakers Drs Alexander R Colvin, St. Paul, on "Fracture Problems", Frederic Christopher, Evanston, "Inflammatory Tumors of the Cecum Simulating Appendicitis," and Robert I Hiller, "Postoperative Anuria."—Drs Donald K Bacon and Joseph F Borg, St. Paul, addressed the Barron-Washburn-Sawyer-Burnett Counties Medical Society, Cumberland, October 29, on "Indications for and Uses of Blood Transfusion" and "Diagnostic Significance of Abdominal Pain," respectively

GENERAL

In Memory of Dr Wiley—Walter Hoge MacIntire of the department of chemistry at the Agricultural Experiment Station, University of Tennessee, gave the fifth Harvey W Wiley memorial address of the Association of Official Agricultural Chemists at the annual meeting November 11 in Washington, D C Dr Wiley was a founder and the first president of the association

Industrial Hygiene Journal Changes Name—The *Journal of Industrial Hygiene*, edited at the Harvard School of Public Health, Boston, announces that in 1936 it will take the name *Journal of Industrial Hygiene and Toxicology*. It will resume its former publishing schedule of ten issues a year instead of six and the content of original papers will be increased about 50 per cent.

Annual Tuberculosis Seal Sale—The twenty-ninth annual sale of Christmas seals by the National Tuberculosis Association and its constituent state and local societies opened November 29 and will continue till Christmas. The 1935 seal shows a girl of about 1860, designed as a reminder of the time when "consumption" was accepted as a plague whose victims were doomed. The sale of seals increased 5 per cent in 1934 over that for the preceding year, the first increase since 1929. The association recently announced that its monthly bulletin is to be expanded to publish



brief articles, abstracts from other health periodicals, book reviews and news of tuberculosis activities

Influenza Virus Desired for Study—The Hospital of the Rockefeller Institute for Medical Research, New York, announces that staff investigators studying the virus of influenza are anxious to obtain new strains for study and comparison with those previously studied. Strains of a filtrable virus apparently having an etiologic significance have been recovered from several localized epidemics in Puerto Rico, Philadelphia and Alaska. The Rockefeller Foundation has requested state and city health officers to cooperate with the hospital. Dr Rufus Cole, director, asks that health officials notify him by telegram collect of any outbreak of typical influenza, that he may take steps to collect the desired material.

Health Officials Tour Country—Seven foreign health officials are guests of the U S Public Health Service in a tour of the United States to study new medical developments under the American social security program. The tour has been arranged by the League of Nations, and the itinerary includes New York, Washington, Baltimore, Knoxville, Tenn, Cincinnati, Chicago, Albany, N Y, Boston and New Haven. Included in the party are Dr L S Fridericia, professor of hygiene, University of Copenhagen, Dr J Parisot, professor of hygiene, University of Nancy, Prof R M F Picken, Welsh National School of Medicine, Cardiff, Dr Einar Rietz, chief medical officer of health Stockholm, Dr H van der Kaa,

chief health officer of the Netherlands, Dr Frank G Boudreau of the League of Nations, and Dr B Boric, chief of the health service, Yugoslavia.

Annual Report of American Red Cross—Seven hundred and sixty-five Red Cross nurses made 1,156,003 visits to 214,444 patients during the year ended June 30, 1935, according to the annual report of the American Red Cross. This represents an increase of 39 per cent over the previous year. Of the 633,944 school and preschool children inspected by the nurses, 325,329 were found to be suffering from one or more physical defects, 195,137 were treated by Red Cross or cooperating physicians. Immunization against diphtheria was a major project in many of the Red Cross chapters, more than 54,700 children being immunized, most of them of preschool age. Between 25,000 and 30,000 persons received treatment for pellagra. An increasing number of mothers and young women are taking courses in home hygiene and care of the sick, it was stated, 52,196 persons having completed this course in the past year. The Will Rogers Nursing Fund, established in 1934 through a gift of \$25,000 by the late Mr Rogers, assisted in supporting public health services in fifty-seven communities of twenty-seven states. Special emphasis was placed on malnutrition, especially among children, and in San Luis Valley, in southern Colorado, an oral hygiene project was inaugurated as the result of a large outbreak of Vincent's infection. There were 128 domestic disasters in which the Red Cross extended aid during the year, exceeding by forty six, or 56 per cent, the average number of disasters annually requiring Red Cross assistance during the past ten years. Not only was the year heavy in the number of disasters, the report stated, but the geographic distribution was wide, with thirty-seven states affected in addition to the territory of Alaska, 110,000 persons were aided in these disasters. The total expenditures during the year amounted to \$2,945,644.13. March 1, Admiral Cary T Grayson took over the duties of chairman, succeeding Judge John Barton Payne, who died in Washington, January 24, within two days of his eightieth birthday.

Medical Activities of Rockefeller Foundation—The annual report of the Rockefeller Foundation shows that, of \$12,679,775 expended in 1934, \$1,026,200 was appropriated for the medical sciences and \$2,200,000 for public health activities. In the medical field emphasis was placed on advancement of neurology and psychiatry, for which aid of four types was provided: grants to universities and institutions for development of research and teaching, endowment and building funds for establishing departments of psychiatry, grants to individual investigators in mental disease, and fellowships to enable men and women to obtain advanced training. In public health the foundation engaged in field research on yellow fever, undulant fever, malaria, hookworm disease, tuberculosis, vaws and diphtheria, conducted yellow fever surveys and control campaigns, carried out malaria control projects, supported demonstrations of public health programs, aided in organizing or maintaining health departments, and contributed to the training of public health personnel through direct fellowships and aid to schools and institutes of public health and hygiene. Yellow fever research has demonstrated that there are two endemic areas in the world, one in West Africa and the other in the Amazon Valley of South America. It has also come to be recognized that yellow fever may be transmitted by vectors other than the stegomyia mosquito, a discovery that opens new problems to the investigator. In addition to these two principal divisions, the foundation appropriated \$1,051,210 for the natural sciences, with specific concentration in experimental and physicochemical biology. President Max Mason indicated in a statement accompanying the report that in the immediate future emphasis will be placed on special fields and realistic research designed to meet definite and clearly recognized needs. It will continue its traditional work in public health, the major interest in medical science will continue to be mental health, and in the natural sciences support will be given to studies in the broad field of modern analytic biology, directed toward the understanding of physical and mental growth and development.

FOREIGN

Nobel Prize in Chemistry Awarded to the Joliot's—The Nobel prize in chemistry was awarded, November 14, to Prof. Frederick Joliot and his wife, Mme Irene Curie Joliot, a daughter of the late Pierre and Marie Curie, discoverers of radium, for their synthesis of radioactive elements. They have succeeded in creating radium substitutes by bombarding atoms of ordinary chemical elements with alpha rays to make them radioactive. The Nobel prize was awarded to Madame Joliot's parents in 1903 for their joint discovery of radium and again to her mother in 1911 for her isolation of the element.

McDonnell Library Opened—The Aeneas McDonnell Library at the Toowoomba General Hospital, Toowoomba, Queensland, Australia, was officially opened September 14. Dr. McDonnell, chief surgeon at the hospital for forty-six years, recently donated his medical library of about 300 books to the hospital, which arranged a special room for it. At the opening ceremony Dr. McDonnell announced his retirement from the active staff. Dr. McDonnell was born in Australia in 1864 and graduated from the University of Sydney. He has been a member of the Medical Board of Queensland since 1909.

Rockefeller Gift to London Hospital—A gift of £60,000 to the National Hospital, Queen-square, London, for new buildings has been announced by the Rockefeller Foundation, with the condition that the hospital authorities raise £120,000 more, the remainder of the amount needed for the new construction. The foundation has offered another £60,000 toward an endowment fund for research, to be available for remuneration of workers. Plans include new teaching rooms, laboratories with special wards, and a new surgical department. National Hospital was the scene of much of the work of Hughlings Jackson, the great neurologist, and has long been recognized as a center for the study of neurology.

Government Services

Annual Report of Food and Drug Administration

During the fiscal year ended June 30, the Food and Drug Administration made 2,011 seizures and 1,029 prosecutions, both slightly larger than the corresponding figures for the previous year. More than 60,000 samples were collected and examined, nearly 50,000 of which were foods. These samples represent the output of more than 13,000 manufacturers, 3,000 of whom were responsible for some form of violation. The report points out that a definite plan of sampling is used, applied in the same manner in all inspection districts.

Violations are classified in three principal groups: practices constituting menaces to public health, adulterations involving contamination of foods with filth and decomposition, and economic cheats. Those in the first group, being obviously most important, take more time than any other effort. Of this type, spray-residue inspections are the most important single regulatory activity. The administration analyzed 6,331 samples from 3,300 producers, 338 seizures were made, 299 of which were apples. The largest number of these were in the Great Lakes and Mississippi Basin states.

The government inspectors investigated seventy-three outbreaks of food poisoning, including seven diagnosed as botulism, but there was no case of botulism from domestic supplies of commercially canned food. A notable fact was that not a single can of the salmon packed during the year was seized. In this connection may be mentioned administration of a new law adopted by Congress in 1934, providing that packers of sea food might apply for government inspection of their processes, the packer to bear the expense.

An unusual development was the seizure of old and deteriorated drugs, which unscrupulous brokers took in trade and tried to work off. Products were found that had been on shelves since before the enactment of the Food and Drugs Act. These dealers were especially active in Texas, where authorities destroyed twenty-eight tons of dangerous old stocks.

Medicinal preparations bearing false and fraudulent claims formed the basis of 177 seizures, of which 174 products were referred to the Solicitor General for prosecutions. Drug preparations other than proprietary medicines and medicinal whiskey accounted for thirty-nine seizures, misbranded antiseptics two, alleged reducing substances four and products misbranded for vitamin claims six. A total of 2,298 samples of products recognized in the U. S. Pharmacopeia and the National Formulary were taken, of these, 1,958 met the requirements of the standards. Extensive sampling of anesthetic ether was continued, of 1,790 individual containers examined, only six failed to meet the requirements of the Pharmacopeia. A few seizures were made of other types of anesthesia. During the fiscal year 2,500 notices of judgment describing terminated actions were published. Penalties imposed ranged from 1 cent to \$4,500, the first for the sale of butter short in weight and low in fat, the second against an eastern manufacturer for selling substandard citrate of magnesia. Two new divisions were created during the year, a unit for assay of vitamin claims in food products and for research in vitamin standardization, and a unit to handle the work connected with biologic products. These were reported in *THE JOURNAL*, August 17, page 522.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov 2, 1935

Further Development of the Social Medical Program

In the competition for votes at the general election, which is now proceeding, each party dilates on the benefits it is prepared to confer on the country if returned to power. One of these is extension of the public health service. In an election speech Sir Kingsley Wood, minister of health in the late government, said that development of the social services formed one of the most important parts of the government's election program. What was needed was a comprehensive plan for the development of the public services as a whole, with two main objects—protection of the community from unhealthy surroundings and complete provision for every individual of such personal services as might be needed at the various stages of life. In short, the policy was to provide decent conditions and the health to enjoy them. Considerable progress had been made toward the attainment of the first aim. The first essential of a healthy environment was a home. The national government had already a comprehensive housing policy, which was being carried out rapidly. It had made a direct attack on the two evils of bad housing—slums and overcrowding. Sixty-thousand slum houses had been pulled down and already 280,000 persons had exchanged the squalor of slum life for modern healthy homes.

MATERNITY AND CHILD WELFARE

Steady progress had been made with the provision of antepartum clinics, which increased from 1,101 in 1930 to 1,493 in 1934, and of hospital accommodations. This progress must be continued. But while the work had resulted in a gratifying reduction of infant mortality from 128 per thousand live births at the beginning of the century to 59 in 1934, there had been no reduction in the maternity mortality. The causes of this failure were not yet fully understood, and the government was giving unremitting attention to the problem. Notwithstanding the good work that was being done there were in many areas a gap in the health services and an urgent need for a salaried midwife service to secure for every woman who required it skilled care in childbirth. If returned to power, the government would introduce legislation for this purpose. Further provision was required for the needs of children under school age. In areas where the mothers could not give children the requisite care and attention, the government would encourage the provision of nursery schools in which good food, fresh air and skilled attention and training would give the youngest children a good start before elementary school days began. For the health of the school child elaborate provision was made in the school medical service, but in many parts of the country facilities for treatment, particularly dental treatment, were in need of expansion. These deficiencies would be remedied, and more remedial and preventive treatment in the form of orthopedic centers and open-air schools would be provided. At present there was no medical supervision between the time when a child left school and the age of 16, when he became eligible for health insurance. That gap would be filled. After children left school, health could be maintained only by systematic physical education, in which games and physical exercises played an important part. The government would promote a scheme of physical education covering all types of schools.

A Bone Setter Must Not Use the Title "Surgeon"

For fifteen years a bone setter had treated fractures, dislocations and disorders of bones and joints at Sheffield, Cardiff and later Paignton and other places in Devon and Cornwall, which he regularly visited. He put up a plate describing himself as

"manipulative surgeon" As he had no medical qualification, the Medical Defense Union wrote to him, pointing out that he was infringing the medical act in using the title "surgeon." He replied that he was not using the title surgeon and added "Prove that I am not a manipulative surgeon and I will remove the words from my plate." He was therefore summoned, but the court dismissed the charge that he was infringing the medical act. An appeal against this decision was made and was heard by the lord chief justice and two other judges. It was contended that the act contained an absolute prohibition against the use of the title "surgeon" by an unregistered person. For the respondent it was contended that he did not use the word "surgeon" by itself and that coupling it with the word "manipulative" was not unlawful and did not imply that he was registered under the act. The court reversed the previous judgment. The lord chief justice said "If a man was not a surgeon he must not call himself surgeon and the use of the adjective 'manipulative' did not alter the case. If the respondent desired to represent to the public that he was not a qualified surgeon many other descriptions were open to him, such as 'manipulative healer'."

District Nursing

An extensive charitable organization exists for "district nursing" (nursing the poor in their own homes). It owes its origin to William Rathbone, who in 1859 provided a nurse to work among the Liverpool poor. The Metropolitan and National Nursing Association was formed in 1875 by the Order of St. John of Jerusalem to train hospital nurses for district work. Subsequently county nursing associations were formed. In 1887 the work was consolidated and raised from the sphere of individual effort to that of a national institution. In 1926 it was calculated that, on a basis of one nurse for 10,000 of the population, nursing was provided for 75 per cent of the population. Subsequent experience showed that there is more work among an industrial population of 10,000 than one nurse can undertake. A survey of the district nursing in England and Wales, compiled by the Queen's Institute of District Nursing, shows that of the 39,864,184 population of England and Wales a nursing service is available for 38,206,867, or 96 and 87 per cent respectively in those countries. The increasing demand for domiciliary nursing indicates that an extension of the service may be expected. The income available for the service is about \$5,000,000 per annum and a nurse costs about \$1,150. In addition to the fund, money is collected in the form of gifts from patients and through provident payments.

The Care of Mental Defectives

Sir Laurence Brock, chairman of the Board of Control (which controls the administration of the lunacy laws) has stated in a public speech that mental defectives if uncared for, usually live in the worst conditions. There was a danger that, unless something was done, they would turn model cottages into slums. This had happened in some parts of the country. Of 300,000 mental defectives in this country, two thirds need not be segregated but should be allowed to live in the community. Here voluntary workers could help a great deal under experienced trained organizers. The colony system was the most economical method of dealing with the other third. Some people suggested that, instead of the patients being allowed to live in attractive villas, it would be cheaper to build barracks. Initial costs were bound to be high, but he was hopeful that the cost of maintenance would be further reduced. The aim was to give an atmosphere of village life. Many mental defectives were keenly alive to their surroundings. Seeing that they had been deprived of their liberty for the benefit of the community, it was only fair that they should live under happy, pleasant conditions. There was a strong case for sterilization although its advantages might be exaggerated. A better instructed public opinion was needed. It was far too common

for well intentioned people to encourage the marriage of defectives when a girl was expecting childbirth. There was a far better chance for the illegitimate child of mental defectives if reared in an institution than for the legitimate children of defectives, often reared in deplorable homes. There was no justification for the dismal articles in the press suggesting national deterioration. The problem was far too serious to lend itself to sensational treatment.

PARIS

(From Our Regular Correspondent)

Oct. 25, 1935

Congress on Gout

It is the custom of the leading thermal resorts in France to organize meetings every fall at which the ailments for which the individual resort is famous are discussed by leading medical men. The congress at Vittel this year was devoted to the various aspects of gout.

A paper on the pathogenesis of gout was read by Merklen and Wolf. Four elements must be considered (a) uricogenesis, (b) uricolysis, (c) hyperuricemia and (d) elimination of uric acid. Uric acid is the result of disintegration of nucleins. The role of the four nucleic acids, which give rise to the nucleins, seems to be that of a buffer in compensating the variations of the acidity or alkalinity of the nuclear medium. The majority of organ extracts furnish ferments ready to act on nucleic acids, so that the conversion of the latter into uric acid is a widespread process in the organism, that is, every tissue can give rise to uric acid. This is especially true of the liver.

As to uricolysis, nitrogenous waste is eliminated so far as albumins are concerned in the form of urea, and for nucleins, in the form of uric acid. The latter as found in the urine is of either endogenous or exogenous origin. One encounters some cases of gout without hyperuricemia, but this is not true for the majority. Hyperuricemia is found in conditions other than gout, such as during the pneumonic crisis and in leukemia. The kidney in gout has a certain almost pathognomonic impermeability or threshold for uric acid, which appears early and is quite elective. The clinical study of attacks of gout reveals the existence of a striking analogy to other acute crises, such as those of asthma. The grouping gout, asthma and eczema is not an uncommon clinical finding, in all of which there exists a condition of hypersensibility of the neurovegetative system. To sum up the pathogenesis of gout, there is hyperuricemia as the result of faulty elimination, humoral instability with an exaggerated tendency to precipitation of acute attacks of gout under the influence of cholesterinemia, certain neurovegetative factors and finally participation in the formation of tophi by histiocytes and reticulo-endothelial tissue.

Gout and allergy were discussed by Pasteur Vallery-Radot and Mauric. For years the sensibility of gouty individuals to certain foods has been known. The attacks of gout are not an anaphylactic manifestation, although a specific hypersensibility exists in some cases. Although certain authors regard the tophi as a form of tissue allergy, the authors believe this to be not proved. All together, the role of allergy in the etiology of gout is not demonstrable beyond all criticism.

Brodin and Grigaud spoke on the metabolism of uric acid in gout. Uric acid is the end product of nucleoproteins, with the purines as an intermediary stage. The uric acid may have its origin thus in the food (exogenous) or in the tissues (endogenous). Retention of uric acid (hyperuricemia) is the direct result and often the first sign of inadequate renal activity.

The role of the liver in gout was the subject of Noel Fiesinger's paper. One finds large livers the seat of a hypertrophic cirrhosis in gouty individuals. As the cirrhosis develops and is accompanied by signs of hepatic insufficiency, the gouty manifestations recede. Icterus in gout is rare and, if present, is due to other causes, but cholelithiasis is a frequent finding.

Fiessinger does not believe that such a biliary lithiasis is to be associated with a hypercholesterinemia, any more than the gouty tophi due to a hyperuricemia. He is of the opinion that the liver in gout allows nonmetabolized purines to remain in the circulation. Uric acid is an inert end product. The still undiscovered chemistry of gout lies in the metabolism of purines and xanthines. The entire body, and not the liver alone, plays a part in the metabolism of purines.

Loeper and Lemaire spoke on disturbances of nutritive exchanges in gout. The real cause of hyperuricemia is still unknown, that is, whether it is due to an excess of uric acid in food, abnormal formation in the tissues or inadequate elimination. One always finds a hypercholesterinemia, so that it is indispensable to make tests as to the existence of this condition, in the form of an intradermoreaction, a flocculation test and an estimation of the cholesterolytic power of the blood serum.

Guy Laroche maintained that biochemical studies are of great interest in gout but that it would be dangerous to base one's treatment on the results of laboratory research alone. Clinical experience should play the dominant part by (a) regulation of the digestive function, (b) giving the overworked liver a chance to recuperate, (c) stimulating elimination by the lungs, kidneys and skin, and, finally, (d) giving sedatives for the unstable neurovegetative system. A diet too rich in purines is not the sole underlying cause of gout, but a disturbance (endogenous) of nitrogen metabolism ending in excessive uric acid production or elimination is just as important. It is a fact based on clinical and biochemical observation that a meat diet is harmful and a vegetable diet beneficial in gout. Hence foods rich in purine or oxalates should be suppressed. The same is true of alcoholic beverages. Attention should be paid to general hygiene and to physical exercises. Although climate does not play an important part, it is advisable to avoid a sojourn at the seashore or in cold regions.

De Gennes discussed the atypical forms of gout. One sees less frequently now the classic localization in the joints of the toe, but, on the other hand, the atypical forms have become common. The polyarticular form may resemble an acute articular rheumatism but the age of the patient, the tendency to involve fewer joints, the resistance to salicylates and the almost specific action of colchicum make the diagnosis of gout easy. The pseudophlegmonous form is the most important of the atypical forms of gout. It may resemble a diffuse cellulitis at some distance from an articulation and may impress one, by its diffuse redness, edema and associated regional lymphadenitis, as being an acute suppuration. The phlebotic type is not difficult to diagnose except in cases in which there is no accompanying joint involvement. One of the most interesting of these atypical forms of gout is that in which the joint effusion and periarthritic edema are not accompanied by acute symptoms and thus resembles a tuberculous arthritis. The differential diagnosis can be readily made by the prompt response to colchicum in gouty arthritis. It is easy in these atypical forms to make a diagnosis of gout if tophi are present, but these are lacking in the majority. The blood examinations for excess of uric acid or cholesterol is not to be depended on in these atypical forms of gout. The rapid development of the muscle and articular lesions, the absence of an atrium of infection, the good general condition of the patient and the quick response to colchicum constitute the best arguments in favor of an atypical form of gout. De Gennes does not believe that there is such a clinical entity as visceral gout. Such symptoms are due either to renal or cardiac insufficiency or to hypertension.

Perrin and Abel spoke on the medical treatment of gout. The principal drugs to relieve the symptoms are the derivatives of salicylic acid, especially sodium salicylate, then the cinchophenic derivatives whose base is quinoline, and colchicum. The latter may be regarded as an almost specific drug in acute gout but it must be employed with much discretion and only when cardio-

renal complications do not exist. In chronic gout, colchicum should be discarded in favor of the salicylate and cinchophenic derivatives. Other drugs that act as uric acid solvents are also indicated. Tonics (iron, arsenic) also must be given from time to time. There has been much discussion of alternating alkali and acid treatment. The results have been good, but one has not yet been able to explain them on a scientific basis.

Lian and Gilbert-Dreyfus took up the cardiovascular system in gout. Symptoms of this character are relatively rare in gout and the latter plays an insignificant part in the etiology of atherosclerosis, hypertension and angina pectoris.

BERLIN

(From Our Regular Correspondent)

Oct. 7, 1935

Further Developments at the Universities

Reference has been made in several letters to the influence exerted by the new political régime on the universities, university instruction, the instructional corps and the student bodies. Further developments have taken place of late.

GENERAL AIMS OF THE UNIVERSITY

At the dedication of the new Cologne university, a few months ago, Rust, the minister of public instruction, expressed his views on the general aims of the university. He said: "Our science and our research have their fundamental origins in the hearts and the minds of our people. Consequently it is clear that much that has hitherto been surrounded by a halo of unquestioned acceptance is now declining and will soon sink into oblivion." He brought out further that the realms of the spirit dominating our intellectual life are undergoing a gradual metamorphosis. Even the erudite professors would have to unlearn much and learn much that is new. Professor von Haberer, surgeon and rector of the University of Cologne, emphasized on this occasion "how infinitely difficult the metamorphosis of the German people in the spirit of the new ideas was going to be. The establishment of the national-socialist German folk culture, planned so majestically over a period of many centuries, can be brought about only at the cost of untold labor, and will require, on the one hand, great caution and discernment and, on the other hand, a keen insight into the future." He said that as rector (president) he would administer the affairs of the university in the spirit of the new Germany. The spirit to which he gave expression was that of a university of, for and by the German people. It was in line with this spirit when, in July, Dr. Wagner, the federal fuhrer of the physicians, emphasized that "the new trend of university policies is controlled by the national-socialist party and the way that the party plans to go is so clear that no further discussion is needed." The remark of Dr. Ley, the fuhrer of the German labor front, concerning "the unchecked devotion to the god of science" is also deserving of mention.

On the other hand, the approval by the university instructors of all these decrees and newer trends is not so universal or so complete as may appear. The views expressed at the festivities in commemoration of the founding of the University of Munich caused dissatisfaction in government and party circles. To express it tersely, the spirit of the instructional corps was disapproved. The traditional celebration held in the university "aula" drew only a small representation of the instructors (less than 25 per cent), who were supposed to attend in a body and sit with the members of the national-socialist student league. The lack of participation in the prize essays and the mediocre quality of the essays presented at the commemorative ceremonies have been taken as evidence of inadequate cooperation between the instructors and the students. In response to a letter from the Bavarian "ministerpräsident" to the rector (president) of the University of Munich, which gave expression to these criticisms, the latter answered that he wholly

disapproved the attitude taken by the university instructors at the commemorative exercises

The federal minister of public instruction has issued instructions with a view to making the administration of the universities more uniform. The university personnel is divided into the instructional corps and the student body. The instructional corps consists of the teaching force of the university, together with assistants. The head of the university is the rector, who is subordinate to the minister and immediately responsible to him and to him alone (formerly the rector of a German university was chosen by his colleagues, or fellow instructors, and was *primus inter pares* for the period of one year). The pro-rector, or vice president, and the deans of the faculties are appointed by the minister from a list of candidates proposed by the rector. The "studentenschaft," or official student body, comprises students of German origin whose mother tongue is German, irrespective of the country to which they owe allegiance. The leader of the official student body of a university is appointed by the minister of public instruction following suggestions obtained from the rector and the "gaufuehrer" (county chairman) of the national-socialist student league, and he is under the authority of the minister. The university "senate" serves the rector now merely in an advisory capacity. This covers the most essential provisions of the new order at present in force at German universities. Thus, the official student body (the "studentenschaft") has acquired equal rights with the instructional corps. The "senate" was formerly the chief authoritative body of the university, but now it has only advisory functions. It is apparent, therefore, that the rigid application of the "fuehrer" principle has had a marked leveling effect on all the university personnel, including both instructors and students. The deans are now the fuehrer of their respective faculties.

A doctor's degree in a new field can now be secured. The University of Hamburg is conferring a doctor's degree for advanced study in "sportwissenschaft," or the scientific aspects of participation in the various sports and the supervision by athletic directors of the devotees of sport activities. Athletic directors and instructors in the various sports (coaches) may now present a scientific thesis in the field of physical education. In the instructional corps a complete reorganization has taken place. All members of the national-socialist party within the instructional corps of the several universities, including the assistants, have been organized into a national-socialist league of university instructors, which, in combination with the national-socialist league of students, constitutes the official party organization at the universities. The league of the instructors and the league of the students are expected to work together in the closest manner. The local fuehrer of the league of instructors and likewise the fuehrer of the league of students are under the authority of the so-called party service centers in matters of discipline.

Likewise in the scientific activities of the university certain controls have been introduced. Among other things, the minister of public instruction has decreed that all persons under his jurisdiction (that is, all professors, instructors and students) who are requested to deliver lectures in a foreign country or who wish to attend international congresses or similar conventions, to be held in foreign countries, must secure his approval. The purpose of these restrictions, it is officially stated, is "to make sure that representatives of German science who are heard in foreign countries shall be of the type that will best conserve the cultural and political interests of the reich." In many cases the foreign office and/or official sources of information in foreign countries will be consulted before a decision is reached. The minister of public instruction likewise demands that full-time university instructors shall not assume any secondary duties or take on themselves any secondary tasks without first securing his approval of such undertakings. Head physicians

and assistants in clinics may serve private clients only after securing his consent. It is thought that, in many cities in which universities are placed, local physicians will appreciate this attempt to remedy a long existing evil.

In a previous letter (THE JOURNAL, April 6, p 1259) reference was made to the new regulations governing the "entpflichtung" of professors, or debarring them from holding the particular courses of lectures that are naturally incident to the chair that they hold. Now the limitation of the rights of professors who have been "relieved of their official duties" has been put on a different basis. Formerly, such professors had the privilege of continuing their lectures as free lances, or at least of delivering lectures on some branch of their special field, in case they had been compelled to turn over to their successor their central course of lectures. Many of the professors thus "relieved of their official duties" made use of this privilege, and their lectures were often gladly attended by the students as a supplement to the usual courses. Now the minister of public instruction has ordered that the professors thus relieved of their official duties shall not have the right to continue their activities as lecturers, even though their new courses of lectures do not conflict with the courses of their successor. Consent to continue lecturing will be granted only "in case the petitioner (that is, the professor relieved of his duties) furnishes the assurance that he will endeavor to fit in with the new spirit that now prevails in the German universities, and that his political attitude will not endanger the educational work that the national-socialist party has planned for the academic youth." Furthermore, the lectures of professors who have been "relieved of their official duties" must not interfere in any way with the central courses of lectures that are to be taken over by the new incumbent of the chair, whether his appointment is merely provisional or definitive, since to him, as the occupant of the chair, must be reserved the right to map out his courses as he deems best.

The Crusade Against Cancer

The ministry of the interior and the ministry of public instruction have agreed to cooperate with the city of Berlin in carrying on a crusade against cancer. Their common endeavors envisage the support of all practical and scientific movements and collective action with respect to all organized efforts to suppress all forms of cancer, in providing continuation courses for physicians, and in the better training of the oncoming generation of physicians. The execution of the extensive plan is based on large-scale arrangements in the largest Berlin hospital, the Rudolf Virchow-Krankenhaus, whose clinical departments and modern roentgenologic institute furnish especially favorable conditions, which can be still further amplified as need arises. Within this hospital a large "general institute for the combating of cancer" has been created, in which treatment, research and instruction will go hand in hand. The university institute for cancer research, established many years ago at the Charite Hospital in Berlin, has consented to cooperate in this collective movement, although the two institutes will preserve their complete independence. The whole movement as so organized will keep in close touch with the federal commission for the combating of cancer, of which Professor Borst of Munich is chairman. The mayor of Berlin and the medical faculty of the University of Berlin are members of the honorary committee of the institute.

The creation of this institute is not designed to effect a concentration of cancer treatment, on the contrary, every clinic and every hospital, within the range of their capacities and equipment, will continue to participate in scientific research and in treatment. In the new institute the clinical point of view will be in the ascendancy, hence Professor Sauerbruch has been chosen director. The new institute has already begun to function, and many cancerous persons are being brought in.

AUSTRALIA

(From Our Regular Correspondent)

Oct 11, 1935

Annual Meeting of British Medical Association
at Melbourne

As stated in a previous letter (*THE JOURNAL*, November 16, page 1620), the one hundred and third annual meeting of the British Medical Association opened September 9 in Melbourne.

THYROTOXICOSIS

The most interesting scientific session, a joint meeting of the sections of medicine and surgery and one that was attended by 800 members, was the discussion on thyrotoxicosis. Lord Horder considered that the thyroid hyperplasia associated with exophthalmic goiter was not a primary but a secondary phenomenon. The *causa causans* remained obscure, although partial thyroidectomy might interrupt a vicious circle, just as a splenectomy could in splenic anemia, but did not get rid of the cause of the trouble. The existence of a diathesis in the disease was generally accepted. Of the predisposing factors little was known—sex, certain collateral familial conditions and an autonomic imbalance. Of exciting causes there were the sex epochs, psychic trauma and focal sepsis. The evidence regarding associated endocrine defects was entirely unconvincing. The recognition of the diathesis called for preventive treatment; this was a thankless task. The simple life was necessary, and for those patients who accepted the control and cooperation of the medical attendant there was a good promise of stabilization. If the symptoms persisted in spite of controlling the patient's routine of life, and whenever the full syndrome had developed, absolute rest in bed for at least three months was needed. There were no specific drugs, but belladonna, among others, had been found useful. The operation of thyroidectomy should be undertaken if the patient failed to respond to six months' careful medical treatment, in cases that relapsed, and when associated with auricular fibrillation or congestive heart failure.

Sir Thomas Dunhill drew attention to the steady advance of the stage at which operation was now performed. Roentgen therapy had its place in the treatment of the early stages, and in young people. In severe cases and older patients, the results from surgery were better. He preferred the one stage operation. Auricular fibrillation was the commonest complication. He found that 84 per cent of his series regained their normal rhythm after operation, and 6.5 per cent had died. The next common complication was glycosuria, which was sometimes insulin resistant. Mental disorder was next on the list, and the difficulty of this complication arising after the operation was mentioned. Emaciation was a factor that would always keep the general death rate of the operation up to 3 per cent.

Prof C E. Hercus of New Zealand drew attention to the thyroid and hydatid muddledness of the dominion physicians. New Zealand had the highest relative death rate from thyrotoxicosis in the world—three times as great as Great Britain. He said that endemic goiter and thyrotoxicosis went together. Nearly all cases of goiter exhibited some degree of toxicity, therefore the division into primary and secondary had no pathologic basis.

Dr A W Holmes of a Court of Sydney urged the necessity of giving iodine for a fortnight before operation. The patient was then at the height of a remission.

Sir Carrick Robertson of New Zealand was convinced that the toxicity of adenomatous goiter was increasing. His practice was to remove from four fifths to five sixths of the gland in one stage if possible. The preliminary ligation of the superior thyroid artery had not in his experience, improved the patient. His mortality rate was 0.9 per cent. Two of these had "woody" thyroids and four suffered from the type described by Lahey as "apathetic" hyperthyroidism.

Dr Turnbull of Melbourne had found that the pulse rate during sleep was helpful in management. If below 75 per minute, operation could be safely postponed in young subjects. Older people could not safely be left without operation, as cardiac failure and auricular fibrillation might come on quickly. He had been disappointed in the value of the estimation of the basal metabolic rate. It was unreliable in the young and not indicative in the old. He had found iodine of value as a diagnostic agent, in thyrotoxic cases an exacerbation occurred fourteen days after stopping the drug.

Dr Alan Newton of Melbourne astounded the meeting by stating that he had operated on 512 patients—a number just sufficient to convince him that he knew nothing about the disease. His mortality was 0.4 per cent in his private practice and 3 per cent in the public hospital. He considered that the difference was due to the frequent changing of the nurses in the latter. Roentgen therapy had its best scope when regeneration occurred after operation.

Dr S F Hansman of Sydney described the negative phosphorus and calcium balance that had been found to be associated with hyperthyroidism, possibly due to an associated hyperparathyroidism. The negative balance was not influenced by rest and iodine, but roentgen therapy had restored it to normal.

HYDATID DISEASE

Although, in Australia, knowledge of hydatid disease was second to none as there was an unrivaled opportunity for its study, observers here had still much scope for further investigation.

Prof H R Dew of Sydney, who is possibly the greatest authority on hydatid disease in the world today, opened a discussion on the advances in knowledge of this disease during the twentieth century. The highest incidence was in the last decade of the nineteenth century. The Royal Australasian College of Surgeons had established a registry of hydatid disease, which should provide valuable statistical material in the future. Caution was expressed against the injudicious use of solution of formaldehyde for injecting the cyst for the purpose of sterilizing its contents. The optimal concentration of solution of formaldehyde in the cyst was 15 per cent.

Prof D W Carmalt Jones of New Zealand discussed the life history of the *Taenia echinococcus*. He pointed out that a primary cyst acted as a benign tumor, producing only pressure effects, if any. It obtained its nourishment from the host, the walls being pervious, and in the early stages enough material often passed out of the cyst to sensitize the host's tissues and give a positive skin reaction. The fibrous adventitia, derived from the host, might become so thick as to starve the cyst, which then died, and the adventitia might become calcified. The record primary cyst contained 22 pints (11 liters) of fluid. If a cyst wall was injured, the life of the parasite might be preserved by the development of daughter cysts of similar structure to that of the primary cyst, probably by cystic transformation of the scolices. Such a cyst was much like a malignant tumor for the reason that it might produce untoward effects as a result of rupture. In addition to pressure effects the two grave risks of hydatid disease were suppuration and anaphylaxis.

Dr Keith D Fairley of Melbourne discussed the laboratory diagnosis of hydatid disease. Eosinophilia was useful only as suggesting investigation by more specific tests. The precipitin test closely paralleled in its results the complement fixation test, but minor reactions were difficult to interpret. The complement fixation test was specific, but failure to react was of no value in excluding hydatid disease. The results were positive in only 54 per cent of preoperative tests with primary or recurrent or residual cysts. Within two or three months after operation the serum might fail to react to the test. The chief value of the test was in the diagnosis of primary suppurating or ruptured cysts and of residual recurrences. Since some

patients reacted with this test but not with the intradermal test, both should be employed in the preoperative diagnosis of primary cysts. In regard to the intradermal test, the delayed reaction should always be looked for, as occasionally a positive result might appear when the immediate reaction failed to develop. The immediate reaction was of great value in the preoperative diagnosis of primary cysts but was of no help in the diagnosis of recurrent or residual cysts. Repeated injections of the same field might sensitize the skin in this locality and lead to fallacious results. In primary preoperative cases a positive result was obtained in about 75 per cent of those with uncomplicated or degenerating and degenerated cysts. After operation the reaction was almost invariably positive and usually remained so for many years. Results showed that after the primary operation a negative result might suggest but did not prove cure, while a positive result was of no significance in the diagnosis of recurrent cysts. The high incidence of latent cysts (16 per cent) discovered at necropsy necessitated post-mortem proof of the absence of hydatid infestation when an apparently fallacious positive result was obtained. One of the chief values of the test was in excluding hydatid infestation. In about 2,000 cases a negative response had correctly indicated the absence of hydatid disease in 95 per cent.

CARCINOMA OF THE COLON

The necessity for a defunctioned and a debacterialized colon before attempting an anastomosis, and the unsatisfactory results of a cecostomy were stressed by Dr H B Devine of Melbourne in discussing carcinoma of the colon in the section of surgery. If the operative mortality rate could be lowered the disease should be eminently curable by surgery, as it did not metastasize early. The patient with carcinoma of the distal part of the colon generally came to the surgeon in the middle stage of his disease. (a) chronically poisoned (metabolically) from the toxic effect of a slowly growing carcinoma, (b) chronically poisoned from the prolonged absorption of the toxic products resulting from chronic intestinal obstruction, (c) with colonic tissue devitalized from the general poisoned condition and also from the local effect of the chronic intestinal obstruction, (d) with highly pathogenic germ content of the colon. Dr Devine's method of operating for carcinoma of the distal part of the colon was based on the principle that, if a segment of an animal's bowel was experimentally isolated and thus deprived of its function, its bacterial content would slowly disappear. He therefore first of all disconnected the proximal from the distal part of the colon. This disconnection was made at the transverse colon if it was mobile enough, otherwise it was made at the hepatic flexure. The cut ends of the bowel were inserted into small separate openings in the abdominal wall. The distal part of the colon was thus completely "defunctioned" and time became a factor in its "debacterIALIZATION". Subsequently the growth was resected.

Dr Victor Hurley of Melbourne said that 50 per cent of tumors were inoperable when diagnosed. There were no characteristic symptoms in the early stages, and one should be guided to the diagnosis by the association of trivial features. Upper abdominal lesions were often simulated. Examination for occult blood should always be done. Patients were often well nourished, and anemia was a late feature. Sigmoidoscopy should be done with no anesthetic and without any preparation. An opaque meal might sometimes precipitate complete obstruction.

PROSTATECTOMY

The importance of eradicating the whole of the diseased portion of the gland was stressed by Dr A Clifford Morson of England. Throughout the discussion the Harris method was regarded as a standard technic. Recurrence of prostatic enlargement was a demonstration of failure on the part of the surgeon who had performed the operation. By the Freyer and Thomson Walker methods the prostatic cavity after enucleation

was left bare of mucous membrane and no attempt was made to unite the bladder to the torn end of the urethra. Eventually this union occurred by what might be termed secondary intention. Harris, on the other hand, claimed that he obtained union by first intention. The difference between healing by secondary and primary union was in the amount of fibrous tissue that formed. With the introduction of the Thomson-Walker technic, stone formation had become a rare complication, but postoperative urethral obstruction still occurred.

Turning to the Harris technic, Dr Morson said that Harris reconstructed the internal meatus. This insured more rapid healing and, by preventing urine from coming into contact with tissues uncovered by mucous membrane, reduced sepsis. The postprostatic pouch was obliterated by drawing down the base of the bladder to the level of the bed of the prostate with the aid of catgut sutures. Cysto-urethroscopy during the convalescent period showed that the new internal meatus was on the same plane as the interureteral bar. There was thus no opportunity for urine to stagnate in the region of the ureteral orifices. Because of successful hemostasis it was possible to close the bladder without suprapubic drainage. In about 50 per cent of Dr Morson's cases there was no leakage of urine through the abdominal wall.

In the last section of his paper Dr Morson discussed the avoidance of certain complications. He referred among other subjects to the safeguarding of the seminal vesicles. He attempted to sterilize these as well as the urethra, before enucleation was commenced, by irrigation through the proximal end of the divided vas deferens, with a 1 in 60 solution of phenol (carbolic acid).

Dr G H Burnell of Adelaide had found blood urea estimations of little assistance and frequently found remarkable variations in the results of the urea concentration test. The lack of correlation between the results of these two tests had led him to discontinue blood urea estimations. He relied on the indigo carmine test, using Thomas's method. Dr Burnell always ligated the vas and used a subcutaneous catgut suture. The Harris technic was suitable for every surgeon.

Dr Richard Harris of Sydney discussed technic. The first incision in a two-stage operation was always a short transverse one 2 inches above the symphysis. He always used the bimanual intra-urethral method of enucleation. Visualization of the prostatic cavity with Harris's retractor was practically perfect. In the process of retrigonization the whole thickness of the trigon was pulled down. Primary closure was not an essential part of the operation, but a nicety of technic. Five hundred and forty-seven patients had now been operated on by S H Harris, and the mortality was still 27 per cent. In the estimation of renal function he relied entirely on the indigo carmine test.

SURGERY OF THE PANCREAS

The desirability of avoiding immediate operation for acute pancreatitis and the value of the urinary diastase test in diagnosis were the chief points made in a discussion on the surgery of the pancreas, in the section of surgery, opened by Dr Harold Upcott of Hull. In regard to acute pancreatitis, he said that certain facts emerged from the experiments carried out to explain the pathology. 1 Acute edema of the pancreas followed the injection of bile into the pancreatic duct. 2 If the injection was combined with damage to the acinous cells as by injection under pressure or by some other means, the ferments were activated and acute necrosis occurred. In a certain proportion of cases the terminal bile and pancreatic ducts were so disposed that an obstruction of the common orifice would allow the entry of bile into the pancreatic duct. It was usual to recognize three types of acute pancreatitis: hemorrhagic, gangrenous and suppurative. There was also a milder inflammation, which had been described as acute pancreatic edema. Passing to consideration of the chronic dis-

orders, the principal difficulty in diagnosis, he thought, was the distinction between chronic pancreatitis and cancer of the pancreas. Even at operation it was not always easy to decide. The surgical treatment of chronic pancreatitis was essentially drainage of the biliary system, either by establishing a temporary external fistula from the gallbladder or common duct or by diverting the bile from the gallbladder into the stomach or the duodenum. He classified pancreatic cysts into four groups: (1) retention or canalicular cysts, (2) neoplastic cysts, (3) pseudocysts, (4) parasitic cysts. Malignant disease of the pancreas was almost always carcinoma. If the diagnosis was confirmed at operation, the simplest method of diverting the bile should be practiced. Dr Upcott concluded by referring to disturbances resulting from alteration in the internal secretion. In regard to increased secretion, he described the symptoms of the hypoglycemic state and pointed out that, if all the other causes of the hypoglycemic state could be reasonably dismissed, it appeared justifiable to advise exploration of the pancreas, for in no other way could the presence of an adenoma of the cells of Langerhans be determined.

OBESITY

Dealing with the endocrine aspect, Sir James Purves Stewart of London in the section of medicine classified obesity into 1 Pineal obesity, which occurred in patients with pineal tumor, but in all such instances pressure occurred on adjacent organs or produced internal hydrocephalus. 2 Hyperinsulinism, such persons were frequently fat rather than thin. 3 Genital eunuchism in the male and menopausal obesity in the female. 4 Adrenal, especially in nondestructive tumors of the gland in women and associated with involution of the uterus and adnexa. 5 Subthyroid, to be diagnosed only when the classic features of obesity were found. 6 Subpituitary, constituting the commonest form of all, and due to a deficiency of the secretion of the basophil cells, which were found in the anterior lobe of the gland and sometimes in the posterior lobe. Obesity with dwarfism occurred when the deficiency also affected the acidophil cells of the anterior lobe. The Fröhlich syndrome was frequently seen in children with sellar and suprasellar tumors showing characteristic pressure syndromes. Grave doubts existed as to whether this obesity was purely endocrine in origin. It was probably rather neuro-endocrine, as, for example, in the obesity of internal hydrocephalus causing compression of the infundibular stalk. 7 The Cushing syndrome, due to suprapituitarism of the basophil cells of the anterior pituitary, which was not entirely a secretory disorder. It was frequently associated with the characteristic sign of hyperadrenalism, hyperparathyroidism and ovarian deficiency.

Dr J H Anderson of Ruthin Castle warned against reduction of diet in true hypothyroidism, as the patients stood it badly. In genital obesity, diet, exercise and thyroid gave the best results, and the same three measures were necessary in pituitary obesity, with the addition of whole gland pituitary extract. Drugs especially thyroid, were controlled by estimating the basal metabolic rate and the tolerance to sugar, and by keeping a watch on the pulse rate.

Prof C G Lambie of Sydney took an accountant's view of the situation. On the debit side of an energy balance table there was expenditure of calories: (a) for basal metabolism, which consumed by far the largest amount of heat, (b) by exercise, which required relatively few calories, and (c) specific dynamic action, the technical measurement of which in man was difficult. The last mentioned represented the smallest fraction and was mostly decreased in obesity. Food constituted the credit side of the balance and was the most important single variable factor. If the energy intake was less than the energy consumption there would be a loss of energy building tissue, otherwise the laws of conservation of energy and mass would be contravened. This was the basis of all rational treatment.

The important problem in obesity was what happened to food taken in excess of caloric requirements. Five possibilities arose: any of which might be responsible for the development of obesity: limitation of absorption, elimination, increased mechanical work, combustion (luxus consumption) and storage. Energy consumption was determined not by a supply of energy but by the margin of tissues, any excess of intake over requirement being stored chiefly as fat. This being true any continued excess, even if slight, of intake over requirement would eventually result in obesity. In general, body weight might nevertheless remain remarkably constant. Big eaters who led a sedentary life free from worry and with plenty of sleep failed to increase in weight, while others of similar age, sex and height who took only a fraction of the amount of food and led an active life became fatter. The first group were said to have a high luxus consumption. It made no difference from the point of view of energy whether the luxus consumption was high from increased burning of food or from entry storage. Diminished burning of food was frequently associated with a low basal metabolic rate, but increased storage occurred in the majority with a normal rate of metabolism. This storage was apparently due to increased conservation of carbohydrate and of the fat. Glycogen synthesis was apparently linked with this process while practically all forms of obesity were associated with an increased glycogen formation and not a mere accumulation, as occurred in von Gierke's description. This conception brought endocrine and nervous obesity into line with nutritional obesity. Endocrine obesity was roughly divisible into two groups: one with a high sugar tolerance and the other with a low sugar tolerance.

THE DIFFERENTIAL DIAGNOSIS AND TREATMENT OF SEVERE ANEMIA

As a working classification, Dr J C Matthews of Downton, England, adopted 1 Pernicious anemia. 2 Idiopathic hypochromic anemia. 3 Other deficiency anemias, for example, scurvy, myxedema. 4 Anemias characterized by hemolysis—acholuric jaundice, anemias due to chemical poisons, and so on. 5 Anemias secondary to (a) malignant disease, especially of the alimentary tract, (b) infections, (c) hemorrhage, acute and chronic. 6 Aplastic anemia. 7 Splenic anemia.

Dr Gunaratnam Cooke of Ceylon said that the chief anemias in his country were associated with hookworm infestation, in the course of which the blood picture sometimes changed from the secondary to the primary type. He had found combined treatment with liver and iron to be valuable. He stated that the complex terminology of the modern hematologist was most confusing to his countrymen, and he himself was content to call pernicious anemia 'large red cell anemia'.

DIABETIC GANGRENE

That disordered fat metabolism associated with an excess of blood cholesterol was the most important factor in the causation of diabetic arteriosclerosis was the contention of Dr A. Clarke Begg of Swansea, England. Diabetic gangrene was due to arteriosclerosis, increased susceptibility to sepsis, and diabetic neuritis. Amputation was the best course in wet spreading gangrene but conservative measures were indicated in dry gangrene. In the borderline case a good general rule was to abandon conservative treatment after four weeks if improvement did not manifest itself. Prophylaxis against gangrene was of the greatest importance.

Other speakers stressed the necessity for weak alcoholic antiseptics, including 2 per cent iodine. As a means of estimating the degree of arterial obstruction, the Pachon oscillometer was recommended.

FAMILIAL ACHOLURIC JAUNDICE

Once the diagnosis was made, splenectomy should not be long delayed, on account of the danger of fatal hemolytic crises, and the operative difficulties in older subjects.

Dr S O Cowen presented the histories of thirty-three patients, of whom seventeen were in one "family." Twenty of the thirty-three had been treated by splenectomy with no deaths. Ulceration of the legs, a common complication, had not recurred after operation.

GALLOP RHYTHM

It is important to distinguish between presystolic and protodiastolic gallop, since the former is a sign of grave significance and the latter is compatible with perfect health. Dr Crichton Bramwell of Manchester stated that protodiastolic gallop was due to accentuation of the physiologic third heart sound. It could be distinguished from presystolic gallop by the absence of any associated palpable impulse and by the unequal spacing of the sound. An accentuated third heart sound was generally audible in mitral stenosis, but presystolic gallop never developed in patients with this lesion, probably because auricular fibrillation intervened first. To appreciate gallop rhythm best, direct auscultation of the chest wall without a stethoscope allowed the double impulse to be appreciated as well as the double sound. The impulse itself was felt just to the left of the xiphisternum.

CESAREAN SECTION

In no uncertain terms, Dr J Bright Banister of London decried the modern popularity of the operation of cesarean section. The best mortality rate was 58 per cent. In his series of 3,846 cases the rate was 66 per cent. As the gross maternal mortality rate for England and Wales was 0.45 per cent, the operation had a considerably increased mortality. Dr Banister expressed the profound conviction that the operation was performed with undue frequency because of the tendency to regard obstetric problems from a surgical point of view. "Let the baby out," said the surgically wise but obstetrically foolish. Such counsel implied a contempt for nature, with its painful but safe technic. In alleged cases of pelvic disproportion section was performed without enlisting the aid of nature at all, or only after a mock trial of natural methods and in apparent ignorance of the fundamental facts of the mechanisms of labor. A second factor making for the undue increase in the number of cesarean sections was the inability of some obstetricians, deficient in practical training, to diagnose by examination the cause of delay in labor.

Prof J B Dawson of Dunedin crossed swords with Dr Banister and drew attention to the obvious fallacy in his statistical statement. Professor Dawson considered that the danger in British countries today was not that too many sections were being done but that too many were being done too late. The disasters did not follow prompt decisive action but operations performed after long delay, begotten by hesitation out of hope, a delay that added a terrific risk to subsequent operations.

Dr W Ivon Hayes of Melbourne quoted the cesarean incidence at the Women's Hospital as 0.8 per cent, with a mortality of 6 per cent. These figures covered fifteen years and a total of 43,727 deliveries. The highest death rates were in eclampsia (21 per cent) and accidental hemorrhage (21 per cent). It was considered that the indications were confined to (1) any degree of placenta praevia in a primipara not in labor, (2) any central placenta praevia, (3) any degree of placenta praevia when the child was a "good risk" and specially desired, and (4) gross disproportion. Fatalities tended to occur in the patients operated on late in labor. Lower segment cesarean section had so many advantages that it should become the regular method of abdominal delivery among obstetric surgeons. Hysterectomy was indicated when the patient showed signs of definite infection and when the membranes had been ruptured a considerable time, or when there had been a history of repeated examinations or repeated attempts at delivery.

BELGIUM

(From Our Regular Correspondent)

Sept. 21, 1935.

The Health Record Book

The Fédération médicale belge created recently the health record book, with the endorsement of the Conseil supérieur d'hygiène publique. This record book, designed for distribution by the physician in all the families, is well gotten up and will centralize all the information concerning the state of health of each member of the family. The creation of a health record book is the most practicable and the most effective method of promoting preventive medicine. The family physician, medical specialists, the army medical corps and certain other official services will have access to the health record book, which will be edited in such a manner that the uninitiated will be unable to understand the recorded diagnoses. This last point is of great importance, for in this manner professional secrecy will be safeguarded. Twenty-five years ago the use of the health record book was recommended in France, but with the difference that any one was able, by inspection of the book, to learn the state of health of the owner. It is to be hoped that many physicians and organizations of social medicine will support this innovation of the Fédération médicale belge, which, as time goes on, will become of ever increasing value.

The Medical Profession in Belgium

The economic crisis is still felt by the physicians of Belgium, particularly in certain large centers. The Belgian universities are nevertheless creating many new physicians every year. The question has been raised as to how this mounting flood can be checked. Various methods have been proposed, notably the creation of an entrance examination at the universities and the introduction of more rigorous term and final examinations.

The plethora of physicians is the cause for the excessive reductions in the medical tariffs, which leads to the remark that, in present-day society, the physician does not occupy the place to which he is entitled by reason of his extensive studies and the services that he renders humanity. The pharmacists and the nurses in exceeding their rights, the numerous societies of a prophylactic character, the provincial and communal hospitals and clinics, the mutual aid societies by their exploitations, the law pertaining to industrial accidents, and the inroads of charlatanism, bear a large share of responsibility for the prevailing conditions among the physicians.

The Fédération médicale belge has sought means of remedying this state of affairs. It has recommended as indispensable a closer union of all physicians and the creation of a sort of corporation with its code of ethics and its regulations, in order to combat all the trends that have a tendency to lessen the prestige of the medical profession. The federation has now become more insistent and demands the immediate creation of an "order," or ethical council, of physicians, it recommends, with regard to industrial accidents, the organization of a service of nation-wide scope, which would be placed at the disposal of the insurance companies, it has succeeded in getting the mutual aid societies to accept the principle of control of the medical features of the mutual aid societies by the medical syndicates, finally, a health insurance society is about to be organized. The Fédération médicale belge has the firm conviction that, if only the physicians will remain united, a better future is assured.

The Industrial Medical Service

After the close of the World War, the industrial medical service was reorganized on the following bases:

1 The industrial medical service is entirely distinct from the inspection of labor properly so called, and its jurisdiction extends to all places where workmen are engaged. As regards the 'right to visit,' the authority of the medical inspectors of labor

is absolute. They are subject only to the instructions furnished by the chief of the medical inspection service.

2 The duties of the industrial medical service have been interpreted as follows (a) to organize the protection of pregnant women and nurses gainfully employed, (b) to assure the sanitary safety of apprentices and to collaborate in their proper professional organization, (c) to study the physiology and the pathology of labor, (d) to bring the knowledge of its agents in special fields to the aid of all organizations dealing with social insurance, (e) to propagate the most useful ideas of professional prophylaxis, and (f) to control the enforcement of regulations of a medical nature.

At present the medical inspectors of labor, to the number of ten, carry out themselves the necessary inspection. To these should be added a woman inspector who is a graduate in medicine, and an inspector who is a doctor of science, for the inspection of laboratories.

To watch over the laws for the protection of the health of industrial workers, and the regulations of professional hygiene, in their applications, their enforcement, their amplifications and their possible improvement—that is, to sum up, the proper domain of industrial inspection.

In the performance of their duties, the inspectors have the right (1) to enter by day or by night the establishments under their supervision, (2) to issue, on the basis of their inspections, official reports receivable in courts of justice until proof of the contrary has been submitted, and (3) to propose to local authorities the closing of a plant by reason of manifest unhygienic conditions.

By reason of a vast collection of objective documents on the subject in hand, the industrial inspectors can now count on the aid of legislators in enforcing respect for the fundamental principles of industrial protection. In this connection a list of royal and ministerial decrees looking toward the health of workers and the hygienic aspects of wage scales has been promulgated.

Although the officers of the industrial medical service have a definite mission to perform and have not available as large a staff of investigators as they might desire, they nevertheless find opportunity to conduct special medical researches on saturnism, hydrargyrisms, anthrax, ancylostomiasis and kindred subjects.

An Ovation to the Surgeon Albin Lambotte

Special ceremonies in honor of the surgeon Albin Lambotte, whose work in the field of osteosynthesis is well known, were held recently in Antwerp. Most of the Belgian surgeons and several foreign surgeons came on this occasion to express to Lambotte their admiration. The first feature of the occasion was the formal reception of Dr Lambotte, in the beautiful surroundings of the Hotel de Ville at Antwerp, by the board of aldermen and the burgomaster Huysmans, who expressed to him the gratitude of the city for the eminent services rendered to the wounded and the sick and for the luster that his works had brought to his city.

In the afternoon an academic session was held at the Université coloniale, at which W. Franch, secretary of state, presided. Professor Hustin of Brussels eulogized the work of Dr Lambotte, following which Professor Sauerbruch of Berlin gave an address on the history of bone surgery, while Professor Leriche of Strasbourg outlined the future of bone surgery. In conclusion, the decoration of Commander of the Order of Leopold was conferred on Dr Lambotte.

In the evening the University of Brussels, at which institution Lambotte formerly studied and of which he is doctor honoris causa, gave him a banquet, following which the secretary of state, the president of the university and representatives of the Société nationale de chirurgie de Paris, the Société des chirurgiens de Paris, and the Société belge de chirurgie de Paris, presented their felicitations to the eminent surgeon.

Marriages

RAYMOND O. FRANKOW, West Bend, Wis., to Miss Elinor Turkish of Stevens Point in Fond du Lac, September 3.

GEORGE M. GREEN, Daytona Beach, Fla., to Miss Margaret Dunn of Lancaster, Pa., in Jacksonville, September 1.

MAURICE JULIAN ROTKOW, Des Moines, Iowa, to Miss Johanna Raskin of Savannah, Ga., September 24.

WILLIAM H. STUDLEY, Shorewood, Wis., to Mrs. Doherty A. Spofford of New York, September 14.

ROBERT A. GILREATH, Hendersonville, N. C., to Miss Marie E. Hench of Defiance, Ohio, in August.

GLEN LUKE YATES, Belleville, N. J., to Miss Frances Sinclair Backs of Glen Ridge, September 7.

GUSTAVE A. ROY to Miss Gertrude R. Fearon, both of Kansas City, Mo., September 20.

FRANK READ HOPKINS to Miss Nancy Scott Adams, both of Lynchburg, Va., September 14.

PAUL HOGG, New York, to Miss Dorothy Elizabeth Williams of Norfolk, September 21.

EUGENE E. POLGAR, Bethlehem, Pa., to Miss Anna Munchak of Scranton, September 7.

Deaths

Bundy Allen ♂ Tampa, Fla., St. Louis College of Physicians and Surgeons, 1912, member of the House of Delegates of the American Medical Association, 1930-1932 and 1935, member of the American Roentgen Ray Society and the American College of Radiology, member and past president of the Radiological Society of North America, on the staff of the Centro Asturiano Hospital, aged 50, was killed, November 25, in an automobile accident.

John Morse Rehfsch ♂ San Francisco, University of California Medical School, San Francisco, 1915, member of the Radiological Society of North America, formerly assistant clinical professor of medicine (radiology), Stanford University School of Medicine, assistant pathologist at his alma mater, 1915-1917, and instructor in medicine, 1919-1923, aged 42, died, September 18, of aortic and mitral stenosis and myocardial hypertrophy.

Pierre Zéphyr Rhéaume, Montreal, Que., Canada, School of Medicine and Surgery of Montreal, 1900, professor of operative surgery, University of Montreal Faculty of Medicine, fellow of the American College of Surgeons, served with the Canadian Army during the World War, surgeon in chief to St. Luke's Hospital, aged 58, died, September 18.

William Collins Pumpelly, Fort Pierce, Fla., College of Physicians and Surgeons, Baltimore, 1903, member of the Florida Medical Association, veteran of the Spanish-American and World wars, at one time professor of pharmacology, chemistry and botany, College of Pharmacy, Mercer University, Macon, Ga., aged 58, died, September 18.

Cyrus Ulysses Johnson, West Berkshire, Vt., University of Vermont College of Medicine, Burlington, 1888, member of the Vermont State Medical Society, past president of the Franklin County Medical Society, member of the state legislature, aged 72, died, October 14, in St. Albans (Vt.) Hospital, of cerebral hemorrhage.

Joseph Abel Thibodeau ♂ Rumford, Maine, College of Physicians and Surgeons, Boston, 1912, member of the New England Society of Psychiatry, past president of the Oxford County Medical Society, aged 51, on the staff of the Rumford Community Hospital, where he died, September 17, of subarachnoid hemorrhage.

Theophilus Erskine Ross ♂ Hattiesburg, Miss., College of Physicians and Surgeons, Baltimore, 1888, in 1928 member of the House of Delegates of the American Medical Association, past president of the Mississippi State Medical Association, fellow of the American College of Surgeons, aged 71, died, September 29.

Dell Ewing Graham ♂ Ottumwa, Iowa, State University of Iowa College of Medicine, Iowa City, 1902, fellow of the American College of Surgeons, aged 58, on the staffs of the City Hospital and St. Joseph's Hospital, where he died, September 22, of malignant hypertension and cerebral hemorrhage.

Ernst Philip Raab, Belleville, Ill., University of Pennsylvania Department of Medicine, Philadelphia, 1881, member of

the Illinois State Medical Society, formerly president of the school board and library board, on the staff of St. Elizabeth's Hospital, aged 75, died, September 21, of heart disease

Patrick Joseph Ryan, Hartford, Conn., University of Buffalo (N. Y.) School of Medicine, 1899, member of the Connecticut State Medical Society, aged 70, for many years on the staff of St. Francis Hospital, where he died, September 29, of suppurative appendicitis and peritonitis

John Lear, Trexlertown, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1889, member of the Medical Society of the State of Pennsylvania, at one time head of the department of biology, Muhlenberg College, Allentown, aged 76, died, October 7, of chronic myocarditis

Charles David Carter, De Kalb, Ill., Rush Medical College, Chicago, 1883, member of the Illinois State Medical Society, past president of the De Kalb County Medical Society, on the staff of St. Mary's Hospital, aged 75, died, November 14, of chronic nephritis and uremia

Frank A. Rich, Burlington, Vt., University of Vermont College of Medicine, Burlington, 1893, member of the Vermont State Medical Society, formerly professor of veterinary science at his alma mater, aged 74, died, September 25, of pulmonary hemorrhage and chronic bronchiectasis

Harry Alexander Lindsay, Sidney, Ohio, State University of Iowa College of Medicine, Iowa City, 1906, served during the World War, aged 63, on the staff of the Wilson Memorial Hospital, where he died, in September, of a self-inflicted bullet wound

Conrade Alleyne Howell, Columbus, Ohio, Homeopathic Hospital College, Cleveland, 1888, Ohio Medical University, Columbus, 1901, fellow of the American College of Surgeons, served during the World War, aged 68, died, September 21, of pneumonia

J. Frank Small, York, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1889, member of the Medical Society of the State of Pennsylvania, director of public health of York, aged 70, died, October 20, of coronary thrombosis

Hugh Ferguson Parrish, Portsmouth, Va., University of Vermont College of Medicine, Burlington, 1893, Bellevue Hospital Medical College, New York, 1895, member of the city council, aged 63, died, October 7, probably of angina pectoris

William Lewis MacDonald, Boston, Harvard University Medical School, Boston, 1865, member of the Massachusetts Medical Society, formerly a dentist aged 101, died, September 24, in Malden, of arteriosclerosis and chronic myocarditis

Francis A. Graham, Lincoln, Neb., Omaha Medical College, 1889, for eight years county coroner, member of the county insanity board, for many years on the staff of St. Elizabeth's Hospital, aged 73, died, October 31, of septicemia

Lloyd Edmund McFarlane, Manhattan, Kan., University of Minnesota Medical School, Minneapolis, 1921, member of the Kansas Medical Society, aged 39, died, September 26, in Rochester, Minn., of jejunal ulcer and bronchopneumonia

James Allen Shackelford, Ranger, Texas, Tulane University of Louisiana Medical Department, New Orleans 1912, member of the State Medical Association of Texas, aged 48, died, September 21, of coronary occlusion

Friend Palmer, Cerrillos, N. M., Cleveland College of Physicians and Surgeons, Medical Department of the University of Wooster, 1887, aged 73, died, September 24, in Albuquerque, N. M., of chronic myocarditis

Perry Harris Munger, St. Paul Park, Minn., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1889, aged 74, died, September 8, in Stillwater, of cerebral arteriosclerosis and kidney disease.

Charles Edward Greenfield, Chicago, Rush Medical College, Chicago, 1886, member of the Illinois State Medical Society, aged 75, died, November 3, in the Presbyterian Hospital, of bronchopneumonia

Edwin Sheridan Day, Earlham, Iowa, College of Physicians and Surgeons of Chicago 1894, aged 66, died, September 17, at the Iowa Methodist Hospital, Des Moines, of hypertensive heart disease.

Charles Albert Macrum, Portland, Ore., University of Michigan Homeopathic Medical School, Ann Arbor 1889, aged 73, died, September 7, in the Good Samaritan Hospital of lobar pneumonia

Fred Walter Murrey, Caldwell, Ohio, Keokuk (Iowa) Medical College, College of Physicians and Surgeons 1900, president of the board of education, aged 62, died, September 15, of tuberculosis

Taylor Rice Jackson, Chariton, Iowa, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1897, aged 65, died, September 12, of septic sore throat

Evert Harwood Ostling, Lewellen, Neb., State University of Iowa College of Medicine, Iowa City, 1919, aged 42, died, September 28, in the Good Samaritan Hospital, Columbus, of septicemia

Christopher George Lehman, Detroit, Michigan College of Medicine and Surgery, Detroit, 1901, member of the Michigan State Medical Society, aged 63, died, September 27, of encephalitis

Edward S. Meers, Kenosha, Wis., Yale University School of Medicine, New Haven, Conn., 1874, aged 84, died, September 17, of cerebral hemorrhage, chronic nephritis and chronic myocarditis

Edward William Jackson, Rochester, N. Y., Albany Medical College, 1907, fellow of the American College of Physicians, aged 58, died, October 2, in Williamson, of cerebral thrombosis

Roy Colony Alt, Cedar Rapids, Iowa, Jefferson Medical College of Philadelphia, 1913, member of the Iowa State Medical Society, aged 48, died, September 10, of myelogenous leukemia

Emily L. Hill, Gloversville, N. Y., Hahnemann Medical College and Hospital, Chicago, 1894, aged 74, died, September 22, of hyperthyroidism and valvular heart disease.

Lawrence S. Pearce, Falkner, Miss., University of Louisville (Ky.) Medical Department, 1875, Confederate veteran, aged 88, died, September 18, of hypostatic pneumonia.

Asher Franklin Snyder, Mount Joy, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1908, aged 50, died, October 5, of coronary thrombosis

Robert John Trimble, Queenston, Ont., Canada, University of Toronto Faculty of Medicine, 1875, L.R.C.S., L.R.C.P., Edinburgh, 1876, aged 86, died, September 16

George F. Sheedy, New York, Yale University School of Medicine, New Haven, Conn., 1902, aged 58, died, October 13, in St. Luke's Hospital, of gastric ulcer

Howard Gillespie Myers, New York, Bellevue Hospital Medical College, New York, 1887, aged 73, died, September 12, in Wilton, Conn., of arteriosclerosis

William James Pearce, Dodgeville, Wis., Rush Medical College, Chicago, 1881, aged 78, died suddenly, September 24, probably of heart disease.

James Albert Snapp, Goshen, Ind., Detroit College of Medicine, 1891, aged 70, died, September 28, of cerebral hemorrhage and arteriosclerosis

James Alfred Maloney, Chicago, Temple University School of Medicine, Philadelphia, 1910, aged 49, died, August 27, of chronic myocarditis

Simon Samuel Albert Miller, Chicago, New Orleans University Medical College, 1900, aged 61, died August 20, of chronic myocarditis

Robert Moorhead Neilson, St. Jerome, Que., Canada, Laval University Faculty of Medicine, Quebec, 1915, aged 45, died, September 27

Lester Samuel Lang, Oneonta, N. Y., Syracuse University College of Medicine, 1907, aged 56, died, September 24, of angina pectoris

Nathan Farmer Davis, Chandler, Ariz., Curtis Physio-Medical Institute Marion, 1897, aged 81, died, September 26, of arteriosclerosis

William Abraham Groves, Fergus, Ont., Canada, University of Toronto Faculty of Medicine, 1903, aged 58, died, September 26

Alfred Roscoe Andrews, Auburn, N. S. Canada, Halifax Medical College, Halifax, N. S., Canada, 1879, aged 76, died in September

Alexander Chittick, Peoria, Ill., National Medical University Chicago, 1904, aged 62, died, October 9, of cerebral hemorrhage

Jonathan W. Lewis, Driggs, Ark. (licensed in Arkansas in 1903), aged 84, died, August 8, of uremia and heart disease.

Robert Jesse Teeter, Waterford, Ont., Canada, Trinity Medical College, Toronto 1893, aged 67, died, September 14

Frederick F. Kitzing, Chicago, Rush Medical College, Chicago, 1905, aged 56, died July 18, of cerebral hemorrhage

Charles Mackay, Seaforth, Ont., Canada, Trinity Medical College, Toronto 1891, aged 73, died, October 16

Bureau of Investigation

MORE NOSTRUMS IN RETROSPECT

Condensed Reports on "Patent Medicines" Previously Dealt With in Greater Detail

Some months ago there were published in this department of THE JOURNAL greatly condensed reports of much longer and detailed articles published previously on several widely-advertised "patent medicines." The material that follows gives in brief form statements regarding additional products that have already been dealt with in the past more extensively.

Laxative Bromo Quinine—Many years ago this product was advertised under the claims that it "cures a cold in one day." The preparation was the subject of an article in this department of THE JOURNAL, Nov 27, 1915. At that time it was reported that the A M A Chemical Laboratory had found that each tablet of Laxative Bromo Quinine contained as its essential ingredients 2 grains of acetphenetidin, $\frac{1}{2}$ grain of caffeine, $\frac{1}{2}$ grain of quinine or cinchona alkaloids with aloe or aloin as a laxative. It was brought out in the article that while the name Bromo Quinine gives the impression that bromine and quinine were the important ingredients, analysis disclosed that the bromide content was only $\frac{1}{200}$ of the whole, corresponding to about $\frac{1}{30}$ of a grain of potassium bromide or $\frac{1}{500}$ part of a Pharmacopoeial dose. The article also stated that the formula for the preparation had apparently changed about the time the National Food and Drugs Act went into effect. An analysis made for the American Medical Association in 1905 indicated that in addition to the laxative principle, the tablets contained acetanilide, quinine sulphate and caffeine, but no trace of bromine. An analysis made by the state chemists of North Dakota and published in 1907 also failed to show the presence of bromine. The Federal Trade Commission in June 1935 reported that the Grove Laboratories, Inc. of St. Louis, exploiters of Groves Laxative Bromo Quinine Tablets had entered into a stipulation with the Commission to cease claiming that its nostrum "is a cold remedy." Yet an advertisement that appeared in the Chicago Tribune Nov 7 1935, read in part as follows: "KILL THAT COLD! Don't Merely Coddle It with Half-Way Measures! A cold is nothing to trifle with! It may end seriously. A cold, being an internal infection, calls for an internal treatment. It also calls for a cold preparation and not something good for a number of other things as well. Groves Laxative Bromo Quinine is what a cold requires. It is expressly a cold tablet." The 1935 trade package declares—as the law requires—that each Laxative Bromo Quinine tablet contains one grain of acetanilide! It thus appears that the most powerful drug in the nostrum has always been a heart-depressing coal-tar product. First acetanilide, then acetphenetidin (phenacetine) and now again acetanilide.

Murine—Before the passage of the Food and Drugs Act, the "eye remedy" Murine was described on the trade package as "a positive cure for sore eyes," etc. Following the passage of the law, Murine became "a reliable relief for sore eyes," etc. In the earlier days the exploiters of Murine also conducted a school of spectacle fitting known as the Northern Illinois College of Ophthalmology and Otology. It conferred at least seven "degrees" and issued ornate "diplomas" that according to the college's catalog, would "frame handsomely 28 x 28 inches." Twenty-seven years ago (November 1908) there was published in this department of THE JOURNAL an extensive article on Murine and its method of exploitation. Considerable information was given regarding the alleged college operated by those who were interested in Murine. In this article there were given the results of an analysis made in the Chemical Laboratory of the American Medical Association. From their examination, the Association's chemists concluded that Murine was essentially a water solution of borax (about 12 grains to the fluid ounce) containing a trace of berberine or some golden seal preparation. At that time the manufacturers of Murine made no pretense of giving information regarding the composition of their product. About 1922, however, when a seeming frankness was the order of the day in

the "patent medicine" business, the Murine carton listed what were said to be the "ingredients used in the compounding of Murine." According to the cartons at that time, these ingredients were Geranium Maculatum [Cranesbill], C P Boracic Acid, Berberine Hydrochlorid, Podophyllum Peltatum [May-apple], Pilocarpus [Jaborandi], Chloramine-T, Rhubarb, Glycerine, Potassium Sesquicarbonate, Distilled Water, Xanthoxylum [Prickly-ash]. In a reprint of the Murine article published in the 1923 edition of the pamphlet "Miscellaneous Nostrums," prepared and issued by the Bureau of Investigation, attention was called to two facts: first, that if chloramine-T were present in Murine in 1923, the formula had obviously been changed, for chloramine-T was not introduced into medicine until 1916; second, that chloramine-T, although declared as one of the ingredients used in making Murine, was not even found in the 1923 preparation! In fact chemists would not have expected to find it, as chloramine-T is incompatible with boric acid. The present (1935) cartons of Murine no longer carry on them the alleged list of ingredients.

Western Medical Corporation—This is one of a number of medical mail-order concerns operating from the same address and putting out a number of nostrums. Under its earlier name, Western Medical Association, it was the subject of an article in this department of THE JOURNAL Jan 28, 1922, and again the subject of a later article under its present name Aug 5, 1933. The name of Harry L. James, M.D., has been played up as the "Directing Physician." This man was reported to be vice-president of the corporation. Part of the advertising ballyhoo has been a six-page puff of Harry L. James, written by Harry L. James. While the advertising might lead the public to believe that James is peculiarly well qualified to treat cases of epilepsy, he is quite unknown to scientific medicine in this field. The analysis made of the so-called treatment put out by the concern when it was known as the Western Medical Association showed its essential ingredient to be phenobarbital (luminal). There were also some so-called digestive tablets and a laxative.

Nurito—This "patent medicine" was first dealt with in this department of THE JOURNAL of Aug 10, 1912. It was analyzed at that time in the A M A Chemical Laboratory and was found to consist of milk sugar, phenolphthalein and amidopyrine (pyramidon). In August 1914 the Food and Drug Administration issued a Notice of Judgment (No 2997) in which it was declared that Nurito had been found misbranded in violation of the National Food and Drugs Act. They reported at the time that the federal chemists found both amidopyrine and milk sugar in Nurito, but no statement was made regarding the presence of phenolphthalein. In 1927 a Chicago daily newspaper was offered the Nurito advertisement. The advertising department of the paper, in asking the Bureau of Investigation for information on Nurito, stated that a representative of the concern that put out Nurito had declared that amidopyrine (pyramidon) had been removed from Nurito and that the "patent medicine" at that time contained aspirin, phenolphthalein, colchicin salicylate, caffeine and milk sugar. No amounts were stated. Whether this represents the essential ingredients in Nurito today, we do not know. In May 1934 the Federal Trade Commission reported that it had directed the Nurito Company of Chicago to discontinue representing the efficacy of its product Nurito as a treatment for neuritis, rheumatism, neuralgia, sciatica and lumbago. The Commission added that Nurito would be a dangerous product to use in some cases and that certain ingredients were likely to produce toxic effects.

Min-amin—This was the subject of an extended article published by the Bureau of Investigation in THE JOURNAL, Jan. 26, 1935. It was brought out in the article that no information was given on or in the trade package (which is all that is subject to the requirements of the National Food and Drugs Act) regarding the composition, other than the vague statement that it was "a combination of pure food concentrates containing minerals and vitamins." A booklet sent out by those who sold Min-amin stated that the product contained 21.85 per cent protein, 14.4 per cent crude fat, 54.05 per cent carbohydrates, 0.8 per cent crude fiber, and 3 per cent ash. The booklet stated, also, that the fuel value of a teaspoonful of Min-amin was 41.84 calories. A report from the A M A Chemical Labora-

tory was given in some detail and the chemists expressed the opinion that Min-amin was essentially powdered wheat germ. The instructions that went with Min-amin were, in effect, that the obese should eat no breakfast and no luncheon, but take instead of each of these meals a rounded teaspoonful of Min-amin in an eight-ounce glass of freshly-made, unstrained orange juice. THE JOURNAL's article closed with the statement that there seemed to be nothing novel or original in Min-amin and that other food powders had appeared on the market in the past year or two recommended in the treatment of obesity as substitutes for breakfast and luncheon.

Correspondence

IMPEDANCE ANGLE TEST FOR THYROTOXICOSIS

To the Editor—In 1933 one of us (M. G. W.) published a paper on the polarization capacity of the skin as an index of thyroid function (*Endocrinology* 17:299 [May-June] 1933). Three months later there appeared a paper by Dr. M. A. B. Brazier (*Lancet* 2:742 [Sept. 30] 1933) dealing with the same subject but designating the method as measuring the impedance angle. In THE JOURNAL, October 12, page 1211, in reply to a query on the impedance angle test for thyrotoxicosis, you state that "American workers fail to corroborate the English observations." This statement requires correction. In the paper published in *Endocrinology* calling the method a polarization capacity, the results substantially agree with those of Dr. Brazier with the following difference. While the polarization capacity as well as the impedance angle was found to be high in thyrotoxicosis, we found that the polarization capacity was not correlated with the basal metabolic rate. Dr. Brazier, on the other hand, finds that the impedance angle can be correlated with the basal metabolic rate. Be that as it may, it is important to point out the fact that the measurements made by Dr. Brazier and ourselves express the same basic phenomenon.

On reading over the various articles dealing with the subject, one may be led to believe that different quantities were being measured by the different workers (Lueg, Grassheim, Wohl, Brazier) since one worker says he is measuring the impedance angle while another worker says he is measuring the polarization capacity of the skin. All the measurements were concerned with the impedance of the human body to an alternating current. To be sure they used different frequencies of current and somewhat different techniques as well as different apparatus, which would certainly be apt to give results not in general agreement, but the quantities measured in every case were closely related to the impedance of the body to the alternating current passed through the body.

In any circuit carrying an alternating current there are three fundamental quantities involved, namely, a pure resistance, a reactance due to the capacitance of the circuit, and a reactance due to any inductance in the circuit. No circuit carrying an alternating current is entirely free of any of these quantities, but it is true that circuits are made in which either the reactance due to the capacitance or to the inductance are made negligibly small and can therefore be neglected. We believe that all the workers interested in this problem have implied that the inductance was negligible, since they have all omitted it from their considerations. We believe they are justified in taking this point of view. Hence the circuit contains only the two remaining quantities, and we have for the total impedance of the circuit

$$Z = \sqrt{R^2 + \left(\frac{1}{C\omega}\right)^2}$$

R = pure resistance
 C = capacity
 ω = 2π times the frequency

Now since the currents used were harmonic functions of the time the pure resistance and the reactance due to the capacitance can be plotted graphically and added as vector quantities. The

total impedance is then the vector sum of the two quantities, and the impedance angle is the angle between the total impedance vector and the resistance vector. It should be stated here that these quantities are not really vector quantities but can be treated as such when the impressed electromotive forces are harmonic. To determine the impedance angle in a circuit containing only resistance and capacitance, one must measure the capacitance that must be inserted into the circuit in order to bring the current in phase with the voltage. This is exactly what all the workers have done and hence they have all been measuring the same basic phenomena. They do express different points of view as to the causes of the capacity of the body, but as to the merits of these points of view they are yet to be determined.

MICHAEL G. WOHL, M.D.

Associate Professor of Medicine, Temple
University Medical School

ROSCOE STINETORF, Ph.D.

Member of Department of Physics,
University of Pennsylvania

Philadelphia.

To the Editor—Regarding the communication from Dr. Killoran on the impedance angle test for thyrotoxicosis, which appeared in *Queries and Minor Notes* in the issue of October 12, I note that in your answer no reference was made to a publication by Wilson and myself in the *Lancet*, showing that no correlation existed between the basal metabolic rate and the impedance angle test. The article referred to is Robertson, J. D., and Wilson, A. T. A Combined Study of the Basal Metabolism and Impedance Angle in Thyrotoxicosis and Myxedema, *Lancet* 2:1158 (Nov. 24) 1934. Our observations anticipated those of the American workers by some six months.

J. DOUGLAS ROBERTSON, M.B.,

Middlesex Hospital Medical School,
London.

LYMPHOCYTIC MENINGITIS

To the Editor—Considerable interest has been shown by medical writers in the syndrome variously called aseptic, idiopathic, epidemic and acute lymphocytic meningitis. It was first clearly described by Wallgren (*Acta paediat* 4:158, 1925) and subsequently it formed the subject of a comprehensive article in the American literature by Viets and Watts (*THE JOURNAL*, Nov. 16, 1929, p. 1553).

At about this time I encountered a case with many similar characteristics at the Boston Psychopathic Hospital. This patient showing cerebral symptoms of an organic nature was found to have the typical signs and blood picture of infectious mononucleosis, commonly known as "glandular fever." Because of the uniqueness of the condition, the case was reported in detail under the title "Involvement of the Central Nervous System in a Case of Glandular Fever" (*New England J. Med.* 205:1238 [Dec. 24] 1931). Simultaneously there appeared a similar report in the Scandinavian literature by A. H. Johansen (*Acta med Scandinav* 76:269, 1931). In both of these articles the relationship between lymphocytic meningitis and infectious mononucleosis was emphasized. My attention was recently called by Dr. Edwin M. Cole (personal communication) to another case of this sort, showing the typical picture of infectious mononucleosis and the syndrome of mild meningitis.

During the last few years many authors, notably S. A. K. Wilson (*J. Neurol. & Psychopath.* 10:36 [July] 1929) and Reiche (*Ztschr. f. klin. Med.* 110:506, 1929) have stressed the association of central nervous system involvement with various generalized infections, such as postvaccinal encephalitis and the acute exanthems. These clinical observations have been subjected to experimental investigations of possible etiologic factors. From the latter standpoint attention has been repeatedly focused on the filtrable viruses.

Recently interest in lymphocytic meningitis was stimulated by some experimental investigations of a filtrable virus isolated from patients with this disease. The work of Armstrong (*Pub Health Rep* 49 1019 [Aug 31] 1934) and of Rivers and Scott (*Science* 81 439 [May 3] 1935) indicates that a filtrable virus is the causative agent of acute lymphocytic meningitis and tends to prove that the disease is a clinical entity.

There are many discrepancies in the clinical and serologic observations in these cases, and the constancy of the signs and symptoms of this disease is questionable. It appears that there are many conditions, sometimes called encephalitis, in which this benign meningitic syndrome occurs. There are also known systemic diseases accompanied by changes in the central nervous system and these are not classed as clinical entities. Furthermore, some of the blood diseases of obscure etiology sometimes show central nervous system involvement. The best illustration of this phenomenon is furnished by the three case reports mentioned of infectious mononucleosis with involvement of the central nervous system. In the first two cases the spinal fluid cellular reaction parallels the cell counts of the peripheral blood, which indicates a close relationship between the two systems and between the diseases infectious mononucleosis and lymphocytic meningitis.

It seems to me that the crux of the whole problem lies in the larger concept of various systemic diseases of known and unknown etiology, giving rise to changes in the central nervous system. I am inclined to believe that such diseases as infectious mononucleosis may produce cerebral changes, and conversely that so-called lymphocytic meningitis, like certain of the encephalitides, is merely symptomatic of some as yet unknown systemic disease.

SAMUEL H. EFSTEIN, M.D., Boston

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address but these will be omitted on request.

OXYGEN INHALATION IN PNEUMONIA

To the Editor.—More than a year ago in answer to an inquiry you published an article on the use of oxygen in pneumonia and described the technic of administration. In this article you described two types of nasal inhalers, one of them by Bullowa, and a device by which the rate of flow might be gaged by the diameter of its orifices. Surgical supply houses here seem unable to obtain these articles. I wish to make the following inquiries: 1. Are the nasal inhalers better tolerated by patients especially children than nasal catheters? 2. Is the administration of oxygen more effective when they are used? 3. Where may they be purchased? Please omit name.

M D Oklahoma

ANSWER.—The advice in Queries and Minor Notes in *THE JOURNAL*, Jan. 27, 1934, page 311, was intended to instruct physicians to use industrial oxygen and, in an emergency, how to utilize an industrial oxygen regulator by interposing a slug perforated with a drill hole of suitable size in the rubber tubing leading from it.

If one purchases a regulator, the best type is a two-stage regulator with a variable orifice or float gage because it indicates the amount of oxygen actually flowing. Once calibrated it does not become inaccurate by use or overstrain. Dial gages are made with Bourdon tubes, which are subject to overstrain. They may indicate a high flow rate though there is no escape of oxygen from the catheter or inhaler. This is readily demonstrable to any one who pinches the tubing and observes the float and the dial.

1. Nasal inhalers with the oxygen discharged just within the nares are frequently better tolerated, especially by children, than soft nasal catheters inserted to the pharynx.

2. The inhaler or metal catheter with rubber tips inserted one-fourth inch into the nostrils is frequently more effective than a soft catheter, because oxygen is admitted to the two nostrils at the same time, and more oxygen can escape through a well made cannula than through even two catheters of size 10 French. Under 3 inches of water pressure no more than 15 liters per minute will escape from a single No. 10 French

catheter of wide bore. The openings in small catheters frequently become obstructed by mucus, which is sometimes due to irritation of the catheter. When oxygen escapes at the same rate from a large and from a small opening, the pressure against the mucous membranes is less when the opening is large, and the mucous membranes are irritated less. When measured by the concentration of oxygen in the alveolar air, the administration of oxygen by the pharyngeal catheter had only slight or no advantage over the administration by a nasal inhaler.

3. Several varieties of inhalers or metal nasal catheters should be available to fit various physiognomies. The Bullowa inhalers, adult size, can be purchased from the F. A. Noble Company, Inc., 2136 Seventh Avenue, New York; the children's size from the Foregger Company, 55 West Forty-Second Street, New York. The Connel, Sanborn and Gwathmey inhalers may be purchased from the Foregger Company and many other surgical supply houses. Inhalers should be made of malleable brass without constriction at the fork. The cross bar for attachment to the forehead should be adjustable on the stem and held in place with an adequate spring. Children size inhalers should permit the free discharge of 6 liters of oxygen per minute measured with a variable orifice or float gage, and the adult size should permit the discharge of 15 liters per minute. Oxygen regulators approved by the Council on Physical Therapy may be purchased from dealers in oxygen and from many surgical supply houses. The Council has approved a float type regulator made by the Air Reduction Company and a dial type regulator made by the Linde Air Products Company.

HYPERTENSIVE DISEASE

To the Editor.—Last October I discovered that I had a blood pressure of 180 systolic 100 diastolic. I am 54 years of age. Since last October the blood pressure has been averaging 180/100 but a few days ago it went to 200/120. I have had two electrocardiograms made which were pronounced normal. The urine is reported as being normal. On roentgen examination my teeth appear to be sound. The chest and heart have been roentgenographed and no abnormality found. The tonsils were removed in 1919, but I was off work for a year at that time with a systemic infection but have been physically fit since then until last October. I sleep well and have a good appetite. There is a constant dull pain in both temples. There is a sense of fullness in the ears at times. I have no pep. I tire easily. I am forgetful. There is some shortness of breath at times. I am of a nervous temperament. The bowels are regular. I have gotten up once or twice at night to urinate for several years. The Wassermann reaction is normal. I have not been working hard for the last two years but until that time I was putting in long, hard hours. My mother died at 75 with a stroke. My father died at 67 with what was supposed to be angina. I have taken sodium nitrite, bismuth subnitrate bromides, phenobarbital and potassium thio cyanate without results. If you can give any advice from this meager history, it will be greatly appreciated. Please omit name.

M D, Indiana

ANSWER.—It would be of considerable interest and value to know what the arterial tension was a year ago and also a year before that. Knowledge of the rate of progression of hypertensive disease is valuable from both the prognostic and the therapeutic point of view. It is quite possible that the "systemic infection" in 1919, which required a year for recuperation, may have initiated the present disturbance.

Failure to obtain benefit from the forms of management already tried may be due to one or more of several factors. In the first place, the effects of medication with sedatives and/or the milder vasodilators may require several weeks before objective benefit is apparent, it is therefore possible that longer trial would be advantageous. The effectiveness of such management is largely nullified by intense apprehension. In the second place, arteriosclerosis may have already occurred and no sedative or vasodilator medication will then be of value. This may be quickly determined by the amylin nitrite test (Steghitz, E. J. *Arterial Hypertension, Arch. Int. Med.* 46 227 [Aug.] 1930, *Illinois M. J.* 62 414 [Nov.] 1932). It is well known that hypertensive arterial disease initiated by influenza or similar systemic infection often progresses rapidly to extensive arteriosclerosis which is irrevocable and not amenable to therapeutic correction. The third explanation for the failure of medical management is that some active etiologic factor or factors yet remain undiscovered and therefore uncorrected. This is the most probable reason at least from the data available, especially as the arterial tension appears to have increased still further recently. Thorough, painstaking search for etiologic factors is certainly indicated. Anemia (often not severe but still significant), thyroid dyscrasia, mild chronic plumbism (commonly overlooked), foci of infection other than the teeth, mild arsenic poisoning, and impairment of the renal function must all be carefully and fully ruled out. Many other factors of etiologic significance must also be considered should these prove "negative." The fact

that the "urine was reported normal" does not rule out renal functional impairment, this can be done only after functional evaluation by renal function tests. The more important of these include the concentration test (Fishberg), the diuresis concentration test (Mosenthal), the urea clearance test and, perhaps, the sodium ferrocyanide excretion as a measure of glomerular efficiency (Stieglitz, E. J., and Knight, A. A. Sodium Ferrocyanide as a Clinical Test of Glomerular Efficiency, *THE JOURNAL*, Dec 8, 1934, p 1760). The relative importance of constitutional or hereditary influences and added insults from various intoxications requires evaluation.

Advice then must be along these general lines. Further studies should attempt to determine and reveal unrecognized but active initiating etiologic factors and the correction of these whenever found feasible. Long continued sedation either through the nervous system (as with bromides) or more directly of the arterioles (as with bismuth subnitrate) is certainly indicated. Such management may require several weeks' continuance before benefit is apparent. Attention to diet, the correction of anemia and an adequate intake of fluid are essential. The newer surgical methods of attack, through denervation of the adrenals, partial adrenalectomy and/or extensive sympathectomy, are still almost wholly experimental and thus far have failed to yield results at all commensurate with the risks involved.

'ADVANCES IN THERAPEUTIC TECHNIC

To the Editor—The paper by Dr. Bernard Fantus, *Advances in Therapeutic Technic* (*THE JOURNAL*, Sept. 14, 1935, p. 877) is interesting but I am not able to understand several points. Failure to have the National Formulary VI at hand makes the situation more difficult for me. I understand that iso-alcoholic elixir is aromatic elixir with a changeable percentage of alcohol whereas the official aromatic elixir has a stable content of about 23 per cent alcohol. Does iso-alcoholic elixir mean that the aromatic elixir should contain the same percentage as the alcoholic extract of the drug in question? e. g. should iso-alcoholic elixir in prescription 1 contain about 70 per cent alcohol because tincture of digitalis contains about 70 per cent? 2. The statement is made before prescription 5: "For nonextractive substances the lowest alcoholic strength of iso-alcoholic elixir should be chosen." As terpin hydrate requires strong alcohol for solution the pharmacist will employ the high alcoholic elixir as the vehicle. I cannot understand this explanation. What does iso-alcoholic elixir mean in regard to nonextractive substances as given in prescription 5? What would be the difference between (a) terpin hydrate 50 iso-alcoholic elixir ad 60.0 and (b) terpin hydrate 50 aromatic elixir U. S. P. ad 60.0? I understand that elixir terpin hydrate N. F. contains 0.08 to one teaspoonful whereas a and b would contain about 0.4 (one teaspoonful 5 cc. as it really is). 3. I was unable to find 'calbromen' in the Epitome fourth edition though calobren is mentioned in the description of the latter however does not indicate that calobren is composed in candy form. How should the candy form be prescribed? 4. May I ask you another question not directly pertaining to Dr. Fantus's paper? What form of prescription would you advise as an iron tonic for children in liquid and which one in candy form but not a ready commercial preparation and how to avoid the high content of alcohol if prescribed as an elixir? Can aromatic elixir with 23 per cent be considered nonirritating if prescribed for children and how about prescribing it for a patient suffering from chronic gastritis a condition in which alcohol should be avoided in any form whatever? As most of the tonics or hematinics contain a high percentage of alcohol if tonics are to be given is there any way out of that quandary by means of iso-alcoholic elixir? Going through all the prescriptions I noticed that there must be a mistake in prescription 4 cannabis (fluidextract) being given as 15.0! Thus prescription 4 would contain 1 cc. per teaspoonful the dosage however being 0.1 cc! What about prescription 12? There the dosage would be 1.25 per tablespoonful. Has that dosage been wanted by the author?

H. MARKT M.D., Astoria, L. I. N. Y.

To the Editor—I have been asked by my doctor to stock several items which I have been unable to locate from local jobs. The items referred to are listed on pages 879 and 880 of *THE JOURNAL*, Sept. 14, 1935. The items in question are iso-alcoholic elixir and alkaline elixir eriodictyon. You say in the same paragraph that the formula can be found in Recipe Book II. Will you please advise me as to where I can purchase these items or where I can find the formula for making them?

CHARLES HORNE, Druggist, Greenville, S. C.

ANSWER.—For the production of iso-alcoholic elixir the pharmacist is given, in N. F. VI, a formula for a low alcoholic elixir and a high alcoholic elixir, which are to be mixed in the proportion required to produce a perfect solution with the medicament, whenever the physician prescribes iso-alcoholic elixir. The formulas for these two elixirs are as follows:

Low-Alcoholic Elixir

| | |
|---------------------------|---------|
| Compound spirit of orange | 10 cc. |
| Alcohol | 100 cc. |
| Glycerin | 200 cc. |
| Sucrose | 320 Gm. |

Distilled water a sufficient quantity to make 1 000 cc.

Mix the alcohol, glycerin and 500 cc. of distilled water add the compound spirit of orange, agitate thoroughly from time to time and let stand for twenty-four hours. Filter through a hard paper filter, return

ing if necessary the first portions of the filtrate until it passes through clear. Dissolve the sucrose in the filtrate by agitation or percolation, and add enough of the solvent mixture to make the product measure 1 000 cc.

Alcoholic content From 8 to 10 per cent by volume of ethyl alcohol.

High-Alcoholic Elixir

| | |
|---------------------------|---------|
| Compound spirit of orange | 4 cc. |
| Saccharin | 3 Gm. |
| Glycerin | 200 cc. |

Alcohol a sufficient quantity to make 1 000 cc.

Dissolve the compound spirit of orange and the saccharin in 700 cc. of alcohol add the glycerin and sufficient alcohol to make the product measure 1 000 cc. mix well and filter.

Alcoholic content From 73 to 78 per cent by volume of ethyl alcohol.

Table for Adjustment of Iso Alcoholic Elixir

| Low Alcoholic Elixir | High Alcoholic Elixir | Suitable as Vehicle for Preparations of the Following Alcoholic Strengths |
|----------------------|-----------------------|---|
| 1 volume | None | 0-10 per cent |
| 4 volumes | 1 volume | 10-20 per cent |
| 3 volumes | 1 volume | 20-30 per cent |
| 2 volumes | 1 volume | 30-40 per cent |
| 1 volume | 1 volume | 40-50 per cent |
| 1 volume | 2 volumes | 50-60 per cent |
| 1 volume | 3 volumes | 60-70 per cent |
| 1 volume | 4 volumes | 70-80 per cent |
| None | 1 volume | 80-95 per cent |

For liquid galenicals the strength of iso-alcoholic elixir to be used is the same as that of the menstruum or solvent employed in the preparation of the galenical.

When galenicals of different alcoholic strengths are used in the same prescription the iso-alcoholic elixir to be used is to be of such strength as to secure the best solution possible under the circumstances. This will generally be found to be the average of the alcoholic strengths of the several ingredients.

For nonextractive substances the lowest alcoholic strength of iso-alcoholic elixir that will yield a perfect solution should be chosen.

In prescription 1, the proportion of 1 volume of low alcoholic elixir and 3 volumes of high-alcoholic elixir will give a liquid of about 70 per cent of alcohol, which will make a clear solution with tincture of digitalis.

2. For the terpin hydrate prescription the high alcohol elixir is to be used as a solvent, as this quantity of terpin hydrate would not dissolve in alcohol of any lower strength. The elixir terpin hydrate N. F. VI is made to carry 0.07 Gm. of terpin hydrate by means of 40 per cent of alcohol. It is impossible to dissolve the required quantity of terpin hydrate in aromatic elixir.

3. Calbromen is also known as sabromin. It is calcium dibromobenzenate and is recognized in N. N. R. Both it and calcium iodobenzenate U. S. P. can be put up in candy form by mixing them with sugar containing 10 per cent of cocoa, with tincture of vanilla for flavoring and by compressing them in a tablet machine. Formulas for such sweet tablets are found in the Recipe Book published by the American Pharmaceutical Association.

4. There is also in the Recipe Book a prescription for sweet tablets of iron. Such tablets are available on the market. It is easy to prescribe an iron tonic for children in liquid form without the use of an elixir. Such a solution is suggested in the article under discussion as prescription 12, with considerable reduction in dosage, of course. The syrup of cinnamon is made by saturating cinnamon water with sugar, which will be the formula for Syrup of Cinnamon N. F. VI.

The low-alcoholic elixir as well as the various other elixirs of the N. F. contain so low a percentage of alcohol that they may be considered unobjectionable when prescribed for children or patients with chronic gastritis. The aromatic elixir U. S. P. might, on the other hand be sufficiently irritating to be objectionable in chronic gastritis and possibly be slightly intoxicating to a small child.

5. The prescription for fluidextract of cannabis is intentionally made to contain a large dose of the active ingredient, as a smaller dose is not likely to produce any effect and the dose given is not dangerous although it may put the patient into a dreamy state.

In prescription 12 the dose is intended to be 1.25 Gm. per tablespoonful, as the modern tendency is in the direction of large and liberal doses.

The formula for "alkaline elixir of eriodictyon" is as follows:

| | |
|---------------------------------|---|
| Oil of bitter almond | 0.5 cc. |
| Vanillin | 1.0 Gm. |
| Saccharin | 1.5 Gm. |
| Fluidextract of eriodictyon | 30.0 cc. |
| Solution of potassium hydroxide | 27.5 cc. |
| Alcohol | 500.0 cc. |
| Syrup | 350.0 cc. |
| Orange flower water | sufficient quantity to make 1 000.0 cc. |

Dissolve the oil of bitter almond the vanillin and the saccharin in the alcohol then add the syrup. Mix the fluidextract of eriodictyon and the potassium hydroxide solution and add to the solution. Finally add enough orange flower water to make 1 000 cc.

LEUKOPENIA WITH GRANULOCYTOPENIA

To the Editor—A woman aged 30, has a white count ranging between 2,500 and 3,000 cells with a polymorphonuclear leukocyte percentage ranging between 30 and 50. This condition was detected one year ago. All possibility of foci of infection has been ruled out and she has not taken any drugs. The only symptom that she has is extreme fatigue and a general lassitude. I have given her pentanucleotide which has caused the white count to increase temporarily but the reaction is so great that I have not felt like giving it over a prolonged period of time. Recently I have been giving her a sterile milk antigen for nonspecific protein therapy it causes very little systemic reaction and produces practically the same white blood count as when pentanucleotide is used. The patient is at rest most of the time. She has no household duties to perform and spends a portion of her time at complete rest in bed. Any suggestions that you might make in this case will be greatly appreciated.

M D, Georgia.

ANSWER—This case corresponds to the chronic leukopenias with granulocytopenia of unknown origin. This is a poorly understood group of cases. Roberts and Kracke have reported on this subject (*Ann Int Med* 5:40 [July] 1931). In an effort to determine whether any relationship existed between the symptoms of fatigue and exhaustion to the degree of granulocytopenia these authors made a statistical study of 8,000 records of patients seen in private practice who were ambulatory and had no acute illness. They found that one of every four patients may be expected to have a mild granulocytopenia and that it was particularly common in female patients between the ages of 40 and 60. The complaints of weakness, exhaustion or fatigue were twice as frequent in the patients with granulocytopenia as in those with normal white cell counts. Further, there was very little difference in the leukocyte count over a period of ten years. It was the opinion of these authors that there is a definite clinical syndrome consisting mainly of weakness, easy exhaustion, tendency to fatigue, loss of strength and inertia associated with leukopenia and granulocytopenia and that the severity of symptoms is largely dependent on the degree of granulocytopenia. The condition of agranulocytosis merely represented the most severe type. Treatment was not discussed in their paper. However, it is obvious that until more is known concerning the etiology of this group of cases the treatment can only be palliative. The use of repeated small transfusions of about 250 cc of blood is safe and based on scientific fact and clinical experience. If patients who have recovered from this disorder are available, Fisher and Chrisman and Hinton report success with such blood when ordinary blood was without result. Any agent that is capable of stimulating the bone marrow to the production of granular cells is worthy of trial but must be used with caution. Among such agents Kracke lists various nonspecific protein substances vaccines, serums adenine sulphate nucleic acid, colloidal sulphur and the production of sterile abscesses. The use of small stimulating doses of x-rays to the long bones has its exponents but this treatment is potentially dangerous unless the blood is carefully checked and the treatment given by an experienced worker. Massive doses of liver extract by mouth have also been used with success in some cases. Each case should be carefully studied from all possible angles, including endocrine function, and the treatment individualized. For purposes of prognosis bone marrow studies would be of value. If hypoplasia of myelocytic tissue is present the prognosis is invariably poor.

KAHN AND WASSERMANN TESTS

To the Editor—A woman, aged 28, single, was sent to a sanatorium for tuberculosis. She had been classified as a minimal case although her lesions were slight. Her sputum was positive for the tubercle bacillus before admission. At the sanatorium routine Wassermann and Kahn examinations are made and the patient, in the absence of a positive history has shown consistently a 4 plus Kahn and a negative Wassermann reaction both in the sanatorium laboratory and in two other laboratories. After standing several days at room temperature the serum shows a negative Kahn reaction. Can you explain such a reaction for me or tell me an authority or source of information on this subject? The patient has a Vincent's infection of the gums the only other positive finding in her physical examination. Kindly omit name.

M D, Virginia.

ANSWER—It is not unusual to find positive Kahn and negative Wassermann reactions in routine examinations in view of the fact that the Kahn test is more sensitive in detecting syphilis than most Wassermann methods. The Kahn test is not known to give false positive reactions in tuberculosis. In one advanced case of Vincent's angina the Kahn reaction was positive during the height of the infection and was negative after the infection had subsided. This patient was believed to be free from syphilis. The observation that a serum will give a positive Kahn reaction and after the serum has stood for

several days at room temperature, a negative reaction is unusual. It is possible that after the serum had stood for several days at room temperature it may have undergone bacterial contamination, which would, of course, affect the results of all tests for syphilis. It may be also that after the serum had stood for several days at room temperature it was not reheated before the Kahn test was performed. Serums that have stood for twenty-four hours, after having been heated for thirty minutes at 56 C., must be reheated for at least ten minutes at this temperature before this test is performed. If the heated serum has stood for several days, it should be reheated for about twenty minutes. Regarding this phase of the inquiry, it might be well to communicate with the author of the Kahn test (Dr R L Kahn, University of Michigan Hospital, Ann Arbor). Practically all complement fixation and precipitation methods will give an occasional false reaction in tuberculosis. This fact must be kept in mind when interpreting positive reactions in this infection. Yet thorough and extensive search for the possibility of syphilis must be instituted before considering a patient giving a positive reaction as nonsyphilitic.

POSSIBLE SCURVY

To the Editor—Recently I saw an infant aged 5 months, for the first time. The mother received antisyphilitic treatment during pregnancy and the infant had received a total of six treatments, agent unknown. He had received no orange juice or cod liver oil and was on an evaporated milk dilution with Karo. He was fairly well nourished, with only slight evidence of rickets. The temperature was 103 F. He had been crying all day when moved especially when the back or shoulders were touched or pressed on. There was no vomiting or diarrhea. Examination gave no evidence of parenteral infection. There were no clinical signs of scurvy, tetany or syphilitic periostitis. The fontanel was flat, the reflexes were slightly increased, not suggesting either meningitis or poliomyelitis. The formula was diluted, an enema was ordered and 2 ounces (60 cc) of orange juice daily was commenced together with antirachitic measures. One-fourth grain (0.016 Gm) of phenobarbital was administered. On the following day the infant appeared perfectly well and now, three days later, continues to be. There is not the slightest tenderness. From this outline what would you consider to be the most likely diagnosis? Please omit name if published.

M.D, Georgia

ANSWER—This 5 months old infant with a fever of 103 who showed extreme tenderness when moved or touched, had received no orange juice and was on an evaporated milk formula, might well have been suffering with scurvy. The rapidity with which the condition cleared following the administration of orange juice strongly substantiates this diagnosis. Fever is often a symptom of scurvy. There is no evidence to show that the condition was of a syphilitic nature, and a syphilitic periostitis would not be so quickly relieved.

In a young infant extreme tenderness and fever may be the only symptoms of scurvy. When no teeth are present, the hemorrhagic changes in the gums are absent. Swelling of the extremities may also be absent. An early sign of scurvy, which is often overlooked, is hematuria. Roentgen examination may be negative, in fact, the changes in the roentgenogram may not be positive until a month or more following the time at which treatment was initiated.

It has recently been found that the cevitic acid (ascorbic) acid content of the blood serum and urine are quite low in scurvy. Such a test might aid in the diagnosis of a case similar to that here under consideration. The rapidity with which the tenderness and fever of an active scurvy disappear following the administration of vitamin C is well known and could well fit in with the case in question.

VAN SLYKE TEST

To the Editor—What is the significance of the Van Slyke test? How is the test made? Can a blood specimen be sent to the laboratory for the test or is it necessary that the patient present himself to the technician? Please omit name.

M D, Florida

ANSWER—The Van Slyke test is a method employed for the determination of the alkali reserve of the blood plasma, often called the carbon dioxide combining power of the blood plasma. This is the most important test for the detection of acidosis or alkalosis. It should be done in every case of suspected acidosis, including severe diabetes, nephritis and ketosis.

The principle of the test is the determination of the carbon dioxide content of blood plasma. The blood plasma is shaken in a separatory funnel filled with an air mixture the carbon dioxide tension of which approximates that of normal arterial blood. Thus the plasma combines with as much carbon dioxide as it is able to hold under normal tension. A known volume of the saturated plasma is then run into a special apparatus,

acid is added, and carbon dioxide is liberated by the production of a partial vacuum. The carbon dioxide is measured at atmospheric pressure and the volume corresponding to 100 cc. of plasma is calculated. A special expensive Van Slyke manometric apparatus is required for this test.

Another method consists of titrating the bicarbonate content of the plasma. It is given in Osgood and Haskins, *Laboratory Diagnosis*, 1931, on pages 296 to 298. It is too long and complicated to give in detail here. The titration method of Van Slyke as modified by Haskins and Osgood agrees closely with the figure obtained by the gasometric method.

The patient must present himself to the technician at the laboratory. Special precautions are necessary in drawing the blood. The patient should rest for one hour. One drop of potassium oxalate, saturated solution, is placed in a small test tube, 5 cc. of venous blood is obtained and the tube is inverted to mix with the oxalate. The blood must be kept in a cool place and the test done within two or three hours.

ANAL NEUROSIS

To the Editor—What is the pathologic condition underlying anal neurosis? I can detect no anal, rectal or adjacent organic disease. The patient does not have hemorrhoids, fissure, fistula, cryptitis, papillitis or pectinitis, but he continuously complains of a burning scalding pain from the sphincter outward on the right side of the anus. He has been treated for years by rectal quacks and regular doctors. The regular doctors have done no more good than the quacks. Will cutting the presacral nerve relieve the anal discomfort? He had a thorough alcohol injection six months ago.

M D, Oklahoma

ANSWER—It is usually unwise to speculate as to the cause or nature of an anorectal disorder on the basis of its description alone. However, if the patient developed his troublesome symptom following the onset of the treatment mentioned it is probable that the difficulty may be traced to that. Probably it will not help to cut the presacral nerve, which has its origin in the sympathetic nervous system. The nerves supplying the margins of the anus originate in the sacral roots. It would be unwise to cut these nerves, because the sensory and motor fibers are intimately connected. So-called anal neurosis is usually seen in just such cases as the one described. The difficulty usually originates as one of the prevalent "rectal" complaints, and "anal neurosis" develops after prolonged treatment and many operations.

EFFECTS OF MORPHINE

To the Editor—What would be the effect of one-eighth grain (0.008 Gm.) of morphine sulphate given by mouth to a woman 72 years old sick in bed with chronic myocarditis having at the time a rapid heart of regular rate with an occasional extrasystole complaining of a weak spell and precordial distress and being at the time under considerable nervous apprehension and never having had morphine before by mouth or any other way? How soon after administration by mouth would the effect occur? How would the effect if any, show itself to an objective examination?

M D Rhode Island.

ANSWER—The first effect most likely would be a relief from the distress, a diminution of the ability to fix attention, and the induction of a dreamy state, succeeded by drowsiness, apathy and sleep. Very rarely excitation, extreme restlessness and even delirium occur instead of the phenomena of sedation. Such effects may occur from fifteen to thirty minutes after a dose taken by mouth, although they may not appear for hours if conditions for absorption from the alimentary tract are unfavorable. Objective examination, when the effects are at their height, would show small pupils, a diminution of the pulse and of the respiration rate. Constipation is usual, nausea and even vomiting are not uncommon after-effects.

RADIATION AND WATER METABOLISM IN EPILEPSY

To the Editor—Is there any information available as to the effects of roentgen irradiation of the pituitary on the water metabolism especially in epilepsy?

HUGH MACDONALD M D Evanston Ill

ANSWER—In the literature there is no evidence available as to the effects of roentgen irradiation of the pituitary on water metabolism especially in epilepsy. However, an authority on epilepsy reports that he has tried this in a few cases without being able to convince himself that radiation under such circumstances has any definite effect on water metabolism. This authority feels that radiation gives collective results on the pituitary hormones without a specific effect on the particular hormone concerned. In a broad way his conclusion is that no beneficial effect can be demonstrated by high voltage roent-

gen therapy applied to the pituitary in cases of epilepsy. A second authority said that he had made special efforts to get information on this subject but without success. In general, at present, the tendency to irradiate the pituitary in a great variety of disturbances, glandular and otherwise, should be deprecated. Not only does roentgen radiation produce an indeterminate change in the pituitary itself, which may have far reaching consequences, but parts of the central nervous system are exposed to the rays at the same time.

INTRANASAL IMMUNIZATION OF SCARLET FEVER

To the Editor—Will you please send me the technic of intranasal immunization of scarlet fever?

W K BULLOCK M.D, Vernal Utah.

ANSWER—Various methods have been employed in attempts at intranasal immunization against scarlet fever. The toxin may be sprayed or instilled into the nose. The amounts of toxin employed for a single treatment have ranged from 2 or 3 to 10 cc. The treatments have been given at intervals of twenty-four hours to one week by different workers. Most of the toxin introduced into the nose is eventually swallowed. It has been shown that partial or complete immunity results from administration of toxin by mouth. Neither method is as effective as hypodermic injection.

'THE POLARITY OF CHEST LEADS

To the Editor—Will you accord me the privilege of commenting on your answer to my letter of August 25 (*Queries and Minor Notes*, *THE JOURNAL*, November 16 p 1627) in regard to the polarity of chest leads? Also I should like to add another argument for my view as to the preferable polarity.

I will not debate the first paragraph of your answer but will merely remark that the incongruity of the inverted record offends my taste but chacun à son goût.

The second paragraph of your answer is I think, a quite inadequate solution of the difficulty discussed. There is a definite need for a general designation for each component of the group of initial ventricular deflections in chest leads as in limb leads. For instance I am at present writing a paper on a matter relating to precordial leads and I wish to refer to the frequent absence of the large initial ventricular deflection in cases of anterior infarction. I should like to write 'R is frequently absent, but this term is not applicable to inverted records while to call the deflection a Q wave is highly objectionable. What term can be used for the missing deflection? McGinn and White's idea is excellent for describing the initial deflections of a particular record but obviously it furnishes no basis for terms of general applicability.

There is however another more fundamental argument I omitted it from my former communication for the sake of brevity, but I will state it here as compactly as possible.

If the derivation is made from one point on the precordium and another point on a limb, the electrocardiogram is essentially a record of the rather large changes in potential at the precordial electrode for the potentials at the distant electrode are relatively small. We are dealing in fact, with a semidirect lead from the surface of the heart and the potentials recorded are largely determined by the potentials in that part of the heart immediately underlying the precordial electrode. The average electric vector of the whole heart has little influence in this case.

The possibility of thus recording local electrical phenomena in the heart has stimulated interest in the exploration of the whole precordial surface and observations are being extended even to the posterior surface of the heart through the esophagus. The pattern of the deflections obtained from these different points varies widely those from the esophagus being more or less the inverse of those from the anterior surface. In view of the variety of patterns recorded it is certain that much confusion will result unless a sound principle guides the choice of polarity.

There is no doubt about what this principle should be. The requirement is that the records should show unequivocally the sign of the potential developed in the part of the heart under examination, and we must agree whether positive potentials are to be represented by upward or by downward deflections. Now the normal initial ventricular deflection is caused by a positive potential at the precordial electrode, since the underlying myocardium is invaded from within outward but if the inverse polarity is used, the deflection is made downward. It seems to me confusing and unwise to choose a downward deflection to indicate a positive potential. To do so violates a long established convention by which positive quantities are always represented by ordinates above the horizontal axis.

The normal polarity moreover gives records that are consistent with the records made by limb leads in particular by lead 2. The erect R of lead 2 means that the left leg electrode is positive during the early phase of the spread of ventricular excitation. Now the left leg potential is influenced chiefly by the state of the surface of the apical half of the heart and an electrode on the precordium over the apex is affected in the same sense. It is therefore consistent that the deflection representing the initial potential on the precordium should be in the same direction as the deflection representing the initial left leg potential that is that it should be upward.

FREDERICK H HOWARD, M.D New York.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country March 14. Oral examination for Group A and B applicants will be held in Kansas City Mo. May 11-12. Applications for written examination should be filed with the secretary before Jan. 15. Sec., Dr. C. Guy Lane, 416 Marlboro St. Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada, Dec. 7. Sec. Dr. Paul Titus, 1015 Highland Bldg. Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY Kansas City Mo. May 11. Asst. Sec., Dr. Thomas D. Allen, 122 S. Michigan Ave. Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St. Louis Jan. 11. Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave. Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY Kansas City, Mo. May 9. Sec. Dr. W. P. Wherry, 1500 Medical Arts Bldg. Omaha.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY New York, Dec. 30. Sec. Dr. Walter Freeman, 1726 Eye St. N. W. Washington D. C.

ARIZONA Basic Science Tucson Dec. 17. Sec. Dr. Robert L. Nugent, Science Hall University of Arizona, Tucson.

CALIFORNIA Reciprocity Los Angeles Dec. 4. Sec. Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO Denver, Jan. 7. Sec. Dr. Harvey W. Snyder, 422 State Office Bldg. Denver.

KANSAS Topeka Dec. 10-11. Sec. Board of Medical Registration and Examination Dr. C. H. Ewing, 609 Broadway. Larned.

KENTUCKY Louisville, Dec. 3. Sec. Department of Health Dr. A. T. McCormack, 532 W. Main St. Louisville.

MARYLAND Medical (Regular) Baltimore, Dec. 10-13. Sec. Dr. John T. O'Mara, 1211 Cathedral St. Baltimore. *Medical (Homeopathic)* Baltimore Dec. 10-11. Sec. Dr. John A. Evans, 612 W. 40th St. Baltimore.

MINNESOTA Basic Science Minneapolis Jan. 7-8. Sec. Dr. J. C. McKinley, 126 Millard Hall University of Minnesota, Minneapolis.

NEBRASKA Basic Science Omaha Jan. 7-8. Dir. Bureau of Examining Boards Mrs. Clark Perkins, State House, Lincoln.

NORTH CAROLINA Endorsement Raleigh Dec. 9. Sec. Dr. Ben J. Lawrence, 503 Professional Bldg. Raleigh.

NORTH DAKOTA Grand Forks Jan. 7-10. Sec. Dr. G. M. William, 34 S. 3d St. Grand Forks.

OHIO Columbus Dec. 3-5. Sec. State Medical Board Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA Oklahoma City Dec. 11. Sec. Dr. James D. Osborn Jr., Frederick.

RHODE ISLAND Providence Jan. 2-3. Dir. Department of Public Health Dr. Edward A. McLaughlin, 319 State Office Bldg., Providence.

TENNESSEE Memphis Dec. 18-19. Sec. Dr. H. W. Qualls, 130 Madison Ave. Memphis.

UTAH Salt Lake City Dec. 10-12. Dir. Department of Registration Mr. S. W. Golding, 326 State Capitol Bldg. Salt Lake City.

VIRGINIA Richmond, Dec. 11-13. Sec. Dr. J. W. Preston, 28 1/2 Franklin Rd. Roanoke.

WASHINGTON Basic Science Seattle Jan. 9-10. *Medical* Seattle, Jan. 13-15. Dir. Department of Licenses Mr. Harry C. Huse, Olympia.

WISCONSIN Basic Science Milwaukee Dec. 21. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave. Milwaukee. *Medical* Madison Jan. 7-10. Sec., Dr. Robert E. Flynn, 410 Main St., LaCrosse.

Illinois June Examination

Mr. Homer J. Byrd, superintendent of registration, Illinois Department of Registration and Education, reports the written and practical examination held at Chicago, June 25-29, 1935. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Two hundred and sixty-one candidates were examined, 259 of whom passed and 2 failed. The following schools were represented:

| School | PASSED | Year Grad | Per Cent |
|--|----------------|-----------|----------|
| George Washington University School of Medicine | (1934) | 88 | |
| Chicago Medical School | (1932) | 84 | |
| (1934) 80, (1935) 77, 77, 78, 79, 79, 79, 79, 80, 80 | | | |
| 80, 80, 81, 81, 81, 81, 81, 81, 81, 82, 83, 83, 83, 83 | | | |
| 83, 84, 84, 84, 84, 84, 84, 84, 85, 85, 86, 87 | | | |
| Loyola University School of Medicine | (1934) | 84 | |
| 86, (1935) 77, 79, 79, 79, 80, 80, 80, 80, 81, 81, 81 | | | |
| 81, 82, 83, 83, 83, 83, 84, 84, 84, 84, 84, 85, 85, 85 | | | |
| 85, 85, 85, 86, 86, 86, 87, 87 | | | |
| Northwestern University Medical School | (1933) | 87* | |
| 89, (1934) 85, 86, 88, (1935) 76, 80, 81, 81, 82, 82 | | | |
| 82, 82, 82, 84, 84, 84, 85, 85, 85, 86, 86, 86, 86, 86 | | | |
| 87, 87, 87, 87, 87, 88, 88, 88, 88, 88, 88, 88, 88 | | | |
| 88, 88, 88, 89, 89, 90, 90 | | | |
| Rush Medical College | (1934) | 87 | |
| 88, 90, (1935) 80, 80, 83, 83, 84, 84, 84, 85 | | | |
| 85, 85, 85, 85, 85, 86, 86, 86, 86, 86, 87, 87, 87, 87 | | | |
| 88, 88, 88, 89, 90, 91 | | | |
| School of Medicine of the Division of the Biological Sciences (1935) | 83, 84, 87, 88 | | |
| University of Illinois College of Medicine | (1934) | 85, | |
| 86, (1935) 75, 78, 79, 79, 80, 80, 81, 81, 81, 81 | | | |
| 81, 82, 82, 82, 82, 82, 83, 83, 83, 83, 83, 83, 83 | | | |
| 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84 | | | |
| 84, 84, 84, 85, 85, 85, 85, 85, 85, 85, 85, 85, 85 | | | |
| 85, 86, 86, 86, 86, 86, 86, 86, 86, 86, 87, 87, 87 | | | |
| 87, 87, 87, 87, 87, 87, 87, 87, 87, 87, 87, 87, 87 | | | |
| 89, 89, 89, 89, 90, 90, 90, 92 | | | |
| University of Maryland School of Medicine and College of Physicians and Surgeons | (1934) | 87 | |
| University of Minnesota Medical School | (1935) | 86 | |

| | | | |
|---|------------------------------------|-----------|-----|
| St. Louis University School of Medicine | (1934) | 83 | |
| Washington University School of Medicine | (1934) | 83 | |
| Creighton University School of Medicine | (1934) | 84 | |
| University of Nebraska College of Medicine | (1934) | 83 | |
| Medical College of the State of South Carolina | (1932) | 88 | |
| Marquette University School of Medicine | (1935) 84, 84, 86 | 86 | |
| University of Wisconsin Medical School | (1930) | 86 | |
| University of Toronto Faculty of Medicine | (1931) | 86* | |
| Friedrich Wilhelms Universität Medizinische Fakultät Berlin | (1912) 84†, (1923) 81†, (1926) 88† | (1928) | 82† |
| Hamburgische Universität Medizinische Fakultät Hamburg | (1922) 83 | (1933) | 85† |
| Universität Heidelberg Medizinische Fakultät | (1925) | 83† | |
| School | FAILED | Year Grad | |
| Chicago Medical School | | (1935) 2) | |

Thirty-five physicians were successful in the practical examination for reciprocity and endorsement applicants. The following schools were represented:

| School | PASSED | Year Grad | Reciprocity with |
|--|----------------------------------|------------|------------------|
| University of Arkansas School of Medicine | (1934) | Arkansas | |
| University of Colorado School of Medicine | (1930) | Colorado | |
| Northwestern University Medical School | (1930) | Minnesota | |
| University of Illinois College of Medicine | (1932) | Georgia | |
| Indiana Medical College | (1905) | Indiana | |
| Indiana University School of Medicine | (1926) (1931) | Indiana | |
| State University of Iowa College of Medicine | (1929) | Iowa | |
| University of Louisville School of Medicine | (1934) 2) | Kentucky | |
| Harvard University Medical School | (1932) | Missouri | |
| University of Michigan Medical School | (1931), (1933)* | Michigan | |
| St. Louis University School of Medicine | (1931)* (1932) (1933)* (1934) 2) | Missouri | |
| Washington University School of Medicine | (1932) | (1934) 2) | Missouri |
| Creighton University School of Medicine | (1934)* | (1934)* | Nebraska |
| University of Nebraska College of Medicine | (1927) | Nebraska | |
| Eclectic Medical College Cincinnati | (1929) | Ohio | |
| University of Cincinnati College of Medicine | (1931) | Minnesota, | |
| (1934) Ohio | | | |
| University of Tennessee College of Medicine | (1934) | Tennessee | |
| Vanderbilt University School of Medicine | (1932) | Tennessee | |
| Baylor University College of Medicine | (1934) | Texas | |
| Milwaukee Medical College | (1908) | Wisconsin | |

| School | PASSED | Year Grad | Endorsement of |
|--|---------|------------------|----------------|
| Loyola University School of Medicine | (1935)* | (1935) 2) | N B M Ex |
| Northwestern University Medical School | | (1934) N B M Ex. | |

* License held for fee.

† Verification of graduation in process.

Oklahoma June Examination

Dr. James D. Osborn Jr., secretary, Oklahoma State Board of Medical Examiners, reports the written examination held in Oklahoma City, June 5-6, 1935. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. Fifty-two candidates were examined, all of whom passed. Four physicians were licensed by reciprocity. The following schools were represented:

| School | PASSED | Year Grad | Per Cent |
|---|-------------------------|-----------|------------------|
| Tulane University of Louisiana School of Medicine | (1935) | 89* | |
| University of Oklahoma School of Medicine | (1935) | 82* | |
| 84, 84, 84, 84, 85, 85, 85, 85, 85, 85, 86* | | | |
| 86, 86, 86, 86, 87, 87, 87, 87, 87, 87, 87* | | | |
| 87, 87, 87, 87, 88, 88, 88, 88, 89, 89, 89* | | | |
| 89, 89, 89, 89, 89, 90, 90, 90, 90, 90, 91, 92* | | | |
| 92, 92, 94, 95, 95, 98* | | | |
| School | LICENSED BY RECIPROCITY | Year Grad | Reciprocity with |
| University of Arkansas School of Medicine | (1932) | (1934) | Arkansas |
| Washington University School of Medicine | | (1929) | Missouri |
| University of Pittsburgh School of Medicine | | (1910) | Penn. |

* License withheld pending completion of internship.

Montana October Examination

Dr. S. A. Cooney, secretary, Montana State Board of Medical Examiners, reports the written examination held in Helena, Oct. 1-2, 1935. The examination covered 10 subjects and included 50 questions. An average of 75 per cent was required to pass. Four candidates were examined, all of whom passed. Seven physicians were licensed by reciprocity and two physicians were licensed by endorsement after an oral examination. The following schools were represented:

| School | PASSED | Year Grad | Per Cent |
|---|-------------------------|-----------|------------------|
| George Washington University School of Medicine | (1932) | 87.1 | |
| Northwestern University Medical School | (1935) | 83.7 | |
| Tulane University of Louisiana School of Medicine | (1935) | 85.1 | |
| Washington University School of Medicine | (1934) | 82.6 | |
| School | LICENSED BY RECIPROCITY | Year Grad | Reciprocity with |
| Rush Medical College | | (1932) | California |
| Kansas Medical College | | (1904) | Kansas |

University of Michigan Medical School
University of Minnesota Medical School
St. Louis University School of Medicine
Creighton University School of Medicine

(1931) Michigan
(1930), (1935) Minnesota
(1933) Missouri
(1934) Nebraska

School LICENSED BY ENDORSEMENT
Northwestern University Medical School
University of Oregon Medical School

Year Endorsement
Grad of
(1933) N B M Ex
(1934) N B M Ex

Book Notices

The Pneumonokonioses (Silicosis) Literature and Laws of 1934
International Abstracts Extracts and Reviews of the Pneumonokonioses
and Their Associated Diseases and Subjects By George G Davis M.D.
Associate Clinical Professor of Surgery Rush Medical College University
of Chicago Ella M Salmonsens Medical Reference Librarian the John
Cramer Library Chicago and Joseph L Earlywine Attorney at Law
Chicago Cloth Price \$10 Pp 490 Chicago Chicago Medical
Press 1935

In 1934 the authors, using a similar title, presented through citations essentially all the bibliography of dusty lung diseases, beginning with 1556 and ending with 1933. That volume included the laws of the various states with reference to dusty disorders of the lung. In it the forecast was made that it constituted the first volume of a series. The present publication is the second volume of this series. Its chief contents are limited to publications on dusty lung diseases and closely related subjects solely for the year 1934. The principal difference in the two volumes resides in the fact that in the present publication abstracts, extracts or reviews are furnished—at times in great length—so that from this one publication it is possible to grasp the trend of thought of workers throughout the world with respect to the many onerous problems associated with dusty lung diseases—their causes, diagnosis, prognosis, significance and compensation. All the references in this volume have been translated into English. On first examination of this book it appears from alphabetical arrangements that the material is poorly organized. However, through the use of secondary indexes it readily becomes possible to bring together quickly all the scattered publications, such as those on "asbestos," "dust counts" or "fibrosis." Part II of the present volume, entitled "Laws—States and Cases," constitutes a supplement to the original publication, and without association with the original publication is by no means complete. This portion of this book is limited to sixteen pages and embraces only a small amount of legal material specifically associated with dusty lung diseases. As to this dearth of material no complaint can be made against the authors, and obviously it is the result of limited legislative action in this domain and of few basic decisions of the supreme courts of the several states. This book is by no means to be regarded as a textbook of dusty lung diseases. It is, as its title implies, a compilation of the extensive literature (396 items) published in the year 1934. For industrial hygienists, industrial physicians, and attorneys engaged in medicolegal practice, it will prove to be of much practical worth. Its greatest worth will fall to those users who have available the preceding volume containing the fundamental publications on this topic and the details of such laws as have a bearing on this type of occupational disease.

Radiological Atlas of Chronic Rheumatic Arthritis (The Hand) By
S Gilbert Scott M.R.C.S. L.R.C.P. D.M.R. and E. Honorary Radiologist
to the British Red Cross Clinic for Rheumatic Diseases Regent's Park
Cloth Price \$8.75 Pp 76 with 42 illustrations New York &
London Oxford University Press 1935

This atlas describes in detail the characteristic changes encountered in the hand in each of the four groups of rheumatoid hypertrophic, chronic infective and gouty arthritis. The author chose the hand because he agrees with Schober, who said "the hand is the visiting card of the rheumatic patient." The radiologic examination should play an important part in the diagnosis and classification of arthritis. In a certain number of cases it is possible to form a fairly accurate idea as to the prognosis. The examination of a large number of standardized roentgenograms of the hand at all ages leads one to conclude that "a man is as old as his bones" rather than "as old as his arteries."

Roentgenology portrays pathologic changes on the films in terms of shadows, and it is on the correct interpretation of these shadows that the ultimate value of the examination depends, while the experience gained by investigating a large amount of roentgenologic material is essential for attaining the maximum degree of diagnostic skill. The most frequent mistake is to diagnose symptoms that are being caused by malignant disease (usually secondary carcinoma of the vertebrae or bones of the pelvis) as lumbago or sciatica. The next mistake is to take in order of frequency is the diagnosis of Paget's disease or osteitis deformans. If the possibility of error in diagnosis is to be reduced to the minimum, every patient complaining of persistent rheumatic pains should be subjected to a careful roentgen examination.

Decalcification of the skeleton is peculiar to rheumatoid arthritis. Loss of cartilage with the formation of osteophytes is associated with the osteoarthritic group. Loss of cartilage with early sclerosis of those bones entering into the formation of the joint, usually of a single finger, denotes a chronic infective arthritis, while the "punched out" areas seen on the edge of the articular surfaces indicates the presence of deposits, which are characteristic of gouty arthritis. It is possible to have a mixed arthritis present in the same patient. In fact, the three types of arthritis might be represented in a single roentgenogram of one hand.

The degree of activity of the arthritis can be estimated in several of the groups from the roentgen examination. For example, the more transparent the bones in rheumatoid arthritis, the more active is the disease. Loss of cartilage in a single finger joint without sclerosis of the bone around denotes an active infective arthritis, and this evidence of activity or quiescence of the condition can be used to estimate the effect of any particular method of treatment. The general decalcification associated with rheumatoid arthritis takes place without any alteration in bone structure and suggests the possibility of a metabolic origin of rheumatoid arthritis.

The author discusses the term "bone density balance." A definite study of the more intimate structure, for instance, of the third metacarpal bone, will demonstrate the presence of three grades of density. The density of bone and any deviation from the normal cannot be accurately assessed unless certain technical details are observed having for their object the production of roentgenograms identical in quality. A roentgenogram of the bone is essential for the study of chronic rheumatic arthritis, not only for comparative purposes but as being the only reliable means of detecting the early decalcification of bone associated with rheumatoid arthritis.

In rheumatoid arthritis the principal clinical feature, atrophy of the soft tissues, is registered roentgenographically in the bones not as a true atrophy but as a general decalcification. Decalcification of bone may occur a considerable time before the onset of joint symptoms and arthritic changes show themselves only when the cartilage has become involved in the general atrophy of tissue. The author believes that no case should be diagnosed or classified as rheumatoid arthritis unless a generalized decalcification of bone is present.

In rheumatoid arthritis the stages as indicated roentgenographically are: First stage, decalcification of bone. Second stage, loss of cartilage in several of the minor joints, increase of decalcification. Third stage, erosion of articular surfaces, subluxation, increase in decalcification. The disease may become quiescent at any time. This will be denoted by a return of bone calcium and an increase in bone density.

In hypertrophic arthritis the stages as indicated roentgenographically are: First stage, loss of cartilage, usually to one side of the terminal joint of a finger, slight lateral displacement. Second stage, complete loss of cartilage with the formation of osteophytes, Heberden's nodes, or the deposit of periarticular ossicles in close proximity of a joint. Third stage, irregularity of the joint surfaces, excessive osteophytic formation.

In chronic infective arthritis the stages as indicated roentgenographically are: First stage, loss of cartilage in a single joint, wrist or metatarsophalangeal joints of ring or middle finger usually involved. Second stage, sclerosis of bone in the immediate neighborhood. Third stage, bony ankylosis, subluxation.

In gouty arthritis the characteristic roentgenographic feature is the presence of deposits, which are recorded on the film as small "punched out" areas on the surface of the articular bone, immediately under the cartilage, or show as definite holes in the articular end of the bone. Critical examination of a roentgenogram of gouty arthritis may show even an earlier stage, indeed the first, which is often overlooked. This consists of a small local destruction or a "wiping out" of bone trabeculae in the immediate neighborhood of a joint and precedes the actual formation of the deposit. The changes may require the use of a lens for their detection.

In gouty arthritis the stages as indicated roentgenographically are: First stage, minute localized destruction or disappearance of bone trabeculae in the immediate neighborhood of a joint. Second stage, small "punched out" areas on the surface of the articular bone, or holes in the articular end of the bone, loss of cartilage may be present. Third stage, loss of cartilage in those joints in which deposits are demonstrated. Fourth stage, destruction of the articular ends of bones from excessive gouty deposits. In gouty arthritis there is no alteration in bone density, however advanced the disease may be.

This is an interesting and instructive contribution. The author has commendably crystallized much material. A word of praise is also due the publishers. It is to be regretted that so fine a book should have the limited sale imposed on it by the price.

Baptism of the Infant and the Fetus. An Outline for the Use of Doctors and Nurses. By the Reverend J. R. Bowen, Chaplain St. Joseph Mercy Hospital, Dubuque, Iowa. Paper. Price 25 cents. Pp. 11. Dubuque: M. J. Knippel Company, 1935.

This brief outline prescribes methods of baptizing Catholic babies. It is directed to Catholic and non-Catholic physicians and nurses officiating at deliveries with the view of bringing "the privileges of Baptism to the little ones, and affording inestimable consolation to the parents," particularly when viability of the new born is in question. This urgency is discussed under such special headings as conditional baptism, the premature fetus, difficult delivery, baptism in the uterus, when a pregnant mother is dying, when a mother dies in pregnancy, the baptism of monsters, and disposal of the dead fetus. Due respect is paid to medical and moral considerations illustrated in the conditions for performing a cesarean section after the death of the pregnant mother. It is made perfectly plain that "a dying mother is in no condition to ponder such an obligation" as permitting a section. Furthermore, section is not permitted when it "does not offer a chance of saving the mother's life but, on the contrary, will directly contribute to her death." The material is clear and brief, and the suggestions should prove no burden to conscientious physicians and nurses of any creed. The pamphlet lends itself to ready reference and should be available in all maternity departments. It is published under official Catholic auspices.

Nouveau traité de médecine. Publié sous la direction de G. H. Roger Fernand Vidal et P. J. Teissier. Fascicule XX. Pathologie du système nerveux (bulbe, nerfs crâniens, méninges, moelle). Half cloth. Price 130 francs. Pp. 984 with 193 illustrations. Paris: Masson & Cie, 1935.

For years those who have the other volumes of this series dealing with the nervous system have been awaiting the publication of the present one. It is five years since the last of the other volumes dealing with the nervous system in this series was published and ten since the first. The subjects already covered are the cerebrum and cerebellum, the sympathetic nervous system and the neuroses, and there is a volume on the general symptomatology of the nervous system. The present volume treats of the pathology of the brain stem, the cord, the cranial nerves and the meninges. The treatment is orderly and follows a conventional pattern, each brain stem subdivision being taken up by a different author, Lari and Thiers contribute most of the articles dealing with the pathology of the spinal cord. The authors of all the sections are well recognized in their respective fields in French neurology. When one goes over each of the topics it is amazing to note the thoroughness with which the subject is discussed, being detailed without waste of words. For the most part the anat-

omy and physiology are given in sufficient detail to permit understanding of the pathology, and in a number of places there is even a historical discussion of the development of knowledge concerning the type of disorder studied. The book is fairly well illustrated with pictures of patients, reproductions of x-ray plates, and microscopic sections. It should serve as a good reference book for persons deeply interested in neurology who do not have the courage or the knowledge of German to consult Lewandowsky, and it must not be forgotten that the present French reference book is more nearly down to date than that famous one in German. Since the various parts are discussed by different authors the style varies, but on the whole it is fairly easy French reading.

Kleine Chirurgie. Von Professor Dr. Hans Kurtzahn. Third edition. Paper. Price 12 marks. Pp. 456 with 170 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1935.

This manual of minor surgery is intended primarily for the use of medical students, for which purpose it is admirably adapted. It reflects the manner in which the author has anticipated the need of students well established and easily performed procedures are given preference to those still in the experimental stage. The organization of the material resembles that of most textbooks of similar character. The book is extensively illustrated and has an adequate index. The tannic acid treatment of burns is not mentioned. Ethyl chloride, not popular in this country for general anesthesia, is recommended for this purpose. An alcoholic solution of tannic acid for preparation of the operative field does not have many sponsors here. Such remarks are not intended to diminish the merits of the book, they only illustrate the confusion created in the mind of an inexperienced American student who finds in foreign books statements not conforming with instructions received in our schools. While the manual summarizes in a practical manner the principles of minor surgery for a medical student, it is too concise, primitive and superficial to be of great service to a general practitioner.

1000 Questions and Answers on T. B. Edited by Fred H. Helse, M.D. Medical Director, Trudeau Sanatorium. Cloth. Pp. 232. New York: National Tuberculosis Association, 1935.

Undertaking to answer a thousand questions about tuberculosis is a momentous task. It would scarcely be expected that such a book of questions and answers would meet with universal approval among physicians dealing extensively with tuberculosis. Difficulties inherent in the question and answer technique are in many instances almost insurmountable. The questions have been assembled from a question and answer department of the *Journal of the Outdoor Life* and here published. Even physicians who do not wholly agree with all the answers will nevertheless find that the book should be helpful and encouraging to the tuberculous patient who has practically never been able to ask his doctor all the questions he would like to. The questions are grouped under sixteen different headings and a satisfactory index affords a quick reference to the particular phase of tuberculosis discussed.

Leistung und Grenzen des Röntgenverfahrens bei der Erkennung tuberkulöser Lungenveränderungen. Von Priv.-Doz. Dr. Walter Schmidt, Direktor u. leit. Arzt des Tuberkulosekrankenhauses Heidelberg-Rohrbach. Eine vergleichende röntgenologische klinische und anatomische Betrachtung unter Mitwirkung von Priv.-Doz. Dr. H. Wurm, Prosektor am pathol. Inst. Heidelberg. Nr. 57. Tuberkulose Bibliothek. Beihefte zur Zeitschrift für Tuberkulose. Herausgegeben von Dr. Franz Redeker, Oberregierungs- und Medizinalrat, Berlin, und Dr. Karl Diehl, dirigierender Arzt, Sommerfeld. Boards. Price 10 marks. Pp. 80 with 104 illustrations. Leipzig: Johann Ambrosius Barth, 1935.

This treatise is the fifty-seventh of a series of monographs issued as supplements to the *Zeitschrift für Tuberkulose* and is devoted to a consideration of the value and limitations of roentgenology in the diagnosis of pulmonary tuberculosis as revealed not only by serial x-ray studies but also by correlating the shadows noted on chest films with the pathologic changes disclosed by frontal sections of the lungs. The twenty-six pages of text included in the monograph present excellent discussions dealing with the roentgenologic identification of calcified and noncalcified old (primary?) foci of disease, the early nodule and the early infiltration of pulmonary tuberculosis of the adult type, the possibility of roentgenographically identi-

fying the pathologic condition present, the prognosis, extent and course of the disease, the technic of roentgen examinations and other pertinent topics of importance. The illustrations have been selected with great care and show all desired details distinctly. This splendid, concise and scholarly treatise reflects comprehensive scientific knowledge and extensive clinical experience on the part of the authors and merits the attention of roentgenologists, physicians, investigators and others interested in tuberculosis.

The Anatomy of the Nervous System from the Standpoint of Development and Function. By Stephen Walter Ranson, M.D. Ph.D. Professor of Neurology and Director of the Neurological Institute Northwestern University Medical School Chicago. Fifth edition. Cloth. Price, \$6.50. Pp 501 with 381 illustrations. Philadelphia & London W B Saunders Company 1935.

The fifth edition of this standard textbook differs from the fourth notably by the addition of forty illustrations of brain sections, chiefly from Jacobsohn and Jørgensen, so that the atlas at the end of the text now comprises Weigert sections of twenty transverse levels of the brain stem, five oblique sections through the region of transition between the midbrain and the thalamus, three horizontal sections of the internal capsule, and twelve frontal sections of the cerebral hemisphere. These, with accompanying descriptions, give the elementary student the necessary landmarks for orientation in the study of his laboratory material. The text has been revised without enlargement, with a judicious selection of references to recent research. Limitations of space are doubtless responsible for the omission of much new detail, especially in the cerebral hemispheres, to which one would expect reference. It is unfortunate that in this revision figure 7 (the Kollmann 24 mm human embryo, figure 13 of the fourth edition) is not replaced by a more accurate picture free from the artefacts of that specimen. On the whole the treatment is well balanced, and this work maintains its place as the most generally useful textbook of neuro-anatomy in the English language for medical students.

Laboratory Manual of the Department of Bacteriology and Immunology Peiping Union Medical College. Prepared under the direction of C E Lim Head of Department. Second edition. Cloth. Price \$1.50. Pp 100 with 2 illustrations. Peiping The College 1935.

This manual was designed for service as a practical guide to those diagnostic and analytic laboratory methods in clinical bacteriology and serology which the author has found to be best adapted to the teaching, research and clinical needs of his department. It is free from the objectionable restrictions and divisions that limit the utility, for advanced workers, of manuals written solely for student courses. The material covered is so treated that it is especially useful to those interested in clinical laboratory procedures. Although it lacks illustrations and is too brief for much research use above that for which it was intended, this manual contains useful information not usually found except in comprehensive volumes. The section on laboratory animals is well written and useful, since this subject is usually neglected elsewhere. A table of temperatures, pulse and respiration rates and Scarborough's hematologic chart for normal laboratory animals are included. Procedures are simplified, although frequently more highly modified than necessary for American use. The volume is well outlined and information is easily accessible. References are numerous, a section on classified references is included. A chapter is reserved for the examination of pathogenic fungi.

The Achievement of Happiness. By Boris Sokoloff M.D. Sc.D. Cloth. Price \$2.25. Pp 271. New York Simon & Schuster 1935.

The evaluation of this book is rather difficult because of its unusual nature. Intended as a book of inspiration, it tries to carry out its purpose by means of short lectures consisting of illustrative yarns from the author's experience and also some which he retells at second hand. How much inspiration a depressed psychotic or maladjusted individual can obtain from a literary source is questionable, but, placed in the hands of an occasional chronic complainer, the present work might serve some purpose. The medical information in it is scattered, from various sources, and scanty. The medical topics are chiefly endocrinology, fatigue and sexual adjustment. The author's primary interest, according to the publishers' note, is biochemistry. He does not mention enough of this in the book to

indicate his soundness or unsoundness in this field—he is obviously no psychiatrist. The book need not be wholly condemned for, as a short unsystematized, well written autobiographical scrap-book, it makes interesting reading. The author has apparently had many unusual experiences.

Trattato di micopatologia umana. Diretto dal Prof. Gino Pollacci direttore del r. Laboratorio crittogamico Italiano Pavia. Volume IV. Repertorio sistematico dei miceti dell'uomo e degli animali. Dal Prof. Arturo Nannizzi libero docente di micologia nella r. Università di Siena. Paper. Price 100 lire. Pp 537 with 224 illustrations. Siena S. A. Poligrafica Meini 1934.

In this abundantly illustrated catalogue the diagnosis of each species is given in telegraphic style, making it unnecessary to wade through the Italian verbiage. In addition, a short paragraph indicates the habitat of the fungus and the type of disease produced. Considering the completeness of the catalogue, Nannizzi has done well to keep such an enormous mass of information within the scope of the 557 pages. The subject matter is down to date and in view of its completeness fills a long needed want for a place to go when examining the various fungous species once the mycologist has gotten as far as the generic diagnosis. For English speaking workers the fact that the text is in Italian may be a disadvantage, however, the general sense of the message may be rather readily obtained by the mycologist by piecing together his knowledge of Latin with already established technical terms in mycology. The most serious criticism is the lack of references, but perhaps these indefatigable workers at Pavia and Siena have plans whereby this can be taken care of. This criticism, however, is insignificant in the face of the numerous other valuable features of the catalogue.

The Evaluation of Symptoms Offered After Fifty Years in Medicine. By Oliver T. Osborne M.A. M.D. F.A.C.P. Cloth. Price \$3.50. Pp 163. New Haven Connecticut Yale University Press for the Author 1935.

This is a small book but it contains a tremendous amount of information. No one but a man of great experience could have attempted to gather together symptoms in the manner in which Dr. Osborne has done. One might anticipate that such a condensed array might be uninteresting reading, but this is not the case. This book certainly presents to the practitioner the importance of the symptomatology of disease. "It is the treatment of symptoms that gives success to many physicians who do not even attempt to make a diagnosis." Dr. Osborne, of course, believes in making a diagnosis but wisely places an analysis of symptoms in the first order of importance. The book should be a valuable addition to the library of physicians as well as fourth year medical students.

Puerperal Gynecology. By J. L. Buhl M.D. F.A.C.S. Consultant in Obstetrics Gynecologist Mt. Sinai Hospital Cleveland Ohio. Cloth. Price \$3.50. Pp 199 with 81 illustrations. Baltimore William Wood & Company 1935.

This book provides one with a collection of material that has never before been available in a single volume. The author considers the subject from the onset of pregnancy to the end of the puerperal period stressing in particular antepartum prophylaxis of the more common and sometimes serious results of negligence or careless handling of the patient during the antepartum and delivery periods. The chapter dealing with the pathology of the cervix is well done and should be of great value to the general practitioner doing obstetric work. Although one may not entirely agree with the author as to the feasibility of doing major plastic repair work on the female genital tract immediately following delivery, one can be safely guided by the criteria laid down in the text for the choice of case in which such treatment may be attempted. This book has a definite place in the obstetric field because of the lack of such material calling to the attention of the profession the need for proper surgical care during the early puerperal period.

The Sinister Shepherd. A Translation of Girolamo Fracastoro's Syphilidis sive de morbo gallico libri tres. By William Van Wyck. Cloth. Price \$4.50. Pp 85 with illustrations. Los Angeles Primavera Press 1934.

Here is another translation of the famous discussion of syphilis by Fracastoro. It is handsomely printed and illustrated with reproductions from early editions of this notable work.

Medicolegal

Workmen's Compensation Acts Pneumothorax Not Attributable to Strain.—The claimant, in the course of his work, was on his knees, in a "twisted" position, in a small space, trying to lift one end of a heavy desk. As he made the effort he felt a sharp pain in the left side of his chest, as if something "gave way." The incident was immediately reported to his superior and he was relieved of the task in which he was engaged. Apparently no further symptoms developed for about twenty-four hours and then, while stooping over and cleaning a wash basin, the claimant felt a very sharp pain, so acute that he could not straighten up. He continued to suffer and after about four days was sent to a hospital. After his discharge he instituted proceedings under the workmen's compensation act. The industrial accident commission denied his claim for compensation, and he petitioned the district court of appeal, second district, division 2, California, for a writ of review. That court was of opinion that the claimant was entitled to compensation and therefore annulled the order of the industrial accident commission and remanded the case to the commission for action in accordance with the court's opinion. *Quigley v Industrial Accident Commission*, 35 P (2d) 544. The commission again denied compensation, and the claimant appealed to the Supreme Court of California.

In the words of the Supreme Court, the claimant sustained "a spontaneous hemopneumothorax, that is, a complete collapse of the left lung." The only disputed question, said the court, is whether the collapse of the lung resulted from a preexisting pathologic condition not connected with the employment or from the strain of lifting the desk. Only under the latter condition would the injury be compensable.

The insurance carrier, in opposing the employee's claim for compensation, produced as a witness a specialist in lung diseases who had personally observed probably 225 cases of pneumothorax. In his opinion, he testified, there is always a pathologic condition preceding a spontaneous pneumothorax, whether that condition is demonstrable or not. He had never known spontaneous pneumothorax to develop in a patient whose lungs were normal and healthy. Statistics show that 90 per cent of such cases are due to tuberculosis. Practically all cases of spontaneous pneumothorax develop from a ruptured tubercle on the outer surface of the lung, the rupture of a single tubercle being able to produce the condition without much infection being present. The fact that the claimant spit up blood while he was in the hospital was suggestive of "some pathology." Most cases of pneumothorax, according to the witness, occur while the patient is asleep or at rest. No case of pneumothorax, according to the witness, ever occurred from strain. It was impossible to say whether the condition occurred when the claimant was endeavoring to lift the desk but even if it did, witness believed that the strain of lifting did not cause it. Human lungs are constructed to withstand, without damage, far more pressure than it is possible for a person to build up by physical effort. A scientific conclusion could not be drawn that the effort that the claimant made to move the desk increased the air pressure to such an extent as to cause his pneumothorax. The witness testified that he made a physical examination of the claimant some months after the injury and had examined the roentgenograms taken when the claimant was first in the hospital and had examined also the reports of various physicians. He could not tell definitely, however, whether the claimant had had tuberculosis, although there were some indications that he did have it.

Other medical witnesses testified that they were unable to connect the claimant's pneumothorax with his muscular strain in undertaking to lift the desk, being inclined to connect it rather with an old or an active tuberculosis. One of them called attention to the twenty-four hour period elapsing after that effort and before the onset of disabling symptoms, for which intervening period he could find no adequate explanation if the pneumothorax came on at the time of the strain.

The evidence, said the Supreme Court, amply supports the action of the industrial accident commission in disallowing

compensation. Physicians testifying for the employee gave a logical explanation of the cause of the delay in the appearance of symptoms and testified that the strain caused a tear in the lung tissue that led to the collapse of the lung and that they could find no evidence of tuberculosis. This evidence was directly contrary to the evidence introduced on behalf of the insurance carrier. It was beyond the province of the appellate court, however, to weigh the evidence.

The action of the commission in disallowing compensation was affirmed.—*Quigley v Industrial Accident Commission (Calif.)*, 43 P (2d) 289.

Charitable Hospitals Liability for Negligence of Student Nurse.—One of the plaintiffs was a patient in the defendant hospital. While there she was severely burned by a hot water bottle, negligently left in a bed that a student nurse prepared for her reception immediately after an operation. The injured patient and her husband sued the hospital, and from a judgment in their favor the hospital appealed to the Supreme Court of Washington.

Under the established rule in the state of Washington the hospital, a charitable institution, was not liable for the negligent act of an employee unless it failed to exercise ordinary care in selecting and retaining her. The trial court however, instructed the jury that the negligence of the nurse in this case raised a presumption that the hospital had not exercised ordinary care in her selection and retention, thus applying to the situation the rule of *res ipsa loquitur*. In the opinion of the Supreme Court, this was error, the nurse's negligence did not necessarily raise any such presumption. It would not be reasonable or logical to attach to a single negligent act of an employee the presumption that her employer was negligent in her employment. To apply the rule of *res ipsa loquitur* in such cases would deprive charitable institutions of the benefit of the rule of exemption and in effect make them liable generally for the negligence of their employees. The Supreme Court reversed the judgment of the trial court and remanded the case for a new trial.—*Bise v St Luke's Hospital (Wash.)*, 43 P (2d) 4.

Diseases Constitutionality of Illinois Occupational Disease Act.—Section 1 of the Illinois occupational disease act, enacted in 1911, provides:

That every employer of labor in this State, engaged in carrying on any work or process which may produce any illness or disease peculiar to the work or process carried on or which subjects the employees to the danger of illness or disease incident to such work or process to which employees are not ordinarily exposed in other lines of employment shall, for the protection of all employees engaged in such work or process adopt and provide reasonable and approved devices means or methods for the prevention of such industrial or occupational diseases as are incident to such work or process.

The constitutionality of this section was contested in two cases here abstracted. In each case the Supreme Court of Illinois held the section to be unconstitutional.

It is a well recognized requirement, said the Supreme Court, that the terms of a penal statute creating a new offense must be sufficiently explicit to inform those who are subject to it what conduct on their part will render them liable to its penalties. *Connally v General Construction Co.*, 269 U S 385, 46 S Ct 126. The fact that the act has been construed and applied during a long period of time does not necessarily make it valid and render it immune from attack. Section 1 of the act under consideration imposes a duty on every employer to know not only whether he is engaged in the pursuit of any work or process which may produce a particular illness or disease but also whether such work or process may produce an illness or disease which is peculiar or special thereto. He must know whether the employment subjects his employees to the danger of illness or disease incident to such work or process to which employees are not ordinarily exposed in other lines of employment. He is required to possess accurate information not only as to the etiology of all occupational diseases to which his employees may be subject but also those to which the employees of other employers are subject. The mere statement of the proposition carries its own condemnation, said the court. The act furnishes no guide to an employer seeking to determine whether an illness or disease produced by his employment is one "to which employees are not ordinarily exposed

in other lines of employment" The meaning of the word "ordinarily" as used in this respect is especially ambiguous. It is obviously impossible for any person reading the language to discern with a reasonable degree of certainty to whom it applies or what illness or diseases fall within its general terms.

Furthermore, section 1 does not attempt to state what "devices" the legislative mind contemplated. To be valid the statute must prescribe a standard so definite, fixed and understandable as to permit a compliance therewith by one who desires to meet its requirements. The statute need not specify and particularize the exact norm, but it must lay down a guide that has a definite, fixed meaning. While the word "reasonable" has a fixed definite meaning at common law as applied to a standard of degree and diligence, the word as used in section 1 cannot be given that sense, as it is employed as a description of the "devices, means or methods" commanded to be furnished and adopted by the employer. "Approved," as used in section 1, is not more intelligible than the word "reasonable" as employed in that section. "Approved" has no definite, special, technical, trade or common law meaning or meaning by established precedents. By whom the approval mentioned is to be made is left open to conjecture. From a reading of section 1 the employer must decide whether his industry is included in the class thereby created and whether he must provide the "reasonable and approved devices, means or methods," and what they are, for the prevention of occupational diseases incident to the work of his undertaking. The employer must be able to forecast accurately the devices, means and methods required of him to avoid liability under the statute. It would be unjust to hold the employer liable in the exercise of his business knowledge for his failure to guess correctly as to his duty where the statute itself creates no criteria for his safe and sure guidance. A statute which requires the performance of an act in terms so indefinite, uncertain and puzzling that men of ordinary intelligence must necessarily guess at its meaning and differ as to its application transcends due process of law.—*Parks v Libbey-Owens-Ford Glass Co (Ill)*, 195 N E 616 *Boshuizen v Thompson & Taylor Co (Ill)*, 195 N E 625

Workmen's Compensation Acts Death from Thrombosis of Mesenteric Artery Following Infected Injury of Eye—Barto, the deceased employee, received compensation for the loss of the use of an eye, resulting from an infection of a wound of the eye in the course of his employment. The wound was infected May 27, and the resulting ulcer on the eye was pronounced healed July 16. About seven months after the latter date Barto died, after an abdominal operation three days earlier, but whether there had or had not been any symptoms of illness during that period, the record does not show. The operation disclosed multiple thrombi in the small branches of the mesenteric artery, involving about three feet of the small intestine. No point of origin of this infection was found in the abdomen. Barto's widow, attributing her husband's death to the injury to his eye, sought compensation under the workmen's compensation act. The industrial commission disallowed compensation, the circuit court set aside the order of the commission, and the employer appealed to the Illinois Supreme Court.

The medical experts agreed that death resulted from thrombosis of the mesenteric artery. They agreed also that the thrombosis was caused by an infection existing in some part of the body. No source of infection was found in the abdomen. There was evidence that the deceased employee had pyorrhea at the time of the injury to his eye. There was evidence also that a year before his death he had what seemed to be an infected gallbladder, for which operation was advised but refused by him. There was lay evidence to show that pus was occasionally discharged from the infected eye up to the time of the employee's death, and medical evidence to show that although the ulcer had healed infection might exist and be discharged into the blood stream. No witness testified definitely that the thrombosis resulted from the eye infection, the most any of them would say was that it could have resulted from that source.

The record is clear, said the Supreme Court, that where as in this case, there is more than one possible point of infection, medical experts cannot determine from which source infective

thrombosis arises. Lacking more definite proof of a causal relation between the eye infection and the thrombosis, the circuit court was not warranted in setting aside the order of the industrial commission disallowing compensation. The judgment of the circuit court was therefore reversed and the award set aside.—*Barto v Industrial Commission (Ill)*, 195 N E 454

Malpractice Liability for Death of Patient under Anesthetic—The mere fact that a patient dies under the influence of an anesthetic, said the superior court of Delaware, imposes no liability on a dentist who administers nitrous oxide gas to the patient preparatory to the extraction of a tooth. The doctrine of *res ipsa loquitur* does not apply in such a case. The plaintiff must either allege and prove a lack of requisite knowledge or skill on the part of the defendant or a failure on his part to exercise the proper degree of care and diligence, or, some negligence of the defendant being alleged, there should appear some state of facts connected with the instrumentality in the control of the defendant or with the treatment accorded to the plaintiff which brings about a result so inconsonant with the normal and usual result that it must presuppose negligence in the application of the treatment.—*Mitchell v Atkins (Del)*, 178 A 593

Indemnity Insurance Malpractice by Unlicensed Assistant—The Hartford Accident and Indemnity Company issued to Lee, a licensed osteopath, a malpractice indemnity policy which excluded from coverage injuries caused by Lee or his assistant while engaged in any unlawful act. A patient obtained a judgment against Lee and his assistant, Matson, in an action based on malpractice. Subsequently the patient instituted the present action against the insurance company to recover the amount of the judgment. The trial court held for the defendant, and the plaintiff appealed to the district court of appeal, second district, division 2, California.

Apparently, the unlicensed assistant, Matson, treated the plaintiff. Since the assistant, said the court, was without any license to heal the sick and afflicted in California, his act in the treatment of the plaintiff and the conduct of Lee in knowingly permitting such treatment made them both guilty of a violation of law and the performance of an unlawful act. The plaintiff's injuries were due to the lack of skill exercised by the assistant and were the result of the use by Lee of an unqualified and unlicensed assistant in violation of the provisions of the law. Such being the case, the loss was not covered by the insurance policy. The judgment of the trial court was therefore sustained.—*Glesby v Hartford Accident & Indemnity Co (Calif)* 44 P (2d) 365

Society Proceedings

COMING MEETINGS

- American Association for the Study of Neoplastic Diseases Baltimore Dec 19 21 Dr Eugene R Whitmore 2139 Wyoming Avenue NW Washington D C Secretary
- American Student Health Association New York Dec 27 28 Dr Harold S Diehl University of Minnesota Medical School Minneapolis, Secretary
- Eastern Section American Laryngological Rhinological and Otolological Society Newark N J Jan 3 Dr Henry B Orton 24 Commerce St Newark N J Chairman
- Middle Section American Laryngological, Rhinological and Otolological Society Milwaukee Jan 11 Dr William E Grove 324 East Wisconsin Avenue Milwaukee Chairman
- Mid Western Section American Laryngological Rhinological and Otolological Society, St Louis Jan 14 Dr Harry W Lyman Carleton Building St Louis Chairman
- National Society for the Prevention of Blindness New York Dec 5 7 Mr Lewis H Carris 50 West 50th Street New York Managing Director
- Puerto Rico Medical Association of Santurce Dec 13 15 Dr Euripides Silva Ave Fernandez Juncos Parada 19 Santurce Secretary
- Radiological Society of North America Detroit Dec 26 Dr Donald S Childs 607 Medical Arts Building Syracuse N Y Secretary
- Society of American Bacteriologists New York Dec 26 28 Dr I L Baldwin College of Agriculture University of Wisconsin Madison, Wis Secretary
- Society of Surgeons of New Jersey Jersey City Jan 15 Dr Walter B Mount, 21 Plymouth St. Montclair Secretary
- Southern Section American Laryngological Rhinological and Otolological Society Jackson Miss Jan 18 Dr Robin Harris Lamar Building Jackson Miss Chairman
- Southern Surgical Association Hot Springs Va Dec 10 12 Dr E W Altom Ochser 1430 Tulane Ave New Orleans Secretary
- Western Surgical Association Rochester Minn Dec 6-8 Dr Albert H Montgomery, 122 South Michigan Boulevard Chicago Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below

American J Digestive Diseases and Nutrition, Chicago

2: 449 510 (Oct) 1935

- Acute Pancreatitis Clinical and Pathologic Study, with Personal Observations A Le Sage and J R A Le Sage Montreal—p 449
Bacteriologic Observations in Disease of Biliary Tract Comparison of Operative Findings with Those of Nonsurgical Drainage of Biliary Tract in One Hundred and Four Cases E. C. Hanssen and A. Yurevich New York—p 460
Calculating Diagnostic Value of Gastric Analysis Study in Methodology of Diagnosis Frances R Vanzant and W C Alvarez Rochester, Minn—p 466
A Year's Exclusive Meat Diet and Seven Years Later C W Lieb New York—p 473
*Gastro-Intestinal Manifestations Accompanying Diseases in Upper Urinary Tract B S Abeshouse Baltimore—p 477

Gastro-Intestinal Symptoms in Diseases of Urinary Tract—According to Abeshouse, an accurate diagnosis of a lesion in the upper urinary tract must be based on a detailed history, careful physical examination, complete laboratory studies of urine and blood, and a thorough urologic study. Every pathologic condition in the kidney and ureter should be studied from the standpoint of its effect not only on the urinary tract but also on the body as a whole. Pathologic conditions in the upper urinary tract usually are accompanied by well recognized symptom complexes but occasionally are unaccompanied by any urinary symptoms. In many instances they produce symptoms referable to other organs or systems of organs outside the urinary tract, particularly the gastro-intestinal tract. The gastro-intestinal manifestations of diseases in the upper urinary tract may be classified as toxic, mechanical or reflex. The renodigestive reflexes concerned in the retroperitoneal syndrome are classified according to their effects on the various portions of the gastro-intestinal tract: the principal types are the renogastric and reno-intestinal reflexes. These reflexes may be motor secretory or vasomotor. They may be associated with one another or combined with cardiac respiratory or vasomotor reflexes, or occur simultaneously with other visceromotor reflexes. The point of origin of the renodigestive reflexes varies in the different clinical cases. The response to these stimuli varies in the same or in different patients. Factors influencing the response to these renodigestive reflexes are summation of primary irritative stimuli sensitization of nerve centers and individual predisposition. The gastro-intestinal manifestations of these renodigestive reflexes may be classified as gastroduodenal, biliary appendical colonic and peritoneal. Cases illustrating each type are presented by the author. A complete urologic examination is indicated in every obscure abdominal condition especially in patients who have been subjected to an abdominal operation without relief. Every urologist should familiarize himself with the symptomatology of pathologic conditions in the gastro-intestinal tract. Every surgeon should recognize the fact that lesions of the upper urinary tract may produce symptoms of a pathologic condition in the gastro-intestinal tract and vice versa. Pyelo ureterography retrograde or intravenous is of immeasurable value in the differential diagnosis of lesions within the upper urinary tract and in their differentiation from other pathologic conditions in the gastro-intestinal tract and in other organs adjacent to the kidneys and ureters. A flat roentgenogram of the genito urinary tract should be adopted as a routine diagnostic measure in every obscure abdominal condition especially in cases of so-called chronic appendicitis. A negative roentgenogram of the genito-urinary tract does not exclude a disease of the kidney or ureter. Pyeloureterographic studies should include horizontal and upright

positions in order to rule out a movable kidney. Stereoscopic pyelo-ureterograms are of great value in determining the exact location and size of any abdominal mass and its relation or effect on the upper urinary tract. The author urges the establishment of an adequate follow-up system to determine the incidence of cures and failures in the operative treatment of abdominal conditions in view of the high percentage of failures to obtain relief of abdominal pain as reported in statistical studies of large series of abdominal operations.

American Journal of Diseases of Children, Chicago

50 827 1094 (Oct) 1935

- Effect of Ketogenic Diet on Blood Sugar and Respiratory Quotient of Children F B Talbot and Velma Bates Boston—p 827
Rheumatic Cardiac Disease in Childhood Statistical Study L. M. Taran Brooklyn—p 840
Pathogenesis of Tuberculosis in Man Certain Governing Principles and the Causal Relationship Existing Between Primary and Reinfection Types of Disease C A Stewart Minneapolis—p 853
Ophthalmoscopic Appearance of Nerve Head in the New Born and in the Young Infant S Karelitz and P Vogel New York—p 872
*Use of Typhoid Vaccine in Treatment of Chorea Its Possible Dangers Rachel Ash and N Einhorn Philadelphia—p 879
Psychologic Interpretation of Persistence of So-Called Moro Reflex W Dennis, Charlottesville Va.—p 888
Respiratory Metabolism in Infancy and in Childhood XVI Effect of Intravenous Infusions of Fat on Energy Exchange of Infants H H Gordon and S Z Levine New York—p 894
Treatment of Gonorrheal Vulvovaginitis in Childhood with Ovarian Follicular Hormone Series of Cases in Which Treatment Was Unsuccessful J T Witherspoon New Orleans—p 913
*Use of Convalescent Blood in Whooping Cough Review of Literature W L Bradford Rochester N Y—p 918
Measurements of Size of Heart in Normal Children Statistical Study Marion G Joseph, New York—p 929
*Congenital Lymphangiectasia (Lymphedema) P B Mason and E V Allen Rochester Minn—p 945

Use of Typhoid Vaccine in Treatment of Chorea—Ash and Einhorn suggest that shock from the use of typhoid vaccine in the treatment of chorea may do harm in the presence of rheumatic carditis. Injections repeated at short intervals may also do harm by causing a continued lowering of the number of circulating leukocytes. Of their seventeen patients having chorea treated with intravenous injections of typhoid vaccine, in four patients with uncomplicated chorea and in one with chorea and rheumatic carditis there occurred a secondary rise of temperature from one to two weeks after the last injection of vaccine. In three patients treated in the presence of active carditis there was evidence of increasing severity of the existent carditis. One of the children died six weeks after the last injection of vaccine. In the other two patients eventual improvement occurred. The carditis might have taken a similarly unfavorable course under conservative treatment. In a disease with such great variability as rheumatism, it is difficult to draw conclusions on the basis of a few cases. The authors cannot help feeling however, that the use of intravenous injections of typhoid vaccine is not harmless in the presence of rheumatic infection. On the other hand a large proportion of patients with chorea do not present carditis. It is in these children without carditis that the use of typhoid vaccine seems justifiable. Perhaps it may prove to be a valuable procedure even in certain nonchoreic forms of nervousness in children. The sedimentation test is the best single laboratory guide to the presence of rheumatic infection but it is not infallible. In the presence of an increased sedimentation rate, conservative measures in the treatment of chorea seem indicated. An early depression and subsequent rise of the number of granulocytes occur during the febrile reaction following intravenous vaccination. Persistent leukopenia in one of the authors' patients was considered an indication for cessation of the administration of vaccine. It may be advisable to control this method of therapy by frequent determinations of the white blood cell count. Otherwise repeated daily use of an agent that depresses the formation of granulocytes may produce harm either through an increase in the rheumatic disease itself or through the development of agranulocytic angina.

Use of Convalescent Blood in Whooping Cough—Bradford gave fifty-eight children, chiefly less than 3 years of age, injections either of 10 cc. of serum taken in the eighth week of convalescence or from 10 to 20 cc of whole blood taken from an adult (parent) who had had the disease previously.

Forty-four of the children were obliged to remain in homes in which one or more cases existed. Twenty-seven of this group received the injections during the incubation period. The disease developed in fifteen but was mild in ten. There was one complication. Of twenty children used as controls, eight had a mild form of the disease, eight, average, and four, severe. Complications developed in four. In seventeen children exposed in the family who received the preventive vaccine after symptoms of coryza existed there was no indication that the course of the disease was modified. In a group of sixteen patients exposed outside the family, nine were given injections during the incubation period, and the number completely protected was so great as to suggest that the exposures may not have been genuine. From evidence obtained by observation of treated patients exposed in the home along with suitable controls and from the survey of the literature to date, it seems probable that immune blood is effective in the prevention and modification of whooping cough if given before the catarrhal symptoms appear. If given after the disease is established, favorable results are less apparent.

Congenital Lymphangiectasis—Mason and Allen present five cases of congenital lymphedema that have been observed at the Mayo Clinic. The macroscopic and microscopic observations of tissues that were removed during the Kondoleon type of operation were characterized by the replacement of normal subcutaneous fat with fibrous tissue and with enlarged lymphatic vessels, chiefly in the region of the deep fascia. The authors feel that the microscopic appearance of the tissue is so characteristic that the term congenital lymphangiectasis should be used to replace the term congenital lymphedema, because congenital lymphangiectasis describes the condition better.

American Journal of Hygiene, Baltimore

22: 257-494 (Sept.) 1935

- Invasion of Body Tissues by Orally Ingested Bacteria and Defensive Mechanism of Gastro-Intestinal Tract. L. F. Gulbrandsen. Chicago—p. 257.
- Plasmodium Hexamerium N. Sp. from Blue Bird Inoculable to Canaries. C. G. Huff. Chicago—p. 274.
- Making Permanent Preparations of Anopheline Mid Guts. Note. H. E. Hingst, Columbia S. C.—p. 278.
- Infectivity of Treponema Pallidum in Excised Syphilitic Tissue. P. D. Rosabn. New York—p. 283.
- Increased Numbers of Carriers of Corynebacterium Diphtheriae Demonstrable by Extensions of Bacteriologic Procedures. M. Frohisher Jr. and Vivian A. Van Volkenburgh. Baltimore—p. 292.
- Efficiency of Pooling for Sterility Cultures. H. Muench. New York—p. 302.
- Susceptibility and Resistance of Rats to Infections with Trichomonad Flagellates from Rat and Man. R. Hegner and Lydia Eskridge. Baltimore—p. 307.
- Absence of Pathogenicity in Cats Infected with Trichomonas Feli* from Cats and Trichomonas Hominis from Man. R. Hegner and Lydia Eskridge. Baltimore—p. 322.
- Carbarnone. Its Action on Trichomonas Hominis and on Rat Trichomonads in Vitro. A. Gabaldon. Baltimore—p. 326.
- Influence of Diphtheria Toxin on Infection with Trypanosoma Equiperdum in the Rat. S. Raffel. Baltimore—p. 339.
- Cultivation of Trichomonas Columbae Free from Bacteria. G. Cauthen and M. M. Harris. Baltimore—p. 364.
- Pathologic Changes Produced in Intestines of Kittens by Endamoeba Histolytica With and Without Certain Added Bacteria. Bertha Kaplan Spector. Chicago—p. 366.
- Further Studies of Revival After Drying of Snail Hosts of Human Schistosomes of Egypt. C. H. Barlow. Cairo, Egypt—p. 376.
- Iso-Electric Zones of Eberthella Typhosa and Brucella Abortus Agglutinins. S. R. Damon and A. A. Hajna. Baltimore—p. 392.
- Diphtheria Toxoid Antitoxin Floccules Prepared with Human Antitoxin Serum. J. Y. Sugg. New York—p. 398.
- Observations on Ascaris Sensitivity in Man. T. L. Jones and A. A. Kingscote. Montreal—p. 406.
- Studies on Life History and Host-Parasite Relations of Hymenolepis Fraterna (H. Nana Var. Fraterna, Stiles) in White Mice. A. V. Hunninen. Baltimore—p. 414.
- Comparative Study of Nippostrongylus Muris in Rats and Mice. D. A. Porter. Baltimore—p. 444.
- Studies on Effect of Milk Diet on Resistance of Rats to Nippostrongylus Muris. D. A. Porter. Baltimore—p. 467.
- Nutritional Requirements of Mosquito Larvae (Aedes Aegypti). W. Trager. Princeton, N. J.—p. 475.

Ascaris Sensitivity in Man.—Jones and Kingscote found that twenty-seven of 108 subjects, mostly veterinary undergraduates selected at random, gave positive reactions to a scratch test with 5 per cent saline extract of pig ascaris. A period of exposure seems to be a necessary precursor and continued reexposure

may lead to at least partial desensitization. Various fractions of ascaris were similarly tested. In some subjects an eosinophilia followed the reaction. A positive reaction is no indication of previous infection, although previous exposure by contact may be necessary. However, continued exposure does not necessarily cause sensitization.

American Journal of Surgery, New York

30: 1204 (Oct.) 1935

- Spinal Tuberculosis. Climatic and Operative Treatment. F. H. Albee. New York—p. 60.
- Treatment of Fractured Skulls. C. O. Bates, Greenville S. C.—p. 66.
- *Fractures of the Pelvis. Clinical Study of Fifty-Six Cases. F. M. Conway. New York—p. 69.
- Avulsion of Distal Biceps Brachii Tendon. D. G. Leavitt and J. H. Clements. Seattle—p. 83.
- Aneurysm of Thoracic Aorta. Report of Case with Surgical Intervention. M. Behrend and R. S. Boles. Philadelphia—p. 86.
- Herniation of Lung Tissue into Bronchus. M. S. Lloyd. New York—p. 90.
- Surgical Care of Patients in Extremes of Life. J. J. Morton. Rochester, N. Y.—p. 92.
- *Technic for Inversion of the Bowel. R. B. Bettman. Chicago—p. 109.
- Benign Fibrous Stenosis of the Common Duct. R. F. Carter. New York—p. 110.
- Resection of the Colonic Flexures. H. Koster. Brooklyn—p. 115.
- Appendicitis Mortality Rates. Regional Differences in the United States. C. C. Dauer and G. D. Lilly. New Orleans—p. 119.
- Lymphangioma and Hemangioma of the Mesentery. C. S. Herman and L. A. Soloff. Philadelphia—p. 125.
- Neoplasms of Kidney and Ureter. Report of Forty Cases. G. G. Smith. Boston—p. 130.
- *Symptoms of Pelvic Endometriosis. R. D. Mussey and W. L. Butsch. Rochester, Minn.—p. 141.

Fractures of the Pelvis—Conway states that in a review of fifty-six cases of pelvic fracture, admitted over a period of nineteen months, there were only four cases of accompanying genito-urinary injury. In twenty-four cases there were abdominal signs of pain, tenderness and increased muscle spasm due to retroperitoneal hemorrhage. Abdominal puncture as an adjuvant to the diagnosis of intra-abdominal injury has proved of inestimable value in positive cases. The mortality, thirteen deaths, was definitely influenced by the degree of severity of the accompanying injuries. Nine patients died within twenty-four hours following admission. Russell traction has a definite part in the reduction of sacro-iliac dislocations and distortions. In cases of suspected involvement of the bladder, direct instillation of a radiopaque substance by the urethral route with a subsequent roentgenogram is of more value than the attempt to siphon back a measured amount of instilled fluid. The mechanism of urethral injuries in children is believed to be due to a temporary diastasis of the urogenital diaphragm with concomitant tearing of the urethra, only rarely does a bony fragment lacerate the urethra. The relative infrequency of visceral complications was a principal feature of the present group of cases.

Technic for Inversion of the Intestine—Bettman points out that in the inversion of the ends of the cut intestine during an intestinal resection with side-to-side anastomosis or the inversion of the duodenal stump during the operation of partial gastrectomy the first half of the closure of the open end of the cut intestine or duodenal stump is performed as usual and the suture is left long and untied. A second suture threaded on a small full curved needle is then placed in what will be the end of the suture line, including all layers, and is tied. The curved needle is then inserted through the intestine or stump of the duodenum, piercing the mucosa about half an inch below the cut edge and emerging through the serosa (that is, from within out). If this suture is now pulled taut, the part of the cut surface of the intestine that otherwise is difficult to invert will invert easily and, if it is held taut, the closure can be completed quickly. The inversion suture is cut off flush with the intestine and will retract inside.

Symptoms of Pelvic Endometriosis—Mussey and Butsch studied the histories of fifty cases of endometriosis demonstrating that dysmenorrhea of the acquired type, which affects a woman more than 30 years of age, is suggestive of endometriosis. Pain that occurs in relation to previously normal menstrual periods whether before, during or after the period, is significant of endometriosis, although in the presence of this condition pain may occur at other times. The pain may be intermittent

at first, but it tends to assume a more constant character and to become progressively worse with successive menstrual periods, it may be increased by physical activity. Pain on defecation or rectal straining, related to the menstrual period, and diarrhea or rectal bleeding that occurs only at the menstrual period, are of distinct significance. Attacks of nausea and vomiting related to the menstrual period and accompanied by localized pain may indicate the presence of endometriosis. The clinical diagnosis of pelvic endometriosis rests largely on the history and physical observations. The latter may be definitely diagnostic, as when the growth is found in the rectovaginal septum, but the diagnosis is often elusive and it is evident that a carefully developed clinical history is of distinct value in the recognition of this condition.

American Journal of Tropical Medicine, Baltimore

15: 495 604 (Sept.) 1935

- Relapsing Fever in Texas. V. Survey of Epidemiology and Clinical Manifestations of Disease as It Occurs in Texas. H. A. Kemp, W. H. Mourund and H. E. Wright. Dallas, Texas.—p. 495
- Embryonic and Tumor Tissues as Culture Mediums for Micro-Organism of Rat Leprosy. E. L. Walker and Marion A. Sweeney, San Francisco.—p. 507
- *Intravenous Toxicity of Atabrine (Atebrin). W. T. Dawson, W. Gingrich and E. D. Hollar. Galveston, Texas.—p. 515
- Infection of Anopheles Bachmanni Petrocchi with Plasmodium Vivax Grassi and Feletti and Observations on Bionomics of Mosquito. L. E. Rozeboom. Panama Republic of Panama.—p. 521
- Intravenous Administration of Certain Drugs in Therapy of Avian Malaria. W. W. Sweeney. Baltimore.—p. 529
- Treatment of Experimental Yellow Fever Encephalitis with Specific Immune Serum. M. Hoskins. Bahia, Brazil.—p. 545
- Rapid Technic for Iron Hematoxylin Staining Requiring No Microscopic Control of Decolorization. C. M. Johnson. Panama Republic of Panama.—p. 551
- History of Bubonic Plague in New Orleans. C. L. Williams. New Orleans.—p. 555
- *Sprue. Roentgenologic Changes in Small Intestine. T. T. Mackie, D. K. Miller and C. P. Rhoads. New York.—p. 571
- Dangers to Southerners in Northward Migration. C. A. Mills. Cincinnati.—p. 591

Intravenous Toxicity of Atabrine.—Owing to the very slow excretion or destruction of atabrine in the body, Dawson and his associates state that it seems unnecessary to employ a dose larger than 0.1 Gm. for intravenous injection for an adult. The margin of safety is probably not great, and intravenous injection should be resorted to only in emergency. The injections should be made slowly and should be timed to take several minutes for completion. The total amount of the drug injected over a period of twenty-four hours should not exceed 0.3 Gm. Untoward effects of atabrine appear to include gasping or accelerated respiration, circulatory failure, collapse, vomiting, possibly rise of temperature, psychoses, loss of appetite and of weight, abdominal pain, headache, diarrhea, yellowed sclera and rather persistent yellowing of the skin. In view of the very slow excretion or destruction of the drug in the body, it is reasonable to consider that a course of treatment with it should not be repeated within a period of approximately eight weeks, and the drug should be taken only under supervision of a physician.

Sprue. Roentgenologic Changes in Small Intestine.—Mackie and his co-workers demonstrated characteristic changes roentgenographically in the small intestine in seventeen cases of sprue. There is a striking variation in the contour and in the size of the intestinal lumen. The motor activity is markedly abnormal and frequently produces a segmental distribution of the barium sulfate. These changes may be localized or may extend throughout the entire length of the small intestine. In the duodenum the mucosal folds appear thickened and the lumen is dilated irregularly. The valvulae conniventes of the jejunum are thickened more widely separated than normal and irregular in size producing a distorted mucosal pattern. Here again the lumen frequently appears dilated a change that may be extensive or may be confined to isolated segments. The barium usually passes through the jejunum very slowly and moves irregularly. It is apt to collect in short segments of intestine that are dilated and abnormally smooth while the regions immediately adjacent are empty. The filled areas show no evidence of peristalsis. Roentgenograms taken subsequently show a similar irregular arrangement of the barium-filled intestinal segments at a lower level. At times all the barium that has left the stomach is collected in a localized pocket, while the remainder of the jejunum

and the duodenum are empty. The discharge from the stomach to the duodenum is spasmodic, corresponding apparently to the local delay in the forward progress of the opaque meal through the small intestine. The changes in the ileum are similar to those in the proximal parts of the intestine. Although the rate of passage of the barium through the small intestine is subject to wide variation, the forward progress of the opaque meal is not more rapid than normal. The specificity and response to therapy of the changes in outline of the small intestine in sprue may be significant in clarifying the mechanism of the disease. Similar changes have been observed in other conditions exhibiting clinical evidence of multiple deficiency states. The intensity and extent of the abnormalities in the small intestine vary directly with the severity of the clinical picture in sprue, and they regress under specific therapy. They may play a part in the defective absorption or utilization of essential food factors.

Annals of Internal Medicine, Lancaster, Pa.

9: 219 358 (Sept.) 1935

- Pulmonary Fibrosis and Emphysema. J. A. Miller, New York.—p. 219
- Etiology of Pulmonary Fibrosis and Medicolegal Aspects of Pneumoconiosis. W. S. McCann. Rochester, N. Y.—p. 234
- *Treatment of Chronic Rheumatoid Arthritis. Further Observations on Use of Streptococcal Vaccine. C. W. Wainwright. Baltimore.—p. 245
- Gastric Acidity in Chronic Arthritis. E. F. Hartung and O. Steinbrocker. New York.—p. 252
- Differential Diagnosis of Diseases of Liver. B. B. V. Lyon, Philadelphia.—p. 258
- Treatment of Peripheral Vascular Disease by Means of Suction and Pressure. E. M. Landis and L. H. Hitzrot, Philadelphia.—p. 264
- Von Gierke's Glycogen Disease. L. M. Lindsay, A. Ross and F. W. Wigglesworth. Montreal.—p. 274
- Diverticulosis of Large Intestine. Evaluation of Historical and Personal Observations. H. C. Ochsner, Waukegan, Ill. and J. A. Barger, Rochester, Minn.—p. 282
- *Internal Myxedema. Report of Case Showing Ascites, Cardiac, Intestinal and Bladder Atony, Menorrhagia, Secondary Anemia and Associated Carotenemia. R. F. Escamilla, H. Lissner and H. C. Shepardson, San Francisco.—p. 297
- Recovery from Coronary Thrombosis. Report of Eight Cases with Particular Reference to Recognition of Less Severe and Atypical Types. C. Smith and H. C. Sauls. Atlanta, Ga.—p. 317

Treatment of Chronic Rheumatoid Arthritis.—Having demonstrated the strain of streptococcus among the many used to which a patient was most skin sensitive, Wainwright used this information as a guide to vaccine treatment. Twenty-eight patients with chronic rheumatoid arthritis received streptococcus vaccine intravenously at weekly intervals for periods varying from two months to more than one year, and since then seventeen additional patients have been treated. All foci of infection were removed. The vaccines used were prepared from hemolytic strains in all but two instances. The patients received weekly intravenous injections of vaccine prepared from the strain to which they had shown the maximal skin sensitivity. The initial dose was approximately 5 million organisms contained in 0.5 cc. of vaccine. The dose was increased by 0.5 cc., provided no constitutional reaction occurred. Febrile reactions were avoided by beginning with a small dose and increasing the dose sufficiently slowly. The increase in dosage was gaged by the patient's response and no set schedule of dosage was followed. Although no constitutional reactions occurred, as a rule the patients complained of focal reactions for about twenty-four hours after each injection. This reaction was manifested by increased pain in the involved joints, but after the reaction subsided the symptoms were usually improved. The improvement came about slowly, making its appearance in from four to six weeks after treatment was begun. Joints have flared up during treatment, but would often subside in a shorter time than was the patient's previous experience. In some cases definite improvement has been observed up to a point at which the arthritis seemed to become stationary, and beyond this point no further improvement was obtained. The benefit derived manifested itself by decreased pain, reduced swelling of the joints and of the surrounding soft tissues, and increased mobility of the joints. Streptococcus vaccine was given intravenously to two patients suffering from active pulmonary tuberculosis. The increase in dosage was made cautiously, and constitutional reactions were avoided. In both cases the arthritis has improved during treatment. Not only has the pulmonary tuberculosis not progressed but healing has gone on, and in one

case the pulmonary lesion is now considered inactive. During treatment the skin reaction to the strain used has regularly diminished in intensity and in most instances has entirely disappeared. Agglutinins have appeared in the patient's serums for the strain employed, when not already present, and when present, as was the case with the hemolytic strains, the titer has materially increased during treatment. In all cases treated the sedimentation rate has been elevated, in some much higher than in others. The highest rate at the beginning of treatment was 54 mm in one hour and the lowest was 15 mm. Fifteen of the forty-five cases treated either have not improved or else the change that has come about has been so slight that improvement was questionable. In none of the cases has the arthritis been made worse by treatment and no untoward reactions have occurred.

Internal Myxedema—Escamilla and his associates cite a case of hypothyroidism that showed ascites, cardiac, intestinal and bladder atony, secondary anemia, menorrhagia and associated carotenemia. The ascitic fluid was thought to be due to the hypothyroidism and showed a protein content above the average, but not as high as in some cases that have been reported previously. The cardiac observations were typical of myxedematous heart without decompensation. Atony of the bladder is thought to be more common than previously reported. The patient was followed over a period of thirteen months and all symptoms and signs showed improvement on thyroid therapy except the anemia, for the improvement of which iron was necessary in addition to the thyroid. An exploratory laparotomy performed for symptoms simulating partial intestinal obstruction showed no evidence of other etiology for the ascites. The authors suggest that the term "internal myxedema" would best describe the manifestations observed in their patient.

Annals of Otol, Rhinol. and Laryngology, St. Louis

44:1 304 (March) 1935 Partial Index

- Cellular Character of One Hundred Temporal Bones. Clinical and Surgical Significance. E. F. Ziegelman. San Francisco—p. 3.
Effect of Phenol in Hyperesthetic Rhinitis with Tissue Study of Nasal Mucosa. A. Palmer. New York—p. 25.
Suppuration in Petrosal Pyramid. Report on Ten Cases. S. J. Kopetzky and R. Almour. New York—p. 59.
Experiences in Ionization of Nasal Mucous Membrane. H. G. Tobey. Boston—p. 94.
Diagnosis of Acute Suppuration of Petrosal Pyramid. C. Eves. Philadelphia—p. 97.
Some Considerations of Adenoid Bleeding. L. Richards. Boston—p. 117.
Laryngeal and Esophageal Atavism in Man as Indicated by Probable Phylogenesis of Hypopharyngeal Receptacle Concerned in the Act of Deglutition. L. Z. Fishman. Chicago—p. 139.
*Hemorrhage in Lung Cancer. Fatal Case Following Bronchoscopy. F. L. Lederer. Chicago—p. 157.
Postoperative Bilateral Abductor Paralysis. W. F. Zinn. Baltimore—p. 164.
Roentgen Demonstration of Cysts in Upper Air Passages. H. K. Taylor and L. Nathanson. New York—p. 170.
Treatment of Rheumatism. H. B. Graham. San Francisco—p. 181.
*Tertiary Syphilitic Infiltrative Lesions of Nasal Mucosa. I. M. Lupton, Portland Ore.—p. 199.
Microtia with Meatal Atresia with Description of an Operation for Its Correction. Report of Two Cases. J. R. Hume and N. Owens. New Orleans—p. 213.
Management of Malignancies of Sinuses. C. S. Nash. Rochester, N. Y.—p. 220.
Brucellosis and Otolaryngology. C. Hirsch. New York—p. 242.
Management of Recent Fractures of Nose and Sinuses. F. D. Woodward. Charlottesville, Va.—p. 264.
Present Status of Sinus Infection as an Etiologic Factor in Retrobulbar Neuritis. J. A. Fisher. Asbury Park, N. J.—p. 274.

Hemorrhage in Cancer of Lung—Lederer believes that the emphasis on hemoptysis as a symptom of lung cancer, together with the presentation of case reports from the literature of fatal hemorrhage, serves to illustrate the possibilities of bronchoscopic interference in these cases. His experience, coupled with the proliferative and ulcerative changes found on postmortem examination in these pulmonary lesions, causes him to believe that similar fatalities have occurred before without special attention being directed to this possibility. The mechanical effort of a bronchoscopic observation, performed under the best conditions, may be sufficient strain to provoke a hemorrhage from a vessel whose walls are near a malignant mass and perhaps even invaded by the neoplasm. There can be no question as to the advisability of the bronchoscopic procedure, but it is well to bear in mind the possibility of hemorrhage.

Tertiary Syphilitic Lesions of Nasal Mucosa—Lupton states that syphilitic infiltration of the nasal mucosa is a definite clinical entity and should be considered in the differential diagnosis of every doubtful lesion of the nasal mucosa. Because of the preponderance of vascular and lymphatic elements present in the mucosa of the direct airways of the nose, specific infiltrative lesions are more frequently found here than in the mucosa lining the accessory sinuses. Biopsy of the nasal mucosa is of extreme value to the clinician in questionable cases. Should the section show at least presumptive and supportive evidence of a chronic syphilitic rhinitis, it will have served its purpose well by suggesting a specific background. Negative blood examinations should not preclude the possibility of a specific infection in questionable lesions of the nasal mucosa, and in doubtful cases one should resort to careful study of the spinal fluid.

Annals of Surgery, Philadelphia

102:481 800 (Oct.) 1935

- Address of the President. Higher Degrees in the Profession of Surgery. E. W. Archibald. Montreal—p. 481.
Surgical Education. Undergraduate Teaching of Surgery. E. C. Cutler. Boston—p. 497.
Id. Graduate Teaching of Surgery in University Clinics. G. J. Heuer. New York—p. 507.
Id. Opportunities for Graduate Teaching of Surgery in Larger Qualified Hospitals. A. O. Whipple. New York—p. 516.
Hippocratic Surgery. F. B. Lund. Boston—p. 531.
Principles of Physiology Involved in Management of Increased Intracranial Pressure. W. Penfield. Montreal—p. 548.
*Diagnostic Value of Phosphatase Determinations in Study of Bone Tumors. C. C. Simmons and C. C. Franseen. Boston—p. 555.
Some Physiologic Principles Involved in Surgical Treatment of Gastric and Duodenal Ulcer. L. R. Dragstedt. Chicago—p. 563.
Factors Governing Results of Surgical Treatment of Duodenal Ulcer. D. C. Balfour. Rochester, Minn.—p. 581.
Possibility of Malignancy as It Affects Treatment of Chronic Gastric Ulcer. W. J. M. Scott. Rochester, N. Y.—p. 586.
Acute Ileus. Comparison of Toxicity of Obstructed and Nonobstructed Intestinal Contents. F. T. van Beuren Jr. New York—p. 605.
*Circulatory Disturbances Caused by Intestinal Obstruction. W. D. Gatch and C. G. Culbertson. Indianapolis—p. 619.
Mesenteric Vascular Occlusion. J. Douglas. New York—p. 636.
*Results of Splenectomy in Childhood. G. C. Penberthy and T. B. Cooley. Detroit—p. 645.
Idiopathic Ulcerative Colitis. Review of One Hundred and Forty Nine Cases with Particular Reference to Value of and Indications for Surgical Treatment. L. S. McKittrick and R. H. Miller. Boston—p. 656.
Regional Ileitis. C. G. Mixer. Boston—p. 674.
Nonspecific Granuloma of Ileocecal Region. H. Binney. Boston—p. 695.
*Colectomy for Adenomatosis and Pseudopolyposis. Report of Five Additional Cases. F. W. Rankin. Lexington, Ky.—p. 707.
Peptic Ulcer and Diseases of Biliary Tract in the Southern Negro. Influence of Diet. F. H. Boland. Atlanta, Ga.—p. 724.
Liver Resection. Case Report and Advantages of Radiocutting. M. B. Tinker. Ithaca, N. Y.—p. 728.
Congenital Obstruction of Bile Ducts. W. E. Ladd. Boston—p. 742.
Stenosis of Bile Ducts by Contiguous Cicatricial Tissue. E. Eliot Jr. New York—p. 752.
Treatment of Carcinoma of Ampulla of Vater. A. O. Whipple, W. B. Parsons and C. R. Mullins. New York—p. 763.
Technic for Hepaticoduodenostomy. L. G. Guerry. Columbia, S. C.—p. 780.
Operative Repair of Sliding Hernia of Sigmoid. R. R. Graham. Toronto—p. 784.

Diagnostic Value of Phosphatase in Bone Tumors—Simmons and Franseen made observations on seventy two cases of bone tumors of various types. They found that the plasma phosphatase reading is normal or low in nonmalignant bone tumors, normal or slightly elevated in multiple myeloma and in endothelial myeloma (Ewing sarcoma), normal or slightly elevated in the giant cell tumor of bone, considerably elevated in malignant disease metastatic in bone, and this fact may be of value in differentiating the multiple bone metastases of carcinoma from endothelial myeloma and multiple myeloma, and consistently high in osteogenic sarcoma of the osteoblastic type. In the osteolytic type (one case) it is approximately the same as in the group of metastatic carcinoma and giant cell tumor. Following surgical removal of an osteogenic sarcoma, the plasma phosphatase falls to normal in the course of from two to three weeks but again becomes elevated when there are demonstrable metastases. The recurrent tumor must attain an appreciable size before an increased plasma phosphatase activity can be demonstrated. In individuals dying of osteogenic sarcoma the activity diminishes shortly before death. Radiation treatment of an osteogenic sarcoma caused a temporary diminution in the

plasma phosphatase activity in one case. The plasma phosphatase activity bears a definite relation to that of the tumor tissue. The high phosphatase activity of the tumor tissue in osteogenic sarcoma is an example of a neoplastic cell continuing to produce the physiologic secretion of the normal cell from which it is derived. In one case of myositis ossificans the plasma reading was high at the time of osteoblastic activity in the lesion.

Circulatory Disturbances Caused by Intestinal Obstruction.—Gatch and Culbertson devised experiments to disclose the relation between intra-intestinal pressure and blood flow through the intestinal wall and to demonstrate the effect of various amounts of intra-intestinal pressure on its viability, motility, secretory activity and power of absorption. Their experiments demonstrated that: 1 Toxic material present in the lumen or wall of the obstructed intestine may reach the systemic circulation by way of the mesenteric vessels and by way of the peritoneal cavity. 2 Before the passage of any toxins by either route or under any conditions can occur, injury to the mucosa must exist. 3 Injury observed under clinical conditions to the mucosa of the obstructed intestine is due practically to distention and venous congestion. 4 Any passage of toxins from an intestine with devitalized mucosa must be transperitoneal as long as its circulation is stopped by pressure or obstruction, by way of the mesentery if its circulation is present. Distention causes a decrease in the blood flow through the intestinal wall, which is in direct proportion to the elevation of the pressure. It almost stops the blood flow when it reaches the level of the diastolic blood pressure. At this level it stops all absorption by way of the mesentery. Transperitoneal absorption then occurs. Distention sufficient to arrest the circulation of the intestine will devitalize the intestinal mucosa in from five to fifteen hours. This devitalization is demonstrated by the loss of selective absorption by the mucosa. It then permits the passage of toxic substances present in the normal and obstructed intestine. The absorption of materials that are normally absorbed by the intestine, except water and probably inert gases, proceeds at a relatively uniform rate in the presence of intra-intestinal pressures between zero and the diastolic blood pressure. Venous obstruction subjects the capillaries of the intestine to the full force of the systolic blood pressure. The circulation of the obstructed intestine is not greatly influenced by the increased intra-abdominal pressure that accompanies intestinal obstruction. The blood flow through distended loops must be lessened by any weakness of the systemic circulation. In the clinical management of patients suffering from advanced obstruction it seems desirable to deflate the intestine gradually before the operative relief of the obstruction is undertaken, otherwise the barriers against absorption of toxins by way of the peritoneum, and against their rapid absorption by way of the mesentery, may be broken down.

Splenectomy in Childhood.—As a large proportion of the cases of fetal erythroblastosis terminate fatally within a short time and as the character of the hemolysis seemed to Penberthy and Cooley strongly suggestive of perverted splenic activity, they performed splenectomy in two cases. Splenectomy promptly checked the rapidly progressing hemolytic anemia. Because of the gravity of the condition, they believe that the operation should be performed as soon as the diagnosis is made. Results are reported of splenectomies performed on children: in six for hemolytic icterus, in four for sickle cell anemia, in five for erythroblastic anemia in six for hemorrhagic purpura, and in five for different types of splenic anemia. The patients with hemolytic icterus seem to have recovered completely from the primary disorder, with no signs of recurrence. One has had trouble from postoperative adhesions and duodenal ulcer. In the cases of sickle cell anemia the condition has been little benefited by the operation but the abdominal and joint crises have been alleviated, and in one case epileptiform attacks ceased after the splenectomy. Splenectomy in erythroblastic anemia has not appreciably altered the course of the anemia. It is followed by a remarkable permanent increase in circulating normoblasts. The patients are considerably relieved by freedom from the weight of the greatly enlarged spleen and may live somewhat longer. Results in hemorrhagic purpura are nearly as good as in hemolytic icterus. Four patients recovered com-

pletely, one has had a single slight recurrence, and one, operated on during a very severe bleeding episode, died. Here, as in hemolytic icterus the authors do not operate during crises, except as a last resort. Two patients exhibiting the syndrome with splenomegaly, leukopenia and anemia, often called the first state of Banti's disease, seem to have been cured by splenectomy. Of three having splenomegaly and anemia without the characteristic leukopenia, apparently secondary to infection, one has died and two have gone on to the late stages of the Banti syndrome with hemorrhage and cirrhosis.

Colectomy for Adenomatosis and Pseudopolyposis.—Rankin gives an additional report of a series of five cases of colectomy for diffuse adenomatosis and complicated chronic ulcerative colitis. Six cases were reported previously in which the entire colon and rectum were removed by multiple procedures. In four of the present cases the colon was removed down to the rectosigmoid juncture, in the other, total colectomy was done. In two cases of the chronic ulcerative colitis variety it is probable that the rectum will have to be removed subsequently, although the patients show marked improvement. In one case the reestablishment of the continuity of the gastrointestinal tract was carried out at the third stage following destruction of the rectal polyps by fulguration. There was one operative death following the second stage colectomy and in this case fulguration had been carried out on the rectal polyps and the plan was to transplant it subsequently at a third maneuver into the terminal ileum. The disappearance of diffuse rectal polyps following vigorous fulguration is surprising and encourages the belief that this plan, which has heretofore been considered an alternative one and available only when the rectal polyps were few, may be available to a great many more of these cases. Technical steps of importance are the preservation of the omentum in the chronic ulcerative colitis group and in the case of adenomatosis when there is no suggestion of a malignant condition. A second technical point of advantage is the method of handling the rectal stump, which turns in with difficulty in many of the polyposis cases and not at all in the chronic ulcerative colitis variety. The stump must be closed over as accurately as possible, covered with whatever tissues there are and if there is any question of leakage, wrapped in iodoform gauze and a rubber tissue to establish a drainage track in the event that the suture line fails to hold. Of the eleven patients, one died eighteen months following the complete operation from recurrence of carcinoma which had developed on the polyps and which was diagnosed at exploration. A second patient died two years later following a hysterectomy performed elsewhere. One patient died in the hospital following the second stage operation, and the remaining eight patients are alive and well and have all returned to their various occupations.

Archives of Neurology and Psychiatry, Chicago

34: 699-930 (Oct.) 1935

- Functional Changes in the Brain of the Dog After Reduction of Cerebral Blood Supply. II. Disturbances of Conditioned Reflexes After Ligation of Arteries. L. A. Andrejev, Moscow, U. S. S. R.—p. 699
- Otologic Findings in Oculogyric Crises. Contribution to Study of Supra-vestibular Pathways. S. L. Shapiro, Chicago—p. 714
- Horn's Syndrome. Report of Ten Cases. R. N. DeJong, Ann Arbor, Mich.—p. 734
- Acoustic Imagination and Acoustic Hallucination. S. Parker and P. Schilder, New York.—p. 744
- Left Handedness. Interrelations with Enuresis and Other Related Factors in So-Called Normal Children. J. J. Michaels, Boston, and Sylvia E. Goodman, Ann Arbor, Mich.—p. 758
- Proteins of Blood Serum in Cases of Essential Epilepsy. B. W. McKenzie, Salisbury, N. C. and E. W. McChesney, Chapel Hill, N. C.—p. 764
- Central Levels of Sensory Integration. J. G. Dussier de Barenne, New Haven, Conn.—p. 768
- Neurogenic Vesical Dysfunction. Alterations in Physiology of Micturition Due to Lesions of Nervous System. C. D. Creevy, Minneapolis—p. 777
- Psychology and the University. H. A. Murray, Cambridge, Mass.—p. 803
- The Psychogalvanic Reflex. Applications to Neurology and Psychiatry. P. Solomon, Boston.—p. 818

Otologic Changes in Oculogyric Crises.—Shapiro examined six patients, four men and two women, aged from 21 to 39 years, suffering from cephalo-oculogyric crises. Four had tremors, rigidity and other evidence of parkinsonism, two presented no striking neurologic symptoms but were considered

by neurologists to have a probable postencephalitic state. Weakness of the muscles of convergence and accommodation or jerky voluntary movements of the eyes were present in five. Cochlear function was good in all. With the exception of one instance, no spontaneous vestibular abnormality was present. Vestibular stimulation revealed absence of, or diminished, susceptibility in all the patients, perverted or absent vertigo in two, perverted past pointing in one, absence of falling in one, who also showed perverted vertigo, and absence or impairment of nystagmus downward as induced by rotation with the head over the shoulder in two. Optic nystagmus in all cardinal directions could be induced in the intervals between attacks in all the patients. Five attacks were witnessed, there was upward or oblique deviation of the head and eyes in four and horizontal deviation in one. The ability to induce vestibular nystagmus while the patient was in a crisis was apparently proportional to the strength of the stimulus applied and the severity of the spasm. The facts available, including the postmortem studies, point definitely to the midbrain as the seat of the pathologic changes. None of the usual changes in the basal ganglia and tracts of this region that are commonly found in chronic parkinsonism can be held responsible, as these have been demonstrated many times in patients who during life had no ocular deviations. The views of Muskens, who regarded oculogyric crises as forced movements due to the interruption of pathways connecting the end stations of the secondary vestibular neurons to the pallidum, offer an explanation which, while based on experimental evidence, does not run counter to the clinical and anatomic data available. There are certain differences between the forced movements elicited by Muskens and other authors in animals and spasmodic deviations of the head and eyes in patients in the postencephalitic state. These can be readily understood in the light of the changing role of the vestibular apparatus in man as contrasted with that in animals and do not, by themselves, constitute an argument against the conclusions of Muskens.

Archives of Otolaryngology, Chicago

22 403 536 (Oct.) 1935

- Diagnosis and Differential Diagnostic Data on Specific Types of Suppuration in Petrosal Pyramid S J Kopetzky, New York—p 403
 "Aural" or Acoustic Method of Treating Deafness H C Ballenger and B A. Patterson Chicago—p 410
 Treatment of Hay Fever and Hyperesthetic Rhinitis by Ionization L M Hurd New York—p 416
 *Sinusitis Allergy and the Common Cold Conception of Their Relationship E. C. Sewall San Francisco—p 425
 Causes of Faulty Interpretation of Roentgenograms of Sinuses I M Law New York—p 435
 Treatment of Pharyngeal Cancer Fractional Dose Methods of External Irradiation W L Mattick Buffalo—p 440
 Xanthoma of Pharynx and Larynx G B New Rochester Minn.—p 449
 Late Changes in Mucosa of Frontal Sinuses and Nose of Dogs Following Ionization B J McMahon St Louis—p 454
 Disease of the Hip Complicating Otogenic Sepsis N Leshin Chicago—p 466

Relationship of Sinusitis Allergy and the Common Cold.—The common cold, in Sewall's opinion, is always due to the pus-forming bacteria, and they are always activated by a filtrable virus. There must therefore be a never ending source of this virus. He believes that chronic sinusitis is the chief source, the endemic reservoir, for the perpetuation of the common cold. He does not mean that one must have chronic sinusitis to contract a cold but that chronic sinusitis must exist in some one for the pus germs lying in the chronically diseased mucosa to produce the virus capable of activating the same bacteria in others. The common pus-forming germs are the direct cause. They lie in the mucosa of the chronically diseased sinus. The lapse of immunity, associated with the factors that reduce resistance, allows them to become active. This activity is associated with the production of a virus that not only promotes the virulence of the sinus infection but, discharged as a secretion from the sinus, activates the same type of bacteria lying in a saprophytic state on the mucous membranes of that person. The result is the common cold engrafted on a chronic sinusitis. The virus secreted as nasal discharge will activate the same type of pus germs lying in a saprophytic state in the nose and throat of another person and cause an acute cold. Thus the vicious circle of the common cold appears

never ending until such time as the endemic reservoir in the chronic sinus may be rendered innocuous or removed. The morbid changes that characterize a common cold depend on the histologic structure of the mucosa. One can distinguish three types of mucous membrane, the normal adult mucosa, the altered mucosa and the diseased mucosa. Each is subject to infection and determines the character of the inflammatory process.

California and Western Medicine, San Francisco

43 249 320 (Oct.) 1935

- Psittacosis Report of Two Cases A B Steele Santa Barbara—p 257
 Psittacosis in Australia K F Meyer, San Francisco—p 260
 Roentgenologic Examination of Stomach and Duodenum Selection of Patients B R Kirklin Rochester Minn—p 261
 Urologic Pathology Its Incidence as Found in One Thousand Consecutive Autopsies at the Los Angeles General Hospital in 1933 G F Schenck Los Angeles—p 266
 Anesthesia in Infant Surgery Mary E Botsford San Francisco—p 271
 The Coroner's System J L Carr, San Francisco—p 274
 Why the Medical Examiner Instead of the Coroner? O T Schultz, Evanston Ill—p 275
 The Liver in Relation to Surgical Treatment of Lesions of Extrahepatic Bile Ducts V C Hunt, Los Angeles—p 278

Canadian Medical Association Journal, Montreal

33 353-474 (Oct.) 1935

- Osler in America with Especial Reference to His Baltimore Period L F Barker Baltimore—p 353
 Galactose Tolerance Test as an Aid to Diagnosis in Jaundice E H Bensley Montreal—p 360
 Study and Treatment of Cancer by Proteolytic Enzymes Preliminary Report H C Connell Kingston Ont.—p 364
 Pleural Shock W F Hamilton Montreal—p 370
 Carcinoma of Cervix Report on One Hundred Cases Treated at the Montreal General Hospital 1925 1929 Eleanor S Percival Montreal—p 374
 Stovarsol (Acetarsone) in Treatment of Congenital Syphilis H S Mitchell Montreal—p 377
 Dietary Factors in Health and Disease W R Campbell, Toronto—p 379
 Renal Amyloidosis W R Kennedy, Montreal—p 385
 Surgery in Treatment of Pulmonary Tuberculosis R M Janet, Toronto—p 389
 Some Results Obtained in Treatment of Atrophic Rhinitis (Ozena) R P Wright Montreal—p 392
 Avertin in Thyroid Surgery Sixty Consecutive Cases K. M. Heard, Toronto—p 395
 Multiple Intracranial Aneurysms W Wagner Toronto—p 401
 *Cellular Reaction to Silica J T Fallon and F G Banting Toronto—p 404
 Tissue Reaction to Sericite J T Fallon and F G Banting Toronto—p 407
 Treatment of Cancer of Larynx and Hypopharynx R S Pentecost, Toronto—p 411
 Hemangioma with Fracture Through the Invaded Bone J H Couch Toronto—p 416
 Recent Investigations on Effect of So-Called Anti Inflammatory Substances M Silberberg Halifax, N S—p 418

Cellular Reaction to Silica—Fallon and Banting studied the cellular reaction produced in rabbits by the subcutaneous injection of hand picked quartz that had been reduced to a fine powder. Weighed quantities of the material were added to distilled water so that each cubic centimeter contained 40 or 60 mg of the powder. The suspension was autoclaved for thirty minutes and 0.5 cc. was injected subcutaneously under aseptic conditions into the external surface of the ears of twenty-four rabbits. For microscopic examination of the effects, sections of the ear were punched out with a large cork borer. The sections taken at ten minute intervals during the first sixty minutes showed a gradually decreasing amount of intercellular fluid. In the sections taken between thirty minutes and six days after the injection of quartz particles the reaction was typical of acute inflammation. The quartz particles appear to have a toxic effect on the polymorphonuclear and mononuclear leukocytes and small lymphocytes that enter the aggregations. All these cells are rapidly broken up in this location. Similar cells retain their normal characteristics when they remain in the surrounding areolar tissue. In as short a time as six days the quartz particles become so intimately mixed with cell debris that the aggregations have an appearance of organization. In the sections taken six days after the injection of quartz suspensions the microscopic picture is that of subacute inflammation. The areolar tissue on one side of the cartilage is extensively

infiltrated by polymorphonuclear and mononuclear leukocytes and fewer lymphocytes. The mononuclear leukocytes are seen in great numbers in the aggregations of silica particles, where they soon become disintegrated, leaving a framework of poorly staining cells and cellular debris throughout the masses of particles. It is along this framework that the histiocytes later advance into the central portions of the aggregations. Beginning as early as the sixth day and increasing as time goes on, the histopathologic picture gradually changes to that of chronic inflammation. The tissue histiocytes and adventitial cells of the blood vessels are mobilized, take on an ameboid appearance and advance toward the aggregations of quartz particles and cellular debris. Many of these cells are seen in mitotic division. Active phagocytosis of the cellular debris and engulfing of the quartz particles are carried on by the histiocytes until the entire mass, except for a few of the larger quartz particles, is taken up by the histiocytes. This process is complete in the smaller aggregations by the third, and, in the larger, by the sixth week. While changes are taking place in the aggregations there is an active granulation tissue formation in the surrounding areolar tissue. Numerous thin walled blood vessels are formed and carried into the nodules in long, thin strands of elongated, spindle-shaped cells. From the sixth week onward the microscopic picture is that of scar tissue formation. The phagocytic cells become elongated and spindle shaped. This process begins at the periphery and extends toward the central portions of the nodules. Hyalinization begins at the outer margin and follows to the center of the nodule. As this change progresses there is a proportionate decrease in cellularity. The cells disappear by a gradual diminution in size, and simultaneously there develops intercellularly a firm fibrous tissue, which ultimately forms the silicotic nodules. The cells in the central portions of some of the nodules break down and disappear, leaving irregularly rounded collections of a very finely granular substance. This has the appearance of caseous necrotic material and by micro-incineration is shown to contain a large amount of siliceous material.

Canadian Public Health Journal, Toronto

26 419-468 (Sept.) 1935

- Plan of Health Insurance for British Columbia G Fleming—p 419
Food Control in Toronto A. R. B. Richmond Toronto—p 422
Some Preventive Aspects of Mental Hygiene as Related to Schizophrenia E. P. Lewis Toronto—p 428
Contribution of the Nutritionist to Health of the Preschool Child Mildred D. Goodeve, Montreal—p 434
Explosions in Sewers F. V. Dowd Montreal—p 440

Indiana State Medical Assn. Journal, Indianapolis

28: 475 564 (Oct. 1) 1935

- Charcot's Disease of the Foot E. M. Van Buskirk Fort Wayne—p 475
Substitute Parentage J. K. Hall Richmond Va.—p 479
Indications for Cesarean Section—Analysis of Three Hundred and Twelve Cases D. A. Bickel South Bend—p 482
Lighting H. Row Indianapolis—p 486
Jaundice L. R. Pearson Indianapolis—p 489
Closure of Postoperative Wound with Irradiated Petrolatum Case Report W. Deutsch Jr. Parker—p 490

Iowa State Medical Society Journal, Des Moines

25 521 572 (Oct.) 1935

- The Historical Background of the Cancer Problem. W. E. Sanders Des Moines—p 524
*Carcinoma of Colon: Diagnosis and Symptomatology E. E. Shaw Indianola—p 528
Id. A. Ray Diagnosis of Carcinoma of Colon C. L. Gillies Iowa City—p 530
Id. Surgical Treatment of Carcinoma of Colon N. B. Anderson Des Moines—p 531
Rocky Mountain Spotted Fever C. F. Jordan Des Moines—p 536
Nephropexy: Indications for Operative Procedure and Results C. W. Losh Des Moines—p 540
The Undescended Testicle with Especial Reference to Treatment with Gonadotropic Hormone and the Torek Operation J. B. Priestley and R. Cohen Des Moines—p 547

Diagnosis and Symptoms of Carcinoma of Colon—

Shaw says that the symptoms and signs of carcinoma of the right half of the large intestine are not diagnostic but suggestive. They are pain usually a dull inconstant pain, fairly well localized to the right side, indigestion of a vague type, anemia and weakness, the anemia being marked, with a red count often

near three million, a decreased hemoglobin and a picture suggestive of pernicious anemia, change of intestinal habit of the patient, whether constipation, diarrhea or alternation of the two, occult blood in the stool, which is a fairly constant finding, but melena is usually a late symptom in lesions of the right colon, a tumor mass in the right abdomen, usually movable and somewhat tender, which is often found and is the presenting symptom, loss of weight and cachexia as late manifestations, usually meaning a far advanced case, and roentgen observations. Signs and symptoms of carcinoma of the left half of the colon are obstruction, either complete or partial, change in the intestinal habit, again the most constant symptom, being usually a progressive constipation, blood and mucus in the stools of practically all these patients, rumbling, visible peristalsis, the feeling and hearing of gas and liquid feces as they pass through the constricted portion of the colon, which is frequently noted and the patient may even be able to localize the lesion by these symptoms, a tumor mass, not often found owing partially to the smaller size of most of these tumors and also to the fact that the sigmoid is deeply situated and not easily palpated (rectal examination will reveal many of these tumors), and roentgen observations. In the differential diagnosis the most common conditions that cause confusion are chronic ulcerative colitis, tuberculous colitis, diverticulitis, appendical abscess and functional diseases of the colon. These are probably best treated for a short time as functional cases, after which a careful reexamination should be made for persistence of the defects.

Journal of Infectious Diseases, Chicago

57: 1 128 (July Aug.) 1935

- Studies on Nature of Bacteriophage I. Extraction of Bacteriophage by Ether J. D. LeMar and J. T. Myers Omaha—p 1
Id. II. Artificial Production of Specific Lytic Agent Which Seems to Behave Like Bacteriophage J. D. LeMar and J. T. Myers Omaha—p 6
Production of Amorphous Extrabacterial Substances in Bacterial Cultures I. Observations with Oerskov's Milk Bacillus L. Dienes Boston—p 12
Id. II. Observations with Various Bacteria Especially with Gram Positive Aerobic Spore Bearing Bacilli L. Dienes Boston—p 22
Goodner's Intradermal Pneumococcal Infection of Rabbits J. A. Kolmer and Anna M. Rule Philadelphia—p 46
The Phases or Types of Haemophilus Pertussis J. A. Toomey Katherine Ranta Lucile Robey and J. E. McClelland Cleveland—p 49
Bacteriostatic Action of Skatole on Gram Negative Enteric Bacilli R. P. Tittler L. A. Sandholzer and E. T. Callahan Rochester, N. Y.—p 57
Simultaneous Immunization with Mixture of Ten Kinds of Laked Blood Edna Delves Chicago—p 61
Bacteriostatic Action of Indole on Gram Negative Enteric Bacilli and on Certain Cocci R. P. Tittler and L. A. Sandholzer Rochester N. Y.—p 64
Preparation and Antigenic Properties of Globins from Hemoglobins of Different Species C. A. Johnson and W. B. Bradley Chicago—p 70
Natural Antibodies in Rabbit and Hereditary Resistance to Infections of Brucella Suis M. R. Irwin and F. N. Bell Madison Wis.—p 74
*Rocky Mountain Spotted Fever: Results of Ten Years Prophylactic Vaccination R. R. Parker Hamilton Mont.—p 78
A Theory of Hapten Action J. H. Lewis Chicago—p 94
Absorption of Bacteriophage by Salmonella P. Levine and A. W. Frisch Madison Wis.—p 104
Behavior of Cholera and El Tor Vibrios Toward the Shwartzman Phenomenon P. Vassiliadis—p 118
*Production of Enterotoxic Substance by Bacteria E. O. Jordan and W. Burrows Chicago—p 121

Rocky Mountain Spotted Fever Vaccine—Parker states that the data from ten years use of the Public Health Service vaccine for the prevention of Rocky Mountain spotted fever justify a broadening of the scope of previously published conclusions with regard to its prophylactic usefulness. The vaccine has definite value. The degree and duration of protection vary with the vaccinated person and with the degree of virulence of an infecting strain of spotted fever virus. The average person vaccinated in the spring retains a considerable degree of immunity during at least the remainder of that year. This degree of immunity is usually sufficient to afford full protection against the relatively mild strains of spotted fever but apparently is progressively less effective as the virus virulence is increased. The degree of protection against the highly fatal type is sufficient to ameliorate markedly the usual very severe course of infection and to ensure the recovery of most persons, the complete protection of occasional persons is not unlikely. Children

are perhaps better protected than adults, and among them full protection against virus strains of high virulence may be more frequent. If a person is infected during the vaccination period, there is a strong probability that the subsequent clinical course of the disease will be affected favorably, even in areas of high case fatality rate. In areas in which relatively mild infections prevail and the incubation period is prolonged, the administration of vaccine as soon as possible after tick bite may ameliorate an impending infection. This appears particularly probable in persons who have been vaccinated in previous years. This procedure is not recommended in areas of highly fatal infections in which the incubation period is short, unless the person has been previously vaccinated. It is probable that a considerable percentage of vaccinated persons carry an uncertain degree of immunity over into the second year, even against highly virulent virus. The degree of this residual immunity appears to be greater in persons who have been vaccinated two or more successive years. The evidence as to whether or not any degree of immunity is carried beyond the second year is less suggestive. Until more definite data are available, however, it is necessary that the vaccination of exposed persons be repeated each year and that three injections of 2 cc, instead of the usual two, be used in areas of high virulence, especially the first year that vaccine is given. Of persons vaccinated and infected the same year, those who have received vaccine two or more successive years appear to have greater resistance than those who have received vaccine only one year.

Production of Enterotoxigenic Substance by Bacteria—Jordan and Burrows found that freshly isolated bacteria of various kinds (staphylococci, streptococci, *Proteus*, *Bacterium coli*, *Bacterium aerogenes*, *Salmonella aertrycke*) when grown under suitable conditions are capable of producing a substance that causes vomiting and other gastro-intestinal symptoms in monkeys. The use of a custard medium or the addition of starch to ordinary medium favors the production of the enterotoxigenic substance. By successive transfers on starch medium the property of producing enterotoxigenic substance was restored to a number of bacterial strains that were originally positive but that had long given negative results. Although the procedures described do not invariably result in the production of toxic filtrates, it has always been possible to restore this property eventually to a given strain by intensive and repeated attempts. Certain bacteria that had never yielded enterotoxigenic filtrates in previous laboratory tests gave positive results after they had been transferred on starch medium.

Maine Medical Journal, Portland

26: 135 150 (Sept.) 1935

- The Tonsil Problem T. A. Foster Portland—p. 139
The Family Doctor and the State Tuberculosis Sanatorium P. Wakefield Fairfield—p. 144

Military Surgeon, Washington, D C

77: 115 176 (Sept.) 1935

- The Early Development of Aviation Medicine in the United States W. H. Wilmer—p. 115
The Present Need for Airplane Ambulances by the United States Army C. L. Beaven—p. 138
Economical and Advantageous Method for Retaining Surgical Dressings A. G. Hulett—p. 146

Missouri State Medical Assn. Journal, St. Louis

32: 387 424 (Oct.) 1935

- The Old and the New in Management of Male Gonorrhea Clinical Review A. L. Stockwell Kansas City—p. 387
Tuberculous Ureitis C. S. O'Brien Iowa City—p. 392
Differential Diagnosis of Imaginary Diseases of Ear, Nose and Throat O. Gilliland Kansas City—p. 394
Hereditary Blindness in Missouri H. D. Lamb St. Louis—p. 398
Radiation Therapy in Treatment of Disease C. E. Virden Kansas City—p. 400
Hydrocephalus (Dura Ureteral Drainage) W. J. Gallagher St. Louis—p. 402
The Changing Practices in Infant Feeding F. C. Neff, Kansas City—p. 406
Physical Factors in Development of Psychoses G. W. Robinson Kansas City—p. 408
Early Diagnosis in Abdominal Diseases F. W. Bailey St. Louis—p. 410
Calcified Pus in Peritonsillar Abscess Report of Case A. I. Meredith Prairie Home—p. 413

Public Health Reports, Washington, D C

50: 1293 1328 (Sept. 20) 1935

- Maternity Nursing Service of Biscouny Health Department Brunswick
Greenville Health Administration Studies Number Five Pearl
McIver—p. 1293

50: 1329 1368 (Sept. 27) 1935

- Blacktongue Preventive Value of Seven Foodstuffs W. H. Sebrell,
G. A. Wheeler and D. J. Hunt—p. 1333

50: 1369 1400 (Oct. 4) 1935

- Dust Storms and Their Possible Effect on Health with Especial
Reference to the Dust Storms in Kansas in 1935 E. G. Brown,
Selma Gottlieb and R. L. Laybourn—p. 1369
Milk Control and the United States Supreme Court J. A. Tobey—
p. 1384

Southern Surgeon, Atlanta, Ga.

4: 297 378 (Oct.) 1935

- Suction Treatment for Undescended Testicles E. G. Ballenger O. F.
Elder and H. P. McDonald Atlanta Ga.—p. 297
Predicting Type of Peritonitis Which Will Develop from Given Case
of Appendicitis A. E. Hertzler Halstead, Kan.—p. 305
Lymphogranuloma Inguinale W. B. Marbury, Washington, D. C.—
p. 312
Lingual Check Valve Observations on Inadequate Treatment of
Asphyxia C. Jackson Philadelphia—p. 323
Management of Incompletely Descended Testis H. Cabot, Rochester
Minn.—p. 331
Endometriosis Clinical Study C. H. Tyrone New Orleans—p. 345
Surgery of Arthritis W. C. Campbell Memphis Tenn.—p. 353

Virginia Medical Monthly, Richmond

62: 361 418 (Oct.) 1935

- Consideration of Certain Less Common Forms of Heart Disease. F. A.
Willius Rochester Minn.—p. 362
*Treatment of Perforated Duodenal Ulcer with Simple Closure and
Jejunostomy A. S. Brinkley Richmond—p. 366
Amaurotic Family Idiocy Three Case Reports G. B. Arnold D. L.
Harrell Jr. and H. L. Riley Jr. Colony—p. 372
Multiple Bladder Stones with Unusual Symptoms Case Report T. B.
Washington Richmond—p. 374
Anal Fissure and Its Nonoperative Treatment M. Silbermann, Boston.
—p. 376
Lymphogranuloma Inguinale. R. F. Simms Richmond—p. 380
Need for Essential Changes in Preparation of Nurses for Service to
Community Ethel M. Smith Craigsville—p. 387

Treatment of Perforated Duodenal Ulcer—Brinkley employed simple closure of the perforation and jejunostomy with drainage of the culdesac in his last five cases of acute perforated duodenal ulcer, in which operation was performed during the last seventeen months. There was one death. The postoperative treatment consists in elevating the head of the bed 12 inches. 500 cc of a 5 per cent solution of dextrose is immediately given intravenously and by the flush method as proctoclysis, and gastric lavage with a warm solution of sodium bicarbonate is given with the duodenal tube from every four to six hours for the first twenty-four hours and continued if necessary. Every four hours 1 cc of digifoline or digitalone is given hypodermically, and one-third grain (0.022 Gm) of a mixture of opium and alkaloids every four to six hours if required. Fluids are withheld by mouth. Feedings every two hours are started through the jejunostomy tube at once. For the first two or three days 2 ounces (60 Gm) of predigested beef in 2 ounces (60 cc.) of warm water is given at one feeding, and 4 ounces (120 cc) of peptonized milk at the next feeding. After this period a more liberal diet is allowed. Water is given between feedings. The drainage tube is removed on the third to the fifth day. Water is allowed by mouth in small quantities on the fifth day, liquids on the eighth to the tenth day. The catheter and sutures are removed on the tenth to the twelfth day and an ulcer diet is started on the fourteenth day. The patient is usually allowed to sit up in bed at the beginning of the third week and is discharged from the hospital during the third or fourth week.

Wisconsin Medical Journal, Madison

34: 701 792 (Oct.) 1935

- What About the Future? R. M. Carter Green Bay—p. 713
Action of Roentgen Rays on Tuberculous Processes A. U. Desjardins
Rochester Minn.—p. 719
Prevention and Treatment of Complications Following Cholecystectomy
J. M. Hayes Minneapolis—p. 731
Pitfalls in Abdominal Surgery V. F. Marshall Appleton—p. 736
Carcinoma of Colon F. A. Stratton Milwaukee—p. 741

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Bristol Medico-Chirurgical Journal

52 143 190 (Autumn) 1935

- Evolution of British Orthopaedics H Rolleston—p 143
- Diseases of Lacrimal Sac A E Iles—p 151
- Treatment of Lacrimal Obstruction G R Scarff—p 159
- Thomas Marryat, M D Memoir A S MacNalty—p 165

British Medical Journal, London

2: 565 608 (Sept. 28) 1935

- Tuberculosis of Kidney in Childhood O L Addison—p 565
- Surgery of the Pancreas H Upcott—p 567
- Radium Treatment of Nevi N S Finzi—p 571
- Incidence of Skin Conditions in Australia H Lawrence—p 572
- *Lymphosarcoma of Stomach Case M A Hameed—p 576
- Strangulation of Traumatic Diaphragmatic Hernia Occurring Nine Months After Original Accident R D B Wright—p 577
- Antemortem Digestion of Esophagus A Lyall—p 578
- Mastoid Radiology W O Lodge—p 579

Lymphosarcoma of Stomach—The symptomatology of the case that Hameed presents did not indicate a new growth of the stomach, as it consisted only of intense anemia, optic neuritis and some wasting of the muscles of the extremities. Whether the neuritis was due to a toxic condition or to an actual infiltration in the spinal cord and its nerves could not be ascertained as permission to remove the spinal cord was withheld. There was leukopenia and some relative increase in lymphocytes. The former condition can be accounted for by aplasia of the bone marrow. Finally, pseudoleukemia of the gastro-intestinal tract is rarely an acute condition and shows no infiltration in organs other than the lymph nodes, while the onset of the condition was somewhat acute and showed infiltration in other organs as well, including the pancreas. Hodgkin's disease was excluded on account of the absence of increased reticular fibers and of large mononuclear and giant cells. Moreover, in Hodgkin's disease enlargement of lymph glands is a common feature, which was not present in the author's case. The hyperchromicity, mitotic division of the cells and extreme degree of cellular infiltration, both in the stomach and in other organs, made the diagnosis of lymphosarcoma quite clear. Metastatic deposits in the liver, the Peyer's patches of the small intestine, the pancreas, kidneys, spleen and medullary cavities of the long bones were interesting features. The fact that the mesenteric and the lymph glands along the greater and smaller curvatures of the stomach were not appreciably enlarged pointed toward the spread of the disease through the blood vessels and not through the lymphatics. The stomach, being the primary organ affected, was infiltrated from the cardia to the pylorus and gave rise to polypoid growths at places.

Clinical Science, London

2 1148 (Sept 30) 1935

- Further Observations on Vessels and Nerves of Rabbit's Ear, with Especial Reference to Effects of Denervation R T Grant with successive collaboration of P D Camp A Graybiel and P Rothschild—p 1
- Reliability of Clearance Tests for Renal Efficiency C L Cope—p 35
- Manner in Which Necrosis Arises in the Fowl's Comb Under Ergot Poisoning T Lewis with collaboration of B Gelfand—p 43
- Observations on Capillary Permeability in Cases of Nephritis and of Hepatic Cirrhosis with Hypoproteinemia F H Smirk—p 57
- *Dietetic Factor Determining Glucose Tolerance and Sensitivity to Insulin of Healthy Men H P Himsworth—p 67
- Diet of Diabetes Prior to Onset of Disease H P Himsworth and E M Marshall—p 95
- *Diet and Increase of Diabetes Mellitus H P Himsworth—p 117

Dietetic Factor Determining Dextrose Tolerance and Sensitivity to Insulin of Healthy Men.—Himsworth describes experiments on healthy human subjects concerning the effect of change in the diet on the dextrose tolerance and the sensitivity to insulin. In healthy subjects the improvement in dextrose tolerance consequent on the change from a low-carbohydrate high fat diet to a high carbohydrate low-fat diet, is not determined by change in the caloric value or ketogenic-antiketogenic ratio, or change in the fat or protein content of the diet, but solely by the amount of carbohydrate in the diet. On the basis of these experiments the author has constructed

a "determination curve of dextrose tolerance" that expresses for healthy subjects the relationship between the change in sugar tolerance and the change in the amount of dietary carbohydrate. The efficiency with which a standard dose of crystalline insulin acts on the blood sugar is determined by the carbohydrate content of the diet so that the greater the amount of carbohydrate in the diet the greater the sensitivity of the organism to insulin. The relationship in healthy subjects between the change in insulin sensitivity and the change in the amount of carbohydrate in the diet can be expressed as a "determination curve of insulin sensitivity." A correlation between the change in dextrose tolerance and the change in insulin sensitivity is such that it can be expressed as a straight line inclined at an angle of 45 degrees to the abscissa. The development of insulin sensitivity is independent of the dose of insulin used as the standard test dose. The quantity of pancreatic insulin brought into action in response to a standard dose of dextrose is constant in amount whatever the degree of tolerance indicated by the blood sugar curve. The change in dextrose tolerance consequent on the change in composition of the diet from a low-carbohydrate high-fat to a high-carbohydrate low-fat diet is completely accounted for by the change in sensitivity of the individual to the insulin secreted by his own pancreas. The bearing of these results on the apparently acute development of diabetes mellitus in man and on the dietetic therapeutics of this disease is discussed.

Diet Prior to Onset of Diabetes—Himsworth and Marshall compared the diet of 143 diabetic patients prior to the onset of their disease with the diet of two comparable groups (137 and 121 persons) of normal subjects. The qualitative method, which by questioning aimed at discovering whether the diet differed from the normal, and the quantitative method in which the subjects, from foodstuffs of known composition, chose a day's intake in food, which was then expressed in terms of carbohydrate, protein and fat, were the methods employed in determining the nature of the diet. Both methods reveal that the majority of diabetic patients, prior to the onset of diabetes, prefer diets containing an excessive proportion of fat, and that a smaller number of these persons than normal subjects prefer diets containing an excessive proportion of carbohydrate foods. The diabetic patients chose diets of greater caloric value and containing larger amounts of carbohydrate, protein and fat. This increased consumption arises possibly from an error inherent in the method used. The difference between the diabetic and normal subjects in the amount of fat consumed is, however, from a statistical point of view, so much greater than the difference in consumption of carbohydrate and protein that significance may be attached to it. The diet of diabetic patients before the onset of the disease, in comparison with the diet of normal subjects, contains the same proportion of protein, a diminished proportion of carbohydrate and an increased proportion of fat. Similar diets impair sugar tolerance and insulin sensitization in nondiabetic subjects, and the ingestion of such a diet by a potentially diabetic individual would favor the appearance of the disease. The habitual ingestion of a diet containing a diminished proportion of carbohydrate may cause progressive permanent impairment of sugar tolerance and insulin sensitivity, so that diabetes mellitus results in the course of time.

Diet and Incidence of Diabetes Mellitus—Himsworth presents data showing the different diets eaten by different races, nations and social classes throughout the world and makes a correlation between dietary preference and the incidence of diabetes mellitus. The incidence rate of diabetes mellitus has been assumed to be reflected by the mortality rate. The available data do not suggest that excessive consumption of sugar and overindulgence in alcohol play a part in the etiology of diabetes mellitus. The data with regard to the total quantity of food eaten show that there is no definite correlation between the rise in the incidence of diabetes and overeating. Prediabetic obesity is an effect of the type of diet eaten. A close correlation exists between the incidence of diabetes mellitus in different races, nations and social classes and the proportionate composition of the diet. A high proportion of carbohydrate and low proportion of fat is found in all cases to be associated with low diabetic incidence, while a low pro-

portion of carbohydrate and a high proportion of fat are associated with a high incidence. The available information suggests that the different diets chosen vary little in calory value. The incidence of diabetes is high when relatively low-carbohydrate diets are taken, and the incidence is low when relatively high-carbohydrate diets are chosen. In view of previous results, the ingestion of a relatively low-carbohydrate diet is the factor determining the onset of diabetes mellitus in individuals with a predisposition to the disease, and, if a high-carbohydrate diet had been taken, a considerable proportion of these persons would not have developed diabetes.

Lancet, London

2 753 810 (Oct 5) 1935

- Treatment of Undescended Testis E D McCrea—p 753
Neurotropic Virus Diseases E W Hurst—p 758
Amnesia Following Head Injuries W R Russell—p 762
Duodenocolic Fistula Simulating Idiopathic Steatorrhea J Mindline and M L Rosenheim—p 764
*Allergic Factor in Etiology of Nonspecific Colitis Dorothy C Hare—p 767

Allergic Factor in Etiology of Nonspecific Colitis—From a study of thirty-eight cases, Hare believes that there is a possibility that allergic factors are of importance in the etiology of nonspecific colitis. Information was sought in these cases with regard to the occurrence of the allergic disorders of asthma, hay fever, spasmodic rhinorrhea, migraine, bilious attacks, urticaria, eczema and epilepsy. Food idiosyncrasies and appetite in childhood were also the subject of inquiry. The incidence of the allergies among the general population was studied by Bruce Pearson (1933), who found that 26 per cent of healthy adults have either a personal or a familial history of allergy. It may therefore be significant that among these colitis patients as many as thirty-two of thirty-eight patients, 85 per cent, gave a personal or family history of allergy. The patients studied were all women and, with two exceptions, were treated as inpatients, the usual methods of investigation and diagnosis were employed, including sigmoidoscopy, roentgenoscopy and stool examinations. The diagnosis of this form of colitis has been based on the appearance of the mucous membrane, which is abnormally granular and congested and bleeds readily on touch. Actual ulceration may or may not be present. The term nonspecific colitis is used to include "ulcerative" and "hemorrhagic" colitis but not "mucocomembranous" colitis. Roentgen examination may show little change in the early cases and diagnostic appearances in later conditions. The stools contain blood and mucus during some part of the attack.

Tubercle, London

16 433-480 (July) 1935

- Prevention of Tuberculosis in Childhood by Methods of Separation G G Kayne—p 433
Series of Eighty-Four Cases of Pulmonary Tuberculosis in Children Aged up to Fifteen Years J R Beal—p 452
Exhibiting Liebermeister's Syndrome Following on Air Filling of Left Pleural Cavity Case A W Smith—p 454
Relation of Allergy to Immunity F M Pottenger—p 458

17 1-48 (Oct.) 1935

- Condition of Lung After Hemoptysis O Orszagh—p 1
*Squamous Carcinoma of Lung Occurring in Asbestosis Two Cases S R Gloyne—p 5
Prevention of Tuberculosis in Childhood by Methods of Separation G G Kayne—p 10
*Massive Tuberculosis of Tonsils Case B Hudson and F L Wollaston—p 30
Clinical Value of Chest Radiogram K Dunham—p 33

Squamous Carcinoma of Lung in Asbestosis—Gloyne reports two cases of squamous carcinoma of the lung. One patient survived nine years after an exposure of eight years to asbestos dust as a spinner, the other lived for fifteen years after exposures of six months and thirteen months. In both cases the occupational history went back to the war years, the malignant lesions were very small and were not recognized during life. The carcinomas appeared to arise in the wall of a small bronchus and to grow into and extend along the lumen. Serial sections suggested that the growths were a continuous prolongation rather than a series of isolated units, though it was not possible to indicate a definite starting point. These prolongations were hollow in places, showing a degenerating layer of cells round a central empty space and an external ring of keratinized squamous cells. The growths

were in a portion of lung in which the asbestosis was fairly advanced. The advancing prolongations of the neoplasms insinuated themselves between the collagenous fibers of the pneumoconiosis. Death had occurred before the tumor had attained a size capable of affecting vital parts. Secondary deposits or even extension to mediastinal glands had not occurred. Pigment, asbestos fibers and asbestosis bodies were pushed aside by the advancing growth. The true squamous nature of the tumor was evident from the presence of prickly cells, keratinization and cell nests. The asbestosis, though fairly advanced, was not sufficiently advanced to cause death. A small meningeal hemorrhage terminated life in the first case. Compared with the squamous carcinoma of the lung in general, as it reaches the postmortem room, the growths were unusually small. The author makes the suggestion that in asbestosis a small tumor turns the scale, just as bronchitis with early bronchopneumonia will do, probably as a result of toxemia. He has observed a similar occurrence in a case of oat cell carcinoma with asbestosis.

Massive Tuberculosis of Tonsils—Hudson and Wollaston cite a case of tuberculosis of the tonsils in which, in view of the history of frequent attacks of tonsillitis during the last two years with enlargement of the glands each lasting about a fortnight, and the microscopic appearance of the tonsils, it seems possible that the tonsils were the primary lesion and that the lung became infected from them during attacks of bronchitis. From the rapidity with which the disease spread in the lung there can have been very little resistance to tuberculosis, such as would have been the case if the present infection was a reactivation of an old childhood focus in the tracheal glands. At present there are no signs of infection anywhere else, and now that the tonsils have been removed and the diseased lung is collapsed successfully the prognosis should be fairly good, though sudden activity of the miliary type of tuberculosis or a meningitis is always a possibility.

Japanese Journal of Experimental Medicine, Tokyo

13 357-590 (Aug 10) 1935

- Some Influences of Rapid Change of Temperature on Living Organism
I Influence on Protein Metabolism A Kashiwazaki—p 357
Id II Influence on Residual Nitrogen in Blood. A Kashiwazaki—p 401
Id III Influence on Blood Picture A Kashiwazaki—p 419
Studies on Mitochondria and Metachondria on Golgi's Apparatus and on Silver Granules of Lieberkuhn's Gland Cells of Intestine of White Rat. Y Sawada—p 441
Clinical and Experimental Studies on Hookworm Infection. M. Yamashita—p 457
Influence of Muscular Exercise on Blood Sugar Content and Few Other Changes in Animals Kept on Different Kinds of Diet E. Takeda—p 471
Influence of Muscular Exercise on Blood Figure of Experimental Animals Kept on Different Kinds of Diet E. Takeda—p 511
Influence of Muscular Exercise on Blood Fat Content of Dogs Kept on Different Kinds of Diet. E. Takeda—p 521
Influence of Muscular Exercise on Residual Nitrogen Content of Blood on Animals Kept on Different Kinds of Diet E. Takeda—p 529
Influence of Muscular Exercise on Carbon Dioxide Combining Capacity of Blood Plasma of Animals Kept on Different Kinds of Diet. E. Takeda—p 535
Studies on Experimental Chagas Disease S. Niumi—p 543
Size of Typhoid and Dysentery Bacteriophages Estimated by Gradocol Membrane of Elford H. Yaoi and K. Sato—p 565
*Experimental Study on Virus of Measles T. Taniguchi M. Hosokawa S. Kuga and K. Terada—p 577

Experimental Study on Virus of Measles—Taniguchi and his co-workers isolated five strains of a kind of virus by serial intratesticular inoculations into rabbits with nasopharyngeal washings or blood from patients having measles. Three strains were examined immunologically and are proved to be identical. They are clearly distinguished from the viruses of vaccinia, varicella, herpes simplex, pemphigus and encephalitis from the immunologic standpoint. The virus is also differentiated from the virus III. A specific virulicidin against this virus is contained in the convalescent serum of measles. When susceptible persons are inoculated with this virus, typical measles supervenes. The elementary body that is assumed to be the virus of this experimental measles is demonstrated. The authors therefore conclude that the virus which they conveyed to the rabbit was most probably that of measles, and that the elementary body encountered must have been the virus of measles.

Presse Médicale, Paris

43 1425 1448 (Sept. 14) 1935

Anatomopathologic Study of Mediterranean Exanthematic Fever J Piéri and M Mosinger—p 1425

*Existence of Tuberculous Ultravirus H Plotz—p 1428

Survival of Dog Having Complete Pancreatic Fistula J Bottin—p 1430

Tuberculous Ultravirus—Plotz calls attention to the fact that the term ultravirus is a misnomer when coupled with "tuberculous," since its properties are not comparable to those of the true ultravirus. For example, a lasting immunity usually succeeds infection with the latter, they are filtrable, invisible, and can be cultivated only in the presence of living cells. The "tuberculous ultravirus," however, is active only in high doses and it does not regularly produce disease, specific lesions or immunity. The filtrates are not always active and cannot be cultivated in the presence of living cells. There are, moreover, numerous evidences that the tubercle bacillus can pass through the filters. It thus becomes unnecessary to postulate a filtrable form and, in the author's opinion, no convincing experimental proof of this form has yet been advanced.

43 1473 1488 (Sept. 21) 1935

Repeated Thoracoplasties P Dreyfus le Foyer—p 1473

Solution to Physiologic Problem of High Altitudes Aerial Diving Apparatus M Rosenstiel—p 1476

*Why Is Tuberculous Infection Allergizing and not Vaccinating? R Pons—p 1477

Allergy and Immunity in Tuberculosis—Pons discusses the factors determining the primarily allergic nature of tuberculosis. The virulent diseases which liberate most protein are the more immunizing, those liberating less protein are the more sensitizing or allergizing. The latter condition is largely fulfilled by tuberculous infection. The proteins of Koch's bacillus are without invasive powers in the well organism, and experience has shown that they are good anaphylactic and poor immunizing reactors. More than any other disease, tuberculous infection provides the conditions necessary for good sensitization: discrete infection, local growth of the organism which does not favor resorption of the microbial proteins, organism poor in proteins, and, contrary to most other infections, long in vivo life of the bacillus.

Archivio Italiano di Chirurgia, Bologna

40 649 756 (July) 1935 Partial Index

Diagnosis and Treatment of Peptic Ulcer Perforated into Free Peritoneum G Pototschnig—p 649

Bullet Retained in Brain (Occipital Lobe) Case A Violato—p 673

*Carcinoid of Stomach Case V Pettinari—p 695

*Behavior of Epinephrine in Blood After Operation Determination by Viale's Reaction M Teppati—p 709

Conservative Operation for Controlling Postoperative Renal Hemorrhage A Slaviero—p 727

Carcinoid of Stomach—Pettinari's is the sixth case of gastric carcinoid reported in the literature and the first in which operation was performed and histologic study of the tumor made. The tumor was at the pyloric region, giving a picture of pyloric obstruction. The patient, aged 47, was discharged in a satisfactory condition two weeks after a gastroduodenal resection. The tumor proved to be seated either in the thickness of the gastric wall or under the mucous membrane, which was not involved in the process. It was made up of polymorphic epithelial cells and of some argentophil cells similar to those that exist in intestinal carcinoid. Gastric carcinoid is small, is of slow evolution and does not produce general disturbances except of a mechanical nature due to its localization as happened in the author's case. The histogenic theory that attributes the origin of intestinal carcinoid to a proliferation of embryonic remains of aberrant epithelium seems plausible in explaining the origin of gastric carcinoid in which aberrant epithelial cells probably existed in the thickness of the gastric walls.

Behavior of Epinephrine in Blood After Operation.—Teppati studied the behavior of Viale's reaction for the determination of epinephrine in the blood, in forty-four patients after several operations. The withdrawal of blood for the determi-

nation was made before the operation, shortly after it and then six, twelve and twenty-four hours later. The following changes were observed: increase of epinephrine in the blood of patients in whom the operation was performed with ether anesthesia, and transient decrease, followed by increase, in the blood of those in whom the operation was performed with spinal anesthesia (hydrochloride of benzoyldimethylaminomethylpropanol—procaine hydrochloride). It did not change in patients who were given local anesthesia. All but one of the patients in the group recovered. The patient who died had a gastroentero-anastomosis performed with ether anesthesia and had hypo-epinephrinemia for the four days during which she survived the operation.

Semana Médica, Buenos Aires

42 897 968 (Sept. 26) 1935 Partial Index

Heine-Medin's Disease A. M. Marque—p 897

*New Chromatic Reaction for Hexoses and Their Polymeric Compounds Its Application to Colorimetric Determinations of Dextrose in Blood J A Sánchez—p 914

New Conceptions on Anatomy and Symptomatology of Coronary Territories Clinical Importance G Bosco—p 919

Multiple Osteogenic Exostoses Cases I G Moreno R. E. Millán and A. Dumm—p 924

Chromatic Reaction for Hexoses—Sánchez discovered a new colorimetric microreaction that is specific for the hexoses and their polymeric compounds, especially dextrose. It consists in producing a pink color in a mixture made up by adding 5 cc of a 1:5,000 hexose solution to 15 cc of concentrated sulfuric acid. The color appears during the reaction, becomes intensified a few minutes later and persists for several days. The determination of dextrose in the blood is done by comparing the color of the blood serum contained in the "problem tube" with that of the solution of dextrose contained in each of five tubes, numbered from 1 to 5, which form the colorimetric scale. The problem tube and those of the colorimetric scale are of the same caliber. Each of the latter contains a mixture made up of 5 cc of a homogenized solution in 15 cc of concentrated sulfuric acid, placed in the water bath at 100 C for five minutes and then cooled. However, while the solution in the "problem tube" contains 0.5 cc of the blood serum (previously deprived of its albumin and diluted in the proportion of 0.5 cc of serum to 4.5 cc of distilled water), that in the tubes of the scale contains 0.1, 0.2, 0.3, 0.4 and 0.5 cc, respectively, of a 1:1,000 solution of dextrose and 1 cc of blood serum (previously deprived of its dextrose by heating the whole blood from which it was taken at 37 C for twenty-four hours, and then of its albumin). The colors in the tubes of the scale, from 1 to 5, represent 0.2, 0.4, 0.6, 0.8 and 1 Gm of dextrose per thousand cubic centimeters of blood. The author performed the reaction on blood serum taken from whole blood heated at 37 C for twenty-four hours, and from blood deprived of fibrin and globules and then heated. He found that while whole blood loses its dextrose in less than twenty-four hours by glycolysis, the blood serum that was heated by itself, without fibrin or globules, retains dextrose for several days. This was proved by the results of the test, which were negative in the former and positive in the latter. The intensity of the color in the second case did not change for several days. The author believes that his results confirm those reported by Lepine and Siebert, according to whom diastases and enzymes of a glycolytic nature exist in the fibrin and globules of the blood, but not in the blood serum.

Beiträge zur klinischen Chirurgie, Berlin

162 177 336 (Sept. 14) 1935 Partial Index

Ether Concentration in Blood of Human Subjects in Course of Anesthesia and Its Significance for Determination of Alcohol Content of Blood J Koller—p 177

Nailing in Operative Treatment of Fracture of Head of Humerus O Voss—p 190

*Treatment of Postoperative Intestinal Paralysis G Loewe and J Herbrand—p 201

Vitamin D and Callus Formation J Marx—p 213

Transfusion of Noncoagulable Blood A. Christ—p 268

Treatment of Postoperative Intestinal Paralysis—Loewe and Herbrand show that the intestinal peristalsis is regulated by nervous and hormone actions. In discussing the

treatment they point out that the great number of suggested remedies indicates the absence of an entirely satisfactory one. In view of this fact they resorted to treatment with a posterior pituitary preparation that influences the vascular system and the intestine. They report a number of cases in which they used this preparation with good success. Strictly individualized dosage stimulated the peristalsis and the intestinal evacuation even in the severest cases of intestinal atony, without causing circulatory disturbances or impairing the general condition. The clinical observations on the efficacy of the pituitary preparation were corroborated by roentgenologic studies. In serial roentgenologic examinations it was observed that, a few minutes after the injection of smallest amounts, the peristalsis increased and reached its maximum after from ten to fifteen minutes. The authors reach the conclusion that this posterior pituitary preparation is an excellent remedy for the stimulation of the disturbed peristalsis.

Klinische Wochenschrift, Berlin

14 1449 1488 (Oct. 12) 1935 Partial Index

- Glycolysis Under Influence of Deuterium Oxide W. Brandt—p. 1453
- *Blood Serum Blood Protein Bodies and Vitamin C E. Schneider and E. Widmann—p. 1454
- *Occurrence of Basophilic Cell Infiltration in Neurohypophysis in Hypertensive Conditions C. G. Ahlstrom—p. 1456
- Treatment of Allergy in Bronchial Asthma L. Hofbauer—p. 1467
- Determination of Blood Diastase for Recognition of Pancreatic Diseases L. Bogendorfer, H. Kramer and W. Pape—p. 1469
- *Treatment of Colitis Gravis with Cevitamic Acid G. Hetényi—p. 1470

Administration of Vitamin C—Schneider and Widmann describe clinical observations and animal experiments on the basis of which they reach the following conclusions: 1. The therapeutic administration of vitamin C produces, although not regularly, a decrease in the globulin content and an increase in the albumin content of the blood, accompanied by a reduction in the sedimentation speed of the erythrocytes. 2. The vitamin C content of the blood seems to be higher in young persons than in older ones. Studies on the serum do not definitely indicate the presence of a hypovitaminosis. 3. The simultaneous administration of thyrotropic hormone of the pituitary and of vitamin C increases the size and weight of the adrenals, which is due to an increase not in the cortex but in the medullary substance.

Basophilic Cell Infiltration in Neurohypophysis in Hypertensive Conditions—Ahlstrom points out that Cushing observed in eclampsia, essential hypertension, arteriosclerosis and basophil adenomas of the anterior hypophysis a more or less severe invasion of basophilic cells in the neurohypophysis, an invasion that originated in the intermediate lobe and extended into the tissues of the posterior lobe. On the basis of these observations Cushing advanced the theory that this infiltration is the morphologic manifestation of an increased secretion of vasopressive hormones of the posterior hypophysis and that the hormones of the posterior hypophysis are formed in the intermediate lobe and from there are passed into the neurohypophysis, the basophilic cell infiltration would be an increased function of the intermediate part and a manifestation of a neurohypophyseal activation. The author emphasizes that Cushing admits that this interpretation is still only a hypothesis. The author studied this problem on thirty-six patients without hypertension and on twenty-five patients with hypertension. He observed that eighteen of the thirty-six patients without hypertension, that is, 50 per cent, had a basophilic cell infiltration in the neurohypophysis and that the infiltration was quite severe in eight cases (22 per cent). He concludes from this that a basophilic cell invasion may exist in the absence of hypertension. Of the twenty-five patients with hypertension twenty-four or 96 per cent, had a basophilic cell infiltration, but it could be considered rather severe in only fifteen cases, or 60 per cent, and it was really severe in only six cases. The author concludes that the interpretation of the basophilic cell invasion is still obscure, for although the studies on this material corroborated Cushing's claim of an increased neurohypophyseal basophilia in hypertensive conditions they indi-

cated also that considerable basophilic invasion may exist in patients without hypertension and that in patients with hypertension the basophilic invasion may be only slight.

Cevitamic Acid in Treatment of Colitis—Hetényi says that two factors induced him to resort to cevitamic acid in the treatment of severe colitis, namely, the hemostatic effect of cevitamic acid and the observation that the diet of patients with this disease frequently has been deficient in vitamin C. He employed the treatment in seven cases. The patients were given at first daily and later every second day an intravenous injection of 150 mg of cevitamic acid. The author reports the clinical histories of two patients in whom the cevitamic acid proved especially helpful and states that in four other cases the results were likewise good, although not quite as favorable as in the two others. In one case the treatment was ineffective.

Medizinische Klinik, Berlin

31 1321 1352 (Oct. 11) 1935 Partial Index

- Causes of Sudden Death in Operative Interventions That as Such Are Without Danger A. M. Marx—p. 1327
- *Aminopyrine in Treatment of Residual Hematuria After Nephritis. K. Hitzberger—p. 1331
- Pelvic Kidney H. Weingarten—p. 1332
- *Case of Superfetation L. Süssi—p. 1334
- *Diuretic Action of Smoking of Tobacco A. Wenusch and R. Schöller—p. 1336

Aminopyrine in Treatment of Residual Hematuria—Hitzberger says that, since Eppinger and his collaborators demonstrated that aminopyrine reduces the permeability of the membranes, he decided to use it in the treatment of post-nephritic hematuria, reasoning that the usual explanation of the etiology of this form of hematuria makes this action of aminopyrine seem desirable. It is generally believed that the glomerular capillaries become impaired by a deficiency in blood perfusion and that, when the blood returns, some erythrocytes pass the capillary membrane and enter the urine. The author describes the clinical histories of six patients with postnephritic hematuria, in whom medication with aminopyrine (from 1.5 to 3 Gm daily) either reduced the hematuria considerably or counteracted it entirely.

Case of Superfetation—Süssi points out that the question of the possibility of superfetation has been frequently the subject of discussions. After citing the opinions of Galen, Hippocrates, Aristotle and Pliny, he shows that, on the basis of present-day knowledge, the possibility of a superfetation depends on the possibility of an ovulation during pregnancy, and recent biologic experiments have proved this possibility. To be sure there still remains the question of nidation. After discussing the various factors that enter into the problem of nidation during an existing pregnancy, the author reports a case that he considers a true superfetation. A primipara, aged 32, gave birth to a full-term boy and twenty minutes later to a living female fetus of about the sixth fetal month. The woman stated that she had had only two cohabitations, the first about twenty days after the last menstruation and the second approximately five months before delivery. There was a great difference in the sizes and in the weights of the fetuses, the ratio being about 7:1, and there was also a considerable difference in the two placentas. As further proof that this was not an ordinary twin birth, the author cites the great differences in the roentgenologic aspects of the two fetuses. He reaches the conclusion that this was a true case of superfetation.

Diuretic Action of Smoking—Wenusch and Schöller describe tests on the diuretic action of the smoking of tobacco. Careful attention was paid to all factors that might influence the diuresis. The persons subjected to these tests were given for several days the same amount and the same types of food and drink, and their mode of living was likewise made uniform during the test period. Moreover, the body temperature, the respiratory and pulse frequencies and the blood pressure were carefully controlled. The first tabular report indicates that a considerable diuresis is produced by smoking in persons who are not accustomed to smoking. The second table reveals that in persons who are strongly addicted to smoking, although a

diuretic action is noticeable, it is not as pronounced as in persons who do not smoke at all or who smoke only occasionally. The third table shows that an incipient diuresis turns into the opposite as soon as signs of nicotine intoxication appear. The authors think that the knowledge gained in these tests may attain practical importance if, for instance, persons who are strongly addicted to smoking are suddenly compelled to stop it, as in case of an operation. They think that in these cases the abolishment of this diuretic component should be given consideration and, if necessary, should be compensated by medication.

Wiener Archiv für innere Medizin, Vienna

37 319-478 (Sept 20) 1935 Partial Index

- *Osteitis Fibrosa Cystica of Parathyroid Origin. Considerable Improvement Following Ovariectomy. C. J. Parhon and Tomorug—p. 327
- Cardiac Echinococcus. Case T. Sağlam—p. 347
- *Roentgen Treatment of Patients with Lymphogranulomatosis (Hodgkin's Disease). G. Schwarz—p. 353
- Prognosis of Hypertension on Basis of Vascular Changes in Fundus Oculi. J. Brana and P. Radnai—p. 371
- Clinical Aspects of Aortitis in Late Syphilitic Disturbances of Central Nervous System. L. Lazarovits—p. 385

Ovariectomy in Osteitis Fibrosa Cystica of Parathyroid Origin.—Parhon and Tomorug report the case of a woman, aged 30, whose bones fractured readily and were extremely flexible. There was slow consolidation of the bones after the fractures. Roentgenoscopy disclosed calcium deficiency of the hip joint, whereas the examination of the blood revealed increased calcium content. The condition was diagnosed as osteitis fibrosa cystica, or, on the basis of Lievre's terminology, as parathyroid osteosis. The patient was given calcium, epinephrine and ultraviolet irradiations, and after that the consolidation of the fractured bones was somewhat better. Later the patient consented to a bilateral ovariectomy, which had been suggested to her previously. One of the ovaries was found to be twice the size of a normal ovary. After this intervention the patient felt at first extremely weak, but later the condition of the vertebral column did not become further exacerbated, the patient felt better and suffered no more fractures, and her movements were considerably freer. Roentgenoscopy of the bones of the arms disclosed deformities of the diaphyses and swellings at the ends. At these sites the normal structure of the bones was replaced by cystic formations. The epiphyses of these bones were thickened and less dense. The same change was present also on the upper end of the femur. Roentgenoscopy of the skull disclosed considerable thickening of the temporal and frontal bones, thinning of the walls of the sella turcica and a lengthening and deepening of the sella. Examination of the parietal bones revealed nodules, the center of which had increased calcium content. The authors are convinced that this is a case of osteitis fibrosa cystica of parathyroid origin. Although they do not recommend ovariectomy for all women with this disorder, they emphasize that in this case ovariectomy resulted in a considerable improvement. They stress that the parathyroids are not the only glands that are involved in the calcium metabolism and think that the ovaries, the thyroid, the hypophysis, the adrenals and perhaps still other organs play a part. They think that the ovaries might play a part in the decalcification of the bones and in the elimination of the calcium from the organism. This would explain the renewed calcium deposit following their removal. The calcium content of the blood was reduced following the castration.

Roentgen Treatment of Patients with Hodgkin's Disease.—Schwarz emphasizes that there are two procedures to be avoided in the roentgen therapy of Hodgkin's disease, namely, the application of a large single dose to a circumscribed field and total irradiation with a large dose. In discussing how roentgen therapy of Hodgkin's disease should be done the author gives the following general rules: 1. Each focus should be irradiated. 2. Irradiation should be done in the fractional manner at one or two day intervals. 3. The sizes of the fields should not exceed 800 sq. cm., that is, they should be about 24 by 30, 18 by 40 and so on. 4. The focal doses should be 50, 80 or at the most 100 roentgens, which

implies that the surface doses should not exceed 250 roentgens. 5. The tolerance of the skin, the status of the blood and the general reaction (nausea, fever) should be watched. 6. The patient should be kept under constant control for the appearance of new foci. The author illustrates with case histories that the ray sensitivity of lymphogranulomatous formations differs greatly. He says that he saw a mediastinal tumor disappear shortly after the fractional application of a total focal dose of 600 roentgens, whereas in other cases mediastinal tumors required total focal doses of 2,000 roentgens. The heart of the patient should as much as possible be excluded from the irradiation. The difference in ray sensitivity and other factors indicate that the roentgen treatment of Hodgkin's disease cannot be done according to rigid rules, but that individualization is necessary. The treatment must take account not only of the course of the disease, that is, whether it is acute, subacute or chronic, but also of the localization of the glandular swellings. The severity of the roentgen intoxication differs greatly in the individual patients. However, it has been found that intravenous as well as oral liver therapy reduces the severity of the symptoms of intoxication. It is further pointed out that, if the foci of lymphogranulomatosis become "refractory" in the course of prolonged roentgen treatment, the torpidity can be counteracted by the intravenous administration of thorium X. This radioactive substance emits alpha rays. Since it is well known that one type of rays sensitizes to another type, the combined administration of roentgen rays and of radioactive thorium seems advisable in some cases. In the conclusion the author points out that there are two factors which are especially detrimental to patients with Hodgkin's disease: pregnancy and the climate at high altitudes. Since these factors are likely to cause rapid progress of the disease or the generalization of the formerly localized process, they must be avoided in patients with Hodgkin's disease.

Wiener klinische Wochenschrift, Vienna

48: 1231-1278 (Oct 11) 1935 Partial Index

- *Cause of Death in Intestinal Occlusion. F. Starlinger and R. Scholl—p. 1232
- Lymphoma of Prostate. C. Wegelin—p. 1236
- Adjustable Spinal Anesthesia According to Kirschner. L. Stecher—p. 1238
- *Blood Transfusion During Childhood and Behavior of Erythrocytes and of Hemoglobin Value Following Transfusion. W. P. Schaffer—p. 1265

Cause of Death in Intestinal Occlusion.—Starlinger and Scholl state that observations on more than 250 necroscopically corroborated cases of intestinal occlusion indicate that peritonitis is the cause of most fatalities in intestinal occlusion, pneumonia and circulatory failure being the other chief causes. In the last analysis, even the fatal outcome of peritonitis is really a circulatory collapse. They show that uncomplicated intestinal occlusion, which as yet has caused neither peritonitis nor destruction of the intestinal wall, is accompanied by a severe disturbance in the intermediate and sodium chloride metabolism, which in turn are partly the result of a severe hepatic impairment and lead to severe dehydration of the tissues. Thus there develops an inspissation of the blood, a capillary stasis, a continuous decrease in the amount of the circulating blood and a failure of the so-called venopressor mechanism, which plays an important part in the maintenance of the circulation. Following a description of observations on dogs, the authors conclude that the failure of the circulation is the chief cause of death in intestinal occlusion. In accordance with this knowledge they advise early surgical treatment, which should aim at the smallest possible intervention. Moreover, attempts should be made to counteract the metabolic disturbances, to promote the hepatic function and to support the circulation. They advise that sodium chloride be administered in the form of hypertonic solutions, 5 per cent solutions of dextrose together with small quantities of insulin and blood transfusions. If peritonitis has already developed, peritonitis serum should be administered. To stimulate diaphragmatic respiration and the circulation, carbon dioxide should be given in carefully adjusted doses. As soon as the intestinal obstruction has been counteracted peristalsis should be stimulated.

Blood Transfusion During Childhood—Schäffer points out that the indications for blood transfusion become steadily more numerous. He says that until three years ago his clinic employed chiefly citrated blood, but since then native blood has been transfused by means of Lampert's amber apparatus. He considers from 10 to 12 cc of blood per kilogram of weight the minimum to be given in children and says that this quantity can be increased up to 30 cc. and, in exceptional cases, even up to 40 cc. The author considers the various forms of anemia the chief indication for blood transfusions. In blood tests performed in children with anemia, he found that the erythrocytes and the hemoglobin content showed a considerable increase immediately after the transfusion. This high level was maintained for from two to three days, but after that there was a decrease, particularly in the number of erythrocytes. Between the twelfth and eighteenth days the erythrocytes sometimes reached the pretransfusion values, but after that there was again an increase, which continued for several weeks and at the end of which the values were like those immediately after the transfusion or even higher. Nurshings were an exception to this rule in that this process took a more rapid course. In septic conditions the erythrocytes showed a different behavior from that in anemia, but when the transfusion was done early there was a favorable influence on the disease process. The results of blood transfusions were not satisfactory in tuberculosis of the bones. The author cites four cases in which citrated blood was used and in which complications developed. However, although no complications arose in the large number of cases in which native blood was given, the author thinks that the complications cannot be entirely ascribed to the citrated blood.

Zeitschrift für klinische Medizin, Berlin

128: 455-604 (Sept. 12) 1935 Partial Index

- Cardiac Disturbances in Case of Pulmonary Embolism D. Scherf and E. Schonbrunner—p. 455
Changes in Number of Erythrocytes in Hepatic Diseases H. Kent and T. Rubel—p. 472
*Splenectomy in Treatment of Varicose Hemorrhages During Cirrhosis of Liver E. Mandel and G. Marcus—p. 504
Problem of Transfer of Bacteria from Blood Stream into Lymph H. Kunz and H. Popper—p. 568
Treatment of Meningitides with Derivatives of Pyrazolon E. Risak.—p. 583

Splenectomy in Treatment of Varicose Hemorrhages in Cirrhosis of Liver—Mandel and Marcus point out that hemorrhages from varices in the stomach and esophagus, which develop after circulatory disturbances in the region of the portal vein, have been treated with extirpation of the spleen. Such varices develop in circumscribed and in general stasis. They represent the collateral channels of the portal vein. Thus they are always present in cases of thrombosis of the splenic vein and consequently this disturbance is characterized by severe gastro-intestinal hemorrhages. The literature reports a number of cases of thrombosis of the splenic vein in which splenectomy was done with good results. Splenectomy has been recommended also for the varices that develop in the course of cirrhosis of the liver. If it is assumed that the development of varices in cirrhosis of the liver is at least partly caused by the chronic generalized stasis of the portal vein it seems natural to assume that an eventual favorable effect of splenectomy is to be found in hemodynamic factors like those that exist in thrombosis of the splenic vein, that is, in a localized stasis. However, an influence on the varices of the stomach and of the esophagus is conceivable only if there exist connections between the splenic vein and the varices of the esophagus and stomach. For this reason the authors decided to study the anatomy of this venous region. After mentioning the connections that normally exist between the esophageal veins and the splenic vein, they point out that these anastomoses, which normally are extremely fine, become dilated and tortuous when they become collaterals in case of cirrhosis. They describe their observations in four cases of cirrhosis of the liver. Then they point out that, in addition to the clarification of the anatomic conditions, the direction of the blood currents in this venous region is important. They are convinced that the cur-

rents in this region are dependent on many different pressure fluctuations, the more so since the branches of the portal vein are without valves. If the flow through the liver is inhibited by a cirrhotic process, the splenic blood passes through the collateral channels in the region of the stomach and the esophagus. Thus, if splenectomy is done, a large portion of the blood that passes through the varices is eliminated, and the veins of the mucous membrane are relieved of some of their load. Moreover, it is possible that the removal of the spleen changes the pressure conditions in the splenic vein and its collaterals in such a manner that blood from gastro-intestinal veins, which normally would enter the portal vein, passes by way of the stump of the lienal vein and its anastomoses into the region of the cava inferior. The authors were able to demonstrate such connections in all cases. Theoretical reasoning permits the conclusion that splenectomy reduces the load of the varices and thus also the danger of hemorrhage.

Sovetskaya Vrachebnaya Gazeta, Leningrad

Aug. 30 (No. 16) pp. 1241-1320 1935 Partial Index

- Pathogenesis of Gastritides and Their Relation to Various Body Systems. M. P. Konchalovskiy V. N. Smotrov and Kh. Kh. Vladov—p. 1241
Symptoms of Gastritides P. A. Lurya—p. 1256
*Roentgen Diagnosis of Chronic Gastritis S. A. Reinberg—p. 1267
Diagnostic Errors in Diseases of Organs of Nutrition Role of Roentgen Study in Some O. O. Den—p. 1277
Gastric Duodenal Ulcer in Children A. Ya. Dukhanov—p. 1289

Roentgen Diagnosis of Chronic Gastritis—To bring out the mucosa in the stomach, Reinberg advises introduction of small amounts of a thin watery suspension of barium sulfate. It does not provoke secretion of gastric juice. He advises emptying of the stomach just before the examination. Manual palpation of the stomach assists in the distribution of the contrast material. Fluoroscopy is to be followed by the taking of serial films. The roentgen diagnosis of chronic gastritis lags far behind the excellent results obtained with the roentgen diagnosis of gastric and duodenal ulceration and tumors of the stomach. Chronic gastritis is not a definite clinical picture but a symptom complex. Gastrosopic or gastrophotographic control of roentgen diagnosis of chronic gastritis reveals a percentage of correct diagnoses between 20 and 50 per cent, as given by various authors. The borderline between the normal and the pathologic appearance of the gastric mucosa has not been clearly determined. The hypertrophic form of gastritis is more readily demonstrable than the atrophic. The increase in the caliber of the folds is of significance only when the furrows between them are widened. This is accompanied by a diminution in the number of the folds so that instead of four or five, there may be two or three thick prominent ridges. Atrophic gastritis, on the contrary, is made manifest by the formation of a delicate relief with a decrease in the height and width of the folds and an increase in the width of the furrows. Particularly valuable for the diagnosis is the rigidity of the folds on palpation as contrasted with the elastic "autoplastic" behavior of the normal gastric mucosa. The persistence of these signs on a repeated roentgenologic examination has a determining value in arriving at the diagnosis of chronic gastritis. High grade edema of the mucosa and the submucosa is readily visualized in the film. Elevation of the mucous membrane, the size of a pea, is likewise recognizable in the film. In the author's experience, gastro-enterostomy is regularly followed by a chronic gastritis, which appears soon after the operation and may persist for years. The notion that hypertrophic gastritis is accompanied by hypersecretion and hyperacidity, while the atrophic form is accompanied by hyposecretion and hypo-acidity, is not correct. It appears that changes in the secretory function are not determined by the anatomic picture. Pyloric gastritis and diffuse gastritis are, as a rule, associated with a duodenitis and, not infrequently, with an enteritis of the adjacent small intestine. The author concludes that the roentgenologic diagnosis of chronic gastritis is a harmless, physiologic, practical method, the principal fault of which lies in its inability to recognize all the cases of gastritis. The common error is to include normal appearances among the pathologic.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 105, No 23

CHICAGO, ILLINOIS

DECEMBER 7, 1935

MODERN CONCEPTS OF ROENTGEN THERAPY IN CANCER

W EDWARD CHAMBERLAIN, MD
PHILADELPHIA

Roentgen discovered the α -rays in November 1895.¹ The news reached the world of science and medicine in January 1896. In an incredibly short time physicians all over the world, oblivious to the possible biologic effects of the new ray, were using it in diagnosis. It soon became apparent that the penetration of the rays through living tissue was not without harmful potentialities and biologic effects.

Haphazard attempts to use the α -rays therapeutically in 1896-1897 were of little significance and were but gropings in the dark. The earliest announcements (1897-1898) of proved therapeutic value, based on scientific observation, concerned diseases of the skin. Applications to malignant disease probably date from the reports of Sjogren,² Stenbeck,³ and Pusey.⁴

The development of roentgen therapy to its present state of relative enlightenment has been immeasurably aided by the excellent work of physicists and engineers. They have made advances technically possible. Nevertheless it must be pointed out that the greatest barriers that have been surmounted have been in the strictly biologic field. This is important, for there has been, from the very beginning, an unfortunate tendency to treat each purely technical advance as of inherent value to the cancer patient. Every time a new tube stand or a slimmer control panel comes from the apparatus manufacturer, some one is sure to acclaim it as of fundamental worth. Yet there has never been a period in the history of roentgen therapy when the potentialities actually at hand were used with complete intelligence and thorough application of all proved facts. It is necessary to stress this point in order to review intelligently the history of this therapeutic modality. Had the roentgen therapist of 1910-1918 made full use of available knowledge, the mistaken ideas of 1918-1924 would not have had their vogue. Today, as one reads the sometimes unconservative accounts of treatment with α -ray tubes operating at voltages of the order of a million, one may ask oneself whether the voltage

applied to the α -ray tube is not of minor importance in comparison with the selection of the proper technic for the individual cancer problem.

At the close of the war, in November 1918, there came out of Germany a series of announcements suggesting that the increase of the voltage factor to 200,000, and the increase of filtration made possible by the use of such voltages, had revolutionized the art by substituting "cancer killing" for "treating patients." That the overenthusiasm of 1919-1924 was unjustified is now well known. That tumor regressions were observed with greater regularity than with older technics cannot be denied. The mistake was in ascribing the change to the increase of voltage and filter when the chief alteration of technic was in the size of the dose delivered. In other words, at the moment of change-over from 135,000 volts to 200,000 volts, and from aluminum to copper filters, very significant changes were made in the size of the total dose, the distance of the patient from the tube and the periodicity of treatments. Most radiologists now recognize the fact that the voltage factor, long believed to be the most important, was actually one of the least important factors changed at that time.

As soon as it was discovered that the so-called deep therapy of 1919 produced a pitifully small percentage of "cures" of deep seated cancer, overenthusiasm gave way to unwarranted skepticism. It became customary to doubt the original diagnosis in every case of apparent cure. However, in the ten years between 1918 and 1928 the real foundations for present roentgen therapy were laid. First came the physicists, with accurate methods of measurement under standardizable and reproducible conditions. For the first time it became possible for physicians in various parts of the world to describe their dosage and quality factors in terms of the centimeter-gram-second system of international physical units. This important advance paved the way for the work of the research biologist, who brought forth scientific data regarding the effects of measured amounts and specified qualities of α -rays on standardized biologic material.

The history of roentgen therapy in cancer from the beginning down to the present day may be tabulated about as follows:

1896-1903, gropings, discovery that tumor regression could sometimes be produced.

1903-1906, optimism based on wishful thinking and ignorance of inherent limitations.

1906-1910, fear of roentgen injuries and natural discouragement, which paved the way for.

1910-1918 first period of disrepute, characterized by unwarranted skepticism and courageous perseverance by a few pioneer spirits.

1918-1924, optimism based on the mistaken idea that the increase of voltage from 135,000 to 200,000 had introduced revolutionary changes in the possibility of cure.

Read before the Section on Practice of Medicine at the Eighty Sixth Annual Session of the American Medical Association Atlantic City N. J., June 13, 1935.

1 Glasser Otto Wilhelm Conrad Roentgen and the Discovery of the Roentgen Rays in the Science of Radiology Springfield Ill Charles C Thomas 1933

2 Sjogren Tage and Sederholm E Beitrag zur therapeutischen Verwertung der Rontgenstrahlen (including report of case presented by Sjogren before the Society of Swedish Physicians on Dec. 19 1899) Fortschr a d Geb d Rontgenstrahlen 4 145 1901

3 Stenbeck Thor Ein Fall von Hautkrebs geheilt durch Behandlung mit Rontgenstrahlen (report of case presented before the Society of Swedish Physicians on Dec. 19 1899) Mitt a d Grenzgeb d Med u Chir 6:34 1900 Fall af hudkrafta lakt genom behandling med Rontgenstralr Hygiea 62:18 1900

4 Pusey W A Report of Cases Treated with Roentgen Rays J A M A 35 911 (April 2) 1902

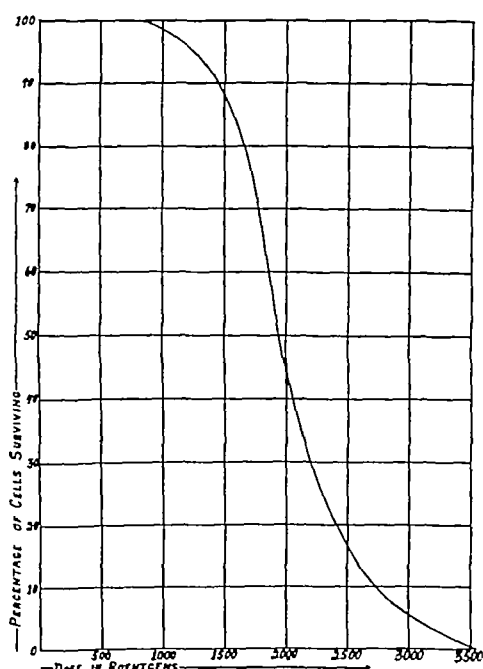
1924-1928, second period of disrepute, during which scientific investigators continued to lay the foundations for 1928-?, the period of healthy growth, steady progress in refinement of technic, scientific evaluation of the method

If the star of roentgen therapy wanes again it will be because a brighter star has risen to outshine it, not because the present use of the method is founded on wrong concepts or unjustified optimism. It is recognized today that, in spite of thousands of cures and countless valuable palliations, irradiation, like surgery, is not the final answer to the cancer problem. Realization of this fact does not interfere with continued progress. It should shield one, however, from the mistake of ascribing revolutionary virtue to the interesting technical changes that loom so large on the present-day horizon.

LIMITATIONS OF THE METHOD

The scientific roentgenologist of today recognizes certain limitations inherent in his method.

1 The tumor he is treating is surrounded by and intimately associated with normal tissues, the integrity



Survival and mortality curve for Flexner rat carcinoma exposed to varying doses of x-rays (after Charles Packard). As much as 800 roentgens failed to influence survival (subthreshold). 10 per cent of the tumor cells were killed by 1450 roentgens, 50 per cent by 1950 roentgens and approximately 1 per cent survived doses as high as 3500 roentgens.

of which must be preserved. The tolerance of these normal tissues is often not sufficient to permit him to use a large enough dose to cure the cancer. Some progress has been made toward overcoming this limitation, particularly by fractionating the dose,⁵ but there are reasons for believing that this will always remain an important limiting factor.

2 Amounts of radiation that are sufficient to rid the patient of from 90 to 99 per cent of his tumor cells may not have any permanent deleterious effect on the remainder, as shown in the illustration. One of the fundamental laws of biologic effects of irradiation is involved in this inherent limitation.⁶

5 Coutard Henri. Principles of X-Ray Therapy of Malignant Diseases. *Lancet* 2:1 (July 7) 1934. Forasell Gosta. Radiotherapy of Malignant Tumours in Sweden. *Brit J Radiol* 3:198 (May) 1930. Regaud C. Sur les principes radiophysiques de la radiothérapie des cancers. *Acta radiol* 11:455 1930.

6 Packard Charles. Biologic Effects of Roentgen Rays and Radium in the Science of Radiology.

3 Seemingly uncontrollable factors are involved. When cures are obtained the dose has frequently been less than would have been necessary for an actual destruction of all the cells of the cancer. Factors other than a direct lethal effect on the tumor must have been operative. One of these factors may be in some way involved in the fibrosis that sometimes follows irradiation. Viable cancer cells may remain for many years in the tissues of a clinically cured carcinoma patient. This accounts for the occasional, very disturbing late recurrence after apparent radiologic cure. The indications for coping with this factor are not clear. At first glance it might appear that surgical removal of the involved organ or tumor bed should follow, as a routine, the production of an apparent cure by irradiation. The trouble with this is that when the original tumor was inoperable there is a great likelihood that the subsequent surgery will cut through some of the encapsulated collections of arrested but viable tumor cells, with resultant disastrous recurrence. It is often safer to "let sleeping dogs lie," though in doing so one may be leaving the sword of Damocles over the patient's head.

4 After irradiation has been extensively used in a given case, whether efficiently or inefficiently, the response of that case to subsequent irradiation may be very disappointing. In a certain percentage of cases a thorough trial of irradiation may close the door to all known forms of therapy, both surgical and radiologic. The reasons for this are not well understood.

5 Like the surgeon, the radiologist suffers the limitation that he is frequently unable to foretell the result of his therapy. Actually his dilemma is greater than the surgeon's, for the latter's is concerned with the location, size and distribution of the tumor, factors that admit of a certain degree of analysis. The corresponding factors for the radiologist, on the other hand, are susceptibility of the tumor cells and certain intangible factors that may be grouped under the general term of the reaction of the patient's tissues. This inability to foretell the outcome in a given case operates as a practical limitation, for it tends to preserve an unfortunate suggestion of experimentation, leading one to advise surgery even in cases that might be treated better by irradiation.

RECENT ADVANCES

In spite of a better knowledge of the limitations of the method, roentgen therapy is being used more extensively today than at any previous time. This fact alone is sufficient evidence that the method has proved merit, for the present vogue is based not on superstition or wishful thinking but on sound knowledge and proved fact. Improvements in apparatus, while immensely valuable, have had small part in promoting this increasing use of irradiation. The important advances have been in the knowledge of how best to divide the dose, how best to preserve the integrity of the normal tissues, and how large a total dose to administer in a given case. These are the advances that deserve attention at this point.

1 *New Knowledge of the Nature and Degree of Skin Tolerance and the Recovery of the Skin After Irradiation*.—Looking back fifteen years, I am surprised that it has taken so long to uncover the facts regarding the nature and rate of recovery of the skin from the immediate effects of irradiation. Fear of permanent damage was undoubtedly the chief cause of the delay, but the simplicity of the methods that finally opened the eyes of the profession leads one to wish

that the superstitions of yesteryear had been dissipated sooner. Only a short time ago radiologists were practically in agreement that skin recovery from the immediate effects of fractional doses of 200 kilovolt, copper-filtered x-rays took place at a rate of from 5 to 9 per cent daily and that this recovery rate could be expressed by a fairly simple logarithmic curve. Through the work of Duffy, Arneson and Voke,⁷ presaged by the courageous experiments of Coutard,⁸ it is now known that recovery may be as high as from 60 to 70 per cent during the first twenty-four hours after a first exposure and from 70 to 80 per cent during the first forty-eight hours. Expressed in terms of practical units, this means that a year ago it was believed that two 400 roentgen doses, twenty-four hours apart, would produce the same effect on the skin as a single dose of about 750 roentgens, it is now known that such a series results in a skin effect equivalent to that produced by a single dose of about 525 roentgens.

2 Increasing Knowledge of the Relationship Between the Location, Type and Microscopic Appearance of the Tumor and the Most Effective Method of Applying the Irradiation—In this matter the profession is on the very frontier of progress. Many experienced radiologists are as yet not fully aware of the full significance of this and related studies. Because Coutard and others have shown that protracted fractional daily dosage will produce a hundred times as many five-year cures of pharyngeal and laryngeal cancer as will any single-dose technic, there is an unwarranted tendency to treat every tumor after the method of Coutard. Unless the rate of recovery from the effects of radiation is slower in the tumor than in the normal tissues, including the skin, protracted daily fractionation is valueless or even inferior. Present indications are that clinical experience plus a proper attention to the microscopic appearance of the biopsy specimen may lead to a definite improvement in results through more and more individualization in the selection of the treatment technic. I have had the experience of obtaining a three year cure in a case of lymphosarcoma of the tonsil treated by a short intensive three-day series, after a protracted fractional method had produced only partial regression, with rapid recurrence during the tenth week after the end of the first treatment series.

Authorities in the field of radiation therapy have always preached individualization. A scientific basis for such individualization is now being set up. As a further example of what may be expected in this field, one may point to the varying effects of different technics on the vascular elements in the irradiated tissue. The arterioles and capillaries are apparently able to recover very well from the effects of a Coutard series, from 100 to 200 roentgens per day, for example, with a total dose in the neighborhood of 3,000 roentgens, a considerably smaller total dose may produce disturbing avascularity if delivered in 500 roentgen fractions at intervals of the order of one month. Ginsburg⁹ showed

in 1927 that the skeletal metastases of certain very radiation-resistant thyroid adenomas may respond favorably to the fourth or fifth monthly series, though apparently quite refractory to a single series of any type. It is reasonable to believe that such results are due to a favorable diminution in the blood supply of the tumor, the tumor itself being too resistant to respond directly to the irradiation. Some believe that, when knowledge is more complete, some tumors will be attacked by single massive doses, some by the protracted fractional dose method of Coutard and still others by special technics yet to be worked out.

3 Increasing Appreciation of the Place of Preoperative Irradiation—That preoperative irradiation is still in its experimental stages, few will deny. Perhaps it is still too soon to include it as one of the important advances in the present state of our knowledge. Nevertheless, the method is growing rapidly in favor of the surgeon and there is evidence that its use is beginning to rest on a scientific basis. For example, the benefits to be derived from preoperative irradiation are minimal when the operation follows immediately or very soon after the irradiation and are maximal when thorough irradiation is followed by a sufficient delay for tumor regression to become maximal. The ability to draw such conclusions is argument for the thesis that preoperative irradiation is entering on a scientific phase, even though it is not yet known exactly how much effect it will have on the five-year cure statistics.

4 Decreasing Emphasis on Postoperative Irradiation—The routine employment of postoperative irradiation has always rested on unscientific thinking. Too often the wish has been father to the thought. It may comfort the patient or his family to hear the surgeon say "There now, I have removed practically all of the cancer. If I have left a few cancer cells, the radiologist can take care of them with a shotgun dose of x-rays." To the thinking radiologist it has often seemed that since radiologic cure rests on tumor cell sensitivity and tissue response to irradiation rather than on the numerical count of tumor cells, the radiologist who can "take care of the residual tumor cells" after a surgical operation might have taken equally good care of the entire tumor, especially in view of the fact that his aim is better and his therapy less hindered when he is treating a tangible tumor, not an intangible ghost. I am not advocating the complete scuttling of all forms of postoperative irradiation in every case. Neither am I advocating the abandonment of surgery in favor of irradiation in carcinoma. I do feel, however, that the decreasing emphasis on routine postoperative irradiation is evidence of progress, toward the substitution of correct thinking for poorly founded superstition.

UNSOLVED PROBLEMS FOR THE FUTURE

1 Will the Use of Higher Voltages and Thicker Filters (i. e., Shorter Wavelengths) Increase the Percentage of Five-Year Cures?—Not long ago, physicists were fairly unanimous in the opinion that the only benefits to be derived from shortening the wavelength, so far as cancer therapy is concerned, are envisaged in the possible increase of the penetration (percentage depth dose). They had ascertained that the increased penetration through metals, obtainable by the use of supervoltages and thicker primary filters, was not accompanied by increased penetration through tissue, beyond a certain easily reached point. Avoiding complicated data and mathematical analyses, one may

7 Duffy, J. J., Arneson, A. N., and Voke, E. L. The Rate of Recuperation of Human Skin Following Irradiation. *Radiology* 23: 486 (Oct. 1934).

8 Coutard, Henri. Zusammenfassung der Grundlagen der röntgen-therapeutischen Technik der tiefgelegenen Krebse. *Strahlentherapie* 37: 50, 1930. Roentgen Therapy of Epitheliomas of the Tonsillar Region. Hypopharynx and Larynx from 1920 to 1926, *Am. J. Roentgenol.* 28: 313 (Sept.) 1932. Miescher, G. Gegenwärtige Methoden der Krebsbestrahlung und ihre Erfolge. I. Einmalige Hochdosis-Strahlen-therapie 37: 17, 1930. Schinz, H. R. Gegenwärtige Methoden der Krebsbestrahlung und ihre Erfolge. II. Verteilte Dosen. *Ibid.* 37: 31, 1930. Schwarz, G. Ueber die theoretischen und praktischen Grundlagen einer Langschwach Bestrahlungsmethode, *ibid.* 37: 209, 1930. Horak, J. Ueber die epidermolytische Bestrahlungsreaktion, *Fortschr. a. d. Geb. d. Röntgenstrahlen* 45: 397 (April) 1932.

9 Ginsburg, S. Bone Metastasis in Thyroid Tumors. Early Diagnosis and Radiotherapy. *Am. J. Roentgenol.* 18: 203 (Sept.) 1927.

sum up their observations about as follows "Desired increases of the percentage depth dose can be obtained by increase of the distance between patient and x-ray tube and by elaboration of the principle of 'cross-fire' We are already operating with percentage depth doses near the maximum obtainable in the animal body The degradation of the x-ray beam (synonyms 'softening,' 'increase of wavelength') through Compton effect becomes such a large factor at higher voltages that the gain is little or nothing In short, there is no physical basis for undertaking to treat patients with costly and troublesome million-volt x-ray apparatus"

Such analyses as the foregoing are valuable but incomplete Before one is justified in deciding that nothing is to be gained by the use of extremely high voltages, certain additional questions must be answered 1 X-ray beams generated at voltages of a million or so may not differ markedly in penetrating power from conventional present day x-ray beams, but they ionize the atoms in the irradiated tissue according to a definitely different pattern Is this significant? 2 Irradiation at "supervoltages" includes bombardment of the tissues with neutrons, highly penetrating particles which are practically absent from conventional present-day x-ray beams May these not prove to be of some value or are they wholly valueless or even harmful? 3 Some of the radiologists who have had a wide experience with external irradiation by both x-rays and radioactive substances are of the opinion that gamma rays are superior to x-rays for the treatment of cancer This has by no means been proved, but if it is so it is not because of any superiority in penetration, expressed in terms of the percentage depth dose As a matter of fact, no radiologist in the world today has sufficient radium at his command to permit a practical technic at depth doses as great as are readily attained with conventional x-ray beams Assuming that gamma rays are actually more efficacious than the x-rays in cancer therapy, it would follow that in spite of an inferior percentage depth dose the gamma ray beam has a greater specificity for the tumor cells, i e., damages the tumor cells more, the normal tissues less If this belief in a demonstrable superiority of gamma rays is superstition, as some believe, there is little reason to think that "million volt x-rays" will prove superior to present-day practice But suppose it turns out otherwise The question must remain, for the present, unanswered

2 *Can Surgery Prevent the Late Recurrences of Tumors That Have Apparently Completely Regressed?*—Perhaps, before enough years have passed for this question to be answered, the real and final answer to the cancer problem will have been given In the meantime one can only plead for complete records and honest analyses of the results of various combinations of irradiation and surgery For the present, this question must also remain unanswered

CONCLUSION

Modern concepts of roentgen therapy in cancer do not permit one to continue any fancied rivalry of twenty years ago between radiation therapy and surgery Today the radiologist and the surgeon stand face to face, each in need of the other's help, each ready to do his proper share of the work of combating cancer¹⁰ The radiologist is just as anxious to avoid taking human life by depriving a patient of the benefits of properly

indicated surgery as the surgeon is anxious to avoid the futile mutilation of a patient who might better be treated by irradiation Their brotherhood is made more complete by their common knowledge that neither has the final answer to the cancer problem that real cooperation between physician, surgeon, pathologist and radiologist constitutes the best armamentarium in the present-day battle with cancer

3401 North Broad Street

ETIOLOGY OF CANCER

A PARTIAL REVIEW

LLOYD F CRAVER, MD
NEW YORK

Modern pathology reveals that cancer is not a single disease but a multitude of different diseases and that the boundary between malignant and benign is not everywhere sharply defined Not much can be said about that aspect of the etiology of cancer which has to do with the fundamental nature of the disease, for that is bound up with the very nature of the growth process itself, about which little is known Therefore this paper will be restricted chiefly to a consideration of those extraneous factors which may act on cells and tissues in such a way as to produce cancer

The multiplicity of the cancer process is indicated not only by its widely varying forms but also by the great number of factors that have already been discovered to be capable of affecting tissues, apparently previously normal or predisposed by some anatomic variation, and inciting them to form malignant tumors Cohnheim's theory accounts for the source of certain tumors, but the great majority may be attributed to the effects of chronic irritation on adult tissues

That cancer in man is not a germ or virus disease is the accepted belief of all competent students of the problem That diet has any general relation to the etiology of cancer may safely be denied, nor does it appear likely that the excess or deficiency of any one chemical substance, hormone, or vitamin will be found to be a universal "cause of cancer" This is not to be taken to deny that in specific organs or tissues, under certain conditions, diet, chemicals or hormones may be important contributing or even more direct etiologic factors

Syphilis probably does not foster the development of cancer in any general sense but only in certain locations, such as the tongue, where syphilitic glossitis and leukoplakia may form the basis for multiple carcinomas

Tuberculosis was formerly believed to offer a certain antagonism to cancer Yet there is a good percentage of cases of epithelioma on the basis of lupus, and cancer of the lung may develop in the walls of tuberculous cavities Tuberculosis is a fairly common complication in cancer patients

In a recent paper on the relation of trauma to malignant tumors Ewing¹ has reaffirmed the teaching that a single trauma of normal tissues is incapable of producing a malignant tumor He grants that trauma may

From Memorial Hospital

Read before the Section on the Practice of Medicine, at the Eighty Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935

1 Ewing, James Causation, Diagnosis and Treatment of Cancer, Beaumont Foundation Lectures, Series 10, Baltimore, Williams and Wilkins Company, 1931, The Prevention of Cancer, in Congreso internacional de lucha científica y social contra el cancer, Sección social, Madrid, S. A. Blass, 1933, pp. 99-114, Modern Attitude Toward Traumatic Cancer, Arch. Path. 10: 690 (May) 1935

10 Holfelder, Hans Comparison of Medical Surgical and Radiological Conceptions in Relation to the Treatment of Disease Brit. J. Radiol. 5: 39 (Jan) 1932

be an important indirect determining cause of certain tumors but in such cases finds that additional factors, such as delayed healing, infection, chronic irritation and probably hereditary and local predisposition, are at work. The production of tumors in experimental animals by trauma occurs only under special conditions of inherited or induced susceptibility, quite without parallel in man. Strict adherence to the criteria emphasized by Ewing successfully nullifies practically all claims of traumatic cancer in man.

AGE AND SEX

Pack's² study of age and sex distribution and incidence of nearly 20,000 tumors showed that the risk of certain tumors developing at various ages is different from what is popularly supposed. For example, the incidence of sarcoma of various kinds differs only slightly from age 20 to age 80, when one takes into account the numbers of persons actually living at different ages.

HEREDITY

While, in general, cancer in man does not appear to be influenced by a genetic factor, there are particular types of tumors that undoubtedly have a hereditary basis, such as neurofibromatosis, entailing a certain risk of neurogenic sarcoma, gliomas of the retina, multiple skin cancer on the basis of xeroderma pigmentosum, osteogenic sarcoma on the basis of multiple enchondromas and exostoses.

A history of the occurrence of cancer more frequently in families of cancer patients is usually interpreted as indicating a combination of factors such as age, occupation, habits, and anatomic or physiologic peculiarities, rather than a true inheritance of susceptibility or resistance to cancer.

Lacassagne³ has shown recently that the development of mammary cancer in mice treated by injections of estrogenic substance is dependent on a hereditary factor determining the susceptibility of the breast to estrogenic substance.

Slye's work on heredity of various tumors in mice is usually looked on as having little importance in regard to human cancer.

Certain observations on the occurrence of cancer in human twins are of interest at this point. It has been noted that, when a tumor occurs in one of a pair of homologous twins, in a high proportion of cases the other member of the pair develops, at about the same age, a tumor which in general is of the same type, in the same organ, or in an ontogenetically related organ. Murphy⁴ looks on these observations as speaking strongly in favor of a genetic control, while Versluys⁵ concludes that, except for determining the site, hereditary factors play a very small role in the development of tumors.

IRRITANTS

A long list of agents of different classes has been demonstrated however, to be definitely capable of acting on tissues to cause chronic irritation or growth stimulus in such a way as to produce cancer.

In the electromagnetic spectrum all wavelengths lying in the range between heat, near one extreme, and gamma rays, near the other extreme, are found to cause chronic tissue reactions that may eventuate in malignant tumors. Repeated exposure of the skin to heat, as in wearers of the kangri box in India or the kairo box in Japan, in iron molders or in English locomotive firemen, may produce a chronic dermatitis that forms the basis for epithelioma. A single burn sufficient to leave a scar, particularly in areas in which the scar is subjected to repeated fissuring or trauma, may eventually lead to cancer of the skin. The age of the scar is more important than the age of the patient. Hot pipe stems may cause cancer of the lip. A habit of drinking hot tea may be responsible for cancer of the esophagus in some cases.

Sunlight has been shown to be a causative factor in cancer of the exposed parts of the skin, as in sailors and farmers. In Australia, Molesworth⁶ finds that cutaneous cancer is more common in the white race and in the albino natives. The ultraviolet rays may be mainly responsible, but Carozzi⁷ believes that the visible spectrum may be injurious. The carcinogenic action of sunlight is startlingly evident in xeroderma pigmentosum. In certain cases of melanoma, sunlight has apparently been the chief irritant of a mole. A protruding lower lip is liable to sunburn and may thus be more likely to develop epithelioma. Epithelioma of the skin of animals has been produced by exposures to ultraviolet rays.

The role in carcinogenesis of the Gurwitsch mitogenic rays lying in the ultraviolet band from about 1,900 to 2,400 angstrom units is still largely speculative. Cancer of the skin resulting from radiodermatitis, particularly on the hands of pioneer roentgenologists and radium therapists, is only too well known. Radiation cancer is also seen frequently as a result of overenthusiastic superficial irradiation as for psoriasis, pruritus ani and facial hypertrichosis. Sarcomas have been produced in experimental animals by exposing them to x-rays.

A new etiology for bone sarcoma in man appeared in dramatic fashion in the painters of radium dials, who, by moistening their brushes in their mouths, ingested appreciable amounts of radium and mesothorium. These substances were deposited, similarly to lead, in the bones, which then became subjected to a ceaseless bombardment from within, chiefly by alpha particles. Those who survived the earlier effects, anemia and necrosis of the jaws, were doomed to die years later of osteogenic sarcoma. The Schneeberg and Joachimstal cancer of the lungs in miners is now attributed mainly to the inhalation of emanations of radioactive minerals.

Animal parasites lead in man and lower animals to a variety of chronic irritations that produce cancer. Bilharzia infestation of the bladder is known to be followed by cancer of that organ in a good proportion of cases. Ewing has found trichinae in a number of cancerous tongues. Fibiger demonstrated that spiroptera carried by cockroaches were responsible for carcinoma in the stomach of rats. Several other kinds of parasites have been found associated with tumors of lower animals.

Chemicals—Since the recognition of chimney sweeps' cancer by Percival Pott in 1820, a long list of chemical

² Pack, G. T. and LeFerre, R. G. The Age and Sex Distribution and Incidence of Neoplastic Diseases at the Memorial Hospital, New York City. *J. Cancer Research* 14: 167-294 (June) 1930.

³ Lacassagne, A. Apparition de cancers de la mamelle chez la souris mâle soumise à des injections de folliculine. *Compt. rend. Acad. de sc.* 193: 630-632 (Oct. 10) 1932. *Compt. rend. Soc. de biol.* 115: 937-939 1934. Lacassagne, A. and Nyka, W. À propos d'une pathogenie de l'adenocarcinome mammaire: recherche de la folliculine dans le colostrum, *ibid.* 116: 844-845 1934.

⁴ Murphy, J. B. Experimental Approach to the Cancer Problem. *Bull. Johns Hopkins Hosp.* 56: 131 (Jan.) 1935.

⁵ Versluys, J. J. Zwillingenpathologische Beitrag zur Aetiologie der Tumoren. *Ztschr. f. Krebsforsch.* 41: 239-259 1934.

⁶ Molesworth, E. H. Die Aetiologie und Zellpathologie des Haut- und Lippenkrebses in Australien. *Dermat. Wechnschr.* 99: 945-951 (July 21) 1934.

⁷ Carozzi, L. Le cancer professionnel in Congreso internacional de lucha científica y social contra el cáncer. Sección social Madrid, S. A. Blass 1933 pp. 3-59.

irritants has been gradually accumulated, the effects of which have been noted chiefly on the skin of man clinically, or in the laboratory on the skin of animals. Scarlet red and other lipid solvents of the aniline series, fats, fatty and mineral acids, indole and skatole fall into this category. The prolonged administration of arsenic may be followed after several or many years by a pathognomonic type of multiple warty keratoses of the palms and soles, and multiple keratoses elsewhere on the skin, a condition which not infrequently serves as the basis for multiple epitheliomas. Arsenic has been suspected also of being cancerigenic in tissues other than the skin, for example, in the lungs of the Schneeberg miners.

In the aniline industry, in workers with the intermediate products and derivatives of benzene, toluene, xylene, naphthalene, anthracene and phenanthrene, there is an incidence of cancer of the bladder of from 4 to 5 per cent. These tumors may appear at any time after two years of exposure. In many cases the tumors are multiple, and studies of pathogenesis suggest that the compounds are absorbed mainly through the respiratory tract and may affect the basal layers of the mucous membrane of the bladder through circulation in the terminal capillaries. According to Ferguson,⁸ all efforts to demonstrate carcinogenic agents in the urine of aniline workers have failed. The compounds that are believed to be responsible are aniline, alpha and beta naphthylamine, and benzidine.

Janssen⁹ reports the occurrence of cancer of the bladder in patients who had been treated with tar over long periods for psoriasis.

A vast amount of experimental work has followed the discovery by Yamagiwa and Ichikawa in 1915 that cancer could be produced in the skin of rabbits' ears by applying tar. Many of the higher distillation components of tar, which have been found to be the agents responsible for its carcinogenic properties, have been chemically isolated, identified and prepared synthetically. Loeb¹⁰ has named seven of the principal carcinogenic hydrocarbons, and he states that in general a molecular structure consisting of rings attached to the 1, 2 and 5, 6 position of the anthracene ring system tends to induce a marked carcinogenic activity.

These agents apparently produce cancer by acting on normal cells, as stimulants of growth, and need not cause local irritation. Evidence has been adduced to show that a general, possibly specific, intoxication of the animals plays a part in the production of cancer by tar derivatives.

RELATION OF TAR DERIVATIVES TO HORMONES AND STEROLS

One of the most interesting recent developments, and perhaps one of epochal importance, is the recognition of the fact that these carcinogenic hydrocarbons are closely related by chemical structure to a series of substances that are of common occurrence in the body and of great importance biologically, namely, bile acids, cholesterol, ergosterol, vitamin D, the testis hormone and particularly the estrus producing and possibly the luteal hormone. This recognition has led naturally

to the suggestion by Kennaway and Cook that under some conditions the sterols normally present in the body might undergo such a chemical alteration as to become carcinogenic. Moreover, it has been found that some of the carcinogenic derivatives of tar are capable of producing estrus in castrated rats and mice. This leads to a consideration of the influence of hormones in carcinogenesis. Choriocarcinoma was attributed years ago by Pick to stimulation of the chorionic cells by excessive secretion of corpus luteum cysts. Early castration of female mice belonging to strains having a known high incidence of mammary cancer reduces the cancer rate to zero or nearly so. Lacassagne has succeeded, by injecting large doses of an estrogenic substance¹¹ in producing mammary cancer in male mice, belonging to the R 3 strain of the Radium Institute of Paris—a strain which regularly develops 72 per cent of mammary cancer in females but none in males. Bagg produced a high incidence of mammary cancer in mice by rapid breeding and removal of the litter to prevent suckling. These experiments were undertaken primarily to test the theory of stasis in breast ducts as a cause of cancer, and their results seemed to favor that theory. It appears likely, however, that a hormonal stimulation through excessive ovarian secretion may have played a large and perhaps dominant role in the results. Lacassagne has reported the presence of estrogenic substance in human colostrum and in cyst fluid from the breast of a woman with mammary cancer.

Bagg, following the lead of Michalowsky,¹² injected zinc chloride into the testes of fowls and succeeded in causing the development of teratomas during the mating season. By treating these fowls also with injections of anterior pituitary-like substance, he has been able to obtain teratomas at other seasons. There is thus demonstrated experimentally the combined influence of hormonal stimulation and chemical irritation.

The presence of the follicle stimulating factor in the urine is found to accompany teratoma of the testis in man with remarkable constancy. Quantitative measurements of this hormone may even be used to predict which of five different histologic types of teratoma is present in a case that has not been influenced by treatment.

The hormone of the middle lobe of the pituitary, termed intermedin, has been shown to be associated in some way with melanoma.

Parathyroid adenomas have been found associated with osteitis fibrosa cystica, on the basis of which giant cell tumors of the bones frequently develop.

MISCELLANEOUS DATA

I shall now briefly survey some of the miscellaneous data regarding cancer of various organs.

In the skin, numerous types of abnormalities may be precancerous: pigmented moles, oily or dry skin, sebaceous cysts, scars of lupus or burns, and various chronic ulcers.

In the mouth, avoidance of syphilis, tobacco and jagged teeth would largely prevent intra-oral cancer. Betel nut or buyo cheek cancer of the orient may be attributed to a combination of lime, cheap tobacco and irritation caused by particles of the betel nut and the essential oils of the buyo leaves. Electrochemical processes between dissimilar metallic dentures may be a factor in the causation of some intra-oral cancers.

⁸ Ferguson R. S. Pathologic Physiology of Teratoma Testis. *J. A. M. A.* 101:1933 1937 (Dec 16) 1933. Ferguson R. S., Gehrmann G. H., Gay D. M., Anderson L. W. and Washburn V. D. Symposium on Aniline Tumors of the Bladder. *J. Urol.* 31:121 171 (Feb.) 1934. Ferguson R. S. Clinical Evaluation of the Quantitative Excretion of Prolan A in Teratoma Testis. *ibid.* 31:397-409 (March) 1934.
⁹ Janssen, P. Die Chirurgie der Harnblase in Handbuch der praktischen Chirurgie, Stuttgart Ferdinand Enke 4:884, 1927.
¹⁰ Loeb Leo. Estrogenic Hormones and Carcinogenesis. *J. A. M. A.* 104:1597 1601 (May 4) 1935.

¹¹ Designated in the original paper folliculine benzoate.
¹² Michalowsky I. Das 10 experimentelle Zink Teratom, *Virchow Arch f. path. Anat.* 274:319 325 1929.

In the esophagus, spasm, excessive heat of ingesta, or irritation by poorly masticated boluses of food, leading to spasm and esophagitis, or scars of peptic ulcers or caustic burns may lead to cancer.

Investigation that I made of the histories of cases of cancer of the stomach and esophagus by a very detailed inquiry into seventeen different postulated factors brought out an interesting discrepancy between the two diseases.¹³ For cancer of the esophagus the factors attaining the higher scores were in the following order: tobacco, alcohol, small intake of water, poor condition of the teeth and lack of teeth. For cancer of the stomach the factors with the higher scores were poor teeth, lack of teeth, other gastro-intestinal diseases, heat of food and drink, irregularity of meals, lack of water, seasonings, use of cathartics, rapid eating, tobacco and alcohol. It may be noted, for example, that for cancer of the esophagus the abuse of tobacco and alcohol took first rank, while in the cases of gastric carcinoma these two factors took much less prominent places. The number of cases studied was too small to permit placing full reliance on such a discrepancy. The main value of the study lies in the demonstration of a clinical method of investigation of the etiology of cancer, a method not appealing perhaps to the experimentalist or to the enthusiast imbued with the notion of finding a universal cause or cure. There is still too little known about the exact clinical settings under which cancer arises in different organs.

In the large intestine, certain cancers are known to arise on the basis of adenomatosis, polyposis or ulcerative colitis. The colon is said to be the most common site of multiple malignant tumors. Ewing observes that "man is the only animal which enjoys unlimited access to food and suffers from restricted opportunity to empty the bowel, and he is the only animal that suffers notably from gastric and rectal cancer."

Cancer of the lung, apparently actually on the increase, mainly in industrial centers,¹⁴ has been attributed to a change in the quality of atmospheric dusts, now laden with combustion products of gasoline and particles from tarred roads. Campbell¹⁵ showed that mice inhaling dust from tarred roads developed an incidence of adenomas of the lungs ten times as great as the controls. Both radium emanations and arsenic are suspected of causing miners' cancer of the lung in Schneeberg and Joachimstal. The effects of respiratory infections, chronic bronchitis and bronchiectasis, and perhaps the influenza pandemic are possible factors in many cases of pulmonary carcinoma.

Aside from the cases in aniline workers the causes of cancer of the bladder are obscure. The American Urological Association's survey of 902 cases showed a low incidence of calculi but a high incidence of multiple tumors (29.2 per cent). This finding, coupled with the observation that has been made in workers in the aniline industry, namely, that there is a high incidence of subepithelial varices and that tumors begin frequently in the basal layers of the epithelium, suggests that carcinogenic agents circulating in the blood may be responsible for some tumors of the bladder.

Carcinoma of the penis is largely the result of chronic irritation due to uncleanness, redundant prepuce and

retention of smegma. It is almost unknown in the circumcised. Teratoma of the testis shows a remarkably higher incidence in undescended testes. Dean¹⁶ estimates that the chances of an undescended testicle becoming teratomatous are from 47 to 273 times as great as those of a normal testis.

Carcinoma of the cervix uteri is notably infrequent in Jewish women, although in general it is commonly believed that birth injuries leading to lacerations, erosions and chronic cervicitis are largely to blame, since it is so regularly a disease of multiparas. Healy,¹⁷ however, has stated that he is quite certain that there is an increasing number of cases in women under 35, many of whom have never conceived. Smith obtained a history of use of saponated solution of cresol douches in a large proportion of women with cervical cancer. An observation common to gynecologists is that cancer of the cervix is very rare in a completely prolapsed uterus, yet in such instances the exposed cervix is certainly subjected to repeated trauma and chronic irritation.

Carcinoma of the body of the uterus is found in single women four times as frequently as carcinoma of the cervix. It occurs mainly beyond the menopause. Carcinoma of the vulva is regularly found to have a basis of chronic changes in the epithelium of the vulva, such as leukoplakia, atrophy and fissuring.

In cancer of the breast, clinical observation shows a high proportion of histories of previous abnormalities of function, such as caked breast, abscess, sore nipples, interrupted nursing, miscarriages or complete lack of use of the breast. It is not at all infrequent in the clinic to note that a cancer of the breast is located in an area of mastitis peripheral to an old scar of incision for breast abscess. Such observations support the theory of irritation of breast and duct epithelium by retained secretions containing butyric and lactic acids and possibly more specific carcinogenic substances. Adair's¹⁸ study of 200 women with mammary cancer showed a normal nursing history in only 8.5 per cent, while in 100 women without breast cancer 80 per cent gave a normal nursing history.

Cancer of the thyroid is known to begin practically exclusively in a diseased thyroid gland.

When osteogenic sarcoma occurs in patients over 50 years of age, in at least 28 per cent it is on a basis of Paget's disease.¹⁹ It is questionable whether trauma may lead to the development of some of the bone-forming sarcomas. It seems likely in some cases that early disturbances, as by rickets, may play a part.

The lymphomatous processes cover a wide range of diseases, some of which, such as lymphosarcoma, are undoubtedly in general malignant tumors, others, such as Hodgkin's disease, are at present subject to dispute as to whether they should be classed with the neoplasms or with inflammatory diseases, and still others, such as acute leukemias, are considered by many to be atypical responses to infection. For most of the varieties of lymphoma one who has access to large numbers of cases could construct a spectrum passing from inflammatory conditions, by insensible gradations, through the typical processes and, beyond, to the highly malignant end of

13 Craver L. F. Etiology of Gastric and Esophageal Carcinoma, *Am J. Cancer* 10: 68-102 (Jan.) 1932.

14 Dissanayake E. Ueber die Häufigkeit des Bronchial- und Lungenkrebes in den Jahren 1925-1931. *Ztschr. f. Krebsforsch.* 36: 563-571 (July 14) 1932.

15 Campbell J. A. Cancer of Skin and Increase in Incidence of Primary Tumours of Lung in Mice Exposed to Dust Obtained from Tarred Roads, *Brit. J. Exper. Path.* 15: 287-294 (Oct.) 1934.

16 Dean A. L. Teratoma Testis to be published.

17 Healy W. P. Experience with Radiation Therapy in Cancer of the Cervix. *Am J. Obst. & Gynec.* 28: 386-391 (Sept.) 1934.

18 Adair F. E. Epitheliomas of the Hand. Types and Treatment, *S. Clin. North America* 13: 423-430 (April) 1933. Etiological Factors of Mammary Cancer in 200 Women. *New York State J. Med.* 34: 61-68 (Jan. 15) 1934.

19 Coley B. L. and Sharp G. S. Paget's Disease. A Predisposing Factor to Osteogenic Sarcoma. *Arch. Surg.* 22: 918-936 (Dec.) 1931.

the scale. With such a variety, no doubt multiple causes are at work. Tuberculosis appears to have some definite but at present indefinable relation to Hodgkin's disease. Steiner,²⁰ using the Seibert tuberculin protein, finds in Hodgkin's disease a marked absence of sensitization to both avian and human tuberculin and explains this finding as indicating either that in Hodgkin's disease there occurs a desensitization to tuberculin or that Hodgkin's disease usually appears in persons in whom a normal reaction to tuberculin does not develop. He suggests that this finding may indicate some obscure relation between the two diseases. However, Uddströmer,²¹ in a recent survey of the occurrence of Hodgkin's disease in Sweden from 1915 to 1931, states that he finds no support for the belief in an etiologic connection with tuberculosis. The reports of numerous investigations on the results of injections of material from Hodgkin's nodes into animals give conflicting evidence on the question of the etiologic relationship to tuberculosis. In the clinic it is difficult to avoid the feeling that Hodgkin's disease may arise on the basis of an atypical tuberculosis. Cases in which the two diseases coexist are by no means rare, and cases are seen not infrequently in which neither the clinician studying the patient nor the pathologist, looking at representative tissue specimens, can decide whether the disease is tuberculosis or Hodgkin's disease.

Lymphosarcoma and chronic lymphatic leukemia appear also to have some relation to tuberculosis. That the causative agent of these diseases in a large proportion of cases probably gains entrance to the body through the gastro-intestinal tract is indicated by increasing recognition of the frequency with which these diseases arise intra-abdominally. Büngeler²² administered small doses of indole to mice over long periods and reported the subsequent development of leukemia, aleukemic myeloses, lymphadenoses and lymphosarcoma. Bernard²³ injected small amounts of tar into the femoral marrow of young white rats and reported the development of erythroleukemia.

It is impossible within the space allotted to do more than indicate briefly some of the widely varying causes of cancers. It seems impossible that such a multiplicity of inciting factors can ever be brought together and found to be operative only in conjunction with some universal growth stimulating substance. While attention has been focused on care of the cancer patient and on animal experimentation, the promising field of detailed clinical investigation of the etiologic factors of the major forms of cancer has been largely passed by. Thus, while many miscellaneous data are at hand, there remains a great need for expansion of our knowledge of the exact conditions under which malignant tumors appear. The opportunity for such investigations will increase as the study and treatment of cancer becomes recognized as a specialty and as more cases are concentrated in special cancer hospitals and tumor clinics.

Central Park West at One Hundred and Sixth Street

20 Steiner, P. E. Hodgkin's Disease, Search for Infective Agent and Attempts at Experimental Reproduction. *Arch. Path.* 17: 749-763 (June) 1934. Etiology of Hodgkin's Disease. Skin Reaction to Avian and Human Tuberculin Proteins in Hodgkin's Disease. *Arch. Int. Med.* 54: 11-17 (July) 1934.

21 Uddströmer, M. On the Occurrence of Lymphogranulomatosis (Sternberg) in Sweden 1915-1931, and Some Considerations as to Its Relation to Tuberculosis. *Acta tuberc. Scand. suppl.* 1: pp. 1-225. 1934.

22 Büngeler, W. Die experimentelle Erzeugung von Leukämie, aleukämische Myelosen, Lymphadenosen und Lymphosarkom. *Klin. Wchnschr.* 11: 1982-1984 (Nov. 26) 1932. *Frankfurt. Ztschr. f. Path.* 44: 202-271. 1933.

23 Bernard, J. L'érythro-leucémie expérimentale provoquée par le goudron. *Sang.* 8: 28-38. 1934.

RELATION OF LEUKEMIA OF ANIMALS TO LEUKEMIA OF MAN

JACOB FURTH, M.D.
HENRY W. FERRIS, M.D.
AND
PAUL REZNIKOFF, M.D.
NEW YORK

Many of the recent contributions to the knowledge of leukemia and related diseases have come through experimental studies in animals. This report is a review of some of these contributions and an attempt to correlate them with the human disease.

LEUKEMIA OF MICE AS A NEOPLASTIC DISEASE¹

Leukemia of a mammal (guinea-pig) was first transmitted by Snyders, but most of the experimental studies that established the neoplastic nature of this disease were made with the leukemias of mice.

Leukemia of mice, both lymphoid² and myeloid,³ is transmissible to healthy individuals of the same species. Transmission is successful only with live leukemic blood cells, and the inoculum loses its ability to transmit the disease when subjected to such procedures as glycerination and desiccation in the frozen state, which injure live cells while they do not destroy viruses and microorganisms. Cell-free extracts fail to transmit the disease.

The source of the leukemic blood cells does not appear to influence transmissibility, and transmission is readily accomplished with a suspension of apparently any organ infiltrated by the immature cells. Leukemic blood cells readily transmit the disease, but cell free plasma does not.

Carcinoma and sarcoma of mice can likewise be passed from one animal to another only by means of live tumor cells. The transfer of leukemia is essentially a graft of immature blood cells from leukemic to healthy mice. The blood forming organs of the recipient play no active part in the development of leukemia following the inoculation. Indeed, the disease may be transmitted to mice whose normal blood forming organs have been destroyed by massive doses of x-rays preceding the inoculation. Mice thus treated may die before the normal blood forming organs injured by the x-rays undergo regeneration. The duration of the disease in irradiated mice is the same or somewhat shorter than in mice not irradiated. Potter and Richter⁴ traced the lymphocytes that infiltrated the various organs to those introduced, by means of microscopic studies, at various intervals after subcutaneous inoculation.

Transmission of some strains of leukemia is successful only in closely related mice, others may also be transmitted to unrelated mice. The factors that deter

From the New York Hospital and the Departments of Pathology and Medicine, Cornell University Medical College.

Read before the Section on Practice of Medicine at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.

1 This section was read by one of us (J. F.) before the American Association for Cancer Research, April 17, 1935.

2 See references in Furth, Jacob, Seibold, H. R., and Rathbone, R. R. Experimental Studies on Lymphomatosis of Mice, *Am. J. Cancer* 19: 521 (Nov.) 1933.

3 Furth, Jacob. Transmission of Myeloid Leukemia. Its Relation to Myeloma. *J. Exper. Med.* 61: 423 (March) 1935. Parsons, L. D. Leukemia Coincident with and Transmissible by a Spindle-Cell Sarcoma in the Mouse, *J. Path. & Bact.* 40: 45 (Jan.) 1935.

4 Potter, J. S. and Richter, M. N. Mouse Leukemia VIII. Continuity of Cell Lineage in Transmission Lines of Lymphatic Leukemia. *Arch. Path.* 15: 198 (Feb.) 1933.

mine the success of inoculation are similar to those that determine the fate of a tumor transplant

The disease produced by intravenous inoculation has the character of the systemic disease leukemia and is indistinguishable from the spontaneous disease. After subcutaneous injections the immature blood cells form, with rare exceptions, tumors at the site of introduction.

The type of disease produced depends on numerous factors, of which the character of the malignant blood cells is most important. Each of nine strains of lymphatic leukemia studied in our laboratories showed individual characteristics that were retained through numerous animal passages, with only slight modifications such as occur among other transmissible neoplasms.

Morphologically the strains of lymphatic leukemia studied differ as to the size, shape, basophilia of the malignant lymphocytes, presence or absence of azure granules and of vacuoles, and fragility as revealed by the presence of smudged (crushed) cells in dry smears prepared in a uniform manner. The malignant cells of the two strains of transmissible myeloid leukemia observed differ with respect to the size of the cells and to the number and size of the granules they contain. Individual cells of different strains cannot always be differentiated from one another morphologically, but groups of cells derived from different strains can usually be distinguished.

Far more numerous are the differences among the transmissible strains of leukemia, revealed in transmission experiments, such as localization and intensity of infiltrations, ability to produce tumors, and the ease of transmissibility to related and unrelated mice.⁵

It is evident from these studies that the leukemic blood cells of mice are not common immature blood cells, they are malignant cells with characteristics of their own.

Several agents that may produce leukemia in mice have been described, such as indole (Bungeler⁶), benzene (Lignac⁶), and x-rays (Krebs, Wagner and Rask-Nielsen⁷ and Furth⁶). Krebs and his associates observed leukemia six times more often among mice that were irradiated than among their unirradiated controls. It is noteworthy that these studies on the production of leukemia by x-rays and benzene have followed observations on human beings suggesting the causation of some cases of leukemia by these agents. In our laboratories mice have been irradiated by massive doses of x-rays at the age of from 2 to 3 months. From six to eighteen months later many of them developed one of three types of neoplasm: (a) mediastinal lymphosarcoma with or without generalized lymphomatosis, (b) myeloid leukemia and (c) ovarian tumors. The incidence of these diseases was approximately ten times greater among irradiated mice than among their unirradiated siblings. Two cases of myeloid leukemia occurring in irradiated mice proved to be transmissible.⁷ The transmitted disease was indistinguishable from the spontaneous.

The inference can be drawn from these observations that leukemia like cancer can be produced by chemical or physical agents, leukemia produced by x-rays can be transmitted from diseased to healthy animals.

The strains of transmissible leukemia studied have a period of latency of from three weeks to three

months, during which the animals appear healthy, while the malignant blood cells introduced by the intravenous route multiply in the blood-forming organs. Victor⁸ found very recently that this period of latency also exists in the spontaneous disease, demonstrable by changes in the respiratory metabolism of lymph nodes and by transmission experiments made with lymph nodes removed from mice during this period.

In summary, variations in the course and anatomic manifestations of leukemia of mice are determined by several factors. Some are intrinsic and are determined by the constitution of the host and of the malignant blood cells. Others are extrinsic such as the site of

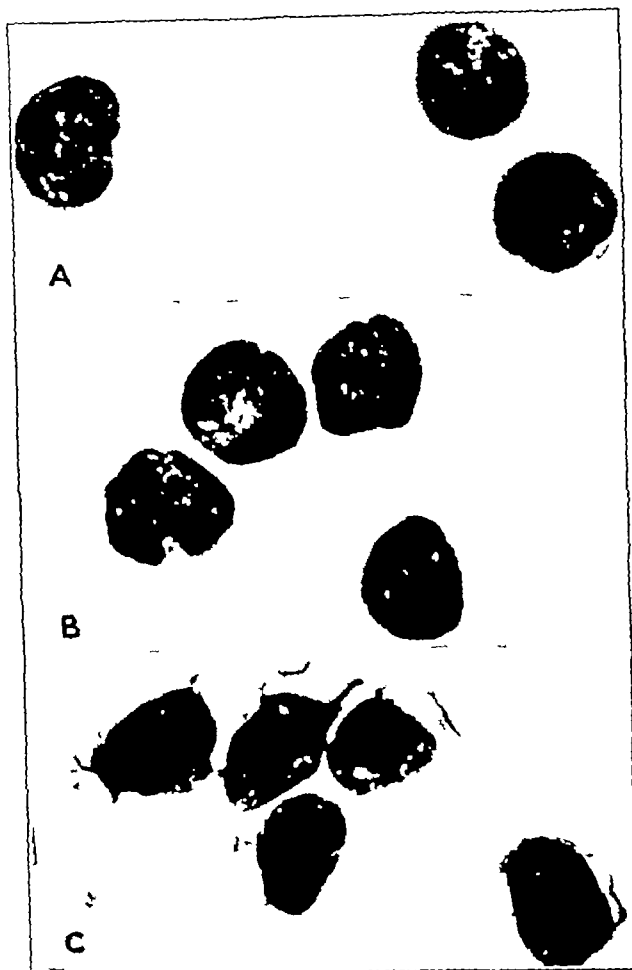


Fig. 1.—Lymphoid leukemia, lymphocytes in the circulating blood. A and C are from mice. B is from child J. P.

origin or entry of the malignant cells, the possibility of their free discharge into the circulation, and the numerous factors that influence the resistance of the host.

THE SIMILARITY OF LEUKEMIA OF MAN TO THAT OF THE MOUSE

Experimental studies indicate that leukemia of mice is a neoplastic disease. How closely does leukemia of man resemble the disease of the mouse, and is one justified in considering it also as neoplastic in nature?

The anatomic manifestations of the various types of leukemia in mice resemble so closely those in man that no essential difference has been found between the two by workers familiar with both. Despite this evidence,

⁵ Lignac, G. O. E. Die Benzol-Leukämie bei Menschen und weissen Mäusen. *Klin. Wchnschr.* 1: 109 (Jan. 21) 1933.

⁶ Furth, Jacob. Transmission of Myeloid Leukemia in Mice. *Proc. Soc. Exper. Biol. & Med.* 32: 923 (May) 1934.

⁷ Furth, Jacob and Barnes, W. A. Unpublished work.

⁸ Victor, J. Personal communication to the authors.

however, some observers familiar with the human disease are skeptical as to a similarity. It has therefore appeared worth while to make a detailed comparative study of the leukemias and related conditions in these two species. For this purpose we have studied twenty-five cases of leukemia (ten lymphoid and fifteen myeloid), ten cases of lymphosarcoma and three cases of myeloma which came to postmortem examination. The material of mouse leukemia has come from the experiments performed in our laboratories.

In all instances of myeloid leukemia of both man and mice studied by us, the normal bone marrow is extensively infiltrated by immature myeloid cells which show disturbed or arrested maturation to normal polymorpho-

The same observations apply to lymphoid leukemia. Enlargement of lymph nodes almost invariably occurs in lymphoid leukemia of both species. The extension of infiltrations beyond the capsule occasionally found in this disease (fig 6) induced many pathologists to regard lymphoid leukemia as a neoplastic disease. Lymphoid leukemia may occur with or without tumor formation, and there are transitional forms between lymphosarcoma and lymphoid leukemia in both species. Lymphosarcoma terminating in lymphoid leukemia (so-called leukosarcoma) is known to occur in both man and the mouse.

Figures 1 to 7 illustrate the similarity of the changes in various organs in the leukemias of man and the mouse. Indeed it is often difficult, if possible at all, to tell from which species the photomicrographs were prepared.

Evidence of inflammation or degeneration is either secondary or absent. Leukemia occurs in small numbers of individuals in any population of mice or human beings and does not spread from affected to healthy individuals although it is fatal in both species.

Any type of cell that is capable of multiplication may, from the theoretical standpoint, produce a neoplasm and immature blood cells should be no exception. The fact that leukemic cells circulate in the blood stream is not opposed to the concept that they are neoplastic in nature, since they may be found in the tissues in large numbers, often forming discrete nodules. Moreover in animals leukemic cells from the blood may form distinct tumors when placed in the subcutaneous tissue.

Ewing⁹ quotes several definitions of neoplasia applicable to the leukemias of mice. In view of the close similarity between mouse leukemia and that of man, is it not logical to consider the human disease as also neoplastic?

THE RELATION OF ACUTE TO CHRONIC LEUKEMIA

It is now generally accepted that the human disease is the result of an overgrowth of immature blood cells in the blood forming tissues, with secondary invasion of the circulating blood. It is believed by some that this overgrowth of immature blood cells may result from an acute infection¹⁰ and progress rapidly; therefore, the disease is called acute. Chronic leukemia, notably the lymphoid, is regarded by most workers as probably neoplastic in nature.

Experimental studies of the animal diseases have shown that there is no essential difference between acute and chronic leukemia. The first generations of the disease produced by transmission often have a chronic course of from one to three months. During repeated passages the virulence of most strains increases so that the experimental disease may terminate fatally within a week. Lymph node and splenic enlargements are usually considerable in the chronic disease but slight in the acute variety. Some transmissible strains remain chronic, others follow a rapid course after isolation and are often associated with extensive hemorrhages and sudden prostration, suggesting an acute infection. Nevertheless, in transmission experiments, both the acute and the chronic cases behave like neoplasms, the anatomic changes are essentially the same in the two transmission being dependent on the presence of live immature blood cells in the inoculum.



Fig 2—A, extensive infiltrations in the kidney in lymphoid leukemia of man; B, same in the mouse.

nuclear leukocytes. Through the bony canal system the immature blood cells may spread to the periosteum and surrounding tissue in both man and the mouse. The pulp of the spleen becomes densely packed with similar cells in the two species. The involvement of lymph nodes occurs less often and is less conspicuous in myeloid than in lymphoid leukemias, whether of man or of mouse. The infiltrations in the liver are either portal or diffuse (fig 3) or both. Small tumors composed of immature myeloid cells may occur in both man and the mouse in numerous locations, e. g., skin, bones and liver. The type of cell that forms infiltrations or tumors in the various organs is usually the same in the same case but may be different in different cases, whether in the mouse or in man. Mitotic figures are occasionally seen among the immature blood cells.

⁹ Ewing, James. *Neoplastic Diseases*, ed. 3. Philadelphia: W. B. Saunders Company, 1928, p. 25.
¹⁰ Ordway, Thomas, Gorham, L. W., and Beebe, R. T. *Oxford Medicine*, New York: Oxford University Press, 2: 683, part 2, 1933.

A postmortem study of the human cases likewise fails to reveal criteria by means of which the disease could be divided in two different varieties, namely, acute and chronic. This classification, accepted by many textbooks of pathology and medicine, found its origin in clinical studies but is not substantiated by anatomic studies of our material. In the cases of clinically acute

There is some indication in most clinical histories obtained from patients with acute leukemia that the disease had been in progress long before the onset of the infection that led to the diagnosis. Manifestations of illness such as fatigue, pallor, lassitude, anorexia (in children), epigastric discomfort, dependent edema, purpura and similar symptoms are often present but are not mentioned by the patient until he has been carefully questioned.

Twenty-four patients with acute or subacute leukemia (seven lymphoid and seventeen myeloid) were studied for the relationship between the apparent onset

TABLE 1—Duration of Symptoms in Eighteen Cases of Acute or Subacute Leukemia

| Duration of Symptoms | Judged by Patient Cases | Judged by Careful History Cases |
|----------------------|-------------------------|---------------------------------|
| 2 weeks or less | 4 | 0 |
| 2 weeks to 1 month | 5 | 1 |
| 1 month to 2 months | 4 | 1 |
| 2 months to 4 months | 1 | 3 |
| 4 months to 6 months | 2 | 2 |
| 6 months to 1 year | 2 | 3 |
| 1 year to 2 years | 0 | 5 |
| More than 2 years | 0 | 3 |

leukemia that came to postmortem examination the changes in the bone marrow were similar to those of chronic leukemia. The infiltrations in other organs were slight or moderate in a few cases of clinically acute disease, but in the majority of cases they were as conspicuous as in the chronic disease. In one case studied through the courtesy of Dr. Jacob Werne, there was a fulminating necrotizing infection of the pharynx and larynx which caused death after an illness of

TABLE 2—The Range of Temperature in Leukemia

| | Number of Cases | |
|---------------|-----------------|---------|
| | Acute | Chronic |
| Normal | 8 | 8 |
| 37.5 to 38° C | 9 | 7 |
| 38 to 39° C | 5 | 11 |
| Above 39° C | 7 | 8 |

apparently one week's duration, but the postmortem examination revealed extensive leukemic infiltration in the bone marrow, spleen and lymph nodes. Interference with normal leukocyte formation may explain the poor resistance to infection. Stasis of immature blood cells in the capillaries, interference with megakaryocyte formation and the low platelet count may explain the hemorrhagic diathesis¹¹ which is often associated with leukemia.

TABLE 3—Frequency of Infection of the Upper Respiratory Tract*

| | Acute Leukemia | Chronic Leukemia |
|--|----------------|------------------|
| Number of cases with evidence of inflammation | 9 | 10 |
| Number of cases with no evidence of inflammation | 15 | 18 |

* The analysis of clinical symptoms and signs (tables 1-3) includes also cases that were not examined post mortem.

Experimental leukemia both acute and chronic, is preceded by a period of latency, dating from the time of inoculation until the onset of symptoms, during which the animal appears healthy. The sudden termination of the disease, although it may resemble or be associated with an infection, occurs in mice whose blood-forming tissues, usually bone marrow, have been largely replaced by the malignant blood cells during the period of latency.

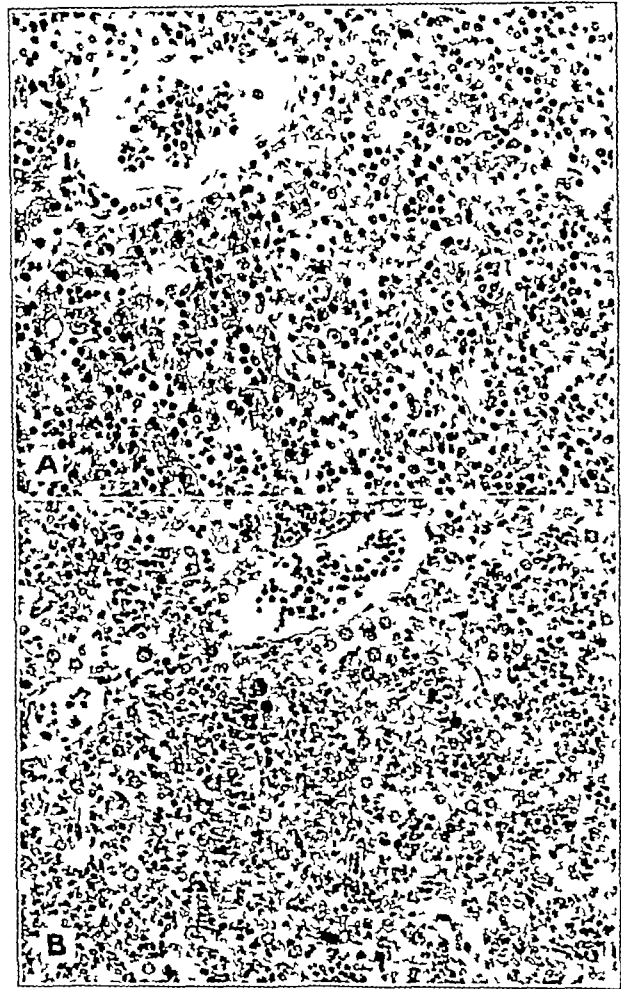


Fig. 3—A, diffuse infiltration of the liver in myeloid leukemia of man; B, same in the mouse.

of symptoms as judged by the patient and the probable beginning of the disease as determined by a careful history. In six of the twenty-four cases an adequate history could not be elicited. The results of the study in the other eighteen cases are given in table 1.

Table 1 shows that symptoms of illness are present in most cases of acute leukemia before the onset of the infection from which the beginning of the disease is often dated. It is evident from experimental studies that, at the very beginning, leukemia is not associated with symptoms of illness.

Fever frequently occurs in leukemia, but it is also found in many conditions other than infections, e.g., in the anemias. Moreover, it occurs in both acute and chronic leukemia (table 2).

¹¹ Hamburger, Werner. Beitrag zu den Gehirnveränderungen bei Leukämie (besonders über die Frage der Genese der Blutungen). Frankf. Ztschr. f. Path. 40: 257, 1933.

Infection of the upper respiratory tract is often found in acute leukemia but it also occurs in chronic leukemia (table 3)

These data indicate that leukemia is often terminated by an infection but there is no evidence that it is caused by it. Evidently an individual whose normal blood forming tissues are replaced by pathologic blood

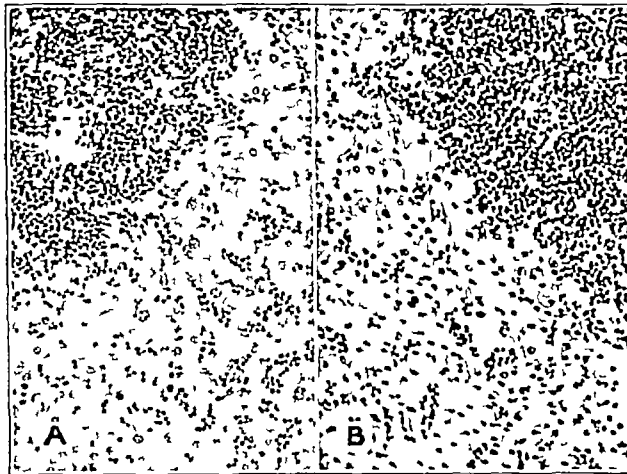


Fig 4—A portal infiltration of the liver in lymphoid leukemia of the mouse B same in man

cells cannot combat an infection as readily as a normal individual

From clinical and pathologic studies of fourteen cases of acute leukemia of children, Gittins¹² recently arrived at conclusions similar to ours. Concerning the differentiation of changes in the bone marrow in leukemia and in infection the reader is referred to his article

TUMOR FORMATION BY IMMATURE BLOOD CELLS (LYMPHOSARCOMA, MYELOMA)

Morphologic studies in man and experimental studies in mice indicate that lymphosarcoma and lymphoid leukemia are related diseases

In experimental lymphoid leukemia of mice the malignant blood cells of some strains, when introduced in the subcutaneous tissue, form huge tumors invading adjacent structures by continuity but do not invade the blood stream. Malignant lymphocytes of other strains, on the contrary, form slight or no tumors in the injected subcutaneous tissue but readily invade the blood, producing the blood picture of leukemia

Similar differences were found between two strains of transmissible myelosis studied. These properties of the various transmissible strains of lymphomatosis and myelosis are retained through numerous successive animal passages and are not permanently modified by the host, hence they are due to inheritable (genetic) differences among the malignant blood cells of the different strains. These properties can be demonstrated also by intravenous inoculation by means of which malignant lymphocytes of some strains produce lymphoid leukemia, others a similar disease with slight or no blood involvement

Generally speaking, malignant blood cells that have the ability to produce leukemia with high blood counts form small or no tumors in the injected subcutaneous tissue, whereas malignant blood cells that produce the aleukemic disease usually form large tumors. Tumors

may also develop after intravenous inoculation, notably with lymphocytes that have little or no ability to invade the blood

In a very recent study on the histogenesis of lymphosarcoma, Ehrlich and Gerber,¹³ discussing the applicability of our studies in the mouse to the human disease, state that "the manner in which a 'virus' reaches a lymph node does not explain why once involved, the process is invasive and destructive in one case (lymphosarcomatosis) and hyperplastic in the other (lymphadenosis)." On the contrary, in our paper² cited by these workers we have demonstrated (a) that mouse leukemia is not caused by a virus and (b) that it is a neoplastic and not a hyperplastic disease, (c) the type of disease is determined by several factors. The character of the malignant lymphocytes and the route of entry are sufficient to explain most if not all the differences between lymphosarcoma and lymphoid leukemia

Another factor that determines whether a mouse will develop the systemic disease or tumors following intravenous inoculation was revealed in the study of transmissible myeloid leukemia of strain Ar117. The immature malignant myeloid cells of this strain produce slowly growing single or multiple myeloid tumors (myeloma) in resistant mice, and myeloid leukemia with no tumors in mice whose susceptibility is decreased by irradiation with x-rays shortly before inoculation.

The differences found in the results of intravenous and subcutaneous inoculations indicate that the type of spontaneous disease is also influenced by the site of origin of the malignant blood cells and the possibility of their free entrance into the circulation

The observations made in the study of the human disease are in harmony with the experimental studies in mouse leukemia. The lymphosarcoma cells have the ability to invade adjacent structures, but blood invasion in human lymphosarcoma occurs, as has been recognized by Ghon and Roman.¹⁴ The study of our human material suggests that blood invasion is far more



Fig 5—A leukemic (neoplastic) hyperplasia of the bone marrow in lymphoid leukemia of man B same in the mouse.

common than is generally supposed. Invasion of the circulation by lymphosarcoma cells is suggested by microscopic changes such as infiltration in the portal tissue throughout the liver, diffuse infiltration of the spleen, and leukostasis (fig 8 A)

¹³ Ehrlich J. C. and Gerber I. E. The Histogenesis of Lymphosarcomatosis. *Am J Cancer* 24 1 (May) 1935
¹⁴ Ghon A. and Roman B. Ueber das Lymphosarkom. *Frankfurt. Ztschr f Path* 19:1 1916

¹² Gittins R. Leukemia (Leukosis) in Children. *Arch Dis Child* 8: 291 (Oct) 1933

Locally invasive growth, a feature of myeloma or lymphosarcoma, was conspicuous in six and very slight in seven of fifteen cases of human myeloid leukemia. It was conspicuous in four and very slight in four of ten cases of lymphoid leukemia. There was evidence of hematogenous spread in four of ten cases of lymphosarcoma. However, the small number of sections



Fig 6—A lymph node with episcapsular infiltrations in lymphoid leukemia of the mouse. B same in man.

available for microscopic study allows no conclusion regarding the frequency of these changes.

Two cases of so-called reticulum-cell sarcoma have not been included in this study. Their relation to the leukemias is obscure, as is their histogenesis.

The problem of myeloma has recently been reviewed in an editorial in *THE JOURNAL*.¹⁵ Our series includes three cases typical of the so-called plasma-cell myeloma. In one, the tumors were localized to the bones, in the other two they were associated with infiltration or tumors of internal organs as seen in lymphomatosis. Morphologically the cells composing these tumors resemble as closely erythroblasts as the plasma cells of Marshall.

Myeloid tumors composed of myelocytes and myeloblasts, some terminating in myeloid leukemia are well known in the literature.¹⁶ One of the two transmissible strains of myeloid leukemia studied by us produces single or multiple myeloid tumors about the bones, the other does not, but both produce myeloid tumors in the injected subcutaneous tissue.

OBSERVATIONS ON THE PATHOGENESIS

Experimental studies indicate that leukemia results when normal white blood cells assume the characteristics of malignant cells. The various manifestations of this disease may be explained by the characteristics of the malignant blood cells, the site of their origin, the possibility of their free entrance into the circulation and the resistance of the host.

Malignant blood cells entering the circulation are at first retained in numerous organs (e.g., bone marrow, spleen, lymph nodes) and multiply at sites favorable for their growth. Hence the gradual enlargement of lymph nodes in most cases of lymphoid leukemia and the infiltration of the bone marrow. This is the first stage of the disease and may be unnoticed. It is followed by invasion of the blood with immature cells in great quantities. These cells may be retained in the

capillary bed of numerous organs (leukostasis), for example, liver and kidney, seldom in the skin, or they may form extravascular infiltrations.

Leukostasis is a common and characteristic finding in leukemia and comparatively little attention is given it. It occurs not only in cases with high leukocyte counts but also in the so-called leukopenic variety (fig 8B) of the disease and may be occasionally found in lymphosarcoma (fig 8A). We know of no disease in which a selective retention of large numbers of very immature blood cells occurs in the capillary bed, other than leukemia, either of mouse or of man.

Leukostasis is usually conspicuous about sites of hemorrhage. The massing of immature leukocytes in blood vessels is sufficient to explain hemorrhage, which often occurs in the presence of a normal thrombocyte count and clotting time.¹¹ Figure 8B shows leukostasis in a child with lymphoid leukemia, whose leukocyte count at the time of death was 1,000, as the result of massive irradiation with x-rays.

There are several recent publications stating that leukemic blood cells are formed from endothelial or reticular cells of organs such as the liver and the spleen.¹⁷ Jaffe¹⁸ states that even resting fibrocytes may display blood-forming potentialities and that the leukemic process is characterized by the hematopoietic activity of the entire mesenchyme.

In leukemia there is frequently extensive proliferation of histiocytes in lymph nodes, spleen and liver. The possible relation of reticulum cells to lymphosarcoma is suggested in some cases of lymphosarcoma but in none of the cases of human leukemia studied by us is there any evidence of blood formation by histiocytes or by endothelial or reticular cells.

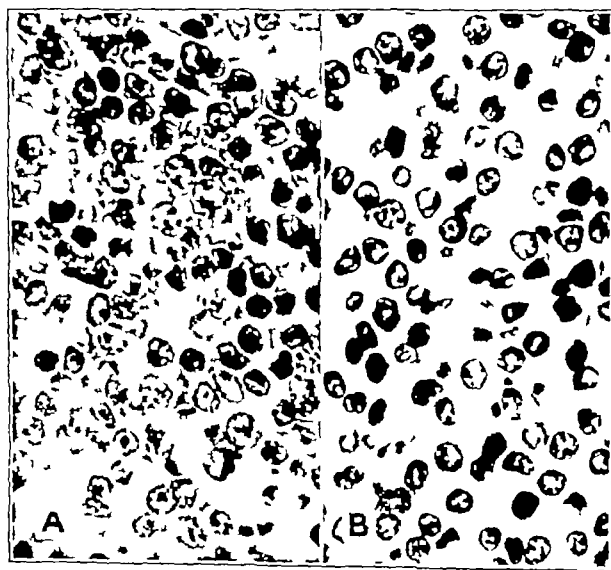


Fig 7—A lymphocytes producing leukemic infiltrations in the mouse shown at higher magnification. B same in man.

Studies on the nature of the histiocytes (Kupffer cells) of the liver have recently been made by Dunning in association with one of us.¹⁹ In sections of liver stained by Horte's

15 The Problem of Myeloma, editorial J. A. M. A. 104: 1420 (April 20) 1935.

16 MacCallum W. C. Textbook of Pathology, ed. 5. Philadelphia: W. B. Saunders Company, 1932. Dubois F. S. Myeloblastic Sarcoma of the Scapula Associated with Chronic Splenomyelogenous Leukemia. Am. J. Path. 9: 113 (Jan.) 1933. Baldrige C. W. and Fowler W. M. Aleukemic Myelosis. Arch. Int. Med. 52: 852 (Dec.) 1933.

17 Stasney J. and Downey H. Subacute Lymphatic Leukemia: Histogenic Study of a Case with Three Biopsies. Am. J. Path. 2: 113 (Jan.) 1935. Potter E. L. Hodgkin's Disease with Special Reference to Its Differentiation from Other Diseases of Lymph Nodes. Arch. Path. 19: 139 (Feb.) 1935.

18 Jaffe R. H. Histological Studies on the Spleen in Cases of Leukemia. Arch. Path. 19: 647 (May) 1935.

19 Dunning H. S. and Furth Jacob. report in preparation.

silver carbonate method for microglia the histiocytes exist as independent elements scattered diffusely throughout the organ. They lie in and about the sinusoids between the liver cells which entirely surround them and in the perivascular connective tissue. In cultures of liver of chicken and guinea pig embryos, the histiocytes maintain their individuality and their independence from other cells and exhibit no erythropoietic or leukopoietic ability.

Morphologic studies are difficult of interpretation and often do not permit definite conclusions. In the controversy as to whether in leukemia the infiltrations of the various organs are the result of metaplasia or colonization (metastasis) strong support is given the latter view by experimental studies. The immature blood cells in the circulation and organs of inoculated mice have the characteristics of those introduced. It is very improbable that the host would produce cells with precisely the same individual characteristics. This is especially unlikely in experiments in which the mice have been so heavily irradiated preceding the inoculation that their ability to produce normal blood cells is almost lost. Yet the course of the disease in these animals is

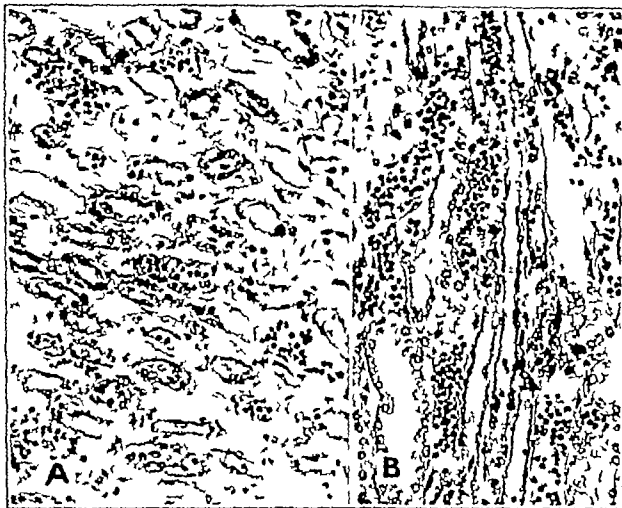


Fig. 8—A leukostasis in the kidney in lymphosarcoma of man. B leukostasis in lymphatic leukemia of man after x-rays reduced the number of circulating leukocytes to 1 000 per cubic millimeter.

the same as in mice not irradiated, and similar to that of the mouse with the spontaneous disease from which the malignant cells are derived.

Naegeli²⁰ called attention to a fundamental difference between the blood picture in simple hyperplasia of the bone marrow and in leukemia. In the former there are continuous transitional forms between the mature and the immature granular leukocytes, a "shift to the left" in Arne's terminology. In leukemia there is a proliferation of primitive blood cells with diminished or with no maturation to polymorphonuclear leukocytes, often there is a hiatus between the mature and the immature forms, called by Naegeli "leukemic hiatus." Microscopic studies of organs more readily demonstrate this hiatus than do blood smears. The inflammatory cells of the exudate in the alveoli of the lung occurring in pneumonia associated with several of our cases of leukemia were polymorphonuclear leukocytes, the leukemic cells that accumulated in the capillaries (leukostasis) were immature myeloid cells without transitional forms between the two. In the

blood and blood forming organs many types of white blood cells may be present, but the leukemic infiltrations outside these organs are composed almost invariably of the malignant cells only.

CONCLUSIONS

Leukemia of man is essentially the same disease as leukemia of mice. Both the acute and the chronic forms lymphoid as well as myeloid, are neoplastic diseases. The immature blood cells in leukemia are malignant cells, which may form tumors or diffuse infiltrations and possess characteristics of their own. Studies of leukemia of the mouse indicate that leukemia, like cancer, is of multiple etiology, its development and manifestations are dependent on intrinsic (genetic) and extrinsic factors. An analysis of these factors in the mouse and their role in the human disease requires further study.

1300 York Avenue

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. CHAMBERLAIN, DR. CRAVER AND
DRS. FURTH, FERRIS AND REZNIKOFF

DR. G. E. RICHARDS, Toronto. For twenty years those who have been engaged in roentgen and radium therapy have been wrestling with the problem of dosage and have gone through the periods when dosage was looked on as purely a physical matter. Dr. Chamberlain has made it clear that, in the presence of the perfected apparatus, dosage is a biologic matter. The correct dose is the dose that best suits the needs of the individual patient at a given time and presupposes the use of a standardized preparation. No dose of x-rays can be a pre-determined, mathematical calculated dose. It must be a dose administered and controlled by the observed tissue reactions in the individual. These observed tissue reactions are of as much importance to radiologic physicians as blood sugar estimations are to the physicians engaged in the treatment of diabetes. The unknown will always be the individual response and this must be controlled regardless of any dose, no matter what it may appear to be on paper. The problem of dosage is as nearly solved as many of the problems of drug therapy. There is available a highly efficient form of therapy, almost an instrument of precision and the application of this instrument to the problems of disease, particularly the problem of cancer, remains an individual one that can never be reduced to a standard formula. Dr. Chamberlain has spoken of the possibilities along the line of super high voltage therapy. It has always seemed to me that the answer to this question was provided by experience with large units of radium from 4 to 8 Gm. as these represent a wavelength of the order of one million volts or one and one-half million volts and the answer to that question can be obtained from the study of this particular work quite as well as and probably more quickly and accurately than from x-ray machines or x-ray tubes operating at a million volts.

DR. T. R. WAUGH, Montreal. From the standpoint of the hematologist the experimental production of leukemia in animals offers a most important method of approach to the problems associated with these conditions. On the other hand from the standpoint of the pathologist I think that one should be a little hesitant about accepting as established the neoplastic nature of these conditions. It is hardly justifiable to define the leukemic process as identical with neoplastic growth, when as a matter of fact the absolute criteria of tumor growth are as yet by no means certain. In the second place there is undoubtedly in the various forms of leukemia in man a wide range which approaches the hyperplasias on the one hand hence called hyperplastoid, and the tumors on the other hence referred to as sarcomatoid. This fact has led to the introduction in the scale of proliferative activities between hyperplasia and neoplasia and merging into them on either side of a third type designated as cataplasia and the leukemias fall into this division. Cataplasias have neither the complete differentiation of cells and preservation of functional activity, which charac-

²⁰ Naegeli, Otto. *Blutkrankheiten und Blutdiagnostik*, ed. 5. Berlin: Julius Springer, 1931.

terizes the hyperplasias, nor the independent atypical manner of growth of the neoplasias. Nor is the introduction of this intermediate type merely a name, for it represents a biologic principle and law of growth. One finds the same stages in development of malignant tumors as in cancer of the breast, in which one can trace the transition of proliferative activity of epithelial cells from a simple hyperplasia through a stage of abnormal development and immaturity to true neoplasms. As regards cancer, Dr Craver has pointed out the need of an investigation of the predisposing factors as encountered in the patient, and this is undoubtedly an important field, particularly open to the clinician. For the research workers there appear to be three main methods of approach. There are first those who study the cancer cells themselves and see in them specific attributes, they might be called specificists. Secondly there are those who investigate the stimulating and irritating factors, they might be termed etiologists. Finally there are the comparatively few who look to the changes within the host which allow the malignant growth to take place, they see in the environment of the proliferating cells the real secret of their emancipation and might be termed environmentalists. Cancer might be likened to a runaway horse. Witnessing such an event, some would be interested in the horse itself, others would wonder what frightened the horse while a few would be concerned with why the horse got away and could not be controlled. Horses frequently get frightened but seldom run away. I am inclined to believe that too much attention has been paid to the various stimulating agents and the cancer cells themselves, to the neglect of that other, most important factor, the host.

DR. L. K. DIAMOND, Boston. The difficulties of determining the etiology of cancer in general and leukemia in particular become greater when the disease occurs in the infant and child rather than in the adult. Leukemia is so much more likely to be an acute fulminating process in the young with symptoms and signs frequently similar to those produced by an infectious process, that even after years of study the evidence for the neoplastic nature of the disturbance has been scant. Too often leukemia in childhood is associated with hyperpyrexia, pain in various organs, the presence of extremely immature, difficult-to-recognize leukocytes and a rapid, fatal course. Infection in this age group often is followed by the same group of symptoms. Therefore the best lead to the understanding of the cause of leukemia in such cases is the comparison of the experimental leukemia in animals with that in human beings. Two years ago I started studying the course of leukemia experimentally produced in mice and was impressed by its similarity to that in infants and children. In fact, examination of tissues from each side by side, showed the impossibility of differentiating the two in many cases. An interesting observation was the fact that a malignant cell can be so specific when injected into a susceptible host by a single route as to produce the same group of symptoms and signs, a similar course and identical changes in the various organs involved in every mouse. In a review of seventy-five cases in infancy and childhood seen during the last eight years it became readily apparent that the leukemias could be divided in a fashion different from that used previously. In fact many similar case histories occurred in which the onset of symptoms, the development of signs, the course of the disease, the character of the malignant cell and its level in the blood, the type of termination and the changes in the organs at necropsy were similar in many respects. This was used as a basis for classification. In forty-five cases certain definite groups could be separated. One easily recognized type invariably started with pain in a single joint followed by hyperesthesia, pains in several joints or bones, limitation of motion, irritability, weakness and fever. Rheumatic fever was most commonly suspected. However the development of pallor, petechiae, enlarged liver and spleen and numerous immature forms of leukocytes even though their level in the blood was not high followed by a rapid terminal anemia and death within a few months with necropsy evidence of leukemia was invariably associated with a small, malignant lymphocytic cell. Another group showed gradual development of pallor, weakness, abdominal pain, generalized glandular adenopathy, extreme hyperpyrexia and a rapid termination in

a few weeks, associated with a single type of malignant lymphoid cell. It has been possible to recognize four other types of malignant cells, each of which is associated with a definite and characteristic progression of symptoms, signs, termination and infiltration of organs.

DR. CHARLES C. LUND, Boston. Dr Chamberlain mentioned biopsy. Many people are still afraid of biopsy. They are afraid that the cancer will be spread by the procedure. I believe that a biopsy done properly on a reasonably accessible tumor is almost universally indicated and that it is perfectly harmless if followed, within a few days or preferably a few hours, by adequate roentgen, radium or surgical treatment. Dr Craver listed many of the known factors in the etiology of cancer. I am going to show how some of these factors may work on one another. There will be cases in which, of course, a single factor is important, and that is the only important one. An example might be x-ray cancer. A sufficient dose of x-rays will certainly produce cancer in every subject. The only difference that the changes in the host will make in that situation will be the rapidity with which the cancer will develop. On the other hand, certain people are born with conditions that are sure to terminate in cancer if they reach an advanced age. One of the worst offenders in that line is multiple polyposis of the intestine. There are others. Inheritance and irritation are both important in skin cancer and by that I mean ordinary common basal cell as well as epidermoid skin cancers. For instance, the person with red hair and very light skin is much more irritated by sunburn or other exposure than the Mediterranean type of person, or he, in turn, than the Negro. With the same exposure to the elements, the incidence of skin cancer in the redheaded individual with light skin is probably ten times what it is in the Italian, Greek and Spaniard. Again, their incidence is probably ten times that of the Negro. The type of skin is what is inherited. The irritation, added to susceptibility, is what produces cancer at a given time in a given case.

DR. W. EDWARD CHAMBERLAIN, Philadelphia. I thank Dr Lund for giving his opinion on biopsy. It is a number of years since I thought of the time when physicians were a little afraid of biopsy. It is now being done universally, and many statistics have been accumulated or much experience has been gained to indicate that it is a perfectly safe procedure when properly carried out.

DR. JACOB FURTH, New York. From the theoretical standpoint any type of cell that has the ability to multiply may undergo unrestricted multiplication and produce a neoplasm. Blood cells should be no exception. When cells of a breast gland undergo unrestricted multiplication one expects to find a growth in the breast. What change is expected when cells that exist as detached individuals and that readily find their way into the blood stream and grow particularly well in certain organs, e. g., bone marrow, spleen and lymph nodes, undergo unrestricted multiplication? One would expect to observe precisely the manifestations of disease that are found in leukemia. Immature cells of the bone marrow injected into normal animals disappear from the blood and the animals remain healthy. When a few immature blood cells, less than ten, from an animal with leukemia are injected into a normal animal the cells introduced multiply unrestrictedly with no apparent purpose until the host dies. Studies of human leukemia led to no definite conclusion concerning the nature of this disease, but studies in animals yielded conclusive results. Those who have availed themselves of the opportunity to study leukemia of mice have come to conclusions similar to those presented by us. We hope that Dr Waugh may also avail himself of this material and reach the conclusion that the human disease is neoplastic and its manifestations are similar to those of the animal disease.

Inspection and Palpation—The examination of the cardiac area by inspection and palpation is too often neglected. The accurate diagnosis of cardiac conditions by the average practitioner can be accomplished far more easily and accurately by the use of inspection and palpation than by auscultation.—Dr E. J. G. Beardsley, quoted by Fisher, *Alexander Aphorisms in Clinical Medicine* *Canad J Med & Surg* 77:166 (June) 1935.

LOBAR COLLAPSE IN CHILDREN

GLADYS L. BOYD, M.D., FRCP (C)

TORONTO

The collapse of one lobe of the lung may take place in various locations and from several causes. Its actual occurrence is so restricted to the atelectasis of a lower lobe, characterized radiologically, by a basilar triangular shadow, that its discussion is practically limited to the study of the latter condition. Since Dieulafoy¹ first described these shadows in 1910 there has been no dearth of literature on the subject. My only excuse for adding to its volume is the clinical and pathologic material that I have to present, which may add to the elucidation of a still unsettled problem.

Before proceeding with the discussion of basilar triangular shadows, I would like to mention the rarer

ences from the usual picture of pneumonic consolidation. It was homogeneous. The lower border was sharply defined, and perhaps, most important, the mediastinum was shifted to the diseased side. Post mortem examination revealed an atelectatic bronchiectatic right upper lobe. There was no pigment present, but this was insufficient evidence to warrant the conclusion that the lesion was congenital.

A basilar triangular shadow may be described as a homogeneous opaque shadow in the form of a right angled triangle having for its base the diaphragm, one side the mediastinum, and a hypotenuse formed by a line extending from the hilus to some point on the diaphragm. The latter may be straight, convex, concave or slightly irregular in its outline. Importance is attached to its character as varying with the underlying cause. These opaque areas until quite recently have been attributed to mediastinal pleurisy, seldom

Bronchiectasis Associated with Lobar Collapse Shadow

| Case | Age of Onset | Cause | Age When Treatment Was First Started | Shadow Noted | Health | Sputum | Clubbing | Location of Disease | Bacteriology (Aspirated from Lung) | Bronchograph | Naso-pharyngeal Infection | Result |
|----------|--------------|---|--------------------------------------|--------------|------------------|-----------------|----------|---------------------|--|----------------------------|------------------------------|--------------------------|
| 1 W J ♂ | 5 yrs | Pneumonia at 5 and 7 tonsillectomy and adenoidectomy at 8 | 10 | 0 | Poor (ear drums) | +++ Foul | + | Bilateral | Pneumococcus | Cylindrical | Tonsils and sinuses | Chronic |
| 2 M S ♀ | 4 mo | Pneumonia at 4 mo ill 4 mo | 8½ | 8½ | Fair | ++ No odor | + | Left | Hemolytic streptococcus influenza bacillus | Saccular dilatations | Pansinusitis | Improved |
| 3 H R ♂ | Infancy | Pneumonia 3 times in infancy | 10 | 10 | Fair | + No odor | 0 | Right | Hemolytic streptococcus | Saccular dilatations | Pansinusitis | Chronic |
| 4 E H ♀ | 3 mo | Pertussis at 3 mo | 10 | 10 | Poor | +++ Foul | ++ | Right | ? | ? | Tonsils pansinusitis | ? |
| 5 H N ♀ | Infancy | Pneumonia in infancy | 10 | 10 | Poor | No odor | + | Right | ? | Cylindrical | Tonsils and sinuses | Chest clear at 20 |
| 6 N E ♀ | 2 yrs | Indefinite | 3 | 3 | Poor | + No odor | + | Left | Pneumococcus type III | Cylindrical | Tonsils and sinuses | Chronic bronchiectasis |
| 7 E V ♂ | 1½ yrs | Indefinite | 2½ | 2½ | Poor | Very little | +++ | Left | Hemolytic streptococcus | Saccular | ++++ Tonsils and all sinuses | Died from accident |
| 8 W H ♀ | 9 yrs | Pneumonia | 11 | 11 | Poor | ++++ Foul | ++ | | Hemolytic streptococcus | Saccular | Tonsils and sinuses | Died following lobectomy |
| 9 M B ♀ | 8 yrs | Pneumonia at 8 yrs | 0½ | 0½ | Poor | ++++ Foul | +++ | Bilateral | Streptococcus viridans | Cylindrical | Pansinusitis | Died following lobectomy |
| 10 B L ♀ | 6 yrs | Indefinite at 6 yrs | 10 | 10 | Poor | +++ Slight foul | +++ | Left | Streptococcus viridans | Cylindrical later saccular | Tonsils maxillary sinusitis | Doing well |
| 11 Q V ♂ | 7 yrs | Peanut aspiration | 7 | 7 | Fair | None | ++ | Right side | Hemolytic streptococcus | Saccular | Tonsils | Doing well |
| 12 M G ♀ | 2 mo | Nasopharyngeal bronchitis | 0 mo | 0 mo | Poor | None | Slight | Right | ? | Saccular | Diseased adenoids | Died |

cases in which lobar collapse of an upper lobe occurs. Years ago, Heller² described a series of cases of bronchiectasis in children from 9 months to 7½ years of age. The lesions involved whole lobes, usually upper ones, and were characterized by collapsed lobes with pus-containing cavities separated by narrow septums and containing little lung tissue. He considered them to be congenital in origin. I have noted that acute bronchiectasis in infancy much more frequently involves these lobes than would be expected from the prevalence of lower lobe infections in older children and in adults. During the life of an infant who died at 6 months of age with a history of infections of the respiratory tract for three months, a roentgenogram was considered a picture of chronic bronchopneumonia. Consideration of the roentgenogram showed several important differ-

proved, and to fibrosis of the lung. Savy³ and Wallgren⁴ have both demonstrated purulent effusion. The hypotenuse in these cases is convex. Armand-Dehille, Levy and Marie⁵ in 1925, and shortly afterward Singer and Graham,⁶ were the first to associate this picture with pulmonary collapse. The former observers noted its association with saccular bronchiectasis, while the latter described its occurrence in a radiologic study of bronchiectasis and noted the collapsed condition of such lobes when removed surgically. Rist and his co-workers⁷ recognized its association with bronchiectasis but did not appreciate its pathologic significance. Granting that this shadow occurs most often in bronchiectasis and by some is regarded as pathognomonic, it is well to point out its possible occurrence in other diseases. Mention has already been made of authentic cases due to pleural effusion. Anspach⁸

Read before the Section on Pediatrics at the Eighty-Sixth Annual Session of the American Medical Association Atlantic City N. J. June 12 1935.

From the wards and laboratories of the Hospital for Sick Children and the Department of Pediatrics University of Toronto under the direction of Alan Brown M.D. FRCP (C).

1 Dieulafoy Georges. Bronchiectasis in *Manuel de pathologie interne* Paris Masson et Cie 1910.

2 Heller A. Die Schicksale atelektatischer Lungenschnitte. *Deutsches Arch f klin Med* 36:189 1885.

3 Savy M. P. *Progrès med* 27 371 1910.
4 Wallgren, Axel. Beitr z Klin d Tuberk 69 641 1923.
5 Armand-Dehille P. F. Lévy R. and Marie J. *Revue franç. de pédiat* 1:125 1925.
6 Singer J. J. and Graham, E. A. *Am. J Roentgenol* 15 54 (Jan) 1926.
7 Rist E. Jacob P. and Trocène. *Ann de méd* 21 144 1927.
8 Anspach, W. E. Atelectasis and Bronchiectasis in Children. *Am J Dis Child* 47:1011 (May) 1934.

reports a case of congenital heart disease showing this picture. Recently one similar case in a young infant was seen in this clinic. In one other child with rheumatic carditis there was a triangular basilar shadow on the right side which on cursory examination presented the picture of pericardial effusion, but closer study showed its true nature. Iodized poppy-seed oil was injected in this case but revealed no bronchiectasis.

Space will not permit either the display of the roentgenograms of all my cases or their case histories. The accompanying table summarizes the essential points and such roentgenograms are shown as will demonstrate the essential points. Physical signs are not given in the table because there is no constancy in those found, except the cardiac displacement to the diseased side. Sometimes they are such as to suggest the presence of lobar collapse without the aid of a roentgenogram, but they vary considerably. There is usually dullness, more or less marked altered breath sounds and some moisture, but such signs are not sufficiently characteristic to differentiate these from other lesions of the lower lobe.

Pathologic specimens were obtained from four patients either by surgical removal or at autopsy. In all, the lobe was greatly shrunk.



Fig 1 (case 7) —E. V. had bronchiectasis from 1½ years of age. Death occurred at 3½ years as a result of an accident.

The upper lobes were enlarged to fill up the space ordinarily occupied by the diseased lobe. In three of the four the collapsed lobe was the only pathologic basis for the triangular shadow, in the fourth case a shadow might have been produced by the fibrous adhesions that extended from the hilus to the base. The pleural adhesions were not marked and could be separated without tearing the lung tissue. The cut surfaces showed numerous dilated bronchi ending in saccular or cylindric dilatations. These were separated by narrow strips of tissue. The bronchial mucosa was thrown into transverse ridges. The parenchyma was much reduced in amount collapsed and nearly airless. There was some fibrosis in all cases.

Microscopically, almost no normal lung tissue was to be seen. The few remaining alveoli were collapsed and thick walled. There was some pigment in every patient except the baby, who was too young to be expected to have any. The bronchi were widely dilated and lined with stratified columnar epithelium. In some areas the lining was replaced by granulation tissue. There were a few islands of cartilage remaining. Some of the bronchi had cilia and a few had hypertrophied mucous glands. The stroma was invaded by lymphocytes, eosinophils and polymorphonuclear cells.

Basilar triangular shadows have been noted in roentgenograms of the lungs in fourteen children at the Hospital for Sick Children. Twelve of these were definitely associated with bronchiectasis. This represents a morbidity of only about 7 per cent of the cases of bronchiectasis studied in the period of observation. In all cases as far as could be determined, such shadows were produced by collapsed lower lobes of

the lung. There was no evidence in our cases and little in the literature to support Kerley's⁹ contention that such collapse usually occurs in an accessory lobe of the lung.

The shadows seen in our cases were permanent with one exception (case 5). No cases have come under observation such as those described by Findlay¹⁰ in which reinflation could be produced by deep breathing induced in his cases by inhalation of carbon dioxide. He states that this reexpansibility is the only proof of the atelectatic nature of the lobe. He explains however, that in long standing cases reinflation may be prevented by fibrotic changes. Bronchiectatic dilatation may be produced within two weeks of onset, as in case 11 so that reinflation would have to be done very early to be effective.



Fig 2 (case 7) —Appearance after injection of iodized oil.

The earlier observers of triangular basilar shadows, while still considering those produced by mediastinal pleurisy, commented on the larger amounts of sputum in these patients. There has been a tendency in more recent literature to stress the mildness of the bronchiectasis associated with lobar collapse, certain observers¹¹ calling it "dry bronchiectasis". A glance at the table will show that, while very early cases may not be attended by serious ill health, the disease is progressive, and ultimately all our patients had sputum. This became foul and abundant only when secondary invasion of



Fig 3 (case 7) —Lung obtained post mortem showing the collapsed lower lobe.

other lobes was present. The general health was seriously impaired in all either periodically or continuously.

The pathologic picture, aside from the very shrunk lobe, varied little from that already described by Erb.¹²

9 Kerley P. *Brit J Radiol* 5: 234-240 (March) 1932.
10 Findlay L. *Arch Dis Childhood* 10: 61 (April) 1935.
11 Wall C and Hoyle J C. *Brit M J* 1: 597 (April 8) 1933.
12 Erb I H. *Pathology of Bronchiectasis*. *Arch Path* 15: 357 (March) 1933.

as found in bronchiectasis in children, the essential difference being in the relatively greater amount of collapse in these cases and the greater degree of fibrosis in the others

There is no difference in the etiology. Pneumonia is the commonest precursor in all types. The bacteriology, as in bronchiectasis, generally is not specific.



Fig. 4 (case 9)—Roentgen appearance Oct. 27, 1932, at 9½ years of age. M. B. was never well following pneumonia at 8 years of age. Bronchiectasis was diagnosed at 9 years and the patient died following lobectomy at 10 years of age.

COMMENT

Why does lobar collapse occur in some cases of bronchiectasis? Warner and Graham¹³ were able to produce such shadows in the lungs of dogs by occluding the bronchus to a lower lobe. It appears strange that if this were the important etiologic factor lobar collapse would not be a frequent result of

foreign body inhalation in children. A goodly number of such cases are seen every year, and until recently none of them have ever shown a triangular shadow in the roentgenogram. This occurred in case 11 but might in this case have been due to the pneumonia that preceded its development or to the mechanical irritation produced by the peanut that had been inhaled. Pulmonary collapse is frequently seen after aspiration of a foreign body, but it is either massive in type or irregular, rarely lobar. Bronchiectasis develops very quickly with bronchial occlusion by a foreign body not removed within a few days.

Some observers consider this lobar bronchiectasis to be congenital, basing their conclusions on the absence of pigment and of alveolar tissue. The latter is certainly small in amount but never entirely absent. Pigment was present in all our patients except the infant. None with lobar collapse dated their illness from birth. There was no evidence of its congenital origin.

Every case was examined bronchoscopically, and pathologic changes of the bronchial mucosa were apparent. The essential lesion is probably in the smaller bronchioles, which become occluded by secretion with resulting collapse. Dilatation is produced readily in the weakened bronchi by increased intrabronchial pressure. Whether such dilatations are compensatory, as Findlay suggests, is not certain. It may be that these cases are more commonly associated with a lobar type of pneumonia than are those without lobar collapse.

CONCLUSIONS

Basilar triangular shadows in roentgenograms of children's chests are due to lobar collapse.

Such collapse is usually associated with bronchiectasis. It is not pathognomonic of this disease but is very suggestive.

Lobar atelectasis is the result of infection or injury of the bronchial wall, with secretion and consequent plugging of the bronchioles.

13 Warner, W. P. and Graham, Duncan. Lobar Atelectasis as a Cause of Triangular Roentgen Shadows in Bronchiectasis. *Arch. Int. Med.* 62: 888 (Dec.) 1933.

ABSTRACT OF DISCUSSION

DR. JOSEPH STOKES, Philadelphia. I think every physician has been interested in this condition since it was brought so forcibly to our attention some years ago. I have been extremely interested in what Dr. Boyd has said. In the study of a group of children at Children's Hospital, Philadelphia, made chiefly by Dr. Rubin, we have been particularly interested in the fact that these children are mostly from the underprivileged classes, most of them being relief board cases, and it has seemed that this was directly associated with conditions of malnutrition and poor hygiene. In the infant, rickets might be an important factor in which there is improper development of the chest and also softening of the ribs, the inability to expand properly and therefore to overcome whatever collapse may have been present. As in congenital heart disease, these children should be transferred to a special group that can be studied thoroughly and watched closely over a period of years so that intercurrent infections may be kept at a minimum. The roentgen examination gives a great many more signs than physical examination, and I think there again it is important to remember that the x-rays should be considered a method of diagnosis as useful and as readily applicable as the stethoscope, and not left entirely to the roentgenologist. In actual clinical diagnosis, I think that very few signs are found in these cases. We have had a group of cases in the Children's Hospital which I should like to ask Dr. Boyd whether she has seen in Toronto, namely, infants with very marked dyspnea, cough, apparently what might be called capillary bronchitis and fatal bronchopneumonia. About six cases have come to necropsy. The characteristic finding has been dilated smaller bronchioles standing out well above the lung tissue. The appearance is that of a group of small white pipes standing out amidst the consolidated lung tissue. Apparently there is marked inflammatory reaction in the bronchial walls. I wonder whether in Dr. Boyd's opinion this type of case may result on recovery, in a future bronchiectasis. I should like very much to hear from Dr. Boyd about the question of treatment in these conditions.

DR. J. S. WALL, Washington, D. C. It is interesting to know that the name of Pasteur is associated so intimately with collapse. This is William Pasteur, an Englishman and not Louis Pasteur the Frenchman. In 1914 when he made his last contribution, he was recognized as the student who knew most about collapse. Dr. Boyd has leaned toward the theory of the plug origin, or obstructive origin, in producing collapse, and strangely enough Dr. Pasteur never acceded to the opinions of others that collapse was produced by a plug. His first studies were on collapse in diphtheritic paralysis and even in his retirement he still is unrepentant in recognizing the plugging of a

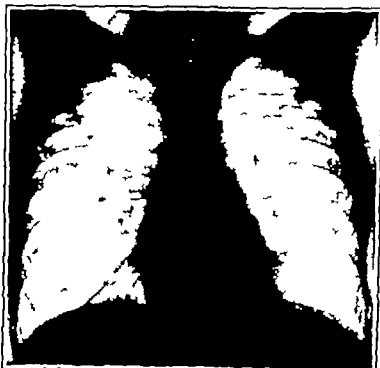


Fig. 5 (case 9)—Roentgen appearance April 21, 1933, at 10 years of age.

bronchus producing collapse. As I understood, in most of Dr. Boyd's cases there was a sequence of pneumonia, bronchiectasis and collapse, showing really that the dilatation of the tube and the presence in that tube of thick, viscid mucus probably had something to do with the production of collapse of the lung. Dr. Stokes said that in these cases very little could be learned from stethoscopic examination. That has often been my experience. The striking thing is the clinical picture of collapse cases in which a considerable area of lung is involved. These children look very much like children who are suffering from clinical acidosis with hyperpnea out of proportion to any somatic disturbance. Perhaps one gets a clue in that way. The second important clue is the dislocation of the heart toward the affected side and those two circumstances taken together even may point the way to diagnosis that would

later be confirmed by roentgen examination or sometimes, unfortunately, by autopsy. An interesting point in connection with collapse is the sequence of pneumonia, bronchiectasis and collapse that has been pointed out by Dr Boyd, and whether it might not be reasonable to believe that pulmonary collapse may even antedate pneumonia. Dislocation of the heart is a striking sign of pulmonary collapse and perhaps pulmonary collapse really does precede pneumonia rather than being the sequel to pneumonia.

DR. WILLIAM E. ANSPACH, Chicago. It seems to me that the important thing is not to wait to recognize the process at work in these cases until bronchiectasis is in full bloom, when the patient must run the risk of lobectomy, which so often fails to cure even though the patient survives the operation. It has



Fig. 6 (case 9).—Lung obtained post mortem. The right lower lobe previously removed by lobectomy showed a similar appearance.

been my privilege to watch a number of these cases from infancy to autopsy or beyond puberty. The triangular shadow in the roentgenogram, which must be depended on for the earliest diagnosis, is seen soon after the first symptom and as a rule is very small, smooth and homogeneous, not like the usual case of pneumonic consolidation. In the early period there is not the striped shadow or the shadow with scattered areas of decreased density so frequently seen in advanced cases of bronchiectasis. Cases coming to necropsy early after the onset of acute symptoms showed atelectasis of the lower lobe and there were no bronchial dilatations. Patients continuing to live, who retained their dense "triangular shadow," developed bronchiectasis. Bronchiectasis develops in a high percentage of children who have inadequate bronchial drainage. The roentgenologic sign of atelectasis is a warning of the presence of bronchial obstruction. Bronchiectasis can be avoided in a large number of cases by means of early bronchial aspiration and postural drainage. At the Children's Memorial Hospital where there has been an unusually large number of these cases, it has been interesting to note the predominance of right sided lower lobe collapse in children under 3 years of age. Additional collapse of other portions of the lung frequently followed and the mortality was high. Those who survived showed most often a left sided collapse and later left sided bronchiectasis.

DR. GLADYS L. BOYD, Toronto. I regret that I did not make my paper briefer so I could read it all. Perhaps it would have made some of the points clear that have been brought up for discussion. In reply to Dr Stokes about the poverty of these patients, most of them were from the poorer classes. I find bronchiectasis largely a disease of these classes and I do not think that patients whose bronchiectasis was associated with basilar triangular shadows were any worse off economically than others. Rachitic chest deformities have not been observed but only those produced by the pulmonary disease. On the

question of the recurrence of bronchiolitis, dilated bronchi in infants, I frequently observed that in cases particularly of influenzal pneumonia or associated with a good deal of bronchiolitis, the bronchi were dilated and sticking out sometimes with abscesses in the lungs as well. As far as treatment is concerned, in this group of cases it is pretty well limited to the treatment of bronchiectasis. I think, from the discussion that has gone on, that there are probably two groups of cases showing these shadows. In Dr Anspach's cases, which are far more numerous than my own they are of course mostly in young children and not necessarily associated with bronchiectasis, and reinflation of the lung could be produced. Specimens were obtained from four of my cases and it would be impossible from looking at these lungs to see how anything could reinflate them. As to diagnosing the shadow before the bronchiectasis occurred, in some of my cases the bronchiectasis has preceded development of the shadow. It is important to appreciate how rapidly bronchiectatic dilatation can occur in children. Ten days after the aspiration of the foreign body with no previous illness at all well marked grapelike dilatations have been frequently observed. In the one case in which a triangular shadow developed four days after aspiration of a foreign body the dilatations were well marked in the course of ten days. It has not been my experience that even in those cases reinflation could occur. They have been bronchiectasis from the start, and treatment has been more successful as far as clinical relief of the condition goes than it has in cases due to infection entirely, but it has not been any more effective in clearing up the dilatation.

OSTEOMYELITIS IN INFANCY

WILLIAM THOMAS GREEN, M.D.

BOSTON

Osteomyelitis in infancy differs in so many respects from osteomyelitis in older children that a separate consideration of the disease in children under 2 years of age is desirable. Until recently these distinctions have not been particularly emphasized in the medical literature. In 1932 Paschla¹ and in 1933 Green and Shannon² independently described certain of these differences, a knowledge of which is essential for proper treatment. At the Children's Hospital, Boston, more cases of acute osteomyelitis are seen in infants than in children from 2 to 12 years of age.

Osteomyelitis at Two Ages

| Children Under 2 Years of Age | Children Over 2 Years of Age |
|----------------------------------|---------------------------------|
| Streptococci 63 per cent | Staphylococci usually |
| Staphylococci 30 per cent | |
| Brief duration | Long duration |
| Rapid healing of wound | Slow healing of sinuses |
| Sequestration infrequent | Sequestration usual |
| Recurrences rare | Recurrences frequent |
| Lesions heal completely | Residual sclerosis of bone |

The usual conception of acute osteomyelitis is that of the syndrome as seen in older children—a disease generally due to *Staphylococcus aureus* (91 per cent), which after the acute phase usually adopts a chronic course of long duration, with sequestration, persistent sinuses and frequent recurrences. On the contrary, osteomyelitis of infancy is a disease more frequently due to *Streptococcus haemolyticus* in which, if the

From the Department of Orthopedic Surgery, Harvard Medical School, the Children's Hospital and the Infants' Hospital.

Read before the Section on Orthopedic Surgery at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, June 14, 1935.

¹ Paschla, Gunther. Die Besonderheiten der Osteomyelitis im frühen Kindesalter. *Monatsschr. f. Kinderh.* 55: 280-306, 1932.

² Green, W. T. and Shannon, J. G. Paper read in March 1933 before the Boston Orthopedic Club.

child survives the acute infection, the prognosis for complete and rapid recovery is excellent

In a previously reported statistical study of ninety-five cases seen at the Children's Hospital, from 1912 to 1932 inclusive Green and Shannon³ suggested that

1 Osteomyelitis in infancy was due more frequently to *Streptococcus haemolyticus* than to *Staphylococcus aureus* (63 per cent were streptococcic, and 30 per cent were staphylococcic)

2 The mortality rate of osteomyelitis in infancy was high, 21 per cent (This compares with 38 per cent in the series of Paschla¹ and 53 per cent in the series of Santi⁴) Under 6 months of age the mortality was even higher 44 per cent as compared to 13.4 per cent in those patients between 6 months and 2 years of age

3 Wounds healed rapidly after operation and were closed permi

thirty-nine were entirely healed clinically and by roentgenographic determinations, one case had been healed clinically for four years, although the roentgenogram suggested a residual lesion The final case, a recent one, has not yet healed

7 Deformities occurred in five of the forty-one cases examined in the end-result study Four of these were from secondary lesions of joints and one was from epiphyseal displacement and injury Of the deformities due to lesions of joints, two were of the hip with destruction of the head of the femur This was in accord with the observations of Paschla¹ who described septic joints and epiphyseal displacements as frequent complications of osteomyelitis in infancy

PATHOLOGY

In explanation of the differences of the disease in infancy, certain of the local manifestations of the infection must be considered as well as the fact that streptococcic osteomyelitis is more frequent than staphylococcic osteomyelitis *Staphylococcus* is liable to give rise to a more destructive process even in infancy The anatomic construction of the bones and certain physiologic characteristics of this age are factors in delimiting the character of the disease. This is discussed in detail in another publication⁵ and will be considered in summary fashion here

Osteomyelitis in infancy almost uniformly has its origin in the metaphysis as it does in older children Once the infection is under way it follows the path of least resistance⁶ (fig 1) In infants there is a minimal amount of cortical bone at the metaphysis, so that the spread to the subperiosteal space is extremely direct The periosteum, more loosely attached at this age, is dissected from the cortical bone, and the consequent subperiosteal abscess may rupture into the soft tissues without necrosis of the shaft This process goes on quite rapidly, and a secondary abscess may be present as soon as the second day after onset Gross sequestration is rare, what necrotic bone there is is usually absorbed rapidly Likewise the healing process goes on more rapidly in infancy, as may be seen in the illustrative cases

REPORT OF CASES

For consideration of the disease, three representative cases are presented

CASE 1—B G a white girl aged 1½ years was admitted May, 5, 1934 with an acute illness and pain in the right shoulder of two days duration Three weeks before the onset the infant had had an acute respiratory infection followed by otitis media

On examination the child was critically ill with a marked swelling of the right arm, maximal at the shoulder, and tenderness over the upper end of the humerus All motions of the shoulder joint were limited by muscle spasm, but there was no palpable fluid in the joint Fluctuation was suggested over the anterior aspect of the upper end of the humerus The temperature was 104 F Blood examination revealed 25,000 leukocytes

A diagnosis of osteomyelitis of the humerus was made.

The part was immobilized poultices were applied, and fluids were forced The next day the child had definitely improved and fluctuation was definitely present.

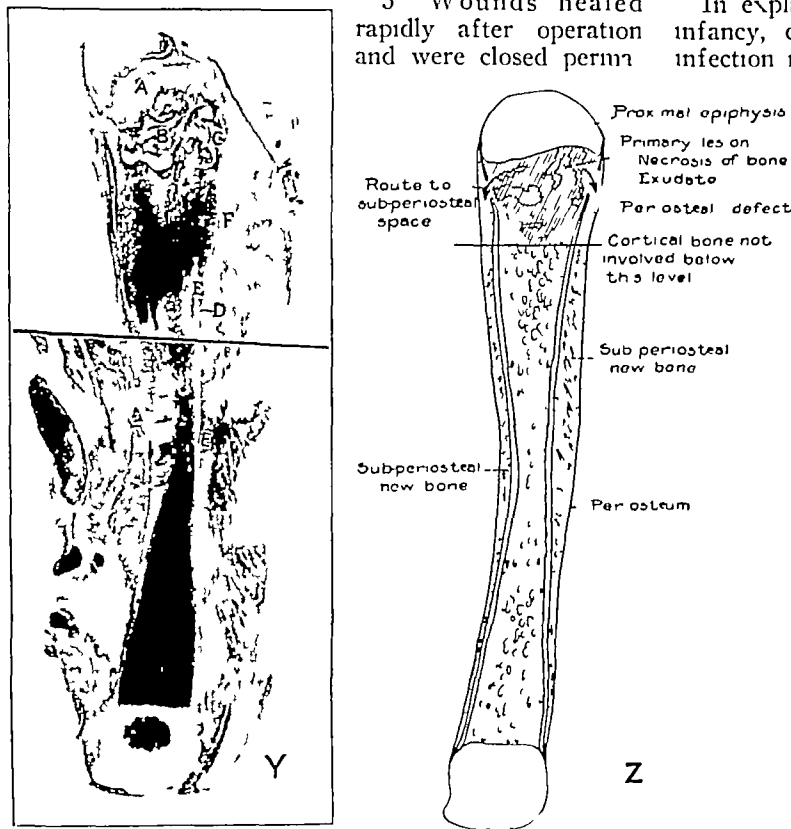


Fig 1—1, longitudinal section of tibia Osteomyelitis of three weeks duration in an infant aged 5 weeks The lesion started adjacent to the proximal epiphysis (A) at the metaphysis (B) and spread to the subperiosteal space at C→ where the cortical bone is minimal Note that subperiosteal new bone (E) extends the length of the shaft although involvement of the cortex does not extend beyond F B original lesion with necrosis of bone and exudate D periosteum Z diagrammatic sketch of Y showing mechanism of natural decompression Note the arrows

nently in an average of three months after the operation Frequently they healed in from four to six weeks

4 Sequestration was infrequent, gross sequestration occurred in only six of the ninety-five cases

5 Recurrences were rare, occurring in only two of ninety-five cases and in both instances consisting of brief drainage followed by final healing

6 Complete healing of the lesion in the bone was the rule In many instances the site of the lesion could not be recognized in the roentgenograms taken in an end-result study Of forty-one cases examined in this end-result study (not selected except as to service)

³ Green W T and Shannon J G Osteomyelitis of Infants Arch Surg to be published
⁴ Santi E Osteomielite nei primi anni della vita Arch ital di chir 35 1 1934

⁵ Starr C L Acute Hematogenous Osteomyelitis Arch Surg 4 567 587 (May) 1922 Green and Shannon³

May 6, the day following admission, an incision with drainage of a secondary abscess in the soft tissue was done, the humerus was not disturbed. The wound was packed with petrolatum gauze and the extremity immobilized. Culture from the wound showed *Streptococcus haemolyticus*.

The temperature was normal on the third postoperative day and thereafter (fig 2). Roentgenograms on May 9, showed extensive destruction of the upper end of the humerus with

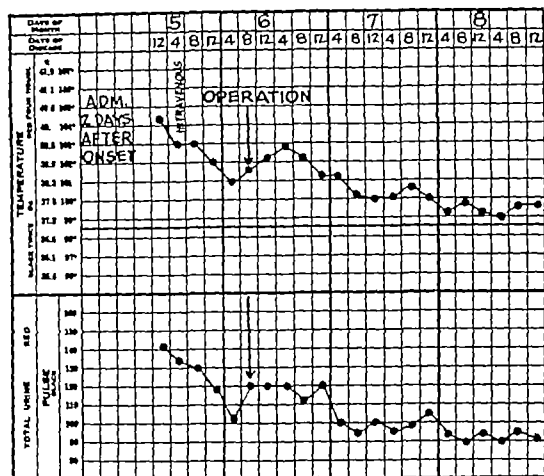


Fig 2 (case 1)—Clinical chart showing that the high temperature and rapid pulse on admission decreased and the patient's general condition improved on treating the child and immobilizing the extremity before operation. Operation: Drainage of a fluctuant abscess which was done at the optimum time. The temperature was normal on the third postoperative day.

displacement of the epiphysis (fig 3). Fourteen days later roentgenograms visualized definite healing with new bone (involucrum) surrounding the shaft throughout its length. The wound was healed in six weeks.

June 1, 1935, thirteen months after onset, the extremity was apparently normal, both to physical and to roentgenographic examination.

CASE 2—J. M. A., a boy aged 1 year, was admitted April 23, 1934, with an acute illness, sensitivity and swelling of the left lower extremity of six days' duration.

On examination the infant was acutely ill, pale and dehydrated, with an extremely swollen left lower extremity. The swelling and tenderness were maximal over the lower end of the femur. Motion at the knee was markedly limited by muscle spasm, but there was no fluid in the joint. Roentgenograms on admission were negative except for edema of the soft tissues. The temperature was 103 F. The white blood cell count was 26,000.

A diagnosis of osteomyelitis of the femur was made.

The extremity was immobilized and poulticed. Fluids were forced.

On April 24, the day after admission, an incision with drainage of a secondary abscess in the soft tissues was done; the femur was not disturbed. The wound was packed with petrolatum gauze and the extremity was immobilized with plaster. Culture from the wound showed *Staphylococcus aureus*.

The postoperative convalescence was uneventful; the temperature was normal by the fourth postoperative day. Roentgenograms two weeks after admission showed destruction at the lower end of the femur with an extensive involucrum about the lower two thirds of the shaft. The wound healed in two and one half months.

On final examination six months later, the extremity was clinically normal and roentgenograms showed little residuum (fig 4).

CASE 3—F. H., an infant aged 1 month, was admitted June 2, 1932, with an acute illness of two weeks' duration

associated with tenderness of the left shoulder. Four days before admission, swelling and redness of the shoulder were noted. Two days before onset a furuncle of the chin was noticed.

On examination the infant was moderately ill with swelling, tenderness and redness of the left shoulder and arm. There was definite fluctuation. Motions of the shoulder joint were limited. Roentgenograms on admission showed extensive destruction of the upper end of the humerus.

A diagnosis of osteomyelitis of the humerus was made.

The day after admission, incision with drainage of a secondary abscess in the soft tissues was done. The humerus was not disturbed. The wound was packed with petrolatum gauze and the part immobilized. Culture from the wound showed *Staphylococcus aureus*.

Roentgenograms, June 20, showed definite healing of the lesion with extensive involucrum surrounding the lesion. The wound was healed six weeks after operation.

June 1, 1935, three years after onset, the extremity was functionally normal on physical examination. Roentgenograms showed little evidence of the former lesion.

These cases may be considered as typical of the disease. Although any degree of illness may be found, the systemic manifestations are frequently quite severe and are usually noted before the presence of a local lesion is appreciated. The acute illness may often be ascribed to a respiratory infection, since antecedent respiratory infection is common. In our series of cases, 55 per cent gave definite evidence of antecedent infection, half of which were respiratory disorders.

Local sensitivity is soon evident. The child does not move the part and is irritated by handling. Swelling may be noted occasionally as soon as twenty-four hours after the onset, and soon becomes marked. It is frequently so diffuse as to be of little aid in localizing the site of the lesion. Redness is not a feature, nor is local heat particularly striking. If the lesion has been present for forty-eight hours or longer, thickening of

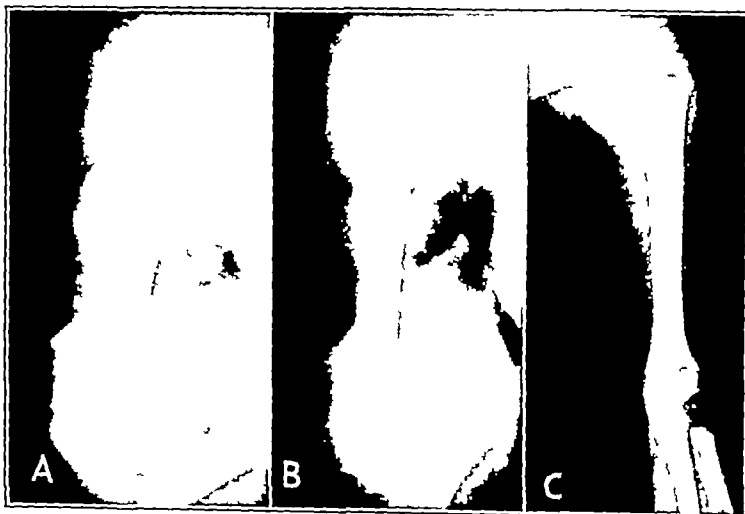


Fig 3 (case 1)—Osteomyelitis of the humerus—*Streptococcus haemolyticus*. Operation consisted of drainage of secondary abscess only. A, seven days after onset showing extensive destruction of the humerus with displacement of epiphysis. B, two weeks later showing considerable healing. C, one year after onset showing normal appearance. The patient is now clinically well.

the shaft adjacent to the epiphysis may be suggested, and soon thereafter palpable deep fluctuation may be recognized. Tenderness at the metaphysis, although more difficult to elicit in infants than in older children, is a determining factor in recognizing the exact site of the lesion.

ROENTGENOGRAPHY

It is our constant practice to take roentgenograms although they are of little positive aid in the diagnosis, in that they do not demonstrate the lesion until from seven to twelve days after the onset. However, they may be helpful in various ways, they may demonstrate the presence of scurvy, syphilis, or an osteomyelitic

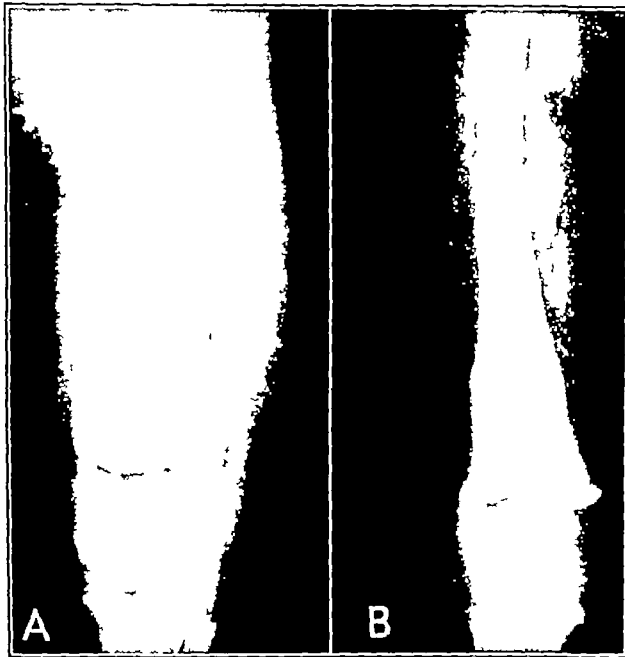


Fig. 4 (case 2)—Acute osteomyelitis of the femur—*Staphylococcus aureus*. Operation consisted of drainage of the secondary abscess only. A three weeks after onset showing destruction of the lower end of the femur with extensive involucrum. B six months later nearly healed. The patient is now clinically well.

lesion of longer duration than the history suggests. The visualization of the soft tissues may be helpful.

Roentgenograms taken to observe the course of the disease are valuable and are very illuminating. Frequently they exhibit extensive destruction with involucrum surrounding the length of the shaft and suggest that gross sequestration will surely occur. One is amazed in subsequent roentgenograms to notice rapid healing without sequestration.

DIFFERENTIAL DIAGNOSIS

Osteomyelitis must be suspected in any infant with an acute illness associated with a sensitive extremity. Other conditions to be considered particularly are abscess (subfascial abscess), septic joint, scurvy and syphilis.

Septic joints are common in infancy. Palpable fluid in the joint with extreme muscle spasm and local sensitivity suggest septic joint. It must be remembered that an effusion into a joint not infected may exist from an adjacent osteomyelitis and that septic joints secondary to osteomyelitis are more common in infancy than at other ages.

Deep abscesses are common in infancy and often are impossible to differentiate from osteomyelitis previous to operation. If the physical signs are maximal away from the metaphysis, it is suggestive of abscess.

Scurvy and syphilis may be recognized by history, multiplicity of lesions, and roentgenograms. Tuberculosis is not difficult to differentiate.

TREATMENT

In acute osteomyelitis of older children there is considerable debate as to the treatment to be adopted—the time of operation, the type of operation and subsequent care. Based on the idea that progressive infection within rigid walls produces increased necrosis, it is, I believe, a prevailing although not universal feeling that operation to “decompress” the infection should be carried out at the earliest possible moment, preferably in the form of a window at the site of the lesion. Whatever the treatment, a long drawn out complicated course is frequent.

In infancy I believe that the indicated therapy is more definite. The prime consideration is the treatment of the acutely ill child, not the local lesion. If the infant survives the acute illness, the disease will be brief, with residuum in the bone unusual. With these considerations in mind we have been able to reduce our mortality in the cases treated from 1931-1934 inclusive to 6.6 per cent. There have been only two deaths in thirty cases and both of these were of infants under 2 months of age who had diffuse sepsis.

Early drainage of the bone does not decrease the amount of destruction nor does it limit the systemic manifestations. On the other hand poorly timed, extensive surgery jeopardizes the child's life. There is no haste in performing an operation and operative procedures must be minimal. The infant should be in the best possible condition at the time of the procedure.



Fig. 5 (case 3)—Osteomyelitis of humerus in child aged 1 month. *Staphylococcus aureus*. Operation consisted of drainage of the secondary abscess. A one month after onset showing destruction with surrounding involucrum. B three years later apparently normal.

Unless an abscess is palpable and the child is in excellent condition on admission, it is our custom to immobilize the part, apply poultices and give the indicated supportive treatment. Usually the child's condition improves (fig. 2), localization of the process occurs, and the exact site of the lesion may be recog-

nized Frequently we allow a palpable abscess to form before an operation is done This occurs quite rapidly

At operation it is not necessary to carry out a procedure on the bone if the secondary abscess is adequately drained At any rate, the operation should not be complicated in order to drain the bone A small window in the bone is permissible but not essential, "the less done, the better" The wound is packed with petrolatum gauze and immobilized, usually in plaster The first dressing is done in ten days and the wound is repacked at weekly intervals The interval of ten days before the first dressing allows granulations to form so that the wound is no longer sensitive

Usually the wound is entirely healed in from four to eight weeks

The reason for adopting this treatment is that there is less immediate danger to the infant and at least as good a final result as is obtained by any other method It must be understood that there can be no absolute statements about treatment individual decisions must be made on individual patients

CONCLUSION

Osteomyelitis of infancy is a disease of relatively brief duration, with sequestration and recurrences rare and residual lesions in the bone unusual, if the child survives the acute illness

The mortality rate may be reduced by "treating the child," by allowing localization and by carrying out the minimal surgical procedures

300 Longwood Avenue

ABSTRACT OF DISCUSSION

DR FRANK R OBER Boston Osteomyelitis in infancy is an emergency problem, not as to local condition but as to the life of the child Twenty years ago at the Children's Hospital in Boston, the plan of treatment was to consider the condition an emergency This involved an immediate operation on admission of the patient and removal of a piece of bone, tunneling the shaft The result of such a procedure was a high mortality rate Postoperative treatment consisted of frequent dressings containing some antiseptic solution I became convinced that these frequent dressings which disturbed the patient and caused bleeding from the wound surfaces, did no good Frequent dressings increase the toxic condition of the patient In those days the mortality in infants was around 50 per cent but as we began to be more conservative in the matter of dressings, the mortality rate decreased It was not until Dr Green began his study of osteomyelitis however, that any of us became aware of the fact that no matter what was done in the way of surgery, the reaction of the bone was practically the same Of these ninety-five cases which Dr Green reports only six show sequestration If a child is very ill and his temperature drops the results are not good if the operation is not performed fairly soon These infants should be watched very carefully and a definitive operation performed when the general condition of the child is at its best Usually the operation means as Dr Green has pointed out only a simple incision and drainage of the abscess This abscess should be packed down to the bone and dressed only once a week In every case of osteomyelitis it is important that the wound heal from the bottom Dr Green is to be commended for bringing to attention that osteomyelitis in infants less than 2 years of age is a different disease from that in the older child

DR WILLIAM T GREEN Boston I have considered the mortality during the past five years to be very low The two deaths in the thirty patients treated during this period have been in infants less than 6 weeks of age who presented multiple septic lesions at the time of admission There has been one deformity in this time and that was due to epiphyseal displacement The epiphysis was displaced at the time of admission I believe that if enough patients are treated there will be a

certain number of deformities and a certain number of deaths I feel that I have been fortunate during the last five-year period and believe that a slightly higher incidence of deformities may be anticipated and a slightly higher mortality rate rather than a lower one I think that immobilization is an important item in preventing deformities

TUBERCULOUS LYMPHADENITIS

SECONDARY TO INCONSPICUOUS HEALED TRAUMATIC CUTANEOUS TUBER- CULOUS LESIONS

B N CARTER, MD

AND

JACOB SMITH, MD

CINCINNATI

During the past twelve years at the Cincinnati General Hospital, four cases of proved and three of probable traumatic inoculation tuberculosis of the skin with metastasis to regional lymph nodes have been seen Instances of this condition constitute a very definite but quite unfamiliar group, and for this reason our cases are being reported The outstanding adenopathy in each case has usually overshadowed the primary focus With a more accurate knowledge of the pathology and clinical course a more frequent identification of new cases should result

Very little has been written about healed traumatic tuberculous lesions of the skin with regional lymphadenopathy Tscherning (quoted by Stokes¹) in 1888 reported the case of a servant of a tuberculous patient who injured a finger with a fragment of a sputum cup Subsequently, lymphatic involvement occurred The finger was amputated and the involved glands were excised, following which the patient recovered Klebs,² in his book published in 1909, mentions extensive tuberculosis of the inguinal glands in an infant resulting from a slight prick of the thigh with a safety pin

Ceremonial circumcisions occasionally lead to a fatal tuberculosis among the poor Jewish and Mohammedan children Holt³ in 1913 collected forty-one such cases, sixteen of which had a fatal termination

From time to time sporadic articles have appeared, but in each the reported primary lesions have always been well defined However, two cases of cutaneous tuberculosis associated with trauma were reported by Chancellor⁴ in 1914 In one case, a pin which had been carried between the lips of a tuberculous uncle was the offending agent and the method of inoculation was a scratch on the cheek, in the other, the playful bite of a nurse produced the focus on the cheek, which was followed by regional lymphadenopathy, and later innumerable tubercle bacilli were demonstrated in the nurse's sputum In 1923 Nixon and Short⁵ described four cases, three following trauma The most recent article is by Stokes¹ in 1925 with a report of twelve cases These will be referred to later

From the Department of Surgery of the University of Cincinnati College of Medicine and the Cincinnati General Hospital

¹ Stokes J H Primary Inoculation Tuberculosis of the Skin with Metastases to Regional Lymph Nodes *Am J M Sc* 100:722 (May) 1925

² Klebs A C Tuberculosis 1909

³ Holt L E Tuberculosis Acquired Through Ritual Circumcision, *J A M A* 61:99 (July 12) 1913

⁴ Chancellor P S Beitrage zur Frage des Primaraffectes bei der Tuberkulose *Ztschr f Kinderh* 10 12 1914

⁵ Nixon J A and Short A R Tuberculous Chancre *Brit J Surg* 10:44 (July) 1922

REPORT OF CASES

CASE 1—C C, a white boy, aged 11, in the Cincinnati General Hospital from March 22 to April 18 1934 ran a nail through the left palm in the web between the first and second fingers two years before admission, and later a lump was noticed in the left axilla. The patient was seen in the surgical clinic two months later, at which time a small nodule was found in



Fig 1—Section through the excised healed lesion on the toe in case 4. Note the intact skin over the focus in which typical tuberculous granulation tissue with giant cells can be seen.

the healed scar at the site of the puncture wound. It measured 6 mm in diameter and lay deep in the web. This was excised in the outpatient clinic and found to have a caseous center. The microscopic examination revealed tuberculosis. The wound healed rapidly but the axillary glands became larger, more tender and fluctuant. Two weeks later, 4 cc. of pus was aspirated. The smear was negative for tubercle bacilli, and the guinea-pig died too soon to demonstrate tuberculosis. The tuberculin test was four plus. A roentgenogram of the chest revealed only calcification at the hilus. A sinus then formed in the axilla and drained for six months. The size of the axillary nodes remained stationary.

Seven weeks before entry into the hospital the nodule reappeared in the palm and the axillary mass again became larger and more tender.

At the base of the web between the first and second fingers of the left hand on the palmar surface there was a slightly tender subcutaneous nodule, 1 cm in diameter, firm but movable. In the left axilla was an irregular hard moderately tender mass 4 by 3 by 1.5 cm, high in the apex. It was freely movable and there was no demonstrable sinus.

Radical excision of the glands and of the primary focus was done.

The pathologic diagnosis was tuberculosis of the skin and glands.

The patient was seen one year later, at which time there was no evidence of any recurrence, either in the web between the fingers or in the axilla.

CASE 2—B S, a white girl aged 14 followed in the outpatient surgical clinic of the Cincinnati General Hospital from May 5 to May 26 1932 cut her right hand on the palmar

surface at the proximal part of the thenar eminence while washing dishes, about eight months before coming to the outpatient dispensary. This was just a superficial laceration, but it did not heal for more than two weeks. During this time it drained a moderate amount of pus. It remained a well healed lesion, but three months later the patient noticed a hard tender lump in the right axilla. This disappeared but then reappeared about one month later and from that time continued to enlarge.

There was a healed scar on the right thenar eminence. In the right axilla there were two masses, one 3 by 2 cm., the other 5 by 7 cm. One was firm, slightly tender and irregular without any fluctuation or evidence of secondary infection, the other was fluctuant and appeared as though ready to break down. A roentgenogram of the chest was negative.

Fifty cc of a grayish fluid was aspirated. The smear was negative for tubercle bacilli, but the guinea pig was positive. The healed wound was then excised and the larger glands were drained by repeated aspiration. When last seen three weeks after the first visit the operative wound on the thenar eminence was healed and the glands in the axilla were decreasing in size.

The pathologic diagnosis was tuberculosis of the skin. The clinical diagnosis of tuberculosis of the axillary glands was confirmed by guinea-pig inoculation.

The patient was seen two years later in the gynecologic clinic, where a note was made that the abscess had remained healed.

CASE 3—G D., a Negro boy, aged 13, in the Cincinnati General Hospital from Jan 10 to Jan 28 1928 struck his right



Fig 2—Section from the femoral glands in case 4.

femoral region six months before while working on a vegetable wagon. Soon after a lump appeared there and two weeks after the original trauma a sinus opened and drained. This sinus never closed. The drainage was always scanty. The patient was not questioned about trauma to his leg or foot.

A small white nodule was found at the base of the second toe. The right femoral nodes were enlarged and irregular. There were no sinuses but two large ulcers were situated on the most prominent regions.

Radical excision of the glands and of the healed scar on the foot was done. The pathologic diagnosis was tuberculosis of the skin and glands. The patient did not return.

CASE 4—W H, a Negro boy, aged 9 in the Cincinnati General Hospital from Feb 10 to April 2, 1930 noticed a swelling in the left groin three months before. One month later this was incised by a physician and following this there was a moderate amount of purulent drainage. There was never any pain associated with it, nor history of any injury to the foot or leg.

A small hard healed lesion was found on one of the toes. In the left femoral triangle was an ulcer 4.5 by 1.5 cm with a dirty granulating base. Medial to it was an indurated mass which was not fluctuant 5 by 3 cm in size.

Radical excision of the glands was done and wedge excision of the healed scar on the toe.

The pathologic diagnosis was tuberculosis of the skin and glands (figs 1 and 2).

The patient did not return.

CASE 5—J T, a white boy, aged 10 in the Cincinnati General Hospital from Nov 1 to Nov 22, 1923 ran a nail into his left heel four months before admission, and a few days later the heel became red and swollen. His father opened it and some

three-story window three months before and struck his left knee. It became quite swollen and remained so for five weeks. Following this a tender lump appeared in the left femoral region. This persisted and a sinus developed.

The knee was normal at the time of admission into the hospital. No skin lesions, healed or otherwise could be demonstrated. There were large nodes in the left femoral region, with a draining sinus.

Radical excision of the glands was performed.

The pathologic diagnosis was tuberculosis of the glands.

The patient did not return.

COMMENT

Tuberculosis cutis following trauma is frequently overlooked, especially if the lesion is apparently healed. Tuberculosis of the skin may be initiated in several ways: (1) through the blood stream, (2) by the lymphatic route, (3) by extension from another focus within the body, and (4) by direct inoculation. The type of infection of particular interest is that occurring by direct inoculation associated with trauma, and healed at the time the patient is first seen. Experimentally

Summary of Cases

| Case | Race | Sex | Age | Date | Etiology (Primary Focus) | Glands | Other Tuberculous Glands | Diagnostic Procedures | Operation | Pathologic Condition | Follow Up |
|------|-------|-----|-----|---------------------|---|----------|-----------------------------|---|------------------------------|---------------------------------|----------------------------|
| 1 | White | ♂ | 11 | 3/22/34 4/18/34 | Traumatic inoculation of web of hand by nail | Axillary | None | Roentgenogram of chest negative | Excision of glands and focus | Tuberculosis of skin and glands | No recurrence 1 yr later |
| 2 | White | ♀ | 14 | 5/5/32 5/20/32 | Traumatic inoculation of thenar eminence of hand by broken dish | Axillary | None | Roentgenogram of chest negative | Excision of focus | Tuberculosis of skin | No recurrence 2 yrs later |
| 3 | Negro | ♂ | 13 | 1/10/28 1/23/28 | Small white nodule at base of 2d toe (no known trauma) | Femoral | None | Roentgenogram of chest negative | Excision of focus and glands | Tuberculosis of skin and glands | None |
| 4 | Negro | ♂ | 9 | 2/10/30 4/2/30 | Small lesion on the toe (no known trauma) | Femoral | None | Tuberculin 4 plus | Excision of focus and glands | Tuberculosis of skin and glands | None |
| 5 | White | ♂ | 10 | 11/1/23 11/22/23 | Traumatic? inoculation of heel (not proved) | Femoral | Enlarged hilar glands | Roentgenogram of chest negative tuberculin negative | Excision of glands | Tuberculosis of glands | No recurrence 12 yrs later |
| 6 | White | ♂ | 10 | 10/21/27 1/17/28 | Traumatic? inoculation of foot (not proved) | Femoral | Enlarged mediastinal glands | Roentgenogram of chest negative tuberculin negative | Excision of glands | Tuberculosis of glands | None |
| 7 | Negro | ♂ | 6 | 3/23/26 5/20/26 | No lesion demonstrable but history of cut on knee | Femoral | None | Tuberculin positive | Excision of glands | Tuberculosis of glands | None |

bloody pus was obtained. The wound healed rapidly then, and the child was able to walk on it without any pain. One month later, a small lump appeared in the left groin. The mass was slightly reddened and gradually increased in size but was never painful.

There was a healed scar on the heel and a mass the size of half an orange in the left femoral region, quite red and fluctuant in its lower portion.

Radical excision of the glands only was performed.

The pathologic diagnosis was tuberculosis of glands.

The patient was seen twelve years later. There was no demonstrable recurrence in the femoral region. The scar on the heel could not be demonstrated. The patient stated that he had been perfectly well.

CASE 6—H M, a white boy, aged 10, in the Cincinnati General Hospital from Oct 21, 1927 to Jan 17, 1928, had had an injury to his right foot but was unable to give accurate information as to the time of injury in relation to the subsequent lymphadenopathy. The wound healed slowly but lumps appeared 'later' in the right femoral region. These broke down and drained and were draining at the time of admission.

The scar was not described in the history. There was marked enlargement of the right femoral nodes with a sinus draining thick white pus. The local area was quite red. There was no fluctuation present.

Radical excision of the glands only was performed.

The pathologic diagnosis was tuberculosis of the glands.

The patient did not return.

CASE 7—W Z, a Negro boy, aged 6 in the Cincinnati General Hospital from March 23 to May 20, 1926 fell from a

transcutaneous tuberculous inoculation can be produced without abrasion or interruption in continuity of the skin, if virulent cultures or sputum teeming with tubercle bacilli is placed on normal skin that has been vigorously massaged or just shaven. Babes and Riegler, Courmont and Lesieur, Fraenkel, Takeya and Dodd (quoted by Calmette⁶) have thus produced tuberculosis in guinea-pigs, rabbits and cattle. Furthermore, transcutaneous infection may not leave behind any residuum, and regional lymphadenopathy does not necessarily follow as a consequential phenomenon.

A study of our first two cases immediately focuses attention on three outstanding features of the primary lesion with its regional adenopathy: (a) The initial causative factor was, in each case, some form of trauma, producing an open wound. In one instance it was a puncture wound by a nail, in the other a laceration secondary to a broken dish. (b) In both, the primary focus when first seen was healed. This point cannot be stressed or emphasized too strongly, as in four of the remaining five cases the site of apparent inoculation was completely healed at the time of admission to the hospital. In two of these it was excised and proved tuberculous, or a total of four proved healed foci, in the remaining two, just a passing note was made in the

⁶ Calmette, Albert. *Tubercle Bacillus Infection and Tuberculosis in Man and Animals*. Baltimore: Williams & Wilkins Company, 1923.

history of one and in the other no consideration was given it (c) The interval of time between the traumatic inoculation and the appearance of regional lymphadenopathy was of some length, in one case three months, in the other just "later" Another case (J T) had a time interval of one month The most prominent feature of this condition is the adenopathy, and it is usually this that brings the patient to seek medical attention Since there is such a relatively long interval between the time of skin inoculation and the appearance of regional adenopathy, the possibility of a primary focus is frequently overlooked

In completing the analysis of our remaining five cases, little can be added to the foregoing Each contains one or more features of the first two typical cases and merely reemphasizes the points mentioned

The lymph glands that may become involved are the cervical, axillary and inguinal groups Tuberculosis of the cervical nodes, or "scrofula," is an infrequent sight now because of careful supervision of dairy herds and the widespread removal of enlarged infected tonsils In this series there were no cases of cervical adenitis secondary to cutaneous lesions Femoral lymphadenopathy was present in five of the cases and there were only two with involvement of the axillary nodes All but one case (B S) were treated by radical excision and were proved tuberculous on microscopic section

Roentgenograms of the chests of two patients demonstrated enlarged mediastinal glands, but in none was there any further involvement of any other group of lymph nodes other than the regional

According to all writers, the human form of the tubercle bacillus is the one most commonly encountered in cutaneous lesions Unfortunately we have no bacteriologic studies in our cases

Very little data can be obtained from our cases as to the clinical pathology of the primary lesion However, Stokes¹ in 1925 reported ten cases of undoubted and two of probable inoculation tuberculosis of the skin with an excellent description of the usual traumatic inoculation site Of his ten proved cases, five were on the face, three on the forearm and hand, and two on the foot Only three occurred in children, aged 2, 4 and 5, three at the ages of 13, 16 and 17, and four in adults The sex was evenly divided, five females and five males In our series there were no adults, the patients all being children between the ages of 6 and 14, six males to one female, four white and three Negroes

Of particular interest are several of Stokes' cases illustrating features of paramount importance from the diagnostic and therapeutic standpoints In his first case there were present large cervical and preauricular glands with multiple draining sinuses Above the right malar prominence there was a small depressed scarlike lesion about 1 cm in diameter, around which a few apple-jelly nodules could be demonstrated in a faintly pink areola "This apple-jelly nodule is a tubercle in the deeper layers of the corium or in the fat which, though ordinarily invisible, can be detected by expressing the blood from the tissue with a glass spatula These nodules are not absolutely characteristic, however, they are a helpful guide to diagnosis and are the first feature to arouse suspicion at a site of traumatic inoculation"

In two of Stokes' cases there was a recurrence of adenitis following excision No primary focus had been identified After the recurrence, search was made and an inconspicuous focus found These were excised, with subsequent healing, which was permanent "These cases furnish excellent examples of the continuous

vicious activity of the 'feeder focus' and the benefit derived from its removal" Another of his patients received rather intensive roentgen therapy to the primary lesion but without effect After excision, activity was demonstrated indicating the ineffectiveness of the roentgen ray in dealing with the primary site of inoculation

CONCLUSIONS

1 Tuberculous lymphadenitis may occur secondary to a focus of a traumatic tuberculous inoculation in the skin

2 The interval between traumatic inoculation and the appearance of regional lymphadenopathy may be of such length that the primary lesion may be healed and consequently overlooked

3 Because of the inconspicuousness of the primary lesion, very little consideration is directed toward it

4 Chronic lymphadenopathy subsequent to even remote trauma of an extremity should immediately arouse suspicion and incite careful search for a tuberculous cutaneous focus This is especially important in the study of solitary involvement of the axillary, epitrochlear and inguinal lymph nodes

5 Surgical excision of the site of inoculation, even though healed and apparently innocuous, should precede any active medical or surgical procedures directed toward the adenopathy

PROGRAM FOR TUBERCULOSIS CONTROL IN PUERTO RICO

EDUARDO GARRIDO MORALES, M.D., DR.P.H.
Commissioner of Health
SAN JUAN, P. R.

Tuberculosis, for the year ended December 1934, ranked as the first cause of death in Puerto Rico In many other countries the death rate from this disease, especially during the past twenty-five years, has had a downward trend, but in Puerto Rico it has shown a steady rise, demonstrated by the average annual rates of 170.5 in 1910-1914, 201.4 in 1920-1924 and 295.3 in 1930-1934 per hundred thousand of population The last rate is approximately five times the death rate from tuberculosis in the United States registration area

Among the important factors presumably responsible for the increase of the tuberculosis mortality in Puerto Rico, cognizance should be given to overcrowding in urban districts as a result of migration of families from rural areas to city slums, the lack of employment which brings overcrowding in dwellings, the relatively low economic status of the island population and the lack of hospital facilities for the isolation of the tuberculous

According to studies carried out by the Insular Department of Health, the tuberculosis mortality in the island is 17 per cent higher in women than in men, 19 per cent higher in the Negro than in the white race and 84 per cent higher in the urban than in the rural districts Approximately 68 per cent of children under 15 react positively to the intradermal tuberculin test the incidence of positive reactors being 37 per cent higher in urban than in rural districts Clinical evidence and autopsy results have revealed that the chronic fibrocaseous type of the disease is the predominant form Pulmonary tuberculosis is responsible for 97 per cent of all deaths from this disease Human tuberculosis of bovine origin is comparatively rare

Read at a meeting of the Pan American Medical Association held at the Antituberculosis Hospital Rio Piedras P. R. July 29 1935

In view of the importance of tuberculosis as a health problem in Puerto Rico, the present administration of the health department formulated a program to intensify its efforts to control the disease. This program included the following:

(a) Intensification of the tuberculosis work in the dispensaries of the public health units, which are the case finding agencies under the health department.

(b) Isolation of the largest possible number of cases of open pulmonary tuberculosis in four district hospitals with a total capacity of 1,500 beds, adequately equipped for giving proper treatment.

(c) Organization of ten antituberculosis centers, each in charge of a tuberculosis specialist, to whom cases are referred for diagnosis and selection before admission to the hospitals.

These centers also serve as collapse clinics for the application of pneumothorax treatment to patients after they leave the hospitals.

(d) Two traveling clinics to provide x-ray facilities and pneumothorax treatment for rural municipalities.

(e) An educational campaign, especially through the public health units and the public schools of the island.

(f) Intensification of preventive measures by increasing the number of rest rooms in the public schools and increasing the number of preventorium beds, activities under the management of the Commission for the Prevention of Tuberculosis in Children of School Age.

(g) Eradication of tuberculosis in cattle.

TUBERCULOSIS DISPENSARIES WITH VISITING NURSES

Before 1934 there were twenty health units in the island, comprising thirty-eight municipalities and serving a population of 1,054,575, or 68 per cent of the island population. At present there are fifty-four municipalities served by health units, with an aggregate population of 1,300,767. Each health unit has a full-time medical officer, one or more public health nurses, one or more sanitary inspectors, a clerk-microscopist and a caretaker. Tuberculosis control is an important feature of the work of these health units. At present they have a staff of thirty full-time and fifteen part-time physicians and 154 visiting nurses. There are in Puerto Rico fifty-eight tuberculosis dispensaries, attached to the public health units of fifty-four municipalities. At least one fourth of the time of the personnel of these public health units is being devoted to tuberculosis work.

TUBERCULOSIS HOSPITALS

We consider the isolation of open cases of tuberculosis among the most urgent measures in a country, such as Puerto Rico, where tuberculosis mortality is excessively high and where the standards of living of a large proportion of the population are so low that effective isolation of the tuberculous patient in the home is out of the question in most cases.

Previous to the year 1934 there were 550 hospital beds available in the insular institutions for the isolation of tuberculous patients. The average yearly number of deaths from tuberculosis during the last five years has been 4,500. According to the standards of the National Tuberculosis Association at least one bed per annual death is required for an effective antituberculosis campaign. Considering these facts, funds were obtained from the Puerto Rico Emergency Relief Administration for the construction of ten hospital units with a total capacity of 1,000 beds. A campaign was organized to raise funds for their equipment, and the insular

legislature, realizing the seriousness of this problem, has provided adequate funds for their maintenance through a lottery bill, approved in the last session of the insular legislature.

Although the number of beds available at present in insular institutions for the isolation of tuberculous patients is only about one third of what it should be in accordance with the recognized standards of one bed for each annual death from this disease, this represents, nevertheless, a large effort in the control of tuberculosis. It is proposed that the hospital beds available will be used to a large extent for the elimination of the open cases through the use of such modern measures of collapse therapy as will convert the positive sputum case into a negative case in as short a time as possible.

ANTITUBERCULOSIS CENTERS AND TRAVELING CLINICS

The Antituberculosis Center, which is a new feature added to the tuberculosis work in Puerto Rico, is an important part of our program. Each center is in charge of a physician specialized in tuberculosis work and is well equipped with fluoroscopic and other facilities for the diagnosis and treatment of tuberculosis.

The specialist in charge of the center serves as a consultant to whom the health officers may refer difficult cases for diagnosis. He also administers pneumothorax treatment to ambulatory patients after they leave the hospitals.

At present four centers are functioning. Six others will be opened during the present year. A traveling clinic, with x-ray equipment and facilities for pneumothorax treatment, is also available for rural municipalities.

It is proposed that each center shall take care of 100 pneumothorax cases besides giving expert advice to health officers in obscure cases. In this way 1,000 additional open cases of pulmonary tuberculosis can be kept from spreading infection in the home and together with the 1,500 isolated in the four district hospitals will make a total of 2,500 cases under control.

EDUCATIONAL ACTIVITIES AND PREVENTIVE MEASURES

The common dictum that "An ounce of prevention is worth a pound of cure" applies in tuberculosis work as well as in any other transmissible disease. Unfortunately, the value of preventive measures in tuberculosis work in Puerto Rico is limited by the relatively poor economic status of the island population and the exceedingly low standards of living of the great majority of the inhabitants. However, the education of the people in the modes of spread of the disease and the essential features of prevention are carried out through conferences by health officers and nurses, and by the distribution of pertinent literature and pamphlets. A moving picture has recently been prepared, which will also be used in connection with educational activities.

The number of rest rooms in the public schools as well as the number of preventorium beds have been almost doubled this year. Undernourished children, especially contacts of tuberculous patients, are taken care of in these rest rooms.

ERADICATION OF TUBERCULOSIS IN CATTLE

Although human tuberculosis of bovine origin is not a serious problem on the island because of the habit of boiling the milk before use, nevertheless the danger of its spread has increased with the recent tendency to use raw milk brought about with the introduction of electrical refrigeration in the homes of the middle class.

On this account a cooperative plan for tuberculosis eradication in cattle has been approved between the federal and insular departments of agriculture and the insular department of health. There are at present seven veterinarians doing intensive tuberculin tests on the island, and 29,380 cattle have already been tested, of which 731, or 2.4 per cent, have reacted positively and have been slaughtered.

The federal government pays an indemnity of \$50 for each slaughtered animal of pure breed and \$25 for each animal of mixed breed that is slaughtered.

Since experience has demonstrated that positive reactors are found to a large extent among imported breeds of cattle, the present law provides that imported cattle must have a certificate from a veterinarian accredited by the federal government, to the effect that they are free from tuberculosis.

SUMMARY

The tuberculosis program in Puerto Rico has been formulated on sound epidemiologic grounds in an effort to protect the community rather than the individual case.

The search and location of the largest number of open cases through the dispensaries in the public health units, their isolation in adequate hospitals until they have been changed from sputum positive to sputum negative by means of collapse therapy, and the continuation of refills in well equipped antituberculosis centers in order to keep the patients free of tubercle bacilli in the sputum, together with some degree of education of the public and the eradication of tuberculosis in dairy cattle, are measures in which we have great hopes.

Clinical Notes, Suggestions and New Instruments

PNEUMOCOCCIC MENINGITIS • REPORT OF A CASE WITH RECOVERY FOLLOWING CISTERNAL DRAINAGE

P. R. MEYER, M.D., PORT ARTHUR, TEXAS

It has always been the general impression that pneumococcal meningitis is practically hopeless. The more one searches the literature, however, the more cases of recovery one finds. The methods of treatment of this condition have been varied. Those with successful recoveries feel that their form of treatment was responsible for the happy conclusion. For example, Weinberg¹ used potassium permanganate following the suggestion of Nott. Reveno and McLaughlin² used Felton's serum alone, intravenously, intraspinally as well as intrathecally, although mentioning the use of the antipneumococcus serum combined with ethylhydrocupreine hydrochloride (optochin). Lynch³ also used Felton's serum and McAuley and Hilliard⁴ report a case in which Felton's serum was used. Eichelbaum⁵ used spinal drainage, lavage and intraspinal injections of antipneumococcus serum, for which he concluded that recovery in his case was responsible. Mella⁶ used subarachnoid lavage and ethylhydrocupreine with good results. Roussel⁷ used large

doses of methenamine. Rohrbach⁸ used Felton's serum in a case of type IV, with recovery. Shuller⁹ in reviewing the literature, refers to five recoveries in which treatment was given by various means besides those just mentioned, one was treated with intracarotid injection of colloidal solution of iodine and acriflavine base, in another, Homton's antibody solution intramuscularly and intradermally, and ethylhydrocupreine hydrochloride were used. His own patient was given Mulford's pneumococcus antibody solution. Ashmun¹⁰ used ethylhydrocupreine hydrochloride intraspinally and acriflavine base in his two cases. Kolmer¹¹ believes that when pneumococci are found in the spinal fluid, pneumococcus antibody solution or antipneumococcus serum should be given intravenously and that the intraspinal injection of a mixture of 25 cc. of pneumococcus antibody solution, or polyvalent antipneumococcus solution, with 1 cc. of 1:100 solution of ethylhydrocupreine hydrochloride should be instituted after removal of the fluid. Intracarotid injection of the same mixture should also be given. He states, however, that in diffuse meningitis continuous and even surgical drainage should be used. Harkavy¹² used Felton's serum and considers it responsible for the sterilization of the spinal fluid and subsequent recovery. Globus and Kasanin¹³ used only repeated lumbar and cisternal punctures, although they feel that serum therapy does have its place. Amessee¹⁴ reports that his patient received only a daily spinal drainage. Bedell's¹⁵ patient also was treated without the use of serum and with cisternal and lumbar drainage and irrigations, however, in her case a rubber drainage tube was inserted into the cisterna magna for continuous drainage.

As to the type of pneumococcus that is the causal agent, Bauer and St. Clair¹⁶ report type III to be most common in cases following otitis media, and type IV in cases without a history of otitis media. Unfortunately in the case to be reported the organism was not typed.

REPORT OF CASE

J. R. M., aged 5 years, became ill, Monday, March 4, 1935, and complained of headache and fever. The past history and family history were irrelevant. The physician who saw the child diagnosed a digestive upset. Fever continued to be high and the child began to vomit. March 6 the patient was seen by another physician, who also diagnosed the condition as a digestive disorder. When seen by me the morning of March 7 the temperature was 105.4 F. The child was alert and complained of a slight headache, otherwise there was no discomfort. As I entered the room the patient had just finished drinking a glass of water. I was sitting in the chair about 2 feet from the bed when the child suddenly and without any effort vomited. The force was so great that very little fell to the floor, the majority reaching my chair.

Physical examination revealed only slight anterior nuchal rigidity, an acutely reddened pharynx, an absent Babinski reflex, absent knee jerks, and positive Brudzinski and Kernig signs, otherwise the examination was negative. A spinal puncture was made and a thick cloudy fluid under some increase in pressure was removed. This fluid was sent to the laboratory and hospitalization was advised.

The fluid on examination had a cell count of 3,500, globulin 4 plus and no sugar reduction but no organisms were found. A culture of the fluid was taken, but subsequent examination failed to reveal any organisms. Fifteen cubic centimeters of meningococcus serum was given intraspinally after removal of

- 8 Rohrbach, H. O. Pneumococcal Meningitis with Recovery. *Pennsylvania M. J.* 32: 646-647 (June) 1929.
- 9 Shuller, E. H. Pneumococcal Meningitis. *J. Oklahoma State M. A. J.* 28: 137 (April) 1932.
- 10 Ashmun, S. H. Pneumococcal Meningitis Combined with Streptococcus and Diplococcus Catarrhalis. *Ohio State M. J.* 29: 243-246 (April) 1933.
- 11 Kolmer, J. A. Pneumococcal and Streptococcal Meningitis. *J. A. M. A.* 92: 874-877 (March 16) 1929.
- 12 Harkavy, Joseph. Pneumococcal Meningitis. Recovery with Serum Therapy. *J. A. M. A.* 90: 597-599 (Feb. 25) 1928.
- 13 Globus, J. H. and Kasanin, J. I. Pneumococcal (Type IV) Meningitis. *J. A. M. A.* 90: 599-601 (Feb. 25) 1928.
- 14 Amessee, J. W. Pneumococcal Meningitis. Report of a Case with Recovery. *Colorado Med.* 28: 361-362 (Aug.) 1931.
- 15 Bedell, Caroline C. Pneumococcal Meningitis. Report of a Case with Recovery Following Cisternal Drainage. *J. A. M. A.* 102: 820-822 (March 17) 1935.
- 16 Bauer, J. T. and St. Clair, Huston. Pneumococcus Types in Acute Mastoiditis and Primary Pneumococcus Meningitis. *J. A. M. A.* 90: 1429-1930 (May 5) 1928.

1 Weinberg, M. H. Case of Pneumococcus (Type III) Meningitis Treated with Potassium Permanganate. Recovery. *J. Nerv. & Ment. Dis.* 74: 38 (July) 1931.

2 Reveno, W. S. and McLaughlin, Nelson. Pneumococcal Meningitis. Recovery with Felton's Serum. *Ann. Int. Med.* 7: 1026 (Feb.) 1934.

3 Lynch, L. J. Pneumococcus Meningitis with Recovery. *New England J. Med.* 203: 257 (Aug. 7) 1930.

4 McAuley, J. and Hilliard, F. M. Recovery from Pneumococcal Meningitis. *Brit. M. J.* 1: 139 (Jan. 28) 1933.

5 Eichelbaum, H. R. An Unusual Case of Cerebrospinal Meningitis Due to the Pneumococcus Lancelatus and Its Recovery. Medical Department. United Fruit Co.

6 Mella, Hugo. The Use of Subarachnoid Lavage and Ethylhydrocupreine in Meningitis. *U. S. Vet. Bur. M. Bull.* 7: 77-78 (Jan.) 1931.

7 Roussel, A. E. Pneumococcus Meningitis Simulating Diabetic Coma with Recovery. *Atlantic M. J.* 30: 159 (Dec.) 1926.

more fluid, and 15 cc was given intravenously. The child was also given 300 cc of citrated whole blood by transfusion. The fluid examination made after admission to the hospital showed a cell count of 3,100, globulin increased, and no sugar. A smear of fluid revealed many pus cells, occasionally gram-positive intracellular diplococci were found. Culture of the fluid March 8, revealed gram positive diplococci and short chain streptococci (contamination not excluded). The white blood count was 13,900, neutrophils 75 per cent large lymphocytes 3 per cent, small lymphocytes 22 per cent. Analysis of the urine revealed a specific gravity of 1.020, a distinct trace of albumin no sugar, a few pus cells, and many fine and coarse granular casts.

On spinal puncture, made by Dr C M Beavens the fluid was cloudy and under increased pressure. This fluid was taken to the laboratory of Dr Hinkle Garst, who made only a smear. The gram-positive diplococcus was also seen here. Because of the negative smear and culture on the first tap, while we waited for confirmation of the gram-positive diplococci and in order not to lose any ground gained, 15 cc. of meningococcus serum was given intraspinally and 15 cc intravenously. That evening a cisternal puncture was made and 30 cc. of cloudy fluid was removed. The cell count was 2,800, smear and subsequent culture were negative.

March 9 there was decreased vomiting, the patient complained less of head pain and could bend the neck more easily. Cisternal puncture was made at 9 45 a m and 30 cc of fluid was removed, which was less cloudy and under less pressure, the cell count was 2,700. Cisternal puncture was made at 7 30 p m and 15 cc. of fluid was removed. The cell count was 2,800, the temperature varied from 99.6 to 102.4 F, smear and subsequent culture were negative.

March 10 at 10 45 a m 15 cc. of fluid was removed by cisternal puncture. The cell count was 2,500. The condition seemed to be improving. There was no vomiting, and a smear revealed many pus cells and occasional gram-positive diplococci, subsequent culture revealed gram positive diplococci. The fluid still showed on examination increased globulin and no sugar. At 6 p m a cisternal puncture was done, but after removal of almost 6 cc of bloody fluid the needle was withdrawn for fear of doing damage, as the child was so restless. The fluid was not sent to the laboratory.

March 11 at 9 15 a m 15 cc of fluid was removed by cisternal puncture, the cell count was 350, smear was negative and the temperature varied between 99.6 and 103 F. The mental condition was clear and the child was feeling much better.

March 12 at 10 a. m 22 cc. of fluid was removed by spinal puncture in order to determine the presence or absence of any block, the cell count was 250 the pressure was still diminishing and the fluid was much clearer. There was a slight increase of globulin and a faint trace of sugar. Fluid was cultured at 7 30 p m, a cisternal puncture was made and 24 cc. of fluid was removed. The cell count was 75.

March 13 at 9 a m 27 cc of fluid was removed by cisternal puncture, it showed that the fluid was still clearing up, the cell count was 60. It was decided to do cisternal punctures only once a day instead of twice a day from now on.

March 14 the mental condition was very good. Twenty-three cubic centimeters of fluid was removed at 9 a m by cisternal puncture. The cell count was 40, culture was made.

March 15 at 9 15 a m. 22 cc of fluid, which was becoming quite clear was removed by cisternal tap. The cell count was 38 and culture was negative after seventy-two hours.

March 16 at 9 30 a m. 15 cc of fluid was removed by cisternal puncture, the cell count was 20. The temperature was now between 99 and 100 F, a culture was taken.

March 17 at 1 p m 6 cc of fluid was removed by spinal tap by Dr C M Beavens. The cell count was 30 and culture was negative after seventy-two hours.

March 18 at 9 45 a m 30 cc of fluid was removed from the cistern. The fluid was clear and the cell count was 15. A culture was taken.

March 19 at 9 45 a m 15 cc. of fluid was removed by cisternal tap. The cell count was 21, and culture was negative after seventy-two hours. Globulin was normal and there was a trace of sugar.

March 20 at 9 30 a m 20 cc of fluid was removed by cisternal puncture, the cell count was 10 and the temperature normal.

March 21 at 9 a m 30 cc. of fluid was removed by cisternal puncture. The cell count was 10, culture was negative after seventy-two hours.

March 22 at 9 a m 15 cc of fluid was removed cisternally. The cell count was 12. In the face of four negative spinal fluid cultures, normal temperature and absent signs or symptoms of any sort, the child was discharged.

About ten days after leaving the hospital and returning home the child developed a lobar pneumonia, involving the right upper lobe. This was also followed by recovery.

COMMENT

It is not my purpose in this paper to criticize other treatments advised but merely to report another recovery and the therapy used. Such simple treatment as was used, being so successful, brought up the thought that pneumococcic meningitis, like pneumococcic pneumonia, might be self limited in its duration. In other words, if life can be continued by reducing pressure within the skull and giving supportive treatment, such as transfusions and fluids used will pneumococcic meningitis end of its own accord as will pneumonia caused by the same organism?

601 Fifth Street

PNEUMOCOCCIC CEREBROSPINAL MENINGITIS WITH RECOVERY

HOMER R SMITH M D MINNEAPOLIS

The report of this case of recovery from a pneumococcic cerebrospinal meningitis has been urged on me because it may be of some help to others and because it adds a little hope to a very desperate situation. The case was uncomplicated and the only etiologic factor was a mild so-called head cold about two weeks previous to the seeking of help.

Mrs. L., aged 43, first seen the morning of Aug 23, 1935 complained of an intense headache beginning two or three days before and gradually getting worse. In addition there was some pain in the neck, worse on the right side, and with considerable stiffness in attempted motion of any kind. The pulse was 88 and the temperature 101. The eyes reacted to light and in accommodation, and all the reflexes of the extremities were normal or nearly so. Nothing abnormal was heard in the lungs or heart sounds, although there was a history of a moderate cold about two weeks before. That evening the temperature rose to 104 and the leukocyte count taken then was 18,000. The next forenoon the patient was admitted to St Barnabas Hospital. All the symptoms regarding the head and neck were worse, the temperature was 103.8 F and the leukocyte count was 28,000. Urinalysis was negative.

A diagnosis of some kind of meningitis was made and a spinal puncture done for diagnosis. The spinal fluid came slowly in drops that were slightly bloody and cloudy. The laboratory examination of the fluid by Dr Floyd Grave revealed Nonne reaction, a heavy trace red blood cells numerous, white blood cells, 1,060 per cubic millimeter. Smears with the Gram stain showed a few gram-positive diplococci (pneumococci). A roentgen examination of the lungs by Dr R W Morse showed only a diffuse congestion.

It was thought that treatment with antipneumococcus serum should be attempted regardless of the report on the types present. The Felton serum, 20,000 units of types I and II combined was given intravenously the next day, August 25 repeated intramuscularly in one hour and again repeated intravenously in three hours from the first dose. The temperature, which was 105.8 by rectum August 25, dropped steadily each day, reaching normal August 31. On the same day it again began going up, reaching 104 at noon of September 2 with a leukocyte count of 30,000. The antipneumococcus serum was repeated intravenously and intramuscularly much the same as before, with a prompt drop of temperature to normal on the next day.

There were some minor fluctuations in temperature for the next three days but no more serum was used. The pulse and respiratory rates responded in their usual manner. During the

illness Dr G L Dovey reported all sinuses clear by transillumination. The patient left the hospital without complications September 17 and has continued an uneventful convalescence.

I regret that through some misadventure the pneumococci in the spinal fluid were not typed, therefore it must be presumed that they were in the groups acted on favorably by the antipneumococcus serum.

612 Medical Arts Building

Special Article

NONSPECIFIC PROTEIN THERAPY

A NUMBER OF FIRMS ARE ADVERTISING NONSPECIFIC PROTEIN PREPARATIONS UNDER PROPRIETARY AND SOMETIMES MEANINGLESS NAMES. RELATIVELY FEW OF THESE PREPARATIONS HAVE BEEN SUBMITTED TO THE COUNCIL ON PHARMACY AND CHEMISTRY AND NO PROPRIETARY NONSPECIFIC PROTEIN PREPARATION HAS BEEN ACCEPTED FOR INCLUSION IN NEW AND NONOFFICIAL REMEDIES. BELIEVING THAT PHYSICIANS DESIRE A MORE EXTENSIVE PRESENTATION OF INFORMATION CONCERNING NONSPECIFIC PROTEIN PREPARATIONS THE COUNCIL ON PHARMACY AND CHEMISTRY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REVIEW. IN ADOPTING THIS REPORT THE COUNCIL EXPRESSES APPRECIATION TO THE AUTHOR OF THE ARTICLE, DR RUSSELL L CECIL AND TO DR LUDVIG HEKTOEN WHOSE ARTICLE WAS PUBLISHED IN THE JOURNAL NOVEMBER 30.

PAUL NICHOLAS LEECH Secretary

RUSSELL L CECIL, M.D.

NEW YORK

Nonspecific protein therapy recently celebrated its twentieth anniversary. Like many other new forms of medical treatment, it has had its ups and downs, its defenders and detractors. If during the past few years it has lost some of its former popularity, one need not be surprised, for this has been the fate of most new methods of therapy. Furthermore, whatever prestige protein therapy has lost through the excessive enthusiasm of its supporters is being regained, at least in part, by reason of a better understanding of the fundamental nature of the reactions that follow its use.

In 1913 Fernando Torres,¹ a South American, reported successful results in the treatment of typhoid fever by giving typhoid vaccine intravenously and described the sharp reactions that followed its injection. Typhoid vaccine had been used previously to this in the treatment of typhoid, but the injections had always been given subcutaneously. In 1914 Dessy, Grapiolo and Fossati,² also Argentines, published a paper on the treatment of typhoid with typhoid vaccine. In this article the results obtained by subcutaneous injection were compared with those which followed intravenous injection. The authors concluded that the intravenous method gave much quicker results and described intravenous vaccine therapy in typhoid as a "brilliant" form of therapy. In 1914 Kraus and Mazza³ treated typhoid with intravenous injections of typhoid vaccine and noted that many cases so treated terminated abruptly by crisis or rapid lysis and that the mortality rate was definitely reduced. In the same year Ichikawa⁴ also reported favorably on this form of treatment. No doubt this method of vaccine treatment was originally intended as a form of specific therapy, but when Kraus and his co-workers⁵ later obtained similar results with colon

bacillus vaccine they opened the door to nonspecific therapy in all its various forms and modifications. Shortly after this, Lüdke⁶ showed that excellent results could be obtained in typhoid with intravenous injections of albumose, and Schmidt⁷ found that intramuscular injections of boiled milk would produce febrile reactions. Since then a large number of different agents, many of them proprietary, have been advocated, some for intravenous, others for intramuscular, use.

Miller and Lusk⁸ in 1916 were the first to use "fever therapy" in the United States, when they reported favorably on the intravenous use of typhoid vaccine in arthritis. About this time V C Vaughan⁹ was writing about poisonous proteins, maintaining that the keystone of the protein molecule was the "protein poison" and that fever was due to the parenteral destruction of proteins. Vaughan pointed out that the parenteral introduction of bacteria, pathogenic or nonpathogenic, living or dead, was followed by fever and that the fever was not the result of the growth of the bacteria but of bacterial destruction and splitting up of bacterial protein.

A distinction must be made between the terms "foreign protein therapy" and "nonspecific therapy." The latter is a broader term, including chemotherapy as well as protein therapy. In the present article, discussion will be limited to protein therapy.

PROTEINS USED

Many forms of protein and protein derivatives have been tried therapeutically. Among the more important may be mentioned:

- 1 Native proteins such as egg albumin, milk and casein.
- 2 Serums either human or animal.
 - (a) Normal serum
 - (b) Immune serums especially diphtheria antitoxin
- 3 Protein split products including peptone, proteose, albumose and histamine.
- 4 Enzymes and tissue extracts.
- 5 Bacterial vaccines.
- 6 Bacterial extracts (tuberculin, Coley's fluid and the like).

Malarial therapy is a form of foreign protein treatment. The protein is set free in the blood of the patient when segmentation of the malarial parasite occurs. The application of bee stings in various rheumatic conditions is probably another instance of protein therapy.

During the last few years a great many commercial protein products have been put on the market. Some of these are derived from milk, others from vegetable proteins, while still others are prepared from bacteria.

At the present time the three proteins most frequently used in America are typhoid vaccine, boiled milk and diphtheria antitoxin. A number of the commercial preparations also enjoy a considerable vogue. Stock and autogenous vaccines of various kinds are used extensively for therapeutic purposes, often no doubt with the intention of stimulating a specific rather than a nonspecific reaction, though there is little evidence to support the belief that a specific antigen-antibody mechanism is involved.

METHODS OF ADMINISTRATION

1 *Milk*—Ordinary skimmed milk, either fresh or pasteurized, is boiled for from five to ten minutes and then cooled to body temperature. The first dose for

6 Lüdke H. Die Behandlung des Abdominaltyphus, mit intravenösen Injektionen von Albumosen. München med. Wchnschr. 62: 321 1915.

7 Schmidt, R. Ueber Proteinkörpertherapie und über parenterale Zufuhr von Milch. Med. Klin. 12: 171 1916.

8 Miller J L and Lusk, F B. The Treatment of Arthritis by the Intravenous Injection of Foreign Protein. J. A. M. A. 66: 1756 (June 3) 1916. The Use of Foreign Protein in the Treatment of Arthritis. Ibid. 67: 2010 (Dec. 30) 1916.

9 Vaughan V C. Protein Fever. Poisonous Proteins. J. Lab. & Clin. Med. 2: 15 (Oct.) 1916.

From the Department of Medicine, Cornell University Medical School.
1 Torres F R. Vacunoterapia ó antigenoterapia antífica. Semana med. 22: 1557 (Dec. 25) 1913.

2 Dessy S, Grapiolo F L and Fossati, V. Nueva vacuna contra la fiebre tifoidea. Notas experimentales y clinicas. Semana med. 21: 357 (Feb. 12) 1914.

3 Kraus R. and Mazza S. Zur Frage der Vakzinetherapie des Typhus abdominalis. Deutsche med. Wchnschr. 40: 1556 1914.

4 Ichikawa, Sadakichi. Abortivbehandlung von Typhosen. Krankheiten Ztschr. f. Immunitätsforsch. u. exper. Therap. 23: 32 1914.

5 Kraus R, Penna J and Bonorino Cuenca, J. Ueber Heterobakterientherapie. Wien klin. Wchnschr. 30: 869 1917.

adults is 5 cc injected intramuscularly, usually into the gluteal muscles. The dose is increased 2 or 3 cc with each injection until a maximum of from 10 to 15 cc is reached.

2 Diphtheria Antitoxin—As used for foreign protein therapy, diphtheria antitoxin is not given for its antitoxic property but because it is an available form of horse serum. The dose is not fixed but is usually from 2 to 4 cc, given intramuscularly. In doses of this size it will usually induce a temperature of from 100 to 101 F.

3 Vaccines—Ordinary stock and autogenous vaccines are given intramuscularly unless sharp thermal reactions are desired. When such is the case, typhoid vaccine is by far the most popular agent and is given intravenously. Ordinary typhoid vaccine is diluted with physiologic solution of sodium chloride to a point at which 1 cc contains 100 million organisms; the initial dose for adults is from 10 to 25 million. Gonococcus vaccine has also been used intravenously in the treatment of gonorrheal arthritis, and intravenous injections of streptococcus vaccine are now quite popular in the treatment of infectious arthritis.

I have observed that intravenous injections of gram-positive bacteria such as the streptococcus, pneumococcus and staphylococcus are much less likely to cause febrile reactions than the gram-negative organisms such as the gonococcus and typhoid bacillus. The reason for this difference is not clear.

THE NONSPECIFIC REACTION

The reaction to foreign protein injections varies from an almost imperceptible one to extreme shock associated with high fever, profound vasomotor disturbance and other constitutional phenomena. The reaction depends on the substance injected, the dose employed and the method of administration. It also depends a great deal on the physical condition of the patient and the number of previous injections.

Intramuscular injections of protein usually excite comparatively mild reactions. There may be only some local reaction at the point of injection and a constitutional reaction may be entirely absent. Sometimes a so-called focal reaction occurs, that is, a temporary flare-up of acute symptoms in some focus of infection, but this phenomenon is more frequently observed in the febrile reactions. When milk or some of the other proteins are injected intramuscularly in sufficiently large amounts, the local reaction may be supplemented by a mild chill and a rise of temperature of one or two degrees. With this rise in temperature there may be some increase in the leukocytes.

When foreign proteins are given intravenously, the reactions are sharper and make their appearance more promptly. When, for example, typhoid vaccine is given intravenously, the reaction usually occurs in from half an hour to one hour after the injection. At first there is marked chilliness or an actual rigor, with general aching similar to that observed at the onset of any acute infection. As the chill subsides, the temperature of the patient begins to rise. A maximum temperature of 103-105 F is obtained, usually within two to four hours after the injection. The increase in pulse rate that occurs is in proportion to the fever. Defervescence is usually rapid though it may be delayed in the first reaction.

In acute infections, such as typhoid or pneumonia, in which a temperature of 102 to 104 F already exists, the temperature during a protein reaction may sometimes go to 106 or 107 F. For this reason the dose of pro-

tein or vaccine should be very carefully gaged in the treatment of febrile conditions. As a rule, the dosage for febrile patients should be about half that for afebrile individuals.

One of the most interesting phases of the protein reaction is its effect on the leukocytes. Immediately following the injection there is a leukopenia due to the reduction of polymorphonuclear cells. With the onset of the chill a gradually increasing leukocytosis takes place, which reaches its maximum in about six hours and then gradually returns to the previous level. The leukocytosis is of the polymorphonuclear type. In afebrile patients the leukocytosis varies from 13,000 to 15,000 per cubic millimeter, but in acute infectious diseases, such as pneumonia, it may reach from 40,000 to 50,000.

The blood pressure shows a gradual rise during the chill. During the period of perspiration, however, the blood pressure gradually returns to normal.

The Focal Reaction—The focal reaction ("Herd-reaction" of the Germans) was first described in connection with tuberculosis, in which an injection of tuberculin was followed by exacerbation of symptoms in the original tuberculous focus. With the introduction of foreign protein therapy, focal reactions were noted by many observers. Menzer¹⁰ was the first to observe that tuberculous foci would respond with a typical focal reaction after the injection of streptococcus vaccine. Since this observation was made, numerous investigators have demonstrated the nonspecificity of focal reactions. Almost any inflammatory process, irrespective of etiology, will react to tuberculin as well as to a great variety of other agents. Even an old traumatic injury may be the site of a focal reaction following the intravenous injection of some foreign protein.

MECHANISM OF THE REACTION

The typical thermal reaction of protein fever can be divided roughly into three phases. Immediately after the intravenous injection there is a short prodromal period, which is characterized by first a stage of latency with no symptoms and later a stage of chill. Then the temperature begins to rise. The period from the onset of fever to the point of maximum temperature is referred to as the first, or "negative," phase. The second, or "positive," phase extends from the height of the fever to the return of normal temperature.

Space does not permit of a detailed description of the many physiologic changes that take place in the body during the protein reaction. Hench¹¹ lists them as follows: 1 Alterations in the basal metabolism. 2 Peripheral and splanchnic vasomotor changes, including alterations in blood pressure and in the caliber and permeability of the arterioles and capillaries. 3 Alterations in renal function, detectable in the output and in the acidity of the urine, excretion of phenolsulphonphthalein, and concentration of nitrogen, phosphate, urea, uric acid, allantoin and albumin. 4 Alterations in serum ferments, anti ferments, antibodies and the Wassermann reaction. 5 Alterations in organic activity demonstrated by increased secretion of lymph, bile, saliva, breast milk and menstrual flow and by changes in the activity of the liver, gastro-intestinal tract and spleen. 6 Alterations in the volume, specific gravity, freezing point and viscosity of the blood. 7 Alterations

¹⁰ Menzer, A. *Allgemeines und Besonderes über Vakzinetherapie*. Med. Klin. 8:311, 1912.

¹¹ Hench, P. S. *Usual and Unusual Reactions to Protein (Fever) Therapy*. Arch. Int. Med. 49:1 (Jan.) 1932.

in the cellular elements of the blood 8 Alterations in the fragility of the blood platelets and in fibrinogen, thrombokinase, coagulation time and sedimentation rate 9 Alterations in the chemical constituents of the blood, demonstrated by changes in the carbon dioxide tension of the plasma, carbon dioxide combining power, total nonprotein nitrogen of whole blood and of serum, sugar tolerance, albumin-globulin ratio and concentration of urea, uric acid, sugar, fat, total serum protein and chlorides

Just which one or more of these physiologic changes are responsible for the beneficial effects that often follow protein injections, it would be hazardous to say For example, Jobling and Peterson¹² attached great importance to the mobilization of enzymes, particularly proteases and ipases following the injection of proteins Modi¹³ in a recent article objects to the term "shock therapy," contending that injections of milk really act as a stimulus to the body Mueller¹⁴ maintains that in giving protein agents the same activities are affected which are naturally stimulated after bacteria have invaded the body in infections According to this writer the protein reaction involves a reaction of the entire vegetative nervous system which manifests itself in certain functional changes or organic activities, which are directed into two different channels, first, dilatation and increase of activity in the entire splanchnic area, and, second, contraction of the peripheral vessels and decrease in skin activities and in the functioning of the peripheral organs

While most writers stress the importance of fever in the protein reaction, Zimmer and Buschmann¹⁵ hold that acute conditions frequently require a fever reaction, while chronic conditions will often be best affected without any fever reaction Barr Du Bois and I¹⁶ have found that fever which followed intravenous injection of protease or typhoid vaccine is accompanied by increased heat production the amount of which corresponds to the degree of fever It was found that this increase in heat production followed van't Hoff's law, namely, that with a rise in temperature of 10 degrees C the velocity of chemical reactions increases between two and three times

Perhaps the most important function of the foreign protein reaction is the mobilization of immune bodies in the circulating blood For example, Bieling¹⁷ found that in rabbits immunized against typhoid bacilli there was an increased amount of typhoid agglutinins in the blood following the injection of colon, dysentery or diphtheria bacilli, and these observations have been corroborated by others Culver¹⁸ noted that in patients with gonorrheal arthritis the intravenous injections of proteases stimulated antibody formation just as actively as did gonococcus vaccine Wolff¹⁹ observed that in rabbits the bactericidal power of the blood could be

increased by both specific and nonspecific agents. Indeed, it has been shown by numerous authors that any form of fever is conducive to an increase of immune bodies in the circulating blood Whether this is due to increased formation or to increased mobilization of antibodies it is difficult to say It has been generally assumed that the beneficial effect of the foreign protein reaction is referable to the fever and that up to a certain point the higher the fever the better the results obtained There are some, however, who believe that the leukocytosis that accompanies the reaction has important therapeutic value

UNTOWARD REACTIONS

Severe and even fatal reactions sometimes follow the intravenous injection of foreign protein Such occurrences, however, usually take place in patients who are already seriously ill or who have been greatly overdosed with protein There have been surprisingly few severe anaphylactic reactions Among the complications attributed to foreign protein reactions have been delirium tremens, cardiac failure, vascular thromboses, acute nephritis, herpes labialis, rheumatic purpura, acute diarrhea, and activation of old pulmonary tuberculosis As pointed out by Hench,¹¹ there are certain reported sequelae of protein treatment, such as appendicitis, cholecystitis, glaucoma, colitis and respiratory infections, for which protein therapy has been deliberately used by the physician with impunity and at times with success Hench¹¹ has recently analyzed the reaction to typhoid vaccine, in most cases given intravenously, of 2,500 patients at the Mayo Clinic Unusual reactions were noted in only fourteen cases These were acute and sub-acute appendicitis, cholecystitis, enteritis, pleurisy, pericarditis, iritis, glaucoma, adenitis, vascular thrombosis and renal insufficiency In this large series, death occurred in only three cases, a mortality rate of 0.12 per cent

I have seen four fatal reactions from foreign protein therapy Three of these were in patients with lobar pneumonia who had received intravenous injections of pneumococcus aqueous extract (Huntton's pneumococcus antibody solution) In two of these cases death was apparently due to vasomotor collapse In the third case a sustained hyperpyrexia was followed by vasomotor collapse and death The fourth patient was in an advanced stage of dementia paralytica and after receiving typhoid vaccine intravenously developed a hyperpyrexia, which terminated in circulatory collapse and death I have never seen a dangerous reaction or any serious complications follow the intravenous use of typhoid vaccine in arthritic or in other patients suffering from some mild infection On the other hand, at the Mayo Clinic, untoward reactions have been noted more frequently in arthritic and vascular cases than in other conditions, though larger doses of protein have usually been employed in dermatologic and urologic cases than in the former groups

CLINICAL APPLICATION OF PROTEIN THERAPY

The literature on the clinical application of foreign protein therapy in various diseases is so enormous that in a short review of this kind reference can be made to only a limited number of them

Typhoid—Typhoid was the first infectious disease to be treated by foreign protein therapy Twenty years ago typhoid was still a fairly common disease and at that time a number of excellent studies appeared, report

12 Jobling J W and Peterson William Nonspecific Factors in Treatment of Disease J A M A 66 1753 (June 3) 1916

13 Modi N J Experiments with Milk Application to Protein Therapy Arch internat de pharmacodyn et de therap 43 111 1932

14 Mueller E F Nonspecific Protein Therapy Its Action and Its Application Wisconsin M J 26 287 (June) 1927

15 Zimmer A and Buschmann P Vermeidung und Verhinderung von Schaden die durch Protein-Korper Therapie hervorgerufen werden Ztschr f arztl Fortbild 22 513 1925

16 Barr D P Cecil R L and Bu Bois E F Clinical Calorimetry XXXII Temperature Regulation After the Intravenous Injection of Protease and Typhoid Bacillus Arch Int Med 29: 608 (May) 1922

17 Bieling R Untersuchungen über die veränderte Agglutininbildung mit Ruhrbacillen vorbehandelter Kaninchen Ztschr f Immunitätsforsch u exper Therap 28 246 1919

18 Culver H Antibodies in Gonococcal Arthritis, J Lab & Clin Med 3 11 (Oct.) 1917

19 Wolff L K Ueber unspezifische Therapie Ztschr f d ges exper Med 67 683 1929

ing the results obtained with protein therapy (Gay and Chickering,²⁰ McWilliams,²¹ Fairley,²² Wiltshire and MacGillcuddy²³ and others) Miller²⁴ states that the course of the disease is favorably influenced in 60 per cent of the cases. He adds, however, that intramuscular injections are safer than intravenous injections in this disease. Holler²⁵ used small doses of a 10 per cent solution of deuterio-albumose, beginning with two treatments a day and later giving one treatment daily, continuing the injections until the fever was broken. In 1917 he reported 350 cases treated by this method, with a death rate of only 0.5 per cent and an average duration of the disease of only ten days. So far as I can find, Holler's figures are the most impressive that have been reported in the literature.

Pneumonia—Pneumonia is a disease for which an efficacious serum therapy is available in more than 60 per cent of the cases. There still remains 40 per cent of pneumococcal pneumonias in which some other form of specific or nonspecific treatment would be feasible. In 1922 Larsen and I²⁶ reported a large series of cases of pneumonia in which Huntoon's antibody solution had been used intravenously in alternate cases. This controlled study offered an opportunity to observe the effect not only of specific but of nonspecific therapy as well, for the antibody solution contained immune bodies against only the three dominant types of pneumococci (types I, II and III). Therefore, when it was administered in the miscellaneous types it became a nonspecific form of therapy. Furthermore, it was nonspecific fever therapy, for each injection of antibody solution was usually followed by a chill and spurt in fever. A series of 110 group IV pneumonias thus treated gave a mortality rate of 16.4 per cent, while 121 untreated group IV cases showed a death rate of 24 per cent.

A similar opportunity occurred when Sutcliffe and I²⁷ reported on the effect of Felton's concentrated anti-pneumococcus serum in the treatment of pneumonia. The nonspecific effect of type I and type II serum could be studied in the miscellaneous group of pneumonias, this time without febrile reactions. Of 142 group IV patients who received type I-type II serum the death rate was 28.2 per cent. Of 133 group IV patients who received none, the death rate was 38.3 per cent.

Miller²⁸ treated fifteen cases of lobar pneumonia during the first two days of the disease with a single intravenous injection of typhoid vaccine. In six of the fifteen the pulse, temperature and respiration returned to normal a few hours after the reaction, but this improvement was temporary in three of the six. Three patients were permanently detoxicated and underwent rapid convalescence. Favorable results with typhoid

vaccine have also been reported by Cowie and Beaven²⁹ and by Wells.³⁰

It is obvious that in an infection of such comparatively short duration as pneumonia the interpretation of protein therapy would be difficult unless the injections were given very early in the disease. Furthermore, in spite of the statistical evidence in favor of protein fever therapy in pneumonia I feel that it is too drastic a form of treatment for routine use in such a severe infection as pneumonia. The fatal reactions mentioned earlier in this article support such a view.

Sepsis—The chills and temperature reactions of a patient with sepsis bear a strong resemblance to those which follow intravenous injections of foreign protein. A number of writers have reported favorable results from this method of treatment. For example, Wilmette³¹ reported a series of cases of puerperal sepsis with good results, some terminating by crisis. Ludke³² treated five cases with three rapid recoveries.

Syphilis—In the earlier days of protein therapy a number of investigators found it quite valuable in the treatment of the cutaneous manifestations of syphilis. With the development, however, of arsphenamine and heavy metal therapy, protein treatment has yielded to a more specific form of medication.

Protein therapy has maintained its prestige, however, in the treatment of dementia paralytica and to a less extent in tabes dorsalis. The outstanding advocate of foreign protein therapy in dementia paralytica has been Wagner-Jauregg.³³ The brilliant results obtained in this disease with typhoid vaccine and malarial therapy is indeed amazing when one considers how comparatively little benefit was gained from ordinary treatment of this condition with mercury and the iodides. As early as 1911, Pilcz³⁴ reported excellent results with tuberculin in the treatment of dementia paralytica. In 1917 malaria was first used therapeutically by Wagner-Jauregg,³⁵ who employed it in the treatment of dementia paralytica. This investigator had previously tried tuberculin and typhoid vaccine in the treatment of dementia paralytica and had obtained very good results following the febrile reactions produced by these agents. In 1928 his co-worker Gerstmann³⁶ summarized the results obtained with 2,000 patients in Wagner-Jauregg's clinic, and in 1931 Wagner-Jauregg³⁷ reported the results in 3,000 cases treated in the Vienna Psychiatric Clinic. The results reported by Wagner-Jauregg and by Gerstmann were most impressive and have been widely corroborated by other investigators in Germany, Great Britain and America. Wagner-Jauregg was convinced that malarial therapy was much superior to other agents for the production of thermal reactions, and this view is now quite widely held by neurologists. There are some, however, who believe that frequent injections of typhoid vaccine are just as efficacious, and certainly typhoid vac-

20 Gay F P and Chickering H T. Treatment of Typhoid Fever by Intravenous Injections of Polyvalent Sensitized Typhoid Vaccine. *Seditment Arch Int Med* 17: 303 (Feb.) 1916.

21 McWilliams H I. Is the Hyperleukocytosis Following the Injection of Typhoid Bacilli into Immunized Rabbits Specific? *J Immunol* 1: 159 (April) 1916.

22 Fairley K D. The Treatment of Typhoid Fever by Intravenous Vaccines. *M J Australia* 2: 291 (Sept 22) 1923. A Preliminary Report on the Treatment of Typhoid Fever with Intravenous Vaccines. *ibid* 2: 428 (Nov. 12) 1923.

23 Wiltshire H W and MacGillcuddy A R N. Treatment of Typhoid Fever by Typhoid Vaccine. *Lancet* 11: 685 1915.

24 Miller J L. Nonspecific Therapy. *Medicine* 6: 513 (Dec.) 1927.

25 Holler G. Beobachtungen über die Wirkungsweise parenteral einverleibter Proteinkörper zu therapeutischen Zwecken bei Infektionskrankheiten. *Med Klin* 13: 1038 1917.

26 Cecil R L and Larsen N P. Clinical and Bacteriologic Study of One Thousand Cases of Lobar Pneumonia. *J A M A* 79: 343 (July 29) 1922.

27 Cecil R L and Sutcliffe W D. The Treatment of Lobar Pneumonia with Concentrated Antipneumococcus Serum. *J A M A* 81: 2035 (Dec 29) 1928.

28 Miller J L. The Effect of Foreign Protein Therapy in Lobar Pneumonia. *J A M A* 74: 1598 (June 5) 1920.

29 Cowie D M and Beaven P W. Nonspecific Protein Therapy in Influenza Pneumonia. *J A M A* 72: 1117 (April 19) 1919.

30 Wells C W. Intravenous Injections of Foreign Protein in Influenza Pneumonia. *J A M A* 72: 1813 (June 21) 1919.

31 Wilmette R G. Injections intraveineuses de métaux colloïdaux. *Traitement de l'infection puerpérale*. *J med de Paris* 36: 117 1916.

32 Ludke H. Ueber Tetragenusssepsis. *München med Wchnschr* 67: 454 (April 16) 1920.

33 Wagner-Jauregg Julius. Ueber die Einwirkung fieberhafter Erkrankungen auf Psychosen. *Jahrb f Psychiat u Neurol* 7: 94 1887.

34 Pilcz A. Weiterer Bericht über die Tuberkulinbehandlung der progressiven Paralyse. *Wien med Wchnschr* 62: 2010 and 2083 1912.

35 Wagner-Jauregg Julius. Ueber die Einwirkung der Malaria auf die progressive Paralyse. *Psychiatr neurol Wchnschr* 20: 132 and 251 1918-1919.

36 Gerstmann J. Die Malariebehandlung der progressiven Paralyse. *Vienna Julius Springer* 1928.

37 Wagner-Jauregg Julius. Verhütung und Behandlung der progressiven Paralyse durch Impfmalaria. *Handbuch der experimentellen Therapie Serum und Chemotherapie (Ergänzungsband)* 1931 p 183.

cine has practical advantages over malaria. Mackenzie,³⁸ for example, has obtained excellent results with typhoid vaccine and stresses the absence of the cachexia and anemia that so often follow malaria. Kunde, Hall and Gerty³⁹ are enthusiastic over typhoid vaccine therapy in dementia paralytica, and favorable reports have recently been published by Jennings⁴⁰ and by Young and Bennett.⁴¹

Both relapsing fever and rat-bite fever have been used therapeutically in dementia paralytica.⁴² The results with relapsing fever as reported by Plaut and Steiner⁴³ and more recently by Signorelli⁴⁴ seem to be about as good as those obtained by others with malaria, this is still further evidence that it is the febrile reaction and not the agent which produced the fever which is the essential part of the treatment.

The results of foreign protein therapy in tabes have not been so brilliant as those obtained in dementia paralytica, though Wagner-Jauregg reports that the lightning pains of gastric crises are often relieved by this treatment.

Other Nervous Diseases—In 1924 Grosz⁴⁵ reported very favorably on the treatment of multiple sclerosis with foreign protein therapy. Twenty-nine patients were treated with typhoid vaccine and forty-two with malaria. In both series something more than 25 per cent showed marked improvement. Other writers, notably Dreyfus and Hanau⁴⁶ and Schacherl,⁴⁷ have also reported good results in this disease. According to Dannhauser⁴⁸ and Leiner,⁴⁹ encephalitis and postencephalitic syndromes are favorably affected by protein therapy. Schmidt⁵⁰ recommends nonspecific therapy for dementia praecox, and Sutton⁵¹ has obtained remarkably good results in chorea with frequent intravenous injections of typhoid vaccine.

The unbiased reader cannot fail to be impressed by the enthusiasm of these writers. However, one should remember that the nervous diseases discussed are all characterized by alternating periods of improvement and relapse, so while one can expect striking improvement in many such cases after fever therapy, the possibility or even probability of a recurrence must always be borne in mind.

Acute and Chronic Arthritis—In the field of arthritis foreign protein therapy has achieved considerable success, and probably more articles have been written on the use of protein therapy in the treatment of various rheumatic conditions than on any other subject. Accord-

ing to Miller⁵² 50 per cent of patients with acute arthritis are free from discomfort after from two to three intravenous injections of typhoid vaccine, and in about 25 per cent of these the relief is permanent.

A number of years ago I⁵³ tried intravenous injection of typhoid vaccine on forty cases of acute arthritis, including a number of cases of rheumatic fever and gonococcal arthritis, and found that 32 per cent made a rapid and complete recovery without recourse to any other treatment, while of the remaining cases all but two showed improvement. The results in the seven cases of gonococcal arthritis were only fairly good. In my opinion foreign protein therapy should always be considered in the treatment of acute arthritis, especially for those cases in which salicylates have failed to give good results.

In chronic arthritis of the rheumatoid type, foreign protein therapy has not proved so satisfactory as in the acute form, though the immediate effects are sometimes quite striking. The swelling of the joints is diminished and the pain is decreased. In the majority of cases, however, relapse occurs sometimes in a few days, sometimes after several weeks or months of comparative freedom from pain. The literature on this subject is so extensive that only a few representative articles can be referred to. Laurie⁵⁴ obtained good results in rheumatoid arthritis by first giving a series of injections of colon bacillus vaccine intravenously in the hospital, then having the patient return once a week for additional injections. Lowenstein⁵⁵ gave intravenous injections of casein and found them helpful. Snyder and Ramirez⁵⁶ obtained "cures" in only six of their series of 70 cases, and these were all of less than two years' duration. Of the remaining cases, half showed definite improvement in the upper extremities, but in only one fourth was a similar relief obtained in the lower extremities. Miller,⁵² after a wide experience with typhoid vaccine in the treatment of chronic arthritis, states that, in the early stages of rheumatoid arthritis in which there is evidence of marked inflammation, fever therapy will occasionally give gratifying results, terminating the disease sometimes permanently, more frequently for a few months, after which it again becomes active but often yields to a second course of treatment. Campbell⁵⁷ treated seventy cases with typhoid vaccine and noted improvement in fifty-eight, though sixteen of these relapsed. In summing up he remarks "Protein shock is not and cannot be regarded as an ideal method of treatment, yet I am of the view that in the present state of our knowledge of rheumatoid arthritis, it offers greater possibility of success than any other treatment."

I have used typhoid vaccine with success in early cases of rheumatoid arthritis,⁵⁸ many such patients remain well. It is particularly useful in the febrile type of case. In chronic, well established cases I prefer small intravenous doses of streptococcus vaccine, too small to excite a febrile reaction. This is not a brilliant form of

38 Mackenzie J. M. Pyrexia Induced by Intravenous Protein Therapy in General Paralysis. *Lancet* 2: 223 (July 30) 1927.

39 Kunde, M. M., Hall, G. W. and Gerty, F. J. Nonspecific Protein Therapy in General Paralysis. A Preliminary Report, *J. A. M. A.* 87: 1376 (Oct. 23) 1926.

40 Jennings, W. B. Foreign Protein Intravenously in General Paralysis. *M. J. & Rec.* 125: 799 (June 15) 1927.

41 Young, G. A. and Bennett, A. E. Nonspecific Protein (Typhoid Vaccine) Therapy of Disseminated Sclerosis. Preliminary Report of Results in Eight Cases. *Nebraska M. J.* 12: 401 (Nov.) 1927.

42 Solomon, H. C., Berk, A., Theiler, M. and Clay, C. L. The Use of Sodoku in the Treatment of General Paralysis. A Preliminary Report. *Arch. Int. Med.* 38: 391 (Sept.) 1926.

43 Plaut, F. and Steiner, G. Die Recurrentherapie der syphilitischen Nervenkrankheiten. *Ztschr. f. d. ges. Neurol. u. Psychiat.* 94: 133 1924.

44 Signorelli, E. Malaria e ricorrente terapia. *Riv. di clin. med.* 28: 705 (Sept. 30) 1927.

45 Grosz, K. Malariaabehandlung der multiplen Sklerose. *Jahrb. f. Psychiat.* u. Neurol. 43: 198 1924.

46 Dreyfus, G. L. and Hanau, R. Grundsatzliches über die Verwendung des neuen Fiebermittels Saprostan in der Neurologie. *Deutsche med. Wchnschr.* 52: 1381 (Aug. 13) 1926.

47 Schacherl, M. Treatment of Multiple Sclerosis. *Wien klin. Wchnschr.* 37: 1037 (Oct. 2) 1924.

48 Dannhauser, A. Protein Therapy in Neurology. *München med. Wchnschr.* 71: 742 (June 6) 1924.

49 Leiner, J. H. Spontaneous Cure of Case of Epidemic (Lethargic) Encephalitis Following Attack of Pneumonia. *J. A. M. A.* 81: 1284 (Oct. 13) 1923.

50 Schmidt, R. Ueber das Problem der Proteinkörpertherapie. *Med. Klin.* 2: 695 (July 4) 1920.

51 Sutton, Lucy P. The Treatment of Chorea by the Induction of Fever. *J. A. M. A.* 97: 299 (Aug. 1) 1931.

52 Miller, J. L. The Present Status of Nonspecific Therapy. *J. A. M. A.* 95: 464 (Aug. 16) 1930.

53 Cecil, R. L. A Report on Forty Cases of Acute Arthritis Treated by the Intravenous Injection of Foreign Protein. *Arch. Int. Med.* 22: 951 (Dec.) 1917.

54 Laurie, H. Intravenous Therapy of Rheumatoid Arthritis. *M. J. Australia* 1: 309 (March 24) 1923.

55 Lowenstein, W. Bemerkungen zur Proteintherapie chronischer rheumatischer Erkrankungen. *Fortschr. d. Therap.* 3: 816 (Dec. 10) 1927.

56 Snyder, R. G. and Ramirez, M. A. Intravenous Use of Foreign Protein in the Treatment of Chronic Cases of Arthritis with Special Reference to the Use of Secondary Proteose. *Arch. Int. Med.* 28: 50 (July) 1921.

57 Campbell, A. D. Nonspecific Therapy in Rheumatoid Arthritis. *Glasgow M. J.* 103: 79 (Jan.) 1925.

58 Cecil, R. L. The Medical Treatment of Chronic Arthritis. *J. A. M. A.* 103: 1583 (Nov. 24) 1934. Cecil⁵³

therapy, but, if the injections are continued for several months, many patients make improvement under it. The injections are given every four or five days, in doses that range from 50,000 bacteria to a final dosage of perhaps fifty or a hundred million.

Diseases of the Skin—In dermatology, foreign protein therapy has been widely used, and with considerable success, in certain inflammatory conditions, such as furunculosis, carbuncle and other staphylococcal infections of the skin, and to a less extent in ringworm, lupus, pruritus and the like. Sometimes a persistent form of urticaria will yield promptly to boiled milk or to some form of bacterial vaccine. Especially good results have been claimed for colon bacillus vaccine in urticaria. Favorable results have been reported in psoriasis, but in my experience the benefit obtained in this disease has been very short lived. O'Leary⁵⁹ has found foreign protein most beneficial in the treatment of anthrax and erysipelas. Less favorable results were obtained in staphylococcal infections of the skin. He saw no benefit whatever from the use of nonspecific therapy in eczema or in allergic dermatitis. Schmidt⁶⁰ reports excellent results with milk therapy in erysipelas. For further data on protein treatment in dermatology the reader is referred to papers by Hall,⁶⁰ Weirauk⁶¹ and Low.⁶²

Diseases of the Eye—Nonspecific therapy in the form of boiled milk or typhoid vaccine has been employed extensively in iritis, uveitis, keratitis, conjunctivitis and other inflammatory conditions of the eye. There seems to be some disagreement as to the benefit to be derived from protein therapy in trachoma. Friedlander⁶³ and Howard⁶⁴ both report good results in this condition, but other writers, such as Steindorff,⁶⁵ are not so enthusiastic. Miller²⁴ states that there is no acute infection in which the results of foreign protein therapy are so good as in acute iritis. According to this writer the results are immediate and the relief permanent, and this opinion is corroborated from many sources. Key⁶⁶ produced experimental ulcers on the cornea of rabbits and obtained prompt relief with diphtheria antitoxin.

Scarlett⁶⁷ found horse serum just as satisfactory as diphtheria antitoxin. He considers protein therapy a "valuable adjunct" in the treatment of ocular infections, but always in conjunction with regular routine treatment. A. C. Woods⁶⁸ believes nonspecific protein therapy one of the most valuable of weapons in certain ophthalmologic conditions but warns that it is "specialized therapy" and that age, duration of disease and condition of the patient must all be considered in every case. Benedict⁶⁹ found that, in eye work, shifting from one form of protein therapy to another often proved to be more effective than continuing with the

same form. If space permitted, many other enthusiastic reports could be cited, such as those of Allen,⁷⁰ Verhoeff⁷¹ and Gaston.⁷²

Gynecology—In pelvic disease the most important field of protein therapy has been in adnexal infections of an acute or subacute type. In such conditions the results of protein therapy have often been quite striking. The consensus seems to be, however, that its chief function is in the relief of pain and extreme tenderness. There is considerable doubt as to just how often a tubal infection is "cured" by protein therapy. Gellhorn⁷³ is enthusiastic over injections of milk for such infections, particularly gonorrheal infection of the tubes and Bartholin's glands. Chaudano⁷⁴ employed milk, but he is not so enthusiastic, nor is Kauert,⁷⁵ who employed "aolan," a milk derivative. Other writers, however, notably Rawls,⁷⁶ Mohler,⁷⁷ Llewellyn,⁷⁸ Jarcho,⁷⁹ Champlin⁸⁰ and Hibbert,⁸¹ used either milk or aolan with excellent effect.

L. H. Stuhler⁸² of the Mayo Clinic has found foreign protein therapy a good measure in pelvic cellulitis and in acute as well as chronic salpingitis. In his experience it is especially adapted to those early cases in which pus formation has not yet started. He considers protein therapy of value even in the well advanced cases, and in his opinion it is the method of choice in cases in which surgery is not yet indicated or is contraindicated. Stuhler believes that protein therapy has saved a great many patients from major surgical operations. This writer goes so far as to say that if he were limited to one method of treatment in salpingitis he would choose foreign protein therapy without hesitation.

Genito-Urinary Infections—Gonorrhea and its complications have been treated by various forms of nonspecific therapy as well as by gonococcus vaccine. Particularly good results have been reported in epididymitis and in gonococcal arthritis. Antoni⁸³ and Müller⁸⁴ have noted remarkable results from milk therapy in buboes.

For gonococcal infections, however, fever therapy is now more successfully used in the form of diathermy or the "short wave" than by typhoid or gonococcus vaccine. The subject of fever therapy in gonococcal infections is well reviewed in a recent article by Desjardins, Stuhler and Popp.⁸⁵

Peptic Ulcer—One would hardly expect protein therapy to have any value in the treatment of peptic

70 Allen T. D. Typhoid Vaccine in Ophthalmology. Tr. Sect. Ophth. A. M. A. 1925, p. 135.

71 Verhoeff F. H. Effective Treatment for Sympathetic Uveitis. Arch. Ophth. 56:28 (Jan.) 1927.

72 Gaston I. E. Milk Injections in Ophthalmic Cases, Am. J. Ophth. 9:111 (Feb.) 1926.

73 Gellhorn George. Milk Injections in Gynecology and Obstetrics. J. Indiana M. A. 19:229 (June) 1926.

74 Chaudano C. Parenteral Injections of Milk in Surgical Diseases. Policlinico (sez. chir.) 28:50 (Feb.) 1921.

75 Kauert F. Ueber Proteinkörpertherapie bei Adnexitiden, München med. Wchnschr. 66:1033 1919.

76 Rawls R. M. Protein (Milk) Injections in Gynecological Infections. New York State J. Med. 25:1108 (Dec. 15) 1925.

77 Mohler R. W. Foreign Proteins as Adjuvants in the Treatment of Obstinate Pelvic Infections. Am. J. Obst. & Gynec. 9:365 (March) 1925.

78 Llewellyn T. H. Protein Therapy for Pelvic Infection. S. Clin. North America 6:122 (Feb.) 1926.

79 Jarcho J. Nonspecific Protein Therapy in Pelvic Infections. M. J. & Rec. 123:237 (Feb. 17) 1926.

80 Champlin J. Jr. The Use of Milk Injection in Pelvic Inflammation. Boston M. & S. J. 194:1029 (June 3) 1926.

81 Hibbert G. F. Protein Therapy in Gynecology. Am. J. Obst. & Gynec. 17:227 (Feb.) 1929.

82 Stuhler L. H. Personal communication to the author.

83 Antoni. Die Aolanbehandlung der weichen Schankers und entzündlicher Bubonen. München med. Wchnschr. 66:746 1919.

84 Müller R. Die Behandlung des venerischen Bubo mit Milch. Injektion. Wien klin. Wchnschr. 32:780 1919.

85 Desjardins W. U. Stuhler L. G. and Popp W. C. Fever Therapy for Gonococcal Infections. J. A. M. A. 104:873 (March 16) 1935.

59 O'Leary P. A. Present Status of Nonspecific Treatment in Dermatology. Arch. Dermat. & Syph. 15:470 (April) 1927.

60 Hall E. R. Nonspecific Protein Therapy in Dermatology. South M. J. 19:1731 (Oct.) 1926.

61 Weirauk H. V. Nonspecific Protein Therapy. Milk in the Treatment of Certain Diseases of the Skin and Syphilis. Ohio State M. J. 22:305 (April) 1926.

62 Low R. C. Uses of Nonspecific Therapy. Brit. M. J. 2:577 (Sept. 24) 1932.

63 Friedlander W. Therapeutische Erfahrungen bei parenteraler Injektion von Proteinkörpern und ihren Spaltprodukten in der Augenheilkunde. Wien klin. Wchnschr. 20:1329 1916.

64 Howard H. J. Nonspecific Protein Therapy in Eye Inflammations with Special Reference to the Use of Typhoid Vaccine. China M. J. 41:395 (May) 1927.

65 Steindorff R. Nonspecific Protein Therapy in Eye Diseases. Deutsche med. Wchnschr. 53:744 (April 29) 1927.

66 Key B. W. Antidiphtheric Serum in Ocular Infection. J. A. M. A. 82:183 (Jan. 19) 1924.

67 Scarlett H. W. Clinical and Experimental Observations on Foreign Protein Especially in Iritis. Am. J. Ophth. 10:747 (Oct.) 1927.

68 Woods A. C. Protein Therapy. Specific and Nonspecific in Ophthalmology. Ohio State M. J. 23:740 (Sept.) 1927.

69 Benedict W. L. Protein Therapy in Ophthalmology. Minnesota Med. 11:203 (April) 1928.

ulcer Pribram,⁸⁶ however, has reported a large series of ulcers treated by intravenous injections of a vegetable albumin (novoprotein) and states that the pain was much relieved in from 50 to 60 per cent of the cases. He even goes so far as to assert that roentgen observations indicate healing of the ulcer. Treatments were given at intervals of from two to four days, the patient receiving a total of eight or ten injections. Martin,⁸⁷ Mueller,⁸⁸ Miller²⁴ and others have confirmed Pribram's results, at least so far as relief of gastric pain is concerned. Miller found that immediate effect of typhoid vaccine on ulcers was very good and stresses the alleviation of pain. A certain number of his cases, however, relapsed shortly after the treatment. In view of the marked tendency of ulcers to periodic remissions and exacerbations, the results of protein therapy in such conditions must be accepted with considerable reservation.

Vascular Disease—One of the newer fields for foreign protein therapy is that of vascular disease, particularly thrombo-angitis obliterans. In vascular disease, however, it is probably the vasodilatation rather than the fever, leukocytosis or mobilization of immune bodies that is responsible for the beneficial effect obtained. According to Wright,⁸⁹ the desired physiologic effect of fever therapy in vascular disease is release of spasm of the partially occluded vessels with resulting increase in the local capillary circulation. This is followed by cessation of pain and healing of ulcerations, if they exist.

The pain in thrombo-angitis obliterans is often excruciating, and Brown⁹⁰ considers the intravenous administration of typhoid vaccine the best medical measure for its relief. Allen and Smithwick⁹¹ have reported successful results with typhoid vaccine in Buerger's disease, in the gangrene of arteriosclerosis, and in purely vasomotor types of vascular occlusion. These authors used doses of from 125 to 300 million bacilli, but Wright believes that the chill should be avoided and recommends small doses, just enough to produce 2 or 3 degrees of fever. Wright recommends an initial dose of 10 million typhoid bacilli, with an increase of 10 million with each subsequent injection.

Goodman and Gottesman⁹² have also reported enthusiastically on the use of fever therapy in vascular disease, particularly Raynaud's disease. They say "Our most satisfactory results were obtained in the three cases of Raynaud's disease that we treated with foreign protein. Immediate and lasting improvement resulted in each case. No other treatment was employed."

It would appear from this brief survey that protein therapy has found one of its most important uses in vascular disease. The danger of thrombosis as a complication of the treatment must be kept in mind. It is for this reason that Wright warns against inducing chills in these patients and advises small doses of protein that will produce fever without the preceding rigor. Barker⁹³

of the Mayo Clinic has recently reported favorable results in peripheral vascular disease with typhoid H antigen. This antigen is a derivative of the typhoid bacillus and when injected intravenously produces fever but definitely less chill than the ordinary typhoid vaccine. In view of the absence or diminution of the chill, Barker believes that it is a better product for vascular disease than the usual typhoid vaccine.

Allergic Diseases—In 1909 Biedl and Kraus⁹⁴ found that an animal sensitized to a foreign protein could be partially desensitized with peptone, and this work has been confirmed by other investigators. No doubt this explains the beneficial effects sometimes obtained by protein therapy in such conditions as asthma, hay fever and urticaria. Rackemann⁹⁵ has pointed out that bacterial vaccines in asthma are beneficial in proportion to their power to produce a local reaction at the site of injection. I once saw an accidental local infection in the arm of an asthmatic patient at the site of a vaccine injection. The improvement that ensued from this local infection was much more marked than that which the patient received from any subsequent vaccine injections. Van Leeuwen⁹⁶ has used tuberculin in the treatment of asthma and reports 300 cases treated by this method with 50 per cent completely or almost completely cured and from 25 to 30 per cent improved.

As Miller²⁴ remarks, however, it is difficult to explain the permanent cures reported by various writers on asthma, for it is generally recognized that desensitization is a more or less temporary state.

CONTRAINDICATIONS

The more important contraindications to intravenous foreign protein therapy are

1 Advanced arterial, renal or cardiac disease. Patients with cardiac decompensation should not have intravenous protein therapy. On the other hand, rheumatic endocarditis with good compensation is not a contraindication.

2 Allergic states or conditions of marked protein sensitivity, such as angioneurotic edema, giant urticaria and the like.

3 States of extreme exhaustion following prolonged illness.

4 Pulmonary tuberculosis, active or quiescent.

5 Hemorrhagic conditions, such as hemophilia, bleeding ulcers and the like.

6 Chronic alcoholism, for fear of delirium tremens.

7 Marked nervous sensibility, such as that seen in hyperthyroidism and the like.

The contraindications for subcutaneous or intramuscular injections of protein are much less stringent than for the intravenous injections. Indeed, there are very few patients who cannot take with impunity small doses of bacterial vaccine, boiled milk or serum subcutaneously.

There has been considerable difference of opinion concerning the danger of protein therapy in patients with pulmonary tuberculosis. A number of writers have reported pulmonary focal reactions in tuberculous patients after injections of protein. Hektoen and Irons⁹⁷ cite five cases of latent pulmonary tuberculosis activated by the use of stock vaccines. I recall one case

86 Pribram B O Proteintherapie und chirurgische Therapie des Magen und Duodenalgeschwurs Deutsche med. Wchnschr 51: 141 (Jan 23) 1925

87 Martin Lay Peptic Ulcer Effect of Parenteral Injections of Purified Milk Proteins on Symptoms and Progress Arch Int Med 43: 299 (March) 1929

88 Mueller, E F Nonspecific Protein Therapy Its Action and Its Application Wisconsin M J 26: 287 (June) 1927

89 Wright I S The Modern Medical Treatment of Diseases of the Peripheral Vascular System M Clin North America 17: 1429 (March) 1934

90 Brown, G E Treatment of Peripheral Vascular Disturbances of the Extremities J A M A 87: 379 (Aug 7) 1926

91 Allen, W and Smithwick, R H Use of Foreign Protein in the Treatment of Peripheral Vascular Diseases J A M A 91: 1161 (Oct. 20) 1928

92 Goodman C and Gottesman J Pain and Its Treatment in Thrombo-Angitis Obliterans New York M J 117: 774 (June 20) 1923

93 Barker N W Typhoid H Antigen Further Observations on Nonspecific Foreign Protein Therapy in Peripheral Vascular Disease Proc Staff Meet. Mayo Clin 5: 267 (Sept 24) 1930

94 Biedl A and Kraus R Experimentelle Studien über Anaphaxie Wien klin Wchnschr 22: 363 1909

95 Rackemann F M and Graham L B The Vaccine Treatment of Asthma J Immunol 8: 295 (July) 1923

96 Storm Van Leeuwen W Allergic Diseases Philadelphia J B Lippincott Company 1925

97 Hektoen Ludvig and Irons E E Vaccine Therapy J A M A 92: 864 (March 16) 1929

of spondylitis in a young man who was treated in the New York Hospital with typhoid vaccine intravenously and who developed active pulmonary tuberculosis a short time after leaving the hospital. On the other hand, Brown, Heise, Petroff and Wilson⁹⁸ noted focal activation in only two of 124 tuberculous patients who received typhoid vaccine subcutaneously for prophylactic purposes.

COMMENT

One of the most difficult problems in modern medicine is the proper evaluation of new therapeutic measures that cannot be tested accurately either by animal experimentation or by carefully controlled statistical studies on patients but which rest for their acceptance entirely on an empirical basis. Foreign protein therapy is an excellent example of such a form of treatment. Animals have been used for studying the physiologic effect of proteins, but with the exception of Key's studies on experimental iritis in rabbits there has been very little effort to test the value of foreign protein experimentally. Numerous statistical studies on foreign protein therapy have been reported, but most of them have been uncontrolled—an omission that perhaps is pardonable in the study of chronic infections, in which controls are always difficult of interpretation.

Whatever popularity foreign protein therapy has received rests largely on an empirical basis. The earliest reports were clinical studies on patients. Experimental work came later. These facts, however, should not raise prejudice against protein treatment, provided the clinical reports can be relied on. Physicians have always been compelled by force of necessity to make use of empirical remedies in the treatment of disease and will probably continue to do so for many years to come.

What then should be the place of foreign protein therapy in modern practice? This question can be answered readily enough with respect to subcutaneous and intramuscular injections of vaccines or proteins such as milk, peptone and the like, which produce little or no reaction in the patient when given in reasonable doses. As a rule these injections do no harm, but often they fail to do any good. The benefit to be derived from protein therapy often seems to be in proportion to the amount of constitutional reaction and fever produced. Such being the case, the physician will in many cases be tempted to resort to intravenous protein therapy with some fever-producing substance like typhoid vaccine, and what every practitioner would like to know is just when he is justified in using this rather drastic form of treatment. He has in mind the question once propounded by Theobald Smith: How much energy does a reaction of this sort cost the patient, and is the final result worth the cost?

I am disposed to agree with Miller⁹⁴ that typhoid vaccine, when given in proper doses and to carefully selected patients, is not a dangerous form of therapy. In the case of intravenous therapy, the most important precautions are to (1) make the first dose a small one and (2) not to try protein therapy on patients who are in an extreme state of exhaustion. The indications and contraindications for this method of treatment have already been discussed. Experience with any form of therapy is a valuable asset to the practitioner, especially when an element of risk enters into its application.

Protein therapy falls into this category, but any well trained physician should be qualified to practice it, provided he will take the necessary precautions. I much prefer to administer fever therapy in a hospital. It can be undertaken in the patient's home if a nurse is in attendance, but the hospital is much to be preferred. Under no conditions should fever therapy be undertaken in the doctor's office. There is too much danger of a chill on the way home.

I believe that foreign protein therapy will always find its greatest usefulness in acute and subacute infections. The glowing reports by some writers on the achievements of protein therapy in various chronic diseases have not been widely corroborated. It is significant that many of these rather startling claims have been made with regard to certain chronic infections such as peptic ulcer, multiple sclerosis and chronic arthritis, which are characterized by periodic remissions and exacerbations.

A great many proprietary remedies have been offered to the medical profession as substitutes for milk, serum and ordinary bacterial vaccines. In many cases special claims have been made for these products, in language that is often mystifying, to say the least. As an example, I quote the following from an editorial in *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*⁹⁹ concerning the claims made for "Proto-Enzyme for the Involvements in Gonorrhea": "The nonspecific proteins contained are claimed to stimulate the production of phagocytes which 'attack and ingest the starved gonococci, changing them into peptones and releasing these peptones osmotically into the blood stream,' where they are taken up by red blood corpuscles.

carried to the liver, where they are split by the hepatic hormones into fatty acids and urates, and easily eliminated by the emunctories.'" It is doubtful whether the man who wrote these words knew what they meant, certainly they mean nothing to a physician who knows his physiology. Furthermore, it is extremely unlikely that these commercial products possess any virtues which are not equally inherent in typhoid vaccine, or the other agents commonly employed for nonspecific therapy.

Finally, as remarked by Hench,¹⁰⁰ foreign protein therapy may prove to be more "specific" than "nonspecific." Foreign protein produces a great many different kinds of specific reactions in the body. It is already being found that some of these reactions are helpful in one disease, while others are helpful in another. For example, in the treatment of peptic ulcer the specific effect desired is to keep the gastric acidity low. In dementia paralytica the fever is presumed to be the desirable part of the reaction. In vascular disease we are concerned exclusively with the degree of vasomotor dilatation produced. In certain other infections it may be the leukocytosis or the mobilization of the specific immune bodies that produces the beneficial result. The future study of foreign protein therapy will no doubt bring to light many new facts which will eventually take this procedure out of the realm of "nonspecific" into that of "specific" treatment, and it is quite possible that, while for the moment foreign protein therapy may seem to have lost some of its prestige and popularity, we may be on the verge of information that will result in a renewed and more skilful application of this method in the treatment of disease.

98 Brown L, Heise F H, Petroff S A, and Wilson G E. A Study of the Effects of Typhoid Fever and Antityphoid Immunization on Pulmonary Tuberculosis. *Am Rev Tuberc* 2:717 (Feb) 1919.

99 The Horowitz Proteins and Lipoids Again, editorial *J A M A* 63: 1975 (Dec. 21) 1929.

100 Hench P S. Personal communication to the author.

CONCLUSION

It may be said that protein therapy, after twenty years of investigation and clinical trial, rests on a sound foundation and has now achieved a permanent though limited place for itself in modern therapeutics. In the realm of infectious diseases it has met with general acceptance in the treatment of (1) infections of the eye, (2) acute and subacute pelvic infections, (3) certain infections of the skin, (4) a few generalized infections, such as sepsis and typhoid, (5) acute and chronic forms of infectious arthritis, and (6) cerebrospinal syphilis, especially dementia paralytica.

In the field of vascular disease, notably in thrombo-angitis obliterans, foreign protein therapy also appears to have earned a secure therapeutic position.

33 East Sixty-First Street

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.



RAYMOND HERTWIG Secretary

KRIM-KO CHOCOLATE FLAVORED DRINK

Bottlers and Distributors—

The Allegan Dairy, Allegan, Mich
Bareman Brothers Dairy, Holland, Mich
Bell Ice Cream Company, Lubbock, Texas
Bruder Dairy Products, Cleveland
Cannon Dairy, Dade City, Fla
Coss Dairy, Dixon, Ill
Gascoyne Dairy, Lockport, N Y
Golden Rod Dairy, Clearfield, Pa
Grand Haven Sanitary Dairy, Grand Haven, Mich
Janesville Pure Milk Co., Inc., Janesville, Wis
Jo-Mar Dairies Company, Salina, Kan
Midwest Creamery Company, Stillwater and Ponca City, Okla
Montgomery Dairy, Inc., Montgomery, W Va
Mount Vernon Dairy, Charleston, W Va
Pet Dairy Products Co., Kingsport, Tenn
Reeser's Milk Company, Allentown, Pa
Sapulpa Creamery, Sapulpa, Okla
Sherman Dairy Company, South Haven, Mich
Smith Dairy Products Co., Orrville, Ohio
Sunrise Dairy, Gastonia, N C

Licenser.—Krim-Ko Company, Chicago, manufactures the Krim-Ko Chocolate Flavored Drink Base and licenses its use, the name Krim-Ko, and standard advertising under definite contract conditions.

Description.—Pasteurized chocolate flavored sweetened skim milk, contains skim milk (from 0.5 to 1.5 per cent milk fat), sucrose, chocolate and cocoa tapioca flour, salt and traces of tartaric acid and agar, flavored with vanilla, vanillin and coumarin. See Krim-Ko Chocolate Flavored Drink (THE JOURNAL, June 30, 1934, p 2187).

RED & WHITE BRAND EVAPORATED MILK

Distributor.—Red & White Corporation, Chicago

Packers.—Manufacturers of accepted brands of evaporated milk.

Description.—Canned, evaporated milk complying with United States Department of Agriculture definition and standard

FAIRWAY BRAND IODIZED TABLE SALT

Distributor.—Twin City Wholesale Grocer Company, St Paul

Manufacturer.—The Ohio Salt Company, Wadsworth, Ohio

Description.—Table salt containing added magnesium carbonate (1 per cent) for preserving its free running properties, sodium bicarbonate (0.1 per cent) and potassium iodide (0.02 per cent by weight), the same as Chippewa Iodized Salt (THE JOURNAL, Sept 28, 1935, p 1039)

LOEB'S BRAND HAWAIIAN PINEAPPLE JUICE

Distributor.—Loeb Dietetic Food Company, New York

Packer.—Hawaiian Pineapple Company, Ltd., San Francisco

Description.—Canned Hawaiian pineapple juice retaining in high degree the natural vitamin content, the same as the accepted Dole Hawaiian Finest Quality Pineapple Juice (Unsweetened) (THE JOURNAL, June 3, 1933, p 1769)

Analysis (submitted by packer) —

| | per cent |
|---------------------------------|----------|
| Moisture | 85.3 |
| Ash | 0.4 |
| Protein (N \times 6.25) | 0.3 |
| Fat (ether extract) | 0.3 |
| Crude fiber | 0.02 |
| Reducing sugars as invert sugar | 12.4 |
| Carbohydrates (by difference) | 12.8 |
| Titratable acidity as citric | 0.9 |

Calories.—0.6 per gram, 17 per ounce

CELLU 10% FRUIT SALAD COMBINATION PACKED IN WATER WITHOUT ADDED SUGAR OR SALT

Distributor.—The Chicago Dietetic Supply House, Inc., Chicago

Packer.—Hunt Brothers Packing Company, San Francisco

Description.—Canned fruit mixture of cooked peaches, pears, apricots, pineapple and white cherries packed in water without added sugar or salt

Manufacture.—Canned peaches, pears, apricots, pineapple and white cherries packed in water without added sugar or salt are combined in definite proportions and processed as described for Cellu Blackberries Packed in Water Without Added Sugar or Salt (THE JOURNAL, Sept. 28, 1935, p 1039)

Analysis (submitted by distributor) —

| | Edible portion per cent |
|--|-------------------------------|
| Moisture | 90.0 |
| Total solids | 10.0 |
| Ash | 0.3 |
| Fat (ether extract) | 0.1 |
| Protein (N \times 6.25) | 0.3 |
| Reducing sugars as invert sugar | 4.8 |
| Sucrose | 2.6 |
| Crude fiber | 0.6 |
| Carbohydrates other than crude fiber (by difference) | 8.7 |

Calories.—0.4 per gram 11 per ounce

Claims of Distributor.—For diets in which sweetened fruit is proscribed

CALIFORNIA ORANGE JUICE

- 1 AMERICAN LADY BRAND
- 2 DEL RAY BRAND
- 3 EDELWEISS BRAND
- 4 IRIS BRAND
- 5 TOPMOST BRAND

Distributors.—1 and 5 General Grocer Company, St Louis
2 Delray Corporation, San Francisco 3 John Sexton & Company, Chicago and Brooklyn 4 Haas Baruch & Company, Los Angeles

Packer.—TreeSweet Products Company, Los Angeles

Description.—Heated California Valencia Orange Juice practically equivalent to fresh orange juice in vitamin C content. The same as TreeSweet Pure California Orange Juice (THE JOURNAL, June 15, 1935, p 2187)

SURVEY OF TUBERCULOSIS HOSPITALS AND SANATORIUMS IN THE UNITED STATES

BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE
AMERICAN MEDICAL ASSOCIATION

(See Index page 1915)

A plan for the survey of tuberculosis hospitals and sanatoriums in the United States was adopted by the Council on Medical Education and Hospitals in October 1932 and was authorized by the House of Delegates of the American Medical Association at its session the following year. This was no new venture but was in conformity with a well defined program of hospital service. To collect and disseminate information about hospitals is one of the functions of the Council which is not limited to any particular field.

The plan of survey was, in a large part, developed and its execution directed by Fritz H. Arestad, M.D., a member of the Council's staff of hospital examiners, who also made a majority of the visits to these hospitals and supervised the preparation of the statistics.

In undertaking this survey, the Council recognized that the medical profession at large is concerned with the problem of tuberculosis control and therefore interested in obtaining a better knowledge of the tuberculosis field. The problem of tuberculosis is not limited to specialists but is one in which the average physician has a share not only from the point of view of diagnosis and treatment but also from the broader aspect of public health. Likewise, tuberculosis hospitalization is no longer the exclusive function of the sanatorium field but has extended into the general hospitals and into other institutions of special service

PURPOSE OF SURVEY

The purpose of the survey was not to standardize the tuberculosis hospitals but rather to (1) appraise institutions for the American Medical Association's Hospital Register, (2) evaluate educational facilities for the training of resident physicians, (3) collect factual data about all tuberculosis institutions in the United States, and (4) present to the medical profession a report of the hospital facilities now available in the United States for the treatment of tuberculosis. An opportunity was afforded to study the educational facilities available for the training of medical students, interns, resident physicians and other graduate physicians. The Council has approved a number of tuberculosis hospitals and sanatoriums for the training of resident physicians and has extended its approval to postgraduate courses in a few of the most important institutions.

METHOD OF SURVEY

The plan of the survey differed little from the methods employed by the Council in its dealings with the medical schools and with other hospitals. As in the past, reliance was placed on personal inspections followed by a supplementary questionnaire. Although the investigation represented a concentrated study of a particular hospital field, it was conveniently combined with the routine inspections of other hospitals. The work was carried out by the Council's regular staff of hospital examiners and required two years for completion. During that time, visits of inspection were

made to all sanatoriums, preventoriums and the principal tuberculosis departments of other hospitals. All together, 656 institutions were inspected exclusive of tuberculosis departments in nervous and mental hospitals that had been surveyed during 1931 and 1932.

Throughout the investigation, an outlined plan was followed to insure uniformity of information and reports. The personal inspections were concerned with the following features: (1) physical plant, including location, ownership and control, finances, general utilities, food service, and bed capacity, (2) special medical facilities, such as x-ray, laboratory, necropsy facilities, pneumothorax equipment, facilities for minor, major and chest surgery, dental equipment, pharmacy, and heliotherapy, (3) staff and personnel, with reference to the regular medical staff, attending and consulting physicians, dental staff, and nursing, technical and general personnel, (4) medical service, including admission procedure, diagnostic service, general treatment and special therapeutic procedures in the form of pneumothorax, phrenic nerve operations, thoracoplasties, and so on, (5) records—administrative, clinical and statistical, and (6) special features, such as educational activities, research, medical library, community service, recreational facilities, occupational therapy and rehabilitation.

Since the investigation took two years, it was to be expected that changes would occur in some of the institutions that were included in the first part of the survey. In order to record such changes and to supplement the information obtained by inspection, a questionnaire was prepared which in itself was a comprehensive report containing 208 separate items. The form was designed with the assistance of the officials of the American Sanatorium Association and the National Tuberculosis Association, whose continued loyal support contributed largely to the success of the survey. Subsequently, many sanatorium superintendents offered valuable suggestions, so that the questionnaire in its final form represented not only the opinion of the Council but also the knowledge and experience of those who are more closely connected with the tuberculosis field.

SCOPE OF SURVEY

Questionnaires were sent to 471 sanatoriums and to 133 of the principal tuberculosis departments. Not only were returns received from 98.9 per cent of the sanatoriums and 92.5 per cent of the tuberculosis departments, but the forms were filled out with unusual accuracy and completeness. Reports were obtained also from fourteen preventoriums and from approximately 5,600 other hospitals which had been requested to report the number of beds available for the treatment of tuberculosis, the number of tuberculous patients admitted last year, and the number of tuberculous patients now under treatment.

The data obtained by inspections and by hospital reports were later supplemented by information supplied by state departments of health and state anti-

tuberculosis associations. By this means the Council was able to obtain a more complete picture of the local tuberculosis problems as well as a clearer understanding of the various methods of tuberculosis control.

The report that follows, therefore, covers 471 sanatoriums, 740 tuberculosis departments and twenty-nine

A classification on the basis of control shows 169 federal institutions offering facilities for the treatment of tuberculosis, 284 state institutions, 250 operated by counties, eighty by municipalities, twenty-four conducted jointly under city and county control, and 433 institutions under private management. Table 1, which

Table 1—Classification of Tuberculosis Institutions by States and by Control

| State | Federal | | State | | County | | | City | | City County | | | Private | | | Totals | | | Total Institutions |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|---------------|--------------------|
| | Sanatoriums | Departments | Sanatoriums | Departments | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums | |
| Alabama | | 3 | | 4 | | 3 | | | | | | | | | | | | | 12 |
| Arizona | 4 | 9 | | | | 2 | 3 | | | | | | 1 | 1 | | 4 | 8 | | 23 |
| Arkansas | | 3 | 2 | 2 | | 12 | | | | | | | 12 | 4 | 1 | 18 | 16 | 1 | 35 |
| California | 1 | 11 | | 8 | 10 | 21 | 3 | | | 1 | 1 | | 24 | 10 | 5 | 30 | 51 | 8 | 95 |
| Colorado | | 3 | | | | 2 | | | | | | | 17 | 0 | | 17 | 17 | | 34 |
| Connecticut | | | 5 | 12 | | | | | | | | | 2 | 2 | | 7 | 7 | | 14 |
| Delaware | | | 2 | 1 | | | | | | | | | | | 1 | 2 | 1 | 1 | 4 |
| District of Columbia | 4 | | | | | | | 2 | 1 | | | | | | | 2 | 7 | | 9 |
| Florida | | 2 | | 3 | | 2 | 3 | | 3 | | | | 1 | 3 | 2 | 3 | 14 | 2 | 19 |
| Georgia | | 5 | 1 | 2 | | 1 | | | | 2 | | | 1 | 1 | 1 | 5 | 8 | 1 | 14 |
| Idaho | | 1 | | 1 | | | | | | | | | 1 | 1 | | 1 | 7 | | 8 |
| Illinois | 1 | 0 | | 14 | 16 | 2 | | 2 | 1 | 1 | | | 7 | 13 | 1 | 20 | 30 | 1 | 63 |
| Indiana | | 4 | 1 | 7 | | 8 | | | | | | | | | | 9 | 12 | | 21 |
| Iowa | 1 | 2 | | 0 | | 4 | | | | | | | | 2 | | 6 | 18 | | 19 |
| Kansas | | 4 | 1 | 4 | | 1 | | | | 1 | | | | 0 | | 3 | 17 | | 20 |
| Kentucky | 1 | 1 | 1 | 2 | | 1 | 1 | | 1 | | | | | 5 | | 4 | 10 | | 14 |
| Louisiana | | 2 | 1 | 4 | | | | | 1 | 1 | | | | | | 3 | 6 | | 9 |
| Maine | | 3 | 3 | 3 | | | | | | | | | 2 | 1 | | 4 | 10 | | 14 |
| Maryland | | 2 | 4 | 0 | | | | | | | | | 1 | 4 | | 8 | 11 | | 19 |
| Massachusetts | 1 | 3 | 4 | 13 | | 7 | 1 | 1 | 8 | | | | 3 | 3 | | 8 | 33 | 1 | 57 |
| Michigan | | 2 | 2 | 10 | | 11 | 3 | | 3 | | | | 7 | 7 | 1 | 23 | 23 | | 46 |
| Minnesota | | 4 | 1 | 0 | | 13 | | | | 1 | 1 | | 6 | 0 | | 16 | 20 | 1 | 37 |
| Mississippi | | 1 | 1 | 2 | | | | | | | | 1 | 1 | | | 2 | 3 | | 5 |
| Missouri | | 4 | 1 | 5 | | 2 | | 2 | 7 | | | | 2 | 4 | 1 | 7 | 20 | 1 | 28 |
| Montana | | 1 | | | | | | | | 1 | | | 1 | 1 | | 1 | 7 | | 8 |
| Nebraska | | 2 | 1 | 1 | | 1 | | | 1 | | | | 1 | 3 | | 1 | 8 | | 9 |
| Nevada | | 1 | | | | 3 | | | | | | | | | | | 4 | | 4 |
| New Hampshire | | 1 | 1 | 1 | | | | | | | | | 1 | 1 | | 2 | 3 | | 5 |
| New Jersey | | 1 | 1 | 4 | | 0 | 3 | | 5 | | | | 0 | 7 | 1 | 10 | 20 | 1 | 37 |
| New Mexico | 3 | 8 | | | | | | | | | | | 5 | 6 | | 8 | 16 | | 24 |
| New York | 2 | 7 | 4 | 28 | 28 | 4 | 2 | 5 | 15 | 1 | | | 20 | 22 | 2 | 60 | 76 | 4 | 140 |
| North Carolina | 1 | 1 | 1 | 3 | | 7 | 2 | | | | | | 14 | 3 | | 23 | 9 | | 32 |
| North Dakota | | 2 | 1 | 3 | | | | | | | | | | | | 1 | 8 | | 8 |
| Ohio | | 3 | 1 | 13 | 14 | 1 | | 1 | 2 | 1 | | | 4 | 10 | 1 | 21 | 35 | 1 | 57 |
| Oklahoma | 2 | 3 | 3 | 4 | | | | | 1 | | | | 1 | 6 | | 6 | 14 | | 20 |
| Oregon | | 2 | 2 | 2 | | 1 | 1 | | | | | | 1 | 3 | | 4 | 8 | | 12 |
| Pennsylvania | | 5 | 3 | 15 | | 3 | 0 | 1 | 3 | 1 | 1 | | 9 | 20 | 1 | 17 | 56 | 1 | 74 |
| Rhode Island | | 1 | 1 | 3 | | | | | 1 | | | | 1 | 1 | 1 | 2 | 6 | 1 | 9 |
| South Carolina | | 1 | 1 | | | 3 | 1 | | | 1 | | | 1 | 4 | | 6 | 6 | | 12 |
| South Dakota | | 4 | 1 | | | | | | | | | | | | | 1 | 4 | | 5 |
| Tennessee | | 2 | | 4 | | 1 | | | | 2 | | 1 | 4 | 4 | | 7 | 10 | 1 | 18 |
| Texas | | 5 | 1 | 7 | | 2 | 3 | | 1 | 3 | 2 | | 11 | 7 | | 17 | 20 | | 42 |
| Utah | | 2 | | | | 1 | | | | | | | | 2 | | 5 | | | 6 |
| Vermont | | | 2 | | | | | | | | | | | 1 | 1 | 2 | 1 | 1 | 4 |
| Virginia | | 3 | 3 | 0 | | | | 2 | 1 | | | | 2 | 1 | | 7 | 10 | | 17 |
| Washington | 1 | 7 | | 2 | | 5 | 1 | | 1 | | | | 3 | 8 | | 9 | 19 | | 28 |
| West Virginia | | 1 | 3 | 4 | | 2 | | | | | | | 2 | 2 | | 7 | 7 | | 14 |
| Wisconsin | | 4 | 2 | 5 | | 17 | 6 | 1 | | | | | 2 | 5 | | 21 | 20 | 1 | 42 |
| Wyoming | | 2 | 1 | 1 | | | | | | | | | | 1 | | 1 | 4 | | 5 |
| Totals | 18 | 151 | 65 | 210 | 173 | 71 | 0 | 22 | 53 | 15 | 7 | 2 | 178 | 234 | 21 | 471 | 740 | 29 | 1,240 |

preventoriums, a total of 1,240 institutions. It is based on (1) the inspection of 656 tuberculosis institutions, (2) data obtained from 602 tuberculosis questionnaires, (3) reports from 5,600 other hospitals, and (4) information supplied by state health departments and state antituberculosis associations.

METHOD OF CLASSIFICATION OF TUBERCULOSIS INSTITUTIONS

For the purpose of this report the institutions can first of all be separated into three groups: the sanatoriums, the tuberculosis departments of other hospitals, and the preventoriums. The term "sanatorium" has been limited to institutions operated exclusively for tuberculosis, "tuberculosis department" signifies a tuberculosis service in conjunction with any other hospital activity, and the term "preventorium" is applied to children's units operated independently and on a permanent basis. Consequently, the list of preventoriums will not show preventorium units conducted as part of a sanatorium and will not include summer camps for children.

lists the tuberculosis institutions by states and according to control, shows the sanatoriums, departments and preventoriums classified as follows:

Classification by Control

| | Sanatoriums | Departments | Preventoriums | Total |
|-------------|-------------|-------------|---------------|-------|
| Federal | 18 | 151 | | 169 |
| State | 65 | 210 | | 284 |
| County | 173 | 71 | 6 | 250 |
| City | 22 | 53 | | 75 |
| City county | 10 | 7 | 2 | 19 |
| Private | 178 | 234 | 21 | 433 |
| Totals | 471 | 740 | 29 | 1,240 |

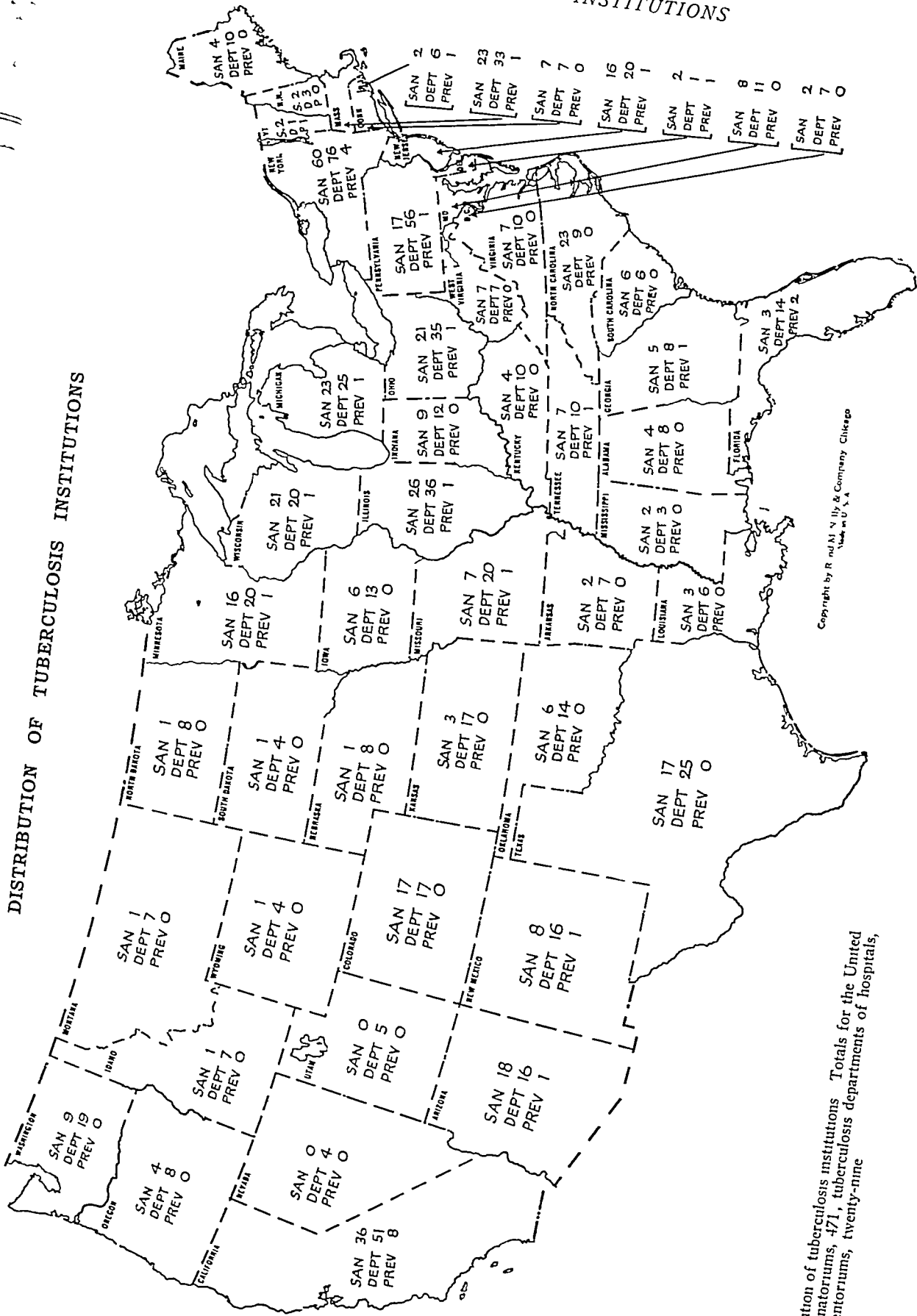
NUMBER, SIZE AND DISTRIBUTION OF TUBERCULOSIS INSTITUTIONS

There are 471 sanatoriums for the treatment of tuberculosis. Reference to the foregoing tabulation will show that eighteen are federal, sixty-five state owned, 173 county, twenty-two city, fifteen city and county, and 178 privately controlled. According to table 2, which shows the tuberculosis institutions by

TUBERCULOSIS INSTITUTIONS

1857

DISTRIBUTION OF TUBERCULOSIS INSTITUTIONS



Distribution of tuberculosis institutions Totals for the United States sanatoriums, 471, tuberculosis departments of hospitals, 740, preventoriums, twenty-nine

Copyright by R. and M. V. Ily & Company Chicago
New U.S.A.

states and by size, there are 41 sanatoriums of less than 25 beds, 90 of 25 to 49 beds, 132 of 50 to 99 beds, and 208 which have a capacity of 100 beds or over

The distribution of the sanatoriums as shown in the map and in table 1 corresponds closely to the density of population except in a few states where climatic conditions have influenced the development of sanatorium facilities beyond local needs. There are eight states with more than twenty sanatoriums each, six

floors or porches, and in 211 the degree of segregation was not reported

The variation in size of the tuberculosis departments is of some significance. In general, the larger departments may be considered part of the regular sanatorium service in a community, whereas the great number of small departments can be taken as an indication of the extent to which tuberculosis hospitalization has been developed in the general hospital field. Eighty depart

Table 2—Tuberculosis Institutions According to Size and by States

| State | Less Than 25 Beds | | | 25 to 49 Beds | | | 50 to 99 Beds | | | 100 Beds and Over | | | Total Sanatoriums | Total Departments | Total Preventorium | Total Institutions |
|----------------------|-------------------|-------------|---------------|---------------|-------------|---------------|---------------|-------------|---------------|-------------------|-------------|---------------|-------------------|-------------------|--------------------|--------------------|
| | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums | | | | |
| Alabama | 1 | 5 | | | 1 | | 2 | 2 | | 1 | | | 4 | 8 | | 12 |
| Arizona | 4 | 12 | 1 | 10 | 1 | | 3 | 1 | | 1 | 2 | | 18 | 16 | 1 | 35 |
| Arkansas | | 6 | | 1 | 7 | | 1 | 1 | | 1 | 1 | | 2 | 7 | | 9 |
| California | 6 | 23 | 1 | 5 | 7 | 4 | 12 | 11 | 3 | 13 | 8 | | 36 | 51 | 8 | 95 |
| Colorado | 2 | 12 | | 3 | 1 | | 6 | 3 | | 6 | 1 | | 17 | 17 | | 34 |
| Connecticut | | 3 | | | 3 | | 1 | 1 | | 6 | | | 7 | 7 | | 14 |
| Delaware | | 1 | 1 | 1 | | | 1 | | | 1 | | | 2 | 1 | 1 | 4 |
| District of Columbia | | 4 | | | 1 | | | | | 2 | 2 | | 2 | 7 | | 9 |
| Florida | 2 | 11 | 1 | | 3 | 1 | 1 | | | | | | 3 | 14 | 2 | 19 |
| Georgia | 1 | 6 | 1 | 2 | 1 | | | 1 | | 2 | 1 | | 5 | 8 | 1 | 14 |
| Idaho | | 7 | | | | | | | | 1 | | | 1 | 7 | | 8 |
| Illinois | 1 | 22 | 1 | 0 | 3 | | 12 | 4 | | 7 | 7 | | 26 | 36 | 1 | 63 |
| Indiana | | 8 | | 1 | 3 | | 12 | 1 | | 6 | | | 9 | 12 | | 21 |
| Iowa | | 9 | | | 2 | | 3 | 2 | | 3 | | | 6 | 13 | | 19 |
| Kansas | | 14 | | | 1 | | 1 | 2 | | 1 | | | 3 | 17 | | 22 |
| Kentucky | | 8 | | | | | 2 | 1 | | 2 | | | 4 | 10 | | 14 |
| Louisiana | | 1 | | | 1 | | 1 | 1 | | 2 | 3 | | 3 | 6 | | 9 |
| Maine | | 0 | | 1 | 1 | | | | | 3 | | | 4 | 10 | | 14 |
| Maryland | | 9 | | 1 | 1 | | 2 | 1 | | 5 | | | 8 | 11 | | 19 |
| Massachusetts | 3 | 18 | | 2 | 6 | 1 | 3 | 5 | | 15 | 4 | | 23 | 33 | 1 | 57 |
| Michigan | 2 | 12 | 1 | 3 | 4 | | 8 | 7 | | 10 | 2 | | 23 | 25 | 1 | 49 |
| Minnesota | 2 | 10 | | 4 | 5 | | 0 | 3 | 1 | 4 | 2 | | 10 | 20 | 1 | 37 |
| Mississippi | | 1 | | 1 | 1 | | | | | 1 | 1 | | 2 | 3 | | 5 |
| Missouri | 1 | 10 | | | 0 | | 1 | 4 | 1 | 5 | | | 7 | 20 | 1 | 28 |
| Montana | | 0 | | | 1 | | | | | 1 | | | 1 | 7 | | 8 |
| Nebraska | | 0 | | | 1 | | | | | 1 | | | 1 | 8 | | 9 |
| Nevada | | 4 | | | | | | | | | | | | 4 | | 4 |
| New Hampshire | | 3 | | | | | | | | 2 | | | 2 | 3 | | 5 |
| New Jersey | 1 | 11 | | 3 | 4 | | 4 | 1 | | 8 | 4 | 1 | 16 | 20 | 1 | 37 |
| New Mexico | | 11 | | | 1 | | 5 | 2 | | 3 | 2 | | 8 | 16 | | 24 |
| New York | 3 | 42 | 2 | 12 | 5 | | 12 | 0 | 1 | 33 | 23 | 1 | 60 | 76 | 4 | 140 |
| North Carolina | 5 | 0 | | 9 | 1 | | 3 | 2 | | 0 | | | 23 | 9 | | 32 |
| North Dakota | | 7 | | | 1 | | | | | 1 | | | 1 | 8 | | 9 |
| Ohio | | 23 | | 3 | 6 | | 6 | 3 | 1 | 12 | 3 | | 21 | 35 | 1 | 57 |
| Oklahoma | | 11 | | | 1 | | 2 | 2 | | 4 | | | 6 | 14 | | 20 |
| Oregon | | 0 | | 1 | 2 | | 1 | | | 2 | | | 4 | 8 | | 12 |
| Pennsylvania | 1 | 40 | | 1 | 6 | | 3 | 5 | | 12 | 5 | 1 | 17 | 56 | 1 | 74 |
| Rhode Island | | 5 | | | | | 1 | 1 | 1 | 1 | | | 2 | 6 | 1 | 9 |
| South Carolina | | 5 | | 2 | | | 3 | 1 | | 1 | | | 6 | 6 | | 12 |
| South Dakota | | 3 | | | | | | 1 | | 1 | | | 1 | 4 | | 5 |
| Tennessee | 1 | 4 | | 2 | 3 | | | 2 | 1 | 4 | 1 | | 7 | 10 | 1 | 18 |
| Texas | 2 | 17 | | 3 | 4 | | 7 | 2 | | 5 | 2 | | 17 | 25 | | 42 |
| Utah | | 4 | | | 1 | | | | | | | | | 5 | | 5 |
| Vermont | | 1 | | 1 | | 1 | 1 | | | | | | 2 | 1 | 1 | 4 |
| Virginia | | 0 | | 1 | 1 | | 2 | 2 | | 4 | 1 | | 7 | 10 | | 17 |
| Washington | 1 | 14 | | 2 | 2 | | 3 | | | 3 | 3 | | 9 | 19 | | 28 |
| West Virginia | 1 | 6 | | 3 | 1 | | 1 | | | 2 | | | 7 | 7 | | 14 |
| Wisconsin | 1 | 18 | | 6 | 1 | | 12 | | | 4 | 1 | 1 | 21 | 30 | 1 | 42 |
| Wyoming | | 4 | | 1 | | | | | | | | | 1 | 4 | | 5 |
| Totals | 41 | 484 | 9 | 90 | 94 | 7 | 132 | 82 | 0 | 208 | 80 | 4 | 471 | 740 | 29 | 1,440 |

have from ten to twenty, thirty-three states have less than ten, and two have no sanatorium facilities

The tuberculosis departments, which number 740 in all, are also shown in table 1. Of these, 151 are federal, 219 state, seventy-one county, fifty-eight city, seven city and county, and 234 under private control. An analysis of the reports shows that 418 tuberculosis departments are connected with general hospitals, twenty-six with isolation hospitals, 193 with nervous and mental institutions, twenty-one with orthopedic hospitals, seventeen are connected with other hospitals, and sixty-five are departments of institutions, including sixteen homes for the aged and forty-eight reformatories and prisons

The extent to which isolation facilities have been provided for tuberculosis in general and other hospitals is illustrated by the table in the adjoining column, which shows that 225 tuberculosis departments are housed in separate buildings, 304 occupy separate wings, wards,

ments are of 100 beds or over, eighty-two have a capacity of from fifty to ninety-nine beds, ninety-four have from twenty-five to forty-nine beds, and 484 have

Isolation Facilities for Tuberculosis

| Type of Hospital | Separate Building | Segregated Unit | Not Designated | Total |
|--------------------------------------|-------------------|-----------------|----------------|-------|
| General | 80 | 175 | 167 | 418 |
| Nervous and mental | 102 | 72 | 10 | 184 |
| Tuberculosis and isolation | 13 | 18 | | 31 |
| Orthopedic | 2 | | 10 | 12 |
| Hospital departments of institutions | 20 | 37 | 8 | 65 |
| All other hospitals | 2 | 7 | 8 | 17 |
| Totals | 225 | 304 | 211 | 740 |

less than twenty-five beds. The second column in table 2 showing tuberculosis departments of less than twenty-five beds includes 266 that did not report the number of beds set aside for tuberculosis

All states have hospitals with tuberculosis departments, as shown in table 1. Eight have more than twenty each, eighteen have from ten to twenty, sixteen have from five to nine, and in seven states there are less than five tuberculosis departments.

There are twenty-nine preventoriums that are operated as independent institutions. Twenty-one are privately owned, six are county institutions, and two are operated jointly under city and county control. The

men, 25,716 for women, 11,647 for children, and 22,284 unassigned. Four hundred and seventy-one sanatoriums operated exclusively for tuberculosis have 64,997 beds, the 740 tuberculosis departments have 28,534 beds, and the twenty-nine preventoriums reported 1,667 beds.

There are 14,468 tuberculosis beds in general hospitals, 9,478 in nervous and mental institutions, 2,556 in tuberculosis and isolation hospitals, 1,322 in depart-

Table 3—Bed Capacity of Tuberculosis Institutions Classified by States

| State | Sanatoriums | | | | | Departments | | | | | Preven- toriums | Total Beds | | | | | Tuberculosis Beds Planned | |
|----------------------|-----------------|-------------------|----------------------|------------|--------|-----------------|-------------------|----------------------|------------|--------|--------------------|----------------------|---------|-----------|--------------|------------|---------------------------------|-------|
| | Beds for Men | Beds for Women | Beds for Children | Unassigned | Total | Beds for Men | Beds for Women | Beds for Children | Unassigned | Total | | Beds for Children | For Men | For Women | For Children | Unassigned | | Total |
| Alabama | 93 | 113 | 36 | | 242 | 111 | | | 109 | 220 | | | 204 | 113 | 36 | 109 | 462 | 65 |
| Arizona | 271 | 170 | 45 | 318 | 805 | 593 | 5 | | 115 | 703 | | 10 | 84 | 181 | 5 | 428 | 1,518 | 64 |
| Arkansas | 199 | 269 | 88 | | 556 | | | | 234 | 234 | | | 199 | 269 | 88 | 234 | 790 | |
| California | 1,304 | 1,148 | 521 | 1,043 | 4,016 | 1,420 | 530 | 191 | 814 | 2,955 | 418 | 2,724 | 1,618 | 1,190 | 1,807 | 7,389 | 602 | |
| Colorado | 504 | 442 | 112 | 625 | 1,743 | 654 | 80 | | 214 | 948 | | 1,218 | 522 | 112 | 839 | 2,691 | 25 | |
| Connecticut | 674 | 559 | 442 | | 1,675 | 46 | 46 | 6 | 142 | 240 | | 720 | 600 | 448 | 142 | 1,910 | 304 | |
| Delaware | 57 | 60 | 44 | | 161 | | | | 60 | 84 | 22 | 5 | 60 | 66 | | 183 | 60 | |
| District of Columbia | 120 | 100 | 150 | | 370 | 40 | 40 | 20 | 106 | 206 | | 160 | 140 | 170 | 106 | 686 | 750 | |
| Florida | 37 | 29 | | 20 | 86 | 47 | 40 | | 111 | 198 | 46 | 84 | 69 | 46 | 181 | 330 | 35 | |
| Georgia | 217 | 251 | 153 | 24 | 645 | | | | 627 | 627 | 13 | 217 | 251 | 166 | 631 | 1,285 | 40 | |
| Idaho | | | | | 132 | 24 | | | 60 | 84 | | 24 | | | 132 | 60 | 216 | |
| Illinois | 1,305 | 1,344 | 828 | 441 | 3,448 | 416 | 161 | 25 | 1,300 | 1,902 | 24 | 1,781 | 1,505 | 877 | 1,741 | 5,404 | 102 | |
| Indiana | 491 | 564 | 302 | | 1,357 | | | | 229 | 229 | | 491 | 564 | 302 | 229 | 1,586 | 275 | |
| Iowa | 128 | 178 | 110 | 363 | 774 | | | | 207 | 207 | | 128 | 173 | 110 | 570 | 881 | 25 | |
| Kansas | 152 | 104 | 42 | | 298 | | | | 183 | 183 | | 182 | 104 | 42 | 183 | 571 | 40 | |
| Kentucky | 530 | 218 | 112 | | 949 | | | | 237 | 237 | | 559 | 278 | 112 | 257 | 1,206 | 50 | |
| Louisiana | 148 | 148 | 30 | | 326 | 157 | | | 570 | 727 | | 305 | 148 | 30 | 570 | 1,033 | 100 | |
| Maine | 174 | 227 | 81 | | 482 | 7 | 9 | | 78 | 84 | | 181 | 236 | 61 | 78 | 570 | 45 | |
| Maryland | 629 | 492 | 174 | 55 | 1,350 | | | | 200 | 200 | | 629 | 492 | 174 | 235 | 1,550 | 185 | |
| Massachusetts | 1,768 | 1,225 | 835 | 235 | 4,063 | 414 | 233 | 107 | 453 | 1,207 | 30 | 2,182 | 1,568 | 972 | 688 | 5,350 | 150 | |
| Michigan | 1,430 | 1,170 | 416 | 339 | 3,355 | 529 | 448 | 11 | 690 | 1,616 | 20 | 1,539 | 1,616 | 447 | 960 | 4,991 | 100 | |
| Minnesota | 872 | 922 | 89 | 77 | 1,960 | 204 | 10 | 5 | 696 | 846 | 80 | 1,016 | 632 | 174 | 703 | 2,435 | 200 | |
| Mississippi | 23 | 24 | | 490 | 537 | | | | 245 | 245 | | 23 | 24 | | 725 | 772 | | |
| Missouri | 666 | 639 | 117 | | 1,412 | 61 | 108 | | 334 | 553 | 85 | 667 | 797 | 202 | 384 | 2,050 | 573 | |
| Montana | 82 | 38 | 30 | | 150 | | | | 110 | 110 | | 82 | 38 | 30 | 110 | 260 | 60 | |
| Nebraska | 51 | 76 | 33 | | 160 | 47 | 53 | 5 | 42 | 147 | | 98 | 129 | 38 | 42 | 307 | 35 | |
| Nevada | | | | | | | | | 18 | 18 | | | | | 18 | 18 | | |
| New Hampshire | 94 | 91 | 25 | | 210 | | | | 20 | 20 | | 94 | 91 | 25 | 30 | 230 | 20 | |
| New Jersey | 1,154 | 919 | 338 | 57 | 2,468 | 218 | 150 | 70 | 442 | 880 | 247 | 1,372 | 1,009 | 655 | 499 | 3,536 | 292 | |
| New Mexico | 411 | 89 | 66 | 804 | 870 | 401 | 25 | | 257 | 658 | | 812 | 114 | 66 | 561 | 1,533 | 50 | |
| New York | 5,043 | 8,084 | 1,462 | 61 | 9,650 | 1,552 | 873 | 170 | 2,085 | 4,660 | 252 | 6,595 | 3,957 | 1,854 | 2,146 | 14,682 | 1,029 | |
| North Carolina | 1,263 | 513 | 188 | 538 | 2,462 | | | | 173 | 173 | | 1,263 | 513 | 138 | 711 | 2,625 | 90 | |
| North Dakota | 94 | 121 | 50 | | 265 | 7 | 7 | | 62 | 76 | | 101 | 128 | 50 | 62 | 341 | 83 | |
| Ohio | 1,235 | 1,250 | 663 | 66 | 3,214 | 450 | 154 | | 792 | 1,396 | 60 | 1,085 | 1,404 | 723 | 838 | 4,010 | 238 | |
| Oklahoma | 842 | 378 | 118 | 60 | 1,398 | | | | 188 | 188 | | 342 | 378 | 113 | 248 | 1,070 | 60 | |
| Oregon | 70 | 69 | | 874 | 513 | | | | 109 | 109 | | 70 | 69 | | 483 | 622 | 130 | |
| Pennsylvania | 1,696 | 1,508 | 702 | 283 | 4,189 | 527 | 304 | 20 | 1,163 | 2,004 | 100 | 2,223 | 1,812 | 822 | 1,436 | 6,293 | 269 | |
| Rhode Island | 224 | 204 | 67 | | 495 | | | | 60 | 60 | 50 | 224 | 204 | 117 | 60 | 605 | 70 | |
| South Carolina | 174 | 247 | 64 | 54 | 539 | 34 | 34 | 30 | 38 | 196 | | 208 | 281 | 94 | 92 | 675 | 50 | |
| South Dakota | 96 | 96 | | | 192 | | | | 15 | 105 | | 156 | 96 | | 16 | 297 | | |
| Tennessee | 403 | 410 | 259 | 52 | 1,124 | | | | 398 | 398 | 50 | 403 | 410 | 309 | 450 | 1,572 | | |
| Texas | 634 | 558 | 240 | 539 | 1,971 | 90 | 28 | | 776 | 894 | | 724 | 586 | 240 | 1,315 | 2,565 | 75 | |
| Utah | | | | | | 19 | 13 | | 22 | 54 | | 19 | 13 | | 22 | 54 | 50 | |
| Vermont | 64 | 68 | | | 127 | | | | | | 44 | 64 | 63 | 44 | | 171 | | |
| Virginia | 471 | 543 | 84 | 25 | 1,123 | 23 | 23 | 6 | 250 | 302 | | 494 | 566 | 90 | 275 | 1,425 | | |
| Washington | 104 | 185 | 67 | 225 | 751 | 288 | 120 | 278 | 94 | 780 | | 482 | 315 | 345 | 239 | 1,531 | 53 | |
| West Virginia | 237 | 284 | 186 | 65 | 772 | | | | 77 | 77 | | 237 | 284 | 136 | 142 | 840 | 229 | |
| Wisconsin | 801 | 827 | 140 | 161 | 1,689 | 254 | | | 138 | 392 | 116 | 1,115 | 827 | 250 | 299 | 2,497 | 169 | |
| Wyoming | 14 | 19 | | | 33 | | | | 32 | 32 | | 14 | 19 | | 32 | 65 | 50 | |
| Totals | 29,638 | 22,174 | 9,036 | 9,049 | 64,997 | 8,718 | 3,542 | 944 | 15,335 | 25,634 | 1,667 | 35,551 | 25,716 | 11,647 | 22,284 | 95,198 | 6,601 | |

capacity varies from ten to 247 beds. Nine institutions have less than twenty-five beds, seven from twenty-five to forty-nine beds, nine from fifty to ninety-nine beds, and in four the capacity is 100 beds or over. There are eight preventoriums listed in California, four in New York, two in Florida, one in each of fifteen states, and none in thirty-one.

The foregoing figures do not represent all the facilities for children, however, for there are more than 250 sanatoriums and tuberculosis departments that admit children for sanatorium or preventorium care. These facilities are included in the sanatorium classification and are described under "Hospitalization of Children."

BED CAPACITY

Reports from 1,240 institutions indicate that there are at present 95,198 beds available in the United States for the treatment of tuberculosis, 35,551 for

men, 25,716 for women, 11,647 for children, and 22,284 unassigned. Four hundred and seventy-one sanatoriums operated exclusively for tuberculosis have 64,997 beds, the 740 tuberculosis departments have 28,534 beds, and the twenty-nine preventoriums reported 1,667 beds.

The number of available beds for Negroes cannot be stated definitely. However, 104 institutions report 3,751 beds for colored patients, and 171 additional hospitals state that beds are made available for Negroes in accordance with demands for hospitalization.

New construction for tuberculosis may add 6,661 beds. Private institutions report plans for 487 new beds, and the state and local public institutions indicate that new construction may increase their capacity by 6,124 beds.

New York State has the greatest number of beds for tuberculosis, 14,582, California is next with 7,389, Pennsylvania has 6,293, Illinois 5,404, Massachusetts 5,350, Michigan 4,991, Ohio 4,670 and New Jersey 3,595 beds. Six states have between 2,000 and 3,000 beds, twelve states have from 1,000 to 2,000 beds each, ten states have from 500 to 1,000 beds, and thirteen states have less than 500, including Nevada, Utah and Wyoming, which do not exceed 100 beds.

In table 3 the bed capacity of tuberculosis institutions has been classified by states. Table 4, which represents

private hospitals. The six county preventoriums have 364 beds, two under city and county control have 130, and twenty-one privately owned preventoriums have 1,173 beds.

PATIENT POPULATION

To illustrate the extent of tuberculosis hospitalization in the United States it becomes necessary to show by figures the changes that occur annually in the patient population of tuberculosis institutions. The statistical data used for this purpose are based on reports received during 1934.

Table 4—Bed Capacity of Tuberculosis Institutions by Control and by States

| State | Federal | | State | | County | | | City | | City County | | | Private | | | Number of Beds | | | Total Beds in Institutions |
|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|---------------|----------------|-------------|---------------|----------------------------|
| | Sanatoriums | Departments | Sanatoriums | Departments | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums | |
| Alabama | | 53 | | 167 | 182 | | | | | | | | 60 | | | 242 | 220 | | 462 |
| Arizona | 250 | 570 | | 2 | 62 | | | | | | | | 467 | 100 | 10 | 805 | 702 | 10 | 1,515 |
| Arkansas | | 82 | 506 | 108 | | 44 | | | | | | | | | | 506 | 234 | | 740 |
| California | 244 | 888 | | 340 | 2,300 | 1,254 | 176 | | | 82 | 416 | | 1,300 | 28 | 242 | 4,016 | 2,900 | 418 | 7,534 |
| Colorado | | 536 | | 30 | | 7 | | | | | | | 1,743 | 286 | | 1,743 | 948 | | 2,691 |
| Connecticut | | | 1,483 | 136 | | | | | | | 80 | | 192 | 48 | | 1,675 | 240 | | 1,915 |
| Delaware | | | 101 | | | | | | 50 | | | | | | 22 | 161 | | 22 | 183 |
| Dist. of Columbia | | 106 | | | | | | 370 | 100 | | | | | | | 3,000 | 206 | | 3,206 |
| Florida | | 26 | | 62 | 76 | 5 | | | 42 | | | | 10 | 13 | 46 | 86 | 198 | 46 | 330 |
| Georgia | | 81 | 837 | 541 | 30 | | | | | 242 | | | 26 | | 13 | 640 | 627 | 13 | 1,283 |
| Idaho | 182 | 24 | | 12 | | | | | | | | | | 48 | | 182 | 84 | | 266 |
| Illinois | | 340 | | 940 | 1,486 | 351 | | 1,200 | 6 | 110 | | | 583 | 240 | 24 | 3,478 | 1,902 | 24 | 5,844 |
| Indiana | | 84 | 211 | 141 | 1,146 | | | | | | | | | 4 | | 1,357 | 225 | | 1,582 |
| Iowa | 80 | 77 | 363 | 180 | 331 | | | | | | | | | | | 774 | 307 | | 1,081 |
| Kansas | | 67 | 268 | 110 | 60 | | | | | 60 | | | | | 6 | 388 | 183 | | 571 |
| Kentucky | 370 | | 80 | 222 | 00 | 20 | | | | 404 | | | | 15 | | 949 | 257 | | 1,206 |
| Louisiana | | 206 | 96 | 621 | | | | | | | | | 230 | | | 326 | 727 | | 1,053 |
| Maine | | 12 | 462 | 68 | | | | | | | | | 20 | 24 | | 482 | 94 | | 576 |
| Maryland | | 68 | 896 | 132 | | | | 170 | | | | | 275 | | | 1,350 | 200 | | 1,550 |
| Massachusetts | 472 | 16 | 1,241 | 640 | 1,176 | 28 | | 744 | 426 | | | | 430 | 147 | 20 | 4,063 | 1,237 | 20 | 5,320 |
| Michigan | | 30 | 866 | 392 | 809 | 160 | | 680 | 802 | | | | 700 | 226 | 20 | 3,330 | 1,616 | 20 | 4,966 |
| Minnesota | | 286 | 300 | 261 | 1,404 | | | | | 215 | 80 | | 76 | 83 | | 1,960 | 840 | 80 | 2,880 |
| Mississippi | | 4 | 480 | 241 | | | | | | | | | 47 | | | 527 | 240 | | 767 |
| Missouri | | 87 | 400 | 228 | 118 | | | 608 | 232 | | | | 221 | 6 | 80 | 1,412 | 553 | 85 | 2,050 |
| Montana | | 100 | 160 | | | | | | | 10 | | | | | | 150 | 110 | | 260 |
| Nebraska | | 40 | 160 | 0 | | | | | | | | | | | | 160 | 147 | | 307 |
| Nevada | | | | | 18 | | | 8 | | | | | | | 8 | | | | 26 |
| New Hampshire | | | 110 | 20 | | | | | | | | | 100 | | | 210 | 20 | | 230 |
| New Jersey | | 27 | 420 | 101 | 1,817 | 417 | | 217 | | | | | 231 | 58 | 247 | 2,468 | 850 | 247 | 3,565 |
| New Mexico | 430 | 446 | | | | | | | | | | | 440 | 237 | | 870 | 683 | | 1,553 |
| New York | 999 | 263 | 300 | 1,842 | 3,075 | 333 | 72 | 2,500 | 1,400 | 130 | | | 2,632 | 693 | 180 | 9,630 | 4,680 | 252 | 14,562 |
| North Carolina | 800 | | 484 | 160 | 480 | 13 | | | | | | | 632 | | | 2,452 | 173 | | 2,625 |
| North Dakota | | 18 | 260 | 50 | | | | | | | | | | | | 260 | 76 | | 336 |
| Ohio | | 273 | 240 | 568 | 2,178 | 20 | | 48 | 804 | 462 | | | 286 | 181 | 60 | 3,214 | 1,396 | 60 | 4,670 |
| Oklahoma | 220 | | 80 | 100 | | | | | | | | | 60 | 3 | | 583 | 188 | | 1,076 |
| Oregon | | 34 | 409 | 16 | 39 | 40 | | | | | | | 60 | 20 | | 613 | 169 | | 782 |
| Pennsylvania | 235 | | 2,416 | 522 | 337 | 414 | | 200 | 610 | 57 | 14 | | 1,690 | 209 | 100 | 4,189 | 2,004 | 100 | 6,293 |
| Rhode Island | | | 430 | | | | | 60 | | | | | 65 | | 50 | 400 | 60 | 50 | 610 |
| South Carolina | | | 277 | | 166 | 98 | | | 20 | | | | 70 | 38 | | 339 | 136 | | 475 |
| South Dakota | | 100 | 162 | | | | | | | | | | | | | 192 | 100 | | 292 |
| Tennessee | | 71 | | 310 | 300 | | | | | 503 | | 80 | 321 | 8 | | 1,124 | 398 | 50 | 1,573 |
| Texas | | 523 | 718 | 236 | 102 | 84 | 32 | 16 | 342 | 31 | | | 809 | 4 | | 1,971 | 894 | | 2,865 |
| Utah | | | | | | | | | | | | | | | | | | | 54 |
| Vermont | | | 127 | | | | | | | | | | | | 44 | 127 | | 44 | 171 |
| Virginia | | 20 | 760 | 230 | | | | 276 | 52 | | | | 85 | | | 1,127 | 302 | | 1,429 |
| Washington | 40 | 503 | | 27 | 570 | | | | | | | | 186 | | | 701 | 780 | | 1,481 |
| West Virginia | | 18 | 648 | 65 | 49 | | | | | 200 | | | 78 | 4 | | 772 | 77 | | 849 |
| Wisconsin | | 291 | 282 | 24 | 1,610 | 43 | 116 | | | | | | 97 | | 34 | 1,680 | 302 | 116 | 2,497 |
| Wyoming | | 32 | 33 | | | | | | | | | | | | | 33 | 32 | | 65 |
| Totals | 4,103 | 6,837 | 17,308 | 9,792 | 20,114 | 3,351 | 364 | 7,365 | 4,530 | 2,423 | 1,015 | 190 | 13,684 | 2,809 | 1,173 | 64,097 | 28,534 | 1,667 | 93,198 |

capacity by control and by states, shows that there are 10,940 beds in federal hospitals, 66,592 in other public institutions, and 17,666 beds for tuberculosis in privately owned sanatoriums, hospitals and preventoriums. There are 4,103 beds in the federal sanatoriums and 6,837 in departments of federal hospitals. In the remaining group of public institutions the state sanatoriums have 17,308 beds, the county sanatoriums 20,114, those operated by municipalities 7,365, and the city and county sanatoriums 2,423. Departments of hospitals under state control have 9,792 beds for tuberculosis, county departments have 3,551, departments of city hospitals have 4,530, and hospital departments of city and county institutions have 1,015 beds. In the private sanatoriums there are 13,684 beds, and 2,809 beds are available for tuberculosis in departments of

1 *Admissions*—Reports from 458 sanatoriums, 607 tuberculosis departments and twenty-four preventoriums, representing 89,173 beds, or 93.7 per cent of the total capacity, indicate that there were 121,706 patients admitted during a twelve months period. Of this number 44,243 were men, 28,434 women, 15,523 children and 33,506 not classified. These figures include readmissions, which, according to a survey made by the National Tuberculosis Association in 1931 amount to nearly 7 per cent of the patients admitted. There are no data available to show the number of patients admitted by transfer from other tuberculosis institutions.

The sanatoriums admitted 70,601 patients, 27,520 men, 21,601 women, 10,394 children and 11,086 not designated. Of these patients, 5,078 were admitted in

the federal sanatoriums, 51,043 in the other public sanatoriums, and 14,480 in those under private control. Seven sanatoriums operated by fraternal organizations admitted 445 patients, twenty-three under church management had 3,196 admissions, and the remaining private sanatoriums admitted 10,839.

There were 47,007 admissions in the tuberculosis departments: 16,723 men, 6,833 women, 1,031 children and 22,420 not designated. Departments under federal control admitted 10,445 patients, those under private management had 6,839 admissions, and all others

In New York State there were 24,331 admissions reported, 10,093 in California, 9,133 in Pennsylvania, 6,430 in Illinois, 5,914 in Michigan and 5,908 in Ohio. Five states have less than 200 admissions annually, namely, Delaware, Nevada, New Hampshire, Utah and Wyoming. Total admissions by states are shown in table 5.

2 Patients Treated—On the basis of reports from 559 tuberculosis institutions, representing 78,128 beds, or 82 per cent of the total capacity, there were 166,818 patients treated: 61,861 men, 40,938 women, 20,934

Table 5—Number of Patients Admitted in Tuberculosis Institutions During Twelve Months Period
(According to Reports Received During 1934)

| State | Sanatoriums | | | | | Departments | | | | | Preven- toriums | Total Admis- sions | Number of Institutions Reporting | | | Number of Beds Represented | | |
|----------------------|-------------|--------|----------|--------------|--------|-------------|-------|----------|--------------|--------|--------------------|--------------------------|--|-------------|---------------|-------------------------------|-------------|---------------|
| | Men | Women | Children | Unclassified | Total | Men | Women | Children | Unclassified | Total | Children | All Institutions | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums |
| Alabama | 122 | 148 | 16 | | 286 | 550 | | | 84 | 634 | | 609 | 4 | 5 | | 242 | 115 | |
| Arizona | 272 | 142 | 143 | 461 | 1,018 | 627 | | | 564 | 1,191 | | 2,200 | 17 | 15 | | 708 | 403 | |
| Arkansas | 290 | 814 | 155 | | 749 | | | | 80 | 85 | | 834 | 2 | 5 | | 500 | 112 | |
| California | 1,513 | 1,224 | 415 | 796 | 3,948 | 2,010 | 758 | 162 | 2,411 | 5,369 | 746 | 10,093 | 23 | 47 | 8 | 3,644 | 2,531 | 416 |
| Colorado | 458 | 250 | 80 | 321 | 1,109 | 149 | 104 | 1 | 1,116 | 1,370 | | 2,507 | 17 | 16 | | 1,743 | 914 | |
| Connecticut | 511 | 372 | 236 | 195 | 1,314 | 118 | 111 | 3 | 130 | 362 | | 1,078 | 7 | 5 | | 1,670 | 104 | |
| Delaware | 35 | 42 | 32 | | 109 | | | | 5 | 5 | 30 | 140 | 2 | 1 | | 181 | | 22 |
| District of Columbia | 125 | 85 | 122 | | 332 | 137 | 146 | 88 | 454 | 775 | | 1,107 | 2 | 7 | | 340 | 206 | |
| Florida | 30 | 18 | | | 48 | 32 | 20 | | 250 | 312 | 520 | 820 | 1 | 10 | 2 | 60 | 121 | 40 |
| Georgia | 30 | 28 | 256 | 913 | 1,227 | | | | 261 | 251 | 28 | 1,501 | 5 | 6 | 1 | 645 | 141 | 13 |
| Idaho | | | 197 | | 197 | 19 | | | 70 | 89 | | 286 | 1 | 6 | | 132 | 72 | |
| Illinois | 1,432 | 1,308 | 1,071 | 49 | 3,920 | 1,184 | 547 | | 770 | 2,500 | | 6,430 | 26 | 28 | | 3,478 | 1,376 | |
| Indiana | 389 | 434 | 485 | 284 | 1,542 | | | | 166 | 166 | | 1,098 | 9 | 9 | | 1,257 | 145 | |
| Iowa | 180 | 254 | 23 | 161 | 618 | | | | 263 | 263 | | 881 | 6 | 12 | | 774 | 135 | |
| Kansas | 106 | 130 | 123 | 67 | 426 | | | | 316 | 316 | | 742 | 3 | 10 | | 388 | 143 | |
| Kentucky | 1,130 | 862 | 88 | | 1,580 | | | | 304 | 304 | | 1,884 | 4 | 7 | | 910 | 158 | |
| Louisiana | 153 | 116 | 23 | | 292 | 330 | | | 539 | 539 | | 836 | 3 | 4 | | 826 | 357 | |
| Maine | 100 | 144 | 42 | 205 | 491 | | | | 125 | 125 | | 2,064 | 4 | 7 | | 482 | 68 | |
| Maryland | 792 | 590 | 123 | 440 | 1,955 | | | | 108 | 108 | | 2,064 | 5 | 5 | | 1,350 | 50 | |
| Massachusetts | 1,608 | 1,038 | 500 | 274 | 3,420 | 327 | 176 | 60 | 634 | 1,237 | 100 | 4,808 | 23 | 30 | 1 | 4,063 | 1,207 | 30 |
| Michigan | 1,169 | 926 | 335 | 205 | 2,735 | 810 | 392 | 26 | 1,945 | 3,173 | | 5,914 | 22 | 10 | | 3,229 | 1,442 | |
| Minnesota | 565 | 548 | 90 | 245 | 1,454 | 407 | 133 | 14 | 537 | 1,141 | 31 | 2,626 | 16 | 19 | 1 | 1,960 | 792 | 80 |
| Mississippi | 17 | 18 | 87 | 273 | 385 | | | | 6 | 6 | | 401 | 2 | 1 | | 127 | 1 | |
| Missouri | 578 | 523 | 68 | 229 | 1,398 | 400 | 360 | | 1,153 | 1,913 | 150 | 3,461 | 7 | 17 | 1 | 1,412 | 335 | 85 |
| Montana | 93 | 66 | 37 | | 196 | | | | 128 | 128 | | 222 | 1 | 6 | | 150 | 30 | |
| Nebraska | 65 | 94 | | | 159 | | | | 220 | 220 | | 358 | 1 | 7 | | 160 | 144 | |
| Nevada | | | | | | | | | 24 | 24 | | 24 | | | | | | |
| New Hampshire | 24 | 27 | | 80 | 137 | | | | 16 | 16 | | 163 | 2 | 2 | | 210 | | |
| New Jersey | 1,140 | 873 | 500 | 428 | 3,040 | 392 | 270 | 89 | 370 | 1,133 | 620 | 4,793 | 14 | 18 | 1 | 2,424 | 832 | 247 |
| New Mexico | 296 | 140 | 15 | 213 | 664 | 384 | 24 | 4 | 432 | 844 | | 1,508 | 8 | 16 | | 570 | 683 | |
| New York | 5,181 | 3,140 | 1,600 | 1,468 | 11,631 | 5,713 | 2,543 | 208 | 3,330 | 11,804 | 846 | 24,331 | 57 | 64 | 2 | 9,520 | 4,004 | 182 |
| North Carolina | 1,744 | 507 | 115 | 470 | 2,836 | | | | 29 | 29 | | 2,865 | 22 | 6 | | 2,428 | 48 | |
| North Dakota | 70 | 83 | 38 | | 200 | | | | 100 | 100 | | 300 | 1 | 7 | | 265 | 66 | |
| Ohio | 1,153 | 1,397 | 437 | 647 | 3,444 | 855 | 253 | | 1,164 | 2,284 | 200 | 5,008 | 21 | 27 | 1 | 3,214 | 1,016 | 60 |
| Oklahoma | 488 | 607 | 99 | 24 | 1,218 | | | | 459 | 459 | | 1,077 | 6 | 13 | | 888 | 155 | |
| Oregon | 102 | 200 | 35 | 65 | 402 | | | | 132 | 132 | | 594 | 4 | 7 | | 513 | 89 | |
| Pennsylvania | 1,845 | 1,508 | 1,175 | 625 | 5,213 | 1,517 | 751 | 68 | 1,350 | 3,686 | 234 | 9,133 | 17 | 41 | 1 | 4,189 | 1,481 | 100 |
| Rhode Island | 204 | 183 | 40 | | 427 | 96 | 54 | | 41 | 101 | 251 | 854 | 2 | 5 | 1 | 405 | 100 | 50 |
| South Carolina | 82 | 71 | 71 | 341 | 565 | | | 7 | 166 | 202 | | 767 | 6 | 5 | | 539 | 130 | |
| South Dakota | 43 | 50 | | 101 | 194 | 103 | | | 139 | 242 | | 343 | 1 | 4 | | 192 | 100 | |
| Tennessee | 355 | 370 | 223 | 26 | 979 | | | | 197 | 197 | 32 | 1,208 | 7 | 6 | 1 | 1,124 | 180 | 50 |
| Texas | 1,378 | 1,532 | 476 | 300 | 3,686 | 73 | 37 | | 884 | 994 | | 4,679 | 17 | 19 | | 1,971 | 708 | |
| Utah | | | | | | 29 | 15 | | 82 | 126 | | 126 | | | | | | |
| Vermont | 70 | 62 | | | 137 | | | | 27 | 27 | 83 | 247 | 2 | 1 | | 127 | | 44 |
| Virginia | 217 | 300 | 126 | 718 | 1,361 | 29 | 23 | | 250 | 307 | | 1,665 | 7 | 9 | | 1,123 | 302 | |
| Washington | 285 | 323 | 71 | 97 | 786 | 174 | 40 | | 172 | 691 | | 1,477 | 9 | 17 | | 751 | 774 | |
| West Virginia | 230 | 342 | 73 | 152 | 797 | | | | 133 | 133 | | 930 | 7 | 4 | | 772 | 62 | |
| Wisconsin | 745 | 651 | 241 | 312 | 1,949 | 197 | | | 487 | 634 | 97 | 2,730 | 21 | 16 | 1 | 1,080 | 380 | 116 |
| Wyoming | 15 | 16 | | | 31 | | | | 28 | 28 | | 59 | 1 | 1 | | 33 | 32 | |
| Totals | 27,520 | 21,601 | 10,394 | 11,086 | 70,601 | 16,723 | 6,833 | 1,031 | 22,420 | 47,007 | 4,098 | 121,700 | 455 | 607 | 24 | 64,678 | 22,602 | 1,543 |

received 29,723 patients. A classification by type of service shows that 37,124 tuberculosis patients were admitted to general hospitals, 2,425 to tuberculosis services in nervous and mental institutions, 1,800 in departments of institutions, prisons and reformatories, 574 to orthopedic hospitals, 4,456 to institutions having combined tuberculosis and isolation services, and 628 patients to other types of hospitals.

Twenty-four preventoriums admitted 4,098 patients. This number does not include the children admitted to preventorium services in sanatoriums and tuberculosis departments. Five county preventoriums admitted 471 children, those under city and county control had 63 admissions, and seventeen private preventoriums admitted 3,564.

children and 43,085 not classified. According to table 6 there were 121,962 patients treated in the tuberculosis sanatoriums, 40,327 in tuberculosis departments, and 4,529 in the independently operated preventoriums. The sanatoriums treated 43,700 men, 34,736 women, 14,982 children and 28,544 unclassified patients, while 18,161 men, 6,202 women, 1,423 children and 14,541 patients not designated were treated in the tuberculosis departments of other hospitals.

3 Patients Discharged—Table 7 shows 432 sanatoriums, 112 tuberculosis departments and eleven preventoriums which reported on the number of patients discharged during a twelve months period. All together, 555 institutions and 78,160 beds are represented: 82 per cent of the total capacity. The discharges includ-

ing deaths total 97,381 39,754 men, 25,320 women, 12,113 children and 20,194 not classified The sanatoriums, representing 63,228 beds, discharged 66,423 patients, including 25,054 men, 19,769 women, 9,718 children and 11,882 not designated The tuberculosis departments show a more rapid turnover There were 29,502 patients discharged in 112 departments representing 14,191 beds An analysis shows that 14,700 were men, 5,551 women, 939 children and 8,312 not classified Incomplete reports from the preventorium group show 1,456 children discharged

the far advanced terminal cases should be under institutional care

4 *Average Daily Census of Patients*—Five hundred and ninety-two tuberculosis institutions representing 83.8 per cent of the total bed capacity maintained an average daily census of 69,024 patients during the twelve months period covered by this report In the sanatorium group, 460 institutions with a capacity of 64,829 beds had a daily average of 56,325 patients Of the tuberculosis departments, 111 with a capacity of 13,748 beds reported an average daily census of 11,648,

Table 6—Number of Patients Treated in Tuberculosis Institutions During Twelve Months Period
(According to Reports Received During 1934)

| State | Sanatoriums | | | | | Departments | | | | | Preventorium | Total Patients | Number of Institutions Reporting | | | Number of Beds Represented | | |
|----------------------|-------------|--------|----------|--------------|---------|-------------|-------|----------|--------------|--------|--------------|------------------|----------------------------------|-------------|--------------|----------------------------|-------------|--------------|
| | Men | Women | Children | Unclassified | Total | Men | Women | Children | Unclassified | Total | Children | All Institutions | Sanatoriums | Departments | Preventorium | Sanatoriums | Departments | Preventorium |
| | | | | | | | | | | | | | | | | | | |
| Alabama | 193 | 232 | 17 | | 442 | 727 | | | | 727 | | 1 169 | 4 | 1 | | 242 | 111 | |
| Arizona | 350 | 190 | 14 | 443 | 1 139 | 927 | | | 224 | 1 151 | | 2 200 | 14 | 1 | | 643 | 325 | |
| Arkansas | 508 | 678 | 230 | | 1 315 | | | | 63 | 63 | | 1 878 | 2 | 1 | | 556 | 125 | |
| California | 2 312 | 2 342 | 304 | 1 719 | 6 737 | 2 210 | 581 | 187 | 3 011 | 6 189 | 776 | 13 702 | 30 | 20 | 8 | 3 628 | 2 268 | 418 |
| Colorado | 630 | 278 | 10 | 1 169 | 2 098 | 230 | 136 | | 128 | 496 | | 2 502 | 15 | 4 | | 1 537 | 263 | |
| Connecticut | 1 067 | 853 | 652 | 335 | 2 807 | 139 | 126 | 10 | | 275 | | 3 082 | 7 | 3 | | 1 675 | 88 | |
| Delaware | 60 | 69 | 36 | 68 | 233 | | | | | | 3 | 268 | 2 | 1 | | 151 | | 22 |
| District of Columbia | 258 | 160 | 122 | | 540 | 138 | 159 | 48 | | 345 | | 891 | 2 | 1 | | 370 | 100 | |
| Florida | | | | 111 | 111 | 49 | 40 | | 140 | 234 | 520 | 865 | 1 | 2 | | 66 | 69 | 46 |
| Georgia | 18 | 20 | | 1 420 | 1 438 | | | | | | 40 | 1 498 | 5 | 1 | | 645 | | 13 |
| Idaho | | | 197 | | 197 | 33 | | | | 33 | | 230 | 1 | 1 | | 182 | 24 | |
| Illinois | 2 288 | 1 992 | 1 838 | 1 154 | 6 772 | 580 | | | 1 929 | 2 509 | | 9 281 | 25 | 3 | | 3 497 | 802 | |
| Indiana | 685 | 771 | 577 | 730 | 2 763 | | | | | | | 2 703 | 8 | | | 1 302 | | |
| Iowa | 413 | 501 | 30 | 320 | 1 324 | | | | | | | 1 324 | 6 | | | 774 | | |
| Kansas | 221 | 274 | 155 | 104 | 754 | | | | | | | 754 | 3 | | | 388 | | |
| Kentucky | 1 037 | 93 | | 1 209 | 2 389 | | | | | | | 2 389 | 4 | | | 919 | | |
| Louisiana | 234 | 180 | 47 | | 461 | 390 | | | 233 | 623 | | 1 084 | 3 | 2 | | 326 | 207 | |
| Maine | 100 | 160 | 77 | 602 | 939 | | | | | | | 939 | 4 | | | 432 | | |
| Maryland | 721 | 600 | 120 | 1 808 | 3 155 | | | | | | | 3 155 | 8 | | | 1 350 | | |
| Massachusetts | 2 733 | 2 001 | 1 252 | 564 | 6 610 | 437 | 205 | 108 | 708 | 1 518 | 195 | 8 323 | 23 | 6 | 1 | 4 003 | 798 | 30 |
| Michigan | 2 312 | 1 876 | 616 | 691 | 5 495 | 655 | 151 | 16 | 2 573 | 3 395 | | 8 890 | 22 | 6 | | 3 829 | 1 164 | |
| Minnesota | 1 119 | 1 141 | 269 | 656 | 3 185 | 609 | 155 | 15 | 464 | 1 243 | 107 | 4 535 | 15 | 6 | 1 | 1 940 | 499 | 80 |
| Mississippi | | | 99 | 610 | 718 | | | | | | | 718 | 2 | | | 527 | | |
| Missouri | 1 076 | 1 023 | 113 | 353 | 2 566 | 499 | 468 | 3 | | 1 000 | 150 | 3 715 | 7 | 3 | 1 | 1 412 | 169 | 80 |
| Montana | | | | 346 | 346 | | | | | | | 346 | 1 | | | 150 | | |
| Nebraska | 127 | 190 | | | 317 | 20 | 30 | 10 | 180 | 240 | | 557 | 1 | 2 | | 160 | 105 | |
| Nevada | | | | | | | | | | | | | | | | | | |
| New Hampshire | 70 | 77 | | 168 | 315 | | | | | | | 315 | 2 | | | 210 | | |
| New Jersey | 1 706 | 1 410 | 893 | 1 237 | 5 286 | 488 | 309 | 62 | 113 | 1 022 | 700 | 7 098 | 13 | 4 | 1 | 2 393 | 433 | 247 |
| New Mexico | 433 | 87 | 91 | 346 | 957 | 558 | 36 | 4 | 274 | 872 | | 1 829 | 6 | 6 | | 735 | 647 | |
| New York | 8 914 | 5 579 | 3 115 | 2 804 | 20 412 | 5 873 | 2 529 | 436 | 2 840 | 11 678 | 810 | 32 060 | 56 | 14 | 2 | 9 690 | 653 | 152 |
| North Carolina | 2 762 | 934 | 218 | 256 | 4 180 | | | | | | | 4 180 | 12 | | | 2 021 | | |
| North Dakota | 142 | 204 | 82 | | 428 | | | | | | | 477 | 1 | 1 | | 260 | 14 | |
| Ohio | 1 639 | 1 715 | 568 | 2 111 | 6 033 | 720 | | | 908 | 1 628 | 200 | 7 561 | 19 | 2 | 1 | 3 148 | 604 | 60 |
| Oklahoma | 1 068 | 928 | 131 | 111 | 2 238 | | | | | | | 2 238 | 6 | | | 888 | | |
| Oregon | 169 | 206 | 65 | 387 | 827 | | | | | | | 827 | 3 | | | 474 | | |
| Pennsylvania | 2 976 | 2 470 | 1 750 | 1 547 | 8 743 | 1 835 | 949 | 79 | | 2 863 | 294 | 11 900 | 17 | 5 | 1 | 4 189 | 851 | 100 |
| Rhode Island | 439 | 389 | 43 | | 871 | 141 | 62 | | | 203 | 201 | 1 325 | 2 | 1 | | 495 | 60 | 50 |
| South Carolina | 132 | 139 | 111 | 450 | 832 | 9 | 38 | 12 | 78 | 137 | | 960 | 5 | 2 | | 469 | | |
| South Dakota | 178 | 220 | | | 398 | 142 | | | | 142 | | 540 | 1 | 1 | | 193 | 90 | |
| Tennessee | 426 | 420 | 238 | 780 | 1 864 | | | | | | 79 | 1 043 | 7 | 1 | 1 | 1 124 | | 50 |
| Texas | 1 689 | 1 797 | 990 | 527 | 4 712 | 120 | 67 | | 50 | 237 | | 4 949 | 14 | 8 | | 1 736 | 127 | |
| Utah | | | | | | 34 | 20 | | | 54 | | 54 | 1 | | | 82 | | |
| Vermont | 123 | 115 | | | 243 | | | | | | 120 | 368 | 2 | 1 | | 127 | | 41 |
| Virginia | 161 | 175 | 95 | 1 915 | 2 340 | 39 | 42 | 7 | | 88 | | 2 434 | 7 | 1 | | 1 123 | 52 | |
| Washington | 167 | 232 | 46 | 835 | 1 330 | 232 | 14 | 424 | 316 | 986 | | 2 316 | 9 | 3 | | 751 | 686 | |
| West Virginia | 493 | 608 | 129 | 271 | 1 441 | | | | | | | 1 441 | 7 | | | 772 | | |
| Wisconsin | 1 400 | 1 444 | 364 | 289 | 3 557 | 327 | | | | 327 | 97 | 3 381 | 20 | 1 | 1 | 1 899 | 254 | 116 |
| Wyoming | 20 | 26 | | | 46 | | | | | | | 46 | 1 | | | 83 | | |
| Totals | 43,700 | 34,736 | 14,982 | 28,544 | 121,962 | 18,161 | 6,202 | 1,423 | 14,541 | 40,827 | 4,529 | 100,818 | 420 | 110 | 24 | 62,833 | 13,647 | 1,543 |

The deaths numbered 16,229, of which 10,923 occurred in the sanatoriums and 5,306 in the tuberculosis departments Reports from the state departments of health and estimates based on provisional reports of the United States Census Bureau indicate that there were in 1933 approximately 74,564 deaths from all forms of tuberculosis and 67,371 from respiratory forms From these figures it appears that only 21.7 per cent of the tuberculosis deaths occur in sanatoriums and hospitals operated for the treatment of tuberculosis Since one of the main functions of tuberculosis institutions is to remove dangerous foci of infection from the community, it seems important that more of

and twenty-one preventorium representing 1,217 beds averaged 1,051 patients per day

According to the foregoing figures there were 20,558,625 treatment days in the tuberculosis sanatoriums, 4,251,520 in the tuberculosis departments and 383,615 in the preventorium—a total of 25,193,760 treatment days in the 592 institutions that reported Five hundred and sixty-three other institutions, mainly tuberculosis departments, reported a day's census of 12,910 patients Accordingly, the tuberculosis institutions in the United States have an average daily census of approximately 81,952 patients and a total of 29,905,910 treatment days annually

The average daily census of patients is shown by states in table 8 and according to institutional control in table 10. The latter table shows a daily average of 6,333 patients in the federal group, 51,178 in the other public institutions, and 11,513 in the sanatoriums, tuberculosis departments and preventoriums under private management.

5 Census of Patients on Day of Reporting—The number of patients under treatment on the day of reporting will, of course, correspond closely to the figures reported in the preceding paragraph. Reports

were awaiting admission to the other public institutions, and the private sanatoriums, tuberculosis departments and preventoriums had a waiting list of 594. At the same time there were 13,571 vacancies reported, 2,580 in federal hospitals, 5,436 in the remaining public institutions, and 5,555 in institutions under private control. Apparently, therefore, the waiting list was due to an unequal distribution in patient load.

Table 9, which represents a day's census of patients, shows 56,579 patients receiving treatment in the sana-

Table 7—Number of Patients Discharged in Tuberculosis Institutions
(Twelve Months Period According to Reports Received During 1934)

| | Sanatoriums | | | | | Departments | | | | | Preven- toriums | Deaths in Tuber- culosis Institu- tions | Tuber- culosis Deaths in United States— All Forms (1933)* | Number of Institutions Reporting | | | Number of Beds Represented | | |
|----------------|-------------|--------|----------|--------------|--------|-------------|-------|----------|--------------|--------|--------------------|--|---|--|-------------|---------------|-------------------------------|-------------|---------------|
| | Men | Women | Children | Unclassified | Total | Men | Women | Children | Unclassified | Total | | | | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums |
| Alabama | 122 | 189 | 15 | | 276 | 258 | | | | 258 | | 564 | 157 | 1,893 | 4 | | 242 | 111 | |
| Arizona | 204 | 131 | 90 | 2,0 | 701 | 629 | | | | 618 | | 1,519 | 168 | 1,075 | 14 | 2 | 648 | 329 | |
| Arkansas | 338 | 330 | 113 | | 771 | | | | | 30 | | 801 | 72 | 1,071 | 2 | 1 | 5,6 | 22 | |
| California | 1,139 | 1,089 | 371 | 831 | 3,430 | 2,000 | 710 | 121 | 1,532 | 4,363 | 217 | 8,010 | 1,238 | 4,619 | 30 | 20 | 3,623 | 2,268 | 155 |
| Colorado | 440 | 223 | 79 | 397 | 1,139 | 164 | 91 | 2 | 964 | 1,211 | | 2,360 | 300 | 873 | 10 | 6 | 1,593 | 810 | |
| Connecticut | 490 | 386 | 212 | 185 | 1,259 | 110 | 103 | 10 | | 282 | | 1,621 | 277 | 816 | 7 | 3 | 1,615 | 88 | |
| Delaware | 26 | 24 | 10 | 23 | 93 | | | | | | | 63 | 31 | 179 | 2 | | 161 | | |
| Dist. Columbia | 120 | 83 | 6 | | 209 | 118 | 127 | 45 | | 290 | | 176 | 47 | 1,030 | 1 | 1 | 370 | 100 | |
| Florida | 17 | 19 | | | 36 | 33 | 28 | | 79 | 140 | 28 | 938 | 109 | 1,782 | 6 | | 645 | | 13 |
| Georgia | 10 | 10 | 182 | 703 | 910 | | | | | 24 | | 158 | 0 | 140 | 1 | 1 | 132 | 24 | |
| Idaho | | | 184 | | 184 | | | | | | | 5,823 | 1,360 | 4,173 | 25 | 3 | 8,467 | 802 | |
| Illinois | 1,313 | 1,104 | 1,202 | 334 | 3,953 | 476 | | | 1,404 | 1,880 | | 1,543 | 216 | 1,802 | 0 | | 1,537 | | |
| Indiana | 880 | 439 | 430 | 299 | 1,543 | | | | | | | 641 | 128 | 654 | 6 | | 774 | | |
| Iowa | 215 | 237 | 23 | 166 | 641 | | | | | | | 401 | 60 | 568 | 3 | | 388 | | |
| Kansas | 108 | 123 | 118 | 52 | 401 | | | | | | | 1,442 | 174 | 2,315 | 4 | | 949 | | |
| Kentucky | 1,021 | 336 | 80 | | 1,437 | | | | | | | 761 | 155 | 1,585 | 8 | 2 | 326 | 207 | |
| Louisiana | 110 | 118 | 27 | 250 | 510 | 828 | | | 183 | 511 | | 515 | 86 | 367 | 4 | | 482 | | |
| Maine | 68 | 94 | 41 | 322 | 515 | | | | | | | 1,857 | 482 | 1,384 | 8 | | 1,340 | | |
| Maryland | 823 | 632 | 169 | 233 | 1,857 | | | | | | | 4,342 | 943 | 2,273 | 23 | 9 | 4,003 | 834 | 30 |
| Massachusetts | 1,416 | 1,014 | 555 | 277 | 3,262 | 250 | 115 | 20 | 500 | 885 | 100 | 5,084 | 807 | 2,343 | 22 | 0 | 3,329 | 1,104 | |
| Michigan | 1,085 | 861 | 331 | 394 | 2,670 | 602 | 99 | 10 | 1,734 | 2,405 | 26 | 2,177 | 391 | 896 | 16 | 5 | 1,060 | 462 | 80 |
| Minnesota | 555 | 540 | 81 | 240 | 1,416 | 410 | 124 | 12 | 183 | 735 | | 373 | 43 | 1,378 | 2 | | 627 | | |
| Mississippi | | | 65 | 308 | 373 | | | | | | | 2,027 | 823 | 2,281 | 7 | 3 | 1,412 | 169 | |
| Missouri | 563 | 477 | 71 | 214 | 1,225 | 843 | 359 | | | 702 | | 202 | 36 | 282 | 1 | | 150 | | |
| Montana | | | 202 | | 202 | | | | | | | 297 | 64 | 303 | 1 | 3 | 160 | 105 | |
| Nebraska | 67 | 93 | | 160 | | 50 | 78 | 14 | | 137 | | | | 87 | | | | | |
| Nevada | | | | | | | | | | | | 141 | 17 | 178 | 2 | | 210 | | |
| New Hampshire | 30 | 34 | 77 | 141 | | | | | | | 600 | 4,240 | 891 | 2,376 | 13 | 4 | 2,393 | 438 | 247 |
| New Jersey | 983 | 773 | 550 | 618 | 2,924 | 337 | 230 | 78 | 36 | 686 | | 854 | 94 | 511 | 7 | 6 | 765 | 647 | |
| New Mexico | 211 | 62 | 20 | 177 | 470 | 310 | 17 | 3 | 1,0 | 514 | 48 | 20,630 | 3,341 | 7,009 | 57 | 14 | 9,650 | 2,633 | 23 |
| New York | 4,939 | 3,181 | 1,504 | 1,617 | 11,501 | 5,541 | 2,470 | 200 | 699 | 9,000 | | 2,445 | 232 | 2,119 | 12 | | 1,075 | | |
| N. Carolina | 1,727 | 411 | 121 | 126 | 2,445 | | | | | | | 213 | 32 | 167 | 1 | 1 | 265 | 14 | |
| N. Dakota | 53 | 83 | 39 | 174 | | | | | | | | 4,183 | 682 | 3,638 | 10 | 2 | 3,148 | 604 | |
| Ohio | 907 | 937 | 240 | 1,003 | 3,092 | 530 | | | 550 | 1,091 | | 1,141 | 126 | 1,210 | 6 | | 888 | | |
| Oklahoma | 438 | 591 | 80 | 27 | 1,141 | | | | | | | 380 | 61 | 345 | 3 | | 474 | | |
| Oregon | 115 | 128 | 32 | 110 | 385 | | | | | | | 7,570 | 549 | 5,088 | 17 | 5 | 4,180 | 851 | 100 |
| Pennsylvania | 1,735 | 1,488 | 1,149 | 656 | 5,028 | 1,456 | 770 | 58 | | 2,314 | 230 | 552 | 128 | 851 | 2 | 1 | 465 | 60 | |
| Rhode Island | 200 | 170 | 42 | | 412 | 90 | 44 | | | 140 | | 500 | 70 | 1,080 | 5 | 2 | 409 | 120 | |
| S. Carolina | 60 | 60 | 69 | 233 | 437 | 3 | 15 | 5 | 45 | 68 | | 189 | 36 | 280 | 1 | 1 | 162 | 90 | |
| S. Dakota | 45 | 48 | | 63 | | 90 | | | | | 31 | 695 | 202 | 2,539 | 7 | 1 | 1,124 | | 50 |
| Tennessee | 296 | 289 | 170 | 204 | 964 | | | | | | | 3,491 | 341 | 4,302 | 10 | 2 | 1,801 | 81 | |
| Texas | 1,273 | 1,390 | 406 | 254 | 3,359 | 67 | 35 | | | 102 | | 36 | 12 | 93 | 1 | | 32 | | |
| Utah | | | | | | 23 | 13 | | | 36 | 81 | 210 | 38 | 170 | 2 | 1 | 127 | | 44 |
| Vermont | 71 | 58 | | 120 | | | | | | | | 1,349 | 213 | 2,034 | 7 | 1 | 1,123 | 52 | |
| Virginia | 198 | 264 | 53 | 777 | 1,252 | 32 | 30 | 5 | | 67 | | 1,235 | 142 | 857 | 9 | 3 | 751 | 680 | |
| Washington | 233 | 221 | 64 | 212 | 730 | 171 | 68 | 206 | | 605 | | 766 | 100 | 638 | 7 | | 772 | | |
| West Virginia | 221 | 360 | 53 | 132 | 766 | | | | | | | 1,937 | 369 | 1,217 | 20 | 1 | 1,899 | 254 | |
| Wisconsin | 675 | 643 | 248 | 178 | 1,744 | 193 | | | | 193 | | 31 | 10 | 70 | 1 | | 33 | | |
| Wyoming | 14 | 17 | | 31 | | | | | | | | | | | | | | | |
| Totals | 25,004 | 19,769 | 9,718 | 11,882 | 66,423 | 14,700 | 5,651 | 939 | 8,312 | 29,502 | 1,406 | 97,381 | 16,229 | 74,564 | 432 | 112 | 63,228 | 14,191 | 741 |

* Based on reports of State Departments of Health and provisional reports of the United States Census Bureau.

were received from 459 sanatoriums, 680 tuberculosis departments and sixteen preventoriums, representing 92,339 beds, or 97 per cent of the total capacity. These institutions indicated that at the time of their report 81,652 patients were receiving hospital treatment for tuberculosis, 27,229 men, 20,487 women, 8,079 children and 25,857 not classified. The sanatoriums were treating 56,579 patients, the tuberculosis departments 24,288, and the preventoriums 785.

The waiting list totaled 9,854 patients. There were 317 on the waiting lists of federal hospitals, 8,943

toriums, 24,288 in the tuberculosis departments, and 785 in the preventoriums. Table 10, which summarizes the main facts about patient population on the basis of institutional control, lists 8,375 patients present in federal institutions, 61,166 in other public institutions, and 12,111 in the private sanatoriums, tuberculosis departments and preventoriums.

6 Average Length of Stay—Five hundred and thirty-two tuberculosis institutions representing 74,881 beds furnished information regarding the average length of stay of the patients treated. There were 422

Table 8—Average Daily Census of Patients in Tuberculosis Institutions During Twelve Months Period
(Based on Reports Received During 1934)

| State | | | | | Number of Institutions Reporting | | | Number of Beds Represented | | |
|----------------------|-------------|-------------|---------------|--------|----------------------------------|-------------|---------------|----------------------------|-------------|---------------|
| | Sanatoriums | Departments | Preventoriums | Total | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums |
| Alabama | 102 | 110 | | 272 | 4 | 2 | | 242 | 111 | |
| Arizona | 430 | 352 | | 788 | 17 | 2 | | 782 | 320 | |
| Arkansas | 555 | 15 | | 570 | 2 | 1 | | 546 | 92 | |
| California | 3 400 | 1 728 | 390 | 5 518 | 33 | 18 | 8 | 3 039 | 2 017 | 418 |
| Colorado | 1 033 | 048 | | 1 681 | 17 | 5 | | 1 743 | 800 | |
| Connecticut | 1 487 | 84 | | 1 571 | 7 | 3 | | 1 675 | 95 | |
| Delaware | 129 | | 20 | 149 | 2 | | 1 | 101 | | 22 |
| District of Columbia | 225 | 63 | | 348 | 2 | 1 | | 370 | 100 | |
| Florida | 60 | 61 | 44 | 165 | 1 | 2 | 2 | 66 | 69 | 46 |
| Georgia | 533 | | 13 | 566 | 5 | | 1 | 640 | | 13 |
| Idaho | 114 | 1 | | 129 | 1 | 1 | | 132 | 24 | |
| Illinois | 2 521 | 779 | | 3 600 | 26 | 3 | | 3 448 | 802 | |
| Indiana | 1 182 | | | 1 182 | 0 | | | 1 257 | | |
| Iowa | 660 | | | 660 | 6 | | | 774 | | |
| Kansas | 734 | | | 734 | 3 | | | 388 | | |
| Kentucky | 014 | | | 914 | 4 | | | 949 | | |
| Louisiana | 108 | 14 | | 343 | 3 | 2 | | 320 | 207 | |
| Maine | 443 | 16 | | 459 | 4 | 1 | | 482 | 16 | |
| Maryland | 1 302 | | | 1 302 | 8 | | | 1 340 | | |
| Massachusetts | 7 407 | 466 | 20 | 3 092 | 23 | 8 | 1 | 4 063 | 504 | 30 |
| Michigan | 2 011 | 1 016 | | 3 027 | 23 | 6 | | 3 222 | 1 164 | |
| Minnesota | 1 750 | 433 | 8 | 2 266 | 16 | 6 | 1 | 1 960 | 492 | 80 |
| Mississippi | 340 | | | 340 | 2 | | | 527 | | |
| Missouri | 1 274 | 144 | 50 | 1 468 | 7 | 3 | 1 | 1 412 | 160 | 80 |
| Montana | 137 | | | 137 | 1 | | | 150 | | |
| Nebraska | 104 | 53 | | 247 | 1 | 2 | | 160 | 100 | |
| Nevada | | | | | | | | | | |
| New Hampshire | 176 | | | 176 | 2 | | | 210 | | |
| New Jersey | 2 303 | 303 | 170 | 2 841 | 14 | 4 | 1 | 2 420 | 438 | 247 |
| New Mexico | 577 | 200 | | 877 | 8 | 6 | | 870 | 647 | |
| New York | 0 202 | 2 627 | 21 | 11 840 | 57 | 15 | 1 | 9 660 | 2 715 | 22 |
| North Carolina | 1 841 | | | 1 841 | 23 | | | 2 462 | | |
| North Dakota | 239 | 10 | | 249 | 1 | 1 | | 260 | 14 | |
| Ohio | 2 012 | 537 | 60 | 3 509 | 21 | 3 | 1 | 3 214 | 624 | 60 |
| Oklahoma | 709 | | | 709 | 6 | | | 888 | | |
| Oregon | 468 | | | 468 | 4 | | | 513 | | |
| Pennsylvania | 3 808 | 700 | 80 | 4 594 | 17 | 5 | 1 | 4 189 | 851 | 100 |
| Rhode Island | 462 | 60 | 47 | 569 | 2 | 1 | 1 | 490 | 60 | 60 |
| South Carolina | 464 | 43 | | 507 | 0 | 2 | | 539 | 120 | |
| South Dakota | 160 | 43 | | 203 | 1 | 1 | | 102 | 00 | |
| Tennessee | 891 | | | 891 | 7 | | | 1 124 | | |
| Texas | 1 509 | 70 | | 1 679 | 17 | 2 | | 1 071 | 81 | |
| Utah | | 25 | | 25 | 1 | | | 32 | | |
| Vermont | 113 | | 44 | 157 | 2 | | 1 | 127 | | 44 |
| Virginia | 985 | 21 | | 1 006 | 7 | 1 | | 1 123 | 52 | |
| Washington | 637 | 546 | | 1 183 | 9 | 3 | | 751 | 686 | |
| West Virginia | 602 | | | 602 | 7 | | | 772 | | |
| Wisconsin | 1 843 | 140 | | 1 980 | 21 | 1 | | 1 089 | 204 | |
| Wyoming | 28 | | | 28 | 1 | | | 33 | | |
| Totals | 66 720 | 11 648 | 1 061 | 69 024 | 460 | 111 | 21 | 64 529 | 13 748 | 1 217 |

sanatoriums with a capacity of 61,234 beds which reported 118,008 patients treated and a total of 19,643,640 treatment days. This indicates an average length of stay of 166 days per patient, a figure similar to that reported by Drolet but somewhat lower than the average reported by the National Tuberculosis Association following its survey of 1931.

According to the accompanying tabulation the federal sanatoriums have an average length of stay of 172 days the state sanatoriums 166, those operated by counties average 173, municipal sanatoriums 170 days, the sanatoriums operated jointly under city and county manage-

treatment days, the average length of stay is 170 days. This group of institutions shows the following averages by states:

Average Length of Stay, Shown by States

| | | | |
|----------------------|-----|----------------|-----|
| Alabama | 133 | Montana | 144 |
| Arizona | 154 | Nebraska | 177 |
| Arkansas | 160 | New Hampshire | 189 |
| California | 103 | New Jersey | 163 |
| Connecticut | 203 | New York | 168 |
| Delaware | 202 | North Carolina | 204 |
| District of Columbia | 100 | North Dakota | 144 |
| Florida | 107 | Ohio | 119 |
| Georgia | 138 | Oklahoma | 214 |
| Illinois | 105 | Oregon | 170 |
| Indiana | 162 | Pennsylvania | 191 |
| Iowa | 177 | Rhode Island | 177 |
| Kansas | 171 | South Carolina | 147 |
| Kentucky | 169 | South Dakota | 177 |
| Louisiana | 180 | Tennessee | 100 |
| Maine | 147 | Texas | 170 |
| Maryland | 104 | Vermont | 100 |
| Massachusetts | 107 | Virginia | 166 |
| Michigan | 202 | Washington | 171 |
| Minnesota | 174 | West Virginia | 180 |
| Mississippi | 188 | Wisconsin | 222 |
| Missouri | | Wyoming | |

In 110 tuberculosis departments representing 13,647 beds there were 40,327 patients treated and 4,073,027 hospital days. This indicates that the average length of stay for the whole group is 101 days. These institutions represent mainly the larger departments, however, which resemble the regular sanatoriums in organization and function. Eighty-one tuberculosis departments in general hospitals showed an average length of stay of ninety-two days. No information is

Average Length of Stay

| Control | No of Sanatoriums Reporting | No of Beds Represented | No of Patients Treated | No of Treatment Days | Average Length of Stay |
|-------------|-----------------------------|------------------------|------------------------|----------------------|------------------------|
| Federal | 15 | 2,399 | 3 760 | 647 580 | 172 |
| State | 62 | 17,868 | 34 623 | 5 761 280 | 166 |
| County | 103 | 19 732 | 38 000 | 6 589 700 | 173 |
| City | 21 | 7,317 | 15 403 | 2 621 890 | 170 |
| City-county | 15 | 2 453 | 5 113 | 842 720 | 165 |
| Private | 146 | 12,035 | 21 104 | 3 190 465 | 161 |
| Totals | 422 | 61 234 | 118 008 | 19 643 640 | 166 |

ment average 165, and, as might be expected, the sanatoriums under private control show the lowest average length of stay, 151 days.

In 261 state and local public sanatoriums, representing 46,780 beds, 93,139 patients treated and 15,805,595

available regarding the length of stay in the other 337 departments of general hospitals except what inference can be made from the fact that they admitted 14,197 patients during a twelve months period and had 3,095 patients remaining on the day of reporting

7 *Condition of Patients on Admission*—Four hundred and ninety-four institutions, representing 73,335 beds, reported on the condition of patients on admission. All together, 89,237 patients are included in this study, as shown in table 11. The reports indicate that 76,797, or 86.1 per cent of the patients, were tuberculous, 8,140, or 9.1 per cent, were diagnosed as

in 1926 Drolet reported 16, 34 and 50 per cent. The gradual increase in the admission rate of far advanced cases and the corresponding decrease in the minimal classification may not be alarming in any way but merely indicative of increased facilities for the isolation and treatment of far advanced, infectious cases of pulmonary tuberculosis

8 *Condition of Patients on Discharge*—Reports on the condition of patients on discharge were received from 507 institutions representing 74,650 beds. The results obtained are listed by states in table 12 and are classified according to adult and childhood type

Table 9—Census of Patients in Tuberculosis Institutions on Day of Reporting

| State | Sanatoriums | | | | | Departments | | | | | Preven- toriums | | Number of Institutions Reporting | | | Number of Beds Represented | | | |
|----------------------|-------------|--------|----------|--------------|--------|-------------|-------|----------|--------------|--------|--------------------|-------------------------------------|-------------------------------------|-------------|-------------|-------------------------------|-------------|-------------|---------------|
| | Men | Women | Children | Unclassified | Total | Men | Women | Children | Unclassified | Total | Children | Total Number of Pa- tients | Number on Waiting List | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums |
| Alabama.. | 68 | 83 | 14 | | 175 | 61 | | | 91 | 152 | | 327 | 62 | 4 | 8 | | 242 | | 220 |
| Arizona | 156 | 90 | 60 | 219 | 525 | 342 | | | 131 | 473 | 6 | 1 004 | 13 | 18 | 15 | 1 | 805 | | 403 |
| Arkansas | 203 | 275 | 66 | | 564 | 6 | 0 | | 75 | 89 | | 633 | 171 | 2 | 6 | | 556 | | 131 |
| California | 1 161 | 1 231 | 189 | 897 | 3 423 | 907 | 3 6 | 89 | 1 081 | 2 483 | 128 | 6 037 | 220 | 25 | 60 | 3 | 3 996 | 2 354 | 150 |
| Colorado | 373 | 220 | 2 | 430 | 1 034 | 62 | 50 | | 673 | 785 | | 1 819 | 130 | 17 | 18 | | 1 743 | | 938 |
| Connecticut | 572 | 466 | 322 | 140 | 1 500 | 30 | 30 | | 108 | 174 | | 1 674 | 164 | 7 | 5 | | 1 675 | | 144 |
| Delaware | 53 | 52 | 34 | | 139 | | | | 13 | 13 | | 162 | 60 | 2 | 7 | | 161 | | |
| District of Columbia | 142 | 79 | 134 | | 335 | 41 | 35 | 6 | 125 | 210 | | 565 | 30 | 2 | 7 | | 3 0 | | 296 |
| Florida | | | 1 | 72 | 73 | 16 | 17 | | 145 | 176 | | 249 | 22 | 3 | 13 | | 80 | | 185 |
| Georgia | 20 | 21 | 6 | 515 | 561 | | | | 530 | 535 | 18 | 1 109 | 762 | 5 | 7 | 1 | 645 | | 551 |
| Idaho | | | 131 | | 131 | 12 | | | 23 | 40 | | 171 | 1 | 1 | | | 132 | | 84 |
| Illinois | 1 075 | 1 135 | 209 | 434 | 2 913 | 503 | 2 6 | 25 | 1 217 | 2 022 | | 4 683 | 228 | 26 | 31 | | 3 478 | | 1 870 |
| Indiana | 382 | 439 | 264 | 100 | 1 251 | | | | 150 | 150 | | 1 401 | 271 | 0 | 10 | | 1 357 | | 175 |
| Iowa | 216 | 310 | 13 | 157 | 703 | | | | 271 | 271 | | 976 | 83 | 6 | 12 | | 774 | | 207 |
| Kansas | 122 | 146 | 39 | 41 | 348 | | | | 104 | 104 | | 542 | 94 | 3 | 14 | | 388 | | 183 |
| Kentucky | 605 | 304 | 139 | | 948 | | | | 129 | 129 | | 1 077 | 1 788 | 4 | 0 | | 949 | | 229 |
| Louisiana | 60 | 83 | 27 | | 190 | 91 | | | 285 | 376 | | 568 | 89 | 3 | 5 | | 320 | | 406 |
| Maine | 153 | 108 | 74 | | 425 | | | | 73 | 73 | | 408 | 21 | 4 | 8 | | 482 | | 70 |
| Maryland | 290 | 268 | 63 | 760 | 1 316 | | | | 221 | 221 | | 1 537 | 159 | 8 | 3 | | 1 350 | | 193 |
| Massachusetts | 1 483 | 1 136 | 667 | 234 | 3 522 | 251 | 141 | 66 | 630 | 1 127 | 27 | 4 079 | 160 | 23 | 32 | 1 | 4 063 | 1 237 | 20 |
| Michigan | 1 162 | 900 | 304 | 462 | 2 804 | 67 | 53 | 6 | 1 244 | 1 389 | 20 | 4 273 | 178 | 23 | 22 | 1 | 3 305 | 1 550 | 20 |
| Minnesota | 688 | 682 | 60 | 289 | 1 745 | 187 | 14 | 3 | 538 | 742 | 82 | 2 560 | 60 | 16 | 19 | 1 | 1 960 | 792 | 80 |
| Mississippi | | | 34 | 311 | 345 | | | | 241 | 241 | | 580 | 2 | 3 | | | 527 | | 245 |
| Missouri | 544 | 604 | 47 | 145 | 1 340 | 62 | 08 | 3 | 424 | 577 | | 1 917 | 236 | 7 | 19 | | 1 412 | | 544 |
| Montana | | | | 133 | 133 | | | | 54 | 54 | | 100 | 56 | 1 | 7 | | 150 | | 110 |
| Nebraska | 63 | 94 | | 157 | 157 | 42 | 48 | 2 | 29 | 121 | | 278 | 41 | 1 | 7 | | 160 | | 144 |
| Nevada | | | | | | | | | 15 | 15 | | 15 | | | | | | | 18 |
| New Hampshire | 76 | 80 | 20 | | 178 | | | | 18 | 18 | | 190 | 3 | 2 | 3 | | 210 | | 20 |
| New Jersey | 846 | 651 | 329 | 430 | 2 262 | 150 | 110 | 64 | 465 | 818 | 100 | 3 270 | 177 | 14 | 19 | 1 | 2 423 | 876 | 245 |
| New Mexico | 290 | 40 | 71 | 221 | 597 | 209 | 18 | 1 | 133 | 301 | | 908 | 40 | 8 | 15 | | 870 | | 633 |
| New York | 4 532 | 2 578 | 1 207 | 617 | 8 734 | 1 262 | 600 | 137 | 2 473 | 4 481 | 34 | 13 240 | 428 | 57 | 68 | 2 | 9 650 | 4 412 | 42 |
| North Carolina | 1 033 | 474 | 116 | 195 | 1 817 | | | | 72 | 72 | | 1 889 | 251 | 20 | 8 | | 2 394 | | 123 |
| North Dakota | 87 | 110 | 43 | | 240 | 8 | 4 | | 23 | 30 | | 279 | 97 | 1 | 8 | | 265 | | 76 |
| Ohio | 785 | 864 | 339 | 1 020 | 3 018 | 359 | | | 650 | 1 180 | | 4 193 | 427 | 20 | 34 | | 3 166 | | 1 860 |
| Oklahoma | 322 | 357 | 112 | | 791 | | | | 131 | 131 | | 922 | 407 | 6 | 13 | | 888 | | 1 693 |
| Oregon | 179 | 191 | 33 | 35 | 441 | | | | 169 | 169 | | 610 | 90 | 3 | 8 | | 474 | | 109 |
| Pennsylvania | 1 097 | 1 431 | 610 | 238 | 3 886 | 482 | 199 | 21 | 895 | 1 697 | 70 | 5 553 | 1 315 | 17 | 51 | 1 | 4 189 | 1 764 | 100 |
| Rhode Island | 208 | 179 | 48 | | 435 | 41 | 12 | | 101 | 164 | 31 | 620 | 0 | 2 | 6 | 1 | 495 | 60 | 50 |
| South Carolina | 57 | 75 | 44 | 211 | 387 | 3 | 8 | 2 | 130 | 143 | | 530 | 258 | 5 | 6 | | 409 | | 130 |
| South Dakota | 90 | 109 | | | 205 | 40 | | | 15 | 61 | | 266 | 38 | 1 | 4 | | 192 | | 105 |
| Tennessee | 306 | 221 | 114 | 348 | 887 | | | | 272 | 272 | 50 | 1 209 | 174 | 7 | 10 | 1 | 1 124 | 298 | 60 |
| Texas | 327 | 530 | 241 | 383 | 1 637 | 47 | 32 | | 605 | 684 | | 2 341 | 408 | 17 | 25 | | 1 971 | 891 | |
| Utah | | | | | | 19 | 12 | | 19 | 60 | | 60 | | | | | 54 | | |
| Vermont | 58 | 68 | | | 116 | | | | 1 | 1 | 44 | 161 | 34 | 2 | 1 | 1 | 127 | | 44 |
| Virginia | 113 | 112 | 50 | 721 | 1 002 | 8 | 3 | 2 | 214 | 227 | | 1 229 | 172 | 7 | 9 | | 1 123 | | 202 |
| Washington | 150 | 155 | 38 | 258 | 631 | 202 | 104 | 244 | 103 | 653 | | 1 284 | 157 | 9 | 18 | | 751 | | 780 |
| West Virginia | 292 | 285 | 73 | 68 | 718 | | | | 84 | 84 | | 892 | 133 | 7 | 7 | | 772 | | 77 |
| Wisconsin | 761 | 767 | 123 | 203 | 1 846 | 134 | | | 125 | 260 | 92 | 2 195 | 100 | 21 | 17 | 1 | 1 989 | 870 | 110 |
| Wyoming | 13 | 16 | | | 29 | | | | 10 | 10 | | 39 | | 1 | 3 | | 33 | | 16 |
| Totals | 21 543 | 18 614 | 6 594 | 10 398 | 60 570 | 5 680 | 2 443 | 700 | 13 450 | 24 288 | 785 | 81 652 | 9 854 | 450 | 650 | 16 | 64 707 | 20 076 | 957 |

nontuberculous, and 4,300, or 4.8 per cent, were unclassified

Of the tuberculous patients, 87 per cent were pulmonary cases 87 per cent childhood type, and 4.3 per cent nonpulmonary forms. These figures correspond closely to the rates of 88, 8 and 4 per cent obtained by the National Tuberculosis Association in its survey of 1931

In the group of frank pulmonary tuberculosis, 66,861 patients in all, it was found that 13.1 per cent were admitted in the minimal stage, 29.7 per cent as moderately advanced, and 57.2 per cent as far advanced. The findings of the National Tuberculosis Association in 1931 were 16.30 and 54 per cent respectively, and

Of the 67,021 patients listed under the adult type classification, 7.5 per cent were discharged as "arrested," 9.8 per cent "apparently arrested," 11.6 per cent quiescent," 30 per cent "improved," 17.2 per cent "unimproved," and 23.9 per cent died. A favorable result was obtained, therefore, in 58.9 per cent of the cases. These figures are practically identical with the report of the National Tuberculosis Association in 1931, when 17 per cent were listed as "apparently arrested" (includes "arrested" cases), 4.1 per cent "quiescent and improved," 19 per cent "unimproved or progressive," and 23 per cent died

The childhood group with reports on 8,164 patients showed, of course, a much higher rate of successful

treatment, 93.3 per cent. There were 27.9 per cent "apparently healed," 12.5 per cent "inactive," 52.9 per cent "improved," 4.4 per cent "unimproved," and 2.3 per cent died.

culosis departments, and 1,667 in the preventoriums. The federal sanatoriums have 328 children's beds, the state sanatoriums have 3,170, those under county control have 3,165, the municipal sanatoriums have

Table 10—Patient Population on the Basis of Institutional Control

| | Federal | | State | | County | | | City | | City County | | | Private | | | Total | | | Grand Total All Institutions | Number of Beds Represented, All Institutions |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|---------------|------------------------------|--|
| | Sanatoriums | Departments | Sanatoriums | Departments | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums | Sanatoriums | Departments | Preventoriums | | |
| Admissions | 5,078 | 10,440 | 10,028 | 4,361 | 20,840 | 6,634 | 471 | 8,346 | 17,304 | 2,824 | 1,434 | 63 | 14,480 | 6,530 | 3,564 | 70,601 | 47,007 | 4,698 | 121,706 | 89,173 |
| Patients treated | 7,710 | 7,497 | 34,023 | 1,703 | 38,000 | 7,444 | 400 | 10,403 | 18,209 | 5,113 | 1,877 | 186 | 21,104 | 3,417 | 3,848 | 121,962 | 40,327 | 4,529 | 166,818 | 78,183 |
| Discharges (including deaths) | 4,617 | 5,789 | 18,406 | 1,335 | 10,827 | 5,157 | 184 | 8,307 | 13,707 | 2,813 | 1,141 | 57 | 12,453 | 2,313 | 1,215 | 66,423 | 20,502 | 1,456 | 97,381 | 78,160 |
| Number of deaths | 500 | 880 | 2,116 | 170 | 4,017 | 1,077 | | 1,716 | 2,103 | 573 | 102 | | 1,911 | 365 | | 10,023 | 5,306 | | 16,229 | 4,009 |
| Daily average | 3,170 | 3,164 | 15,760 | 287 | 18,364 | 2,000 | 184 | 7,227 | 4,218 | 2,200 | 660 | 78 | 9,400 | 1,234 | 789 | 56,320 | 11,048 | 1,051 | 69,094 | 70,704 |
| Patients present | 3,442 | 4,933 | 10,047 | 8,720 | 18,440 | 3,160 | 190 | 7,014 | 4,538 | 2,316 | 695 | 132 | 9,420 | 2,228 | 463 | 56,570 | 24,288 | 780 | 81,632 | 92,330 |
| Vacancies | 676 | 1,004 | 1,301 | 1,000 | 1,674 | 380 | 174 | 361 | | 107 | 317 | | 4,204 | 551 | 710 | 8,433 | 4,264 | 884 | 13,571 | |
| Patients on waiting list | 150 | 167 | 6,108 | 12 | 1,637 | 294 | 12 | 228 | 228 | 392 | 4 | 28 | 470 | 67 | 51 | 8,091 | 772 | 91 | 9,554 | |

Table 11—Condition of Patients on Admission
(Sanatoriums and Tuberculosis Departments)

| State | Number of Institutions Reporting | Number of Beds Represented | Tuberculous Patients | | | | | | Non Tuberculous | | Not Classified | | Total, All Patients | |
|----------------------|----------------------------------|----------------------------|----------------------|---------------------|--------------|------------|----------------------|--------|-----------------|-----------|----------------|-----------|---------------------|--------|
| | | | Pulmonary | | | Child hood | Non pulmo nary Forms | Total | Adults | Chil dren | Adults | Chil dren | | |
| | | | Minimal | Moderately Advanced | Far Advanced | | | | | | | | | |
| Alabama | 4 | 240 | 26 | 96 | 153 | | 3 | 278 | 14 | 14 | | | | 306 |
| Arizona | 13 | 732 | 61 | 213 | 650 | 13 | 30 | 976 | 205 | | | 16 | 101 | 1,348 |
| Arkansas | 3 | 578 | 36 | 87 | 804 | | 2 | 1 167 | | | | 140 | | 1,277 |
| California | 40 | 5 718 | 833 | 1 591 | 2,349 | 467 | 637 | 0 077 | 115 | 38 | | 125 | 13 | 6,268 |
| Colorado | 16 | 1 602 | 83 | 162 | 780 | 21 | 17 | 1 003 | 74 | 29 | | 63 | 3 | 1,522 |
| Connecticut | 10 | 1,773 | 104 | 326 | 718 | 71 | 47 | 1 266 | 142 | 32 | | 53 | 7 | 1,500 |
| Delaware | 2 | 161 | 9 | 22 | 54 | 16 | 6 | 107 | | | 2 | | | 111 |
| District of Columbia | 3 | 470 | 36 | 71 | 113 | 128 | 30 | 383 | | | | 317 | | 700 |
| Florida | 2 | 103 | 2 | 79 | 42 | | 2 | 120 | | | | | | 127 |
| Georgia | 3 | 579 | 46 | 163 | 397 | 146 | 60 | 812 | 62 | 35 | | 17 | | 928 |
| Idaho | 2 | 156 | 59 | 16 | 0 | 52 | 7 | 143 | | 13 | | | | 157 |
| Illinois | 27 | 4 209 | 472 | 975 | 2,837 | 200 | 167 | 4 676 | 209 | 1 038 | | 203 | 72 | 6,218 |
| Indiana | 9 | 1 337 | 204 | 109 | 507 | 500 | 29 | 1,508 | 31 | 376 | | 70 | 11 | 2,009 |
| Iowa | 6 | 774 | 61 | 209 | 287 | 43 | 24 | 624 | 18 | 20 | | 6 | 10 | 678 |
| Kansas | 2 | 328 | 56 | 110 | 210 | 41 | 36 | 462 | 63 | 127 | | 7 | | 660 |
| Kentucky | 4 | 940 | 33 | 241 | 562 | 114 | 63 | 1 013 | 238 | 5 | | 18 | | 1,274 |
| Louisiana | 5 | 533 | 123 | 243 | 262 | 19 | 136 | 708 | 32 | 1 | | 141 | | 974 |
| Maine | 4 | 482 | 33 | 91 | 208 | 60 | 20 | 412 | 47 | 0 | | 46 | 8 | 519 |
| Maryland | 7 | 1,290 | 208 | 451 | 862 | 180 | 15 | 1 770 | 70 | 10 | | 22 | 66 | 1,840 |
| Massachusetts | 30 | 4,807 | 371 | 1 267 | 2 400 | 269 | 245 | 4 542 | 165 | 46 | | 113 | 12 | 4,868 |
| Michigan | 27 | 4 403 | 500 | 1 144 | 2 412 | 262 | 204 | 4 678 | 568 | 20 | | 171 | 0 | 5,346 |
| Minnesota | 20 | 2 432 | 181 | 512 | 1 114 | 20 | 110 | 1 943 | 169 | 3 | | 81 | 27 | 2,213 |
| Mississippi | 2 | 527 | 52 | 88 | 60 | | 4 | 210 | 41 | | | 51 | 60 | 2,867 |
| Missouri | 9 | 1,510 | 113 | 519 | 1 112 | 60 | 16 | 1,890 | 72 | 42 | | 20 | 7 | 1,961 |
| Montana | 1 | 150 | 31 | 58 | 47 | 28 | 6 | 170 | 6 | | | 20 | | 196 |
| Nebraska | 3 | 260 | 62 | 86 | 153 | 32 | 7 | 345 | 4 | | | | 4 | 353 |
| Nevada | | | | | | | | | | | | | | |
| New Hampshire | 2 | 210 | 24 | 24 | 80 | 19 | 1 | 154 | 2 | | | | | 156 |
| New Jersey | 10 | 2 603 | 326 | 1 065 | 1 638 | 466 | 34 | 3,530 | 157 | 52 | | 33 | 32 | 3,812 |
| New Mexico | 8 | 1 037 | 86 | 176 | 320 | 45 | 33 | 600 | 28 | 1 | | 18 | | 718 |
| New York | 65 | 11 215 | 1 481 | 2 981 | 6,847 | 649 | 617 | 12,575 | 1 169 | 712 | | 589 | 174 | 15,154 |
| North Carolina | 10 | 1,560 | 184 | 551 | 823 | 105 | 40 | 1 703 | 324 | 10 | | 348 | 9 | 2,294 |
| North Dakota | 2 | 279 | 29 | 62 | 102 | 72 | 12 | 277 | 4 | 4 | | 14 | | 299 |
| Ohio | 20 | 3,696 | 787 | 868 | 2,078 | 569 | 166 | 4 406 | 162 | 84 | | 244 | 12 | 4,560 |
| Oklahoma | 6 | 588 | 206 | 312 | 473 | 125 | 1 | 1 117 | 100 | 1 | | 51 | | 1,265 |
| Oregon | 2 | 400 | 35 | 71 | 136 | 20 | 1 | 289 | 20 | 6 | | 5 | | 300 |
| Pennsylvania | 18 | 4 659 | 481 | 1 176 | 1 996 | 336 | 85 | 4 074 | 125 | 322 | | 301 | 40 | 4,803 |
| Rhode Island | 3 | 555 | 71 | 143 | 230 | 5 | 43 | 497 | 38 | 1 | | 27 | 1 | 561 |
| South Carolina | 7 | 589 | 68 | 87 | 201 | 53 | 7 | 416 | 45 | 9 | | 8 | 9 | 497 |
| South Dakota | 2 | 282 | 8 | 64 | 78 | | 3 | 153 | 20 | | | 4 | | 177 |
| Tennessee | 6 | 1 112 | 68 | 220 | 264 | 163 | 14 | 734 | 9 | 25 | | | | 768 |
| Texas | 18 | 1 048 | 305 | 1 601 | 1 158 | 474 | 12 | 3,550 | 33 | 11 | | 4 | | 3,598 |
| Utah | 1 | 32 | 6 | 17 | 32 | | | 55 | | | | 9 | | 64 |
| Vermont | 2 | 127 | 14 | 30 | 61 | | 2 | 112 | 0 | | | 15 | | 138 |
| Virginia | 8 | 1 175 | 108 | 216 | 673 | 74 | 4 | 1 075 | 50 | 59 | | 109 | | 1,299 |
| Washington | 12 | 1 437 | 152 | 304 | 435 | 352 | 57 | 1,300 | 47 | 83 | | 1 | | 1 431 |
| West Virginia | 7 | 772 | 133 | 203 | 281 | 48 | 28 | 693 | 07 | 20 | | 1 | 4 | 815 |
| Wisconsin | 20 | 2 111 | 234 | 690 | 937 | 149 | 132 | 2 142 | 60 | 29 | | 125 | 5 | 2,328 |
| Wyoming | 1 | 33 | 3 | 4 | 16 | | 1 | 24 | 7 | | | | | 31 |
| Totals | 494 | 73,335 | 8 735 | 19,888 | 38 238 | 6 650 | 3,277 | 76 707 | 4 904 | 3 236 | | 3,560 | 701 | 89,237 |

The results obtained in the treatment of extra-pulmonary tuberculosis are included in the foregoing classifications. No figures were available for a separate listing.

HOSPITALIZATION OF CHILDREN

There are in the tuberculosis institutions 11,647 beds for children, 9,036 in the sanatoriums, 944 in the tuber-

culosis departments, and 1,667 in the preventoriums. The federal sanatoriums have 328 children's beds, the state sanatoriums have 3,170, those under county control have 3,165, the municipal sanatoriums have 1,001, those operated jointly under city and county management have 480 beds, and the privately owned sanatoriums have 892. All together, 230 sanatoriums, thirty of the principal tuberculosis departments, and twenty-nine preventoriums admit children. The replies to the questionnaire indicate that in addition to the preventoriums there are 161 sanatoriums and fifteen

tuberculosis departments which accept childhood tuberculosis, contacts and other nontuberculous children. One hundred and twenty of the sanatoriums that admit childhood tuberculosis also receive children with pulmonary tuberculosis of the adult type.

Many of the sanatoriums admitting children have a waiting list for adults. This creates a problem worthy of special consideration by those in charge of tuberculosis institutions, for in the crusade against tuberculosis it seems more important to remove dangerous foci of infection from the community than to seek prevention through the hospitalization of nontuberculous

units there may be need for individual segregation, for sixteen of the twenty-nine preventoriums reported 2,479 patients admitted, of whom twelve were adult type tuberculosis, 424 childhood type, twenty-four had extrapulmonary lesions, 1,326 were nontuberculous, and 693 unclassified.

Four tuberculosis departments and 120 sanatoriums have separate buildings for children. In others, the children are segregated in wards or separate rooms but may be in close proximity to the adult patients. Although by far the majority of sanatoriums provide adequate segregation, there are some in which the

Table 12—Condition of Patients on Discharge
(Sanatoriums and Tuberculosis Departments)

| State | Number of Institutions Reporting | Number of Beds Represented | Adult Type | | | | | | | Childhood Type | | | | | | | Nontuberculous | Not Classified | Total Patients Represented |
|----------------------|----------------------------------|----------------------------|------------|---------------------|-----------|----------|------------|--------|--------|-------------------|----------|----------|------------|------|-------|-------|----------------|----------------|----------------------------|
| | | | Arrested | Apparently Arrested | Quiescent | Improved | Unimproved | Died | Total | Apparently Healed | Inactive | Improved | Unimproved | Died | Total | | | | |
| Alabama | 6 | 353 | 18 | 36 | 51 | 65 | 37 | 157 | 350 | | | 7 | | | 7 | 12 | | 380 | |
| Arizona | 15 | 1 063 | 90 | 15 | 13 | 279 | 348 | 106 | 911 | | | 12 | 6 | 2 | 20 | 201 | 25 | 1 157 | |
| Arkansas | 3 | 578 | 182 | 30 | 94 | 129 | 122 | 71 | 578 | 99 | | 12 | 1 | 1 | 113 | 143 | | 634 | |
| California | 42 | 5,180 | 577 | 602 | 692 | 1 193 | 933 | 1 294 | 5,191 | 97 | 67 | 90 | 8 | 4 | 266 | 219 | 78 | 5 754 | |
| Colorado | 18 | 2 194 | 37 | 102 | 147 | 268 | 186 | 298 | 888 | 1 | 1 | 71 | 2 | 2 | 77 | 81 | 58 | 1 204 | |
| Connecticut | 10 | 1 773 | 35 | 70 | 127 | 502 | 170 | 261 | 1 171 | 53 | | 130 | 17 | 16 | 221 | 77 | 36 | 1 500 | |
| Delaware | 2 | 161 | 1 | 5 | | 28 | 14 | 30 | 78 | | | 5 | | | 6 | 4 | 6 | 93 | |
| District of Columbia | 3 | 470 | | 21 | | 166 | 140 | 190 | 512 | | | 6 | | | 6 | | | 517 | |
| Florida | 2 | 103 | 5 | 18 | | 33 | 10 | 47 | 113 | | | | | | | 2 | | 115 | |
| Georgia | 3 | 579 | 38 | 147 | 100 | 240 | 53 | 109 | 692 | 54 | 9 | 2 | | | 65 | 51 | | 808 | |
| Idaho | 2 | 106 | 8 | 1 | | 32 | 3 | 7 | 51 | 20 | 4 | 73 | 5 | 2 | 109 | 3 | | 163 | |
| Illinois | 26 | 4 209 | 257 | 511 | 590 | 1 112 | 498 | 1,338 | 4 306 | 30 | 44 | 63 | 6 | 2 | 755 | 342 | 307 | 5 810 | |
| Indiana | 9 | 1 357 | 17 | 293 | 129 | 179 | 149 | 214 | 961 | 216 | 45 | 100 | 18 | 4 | 448 | 46 | 14 | 1 489 | |
| Iowa | 6 | 774 | 80 | 110 | 54 | 148 | 40 | 126 | 524 | 17 | | 53 | 7 | 2 | 79 | 12 | | 615 | |
| Kansas | 3 | 338 | 3 | 12 | 20 | 219 | 143 | 60 | 457 | 8 | | 23 | 5 | | 35 | 137 | | 629 | |
| Kentucky | 4 | 949 | 65 | 67 | 63 | 298 | 242 | 174 | 909 | 40 | 14 | 20 | 1 | | 80 | 225 | 228 | 1 442 | |
| Louisiana | 5 | 533 | 20 | 27 | 27 | 144 | 51 | 155 | 430 | 7 | 21 | | | | 28 | 53 | | 511 | |
| Maine | 5 | 408 | 2 | 55 | 51 | 101 | 70 | 85 | 429 | 15 | | 16 | 4 | 1 | 86 | 40 | | 505 | |
| Maryland | 8 | 1,350 | 29 | 81 | 250 | 457 | 337 | 421 | 1 600 | 88 | 60 | 65 | 14 | 11 | 244 | 89 | 17 | 1 905 | |
| Massachusetts | 31 | 4 843 | 333 | 331 | 594 | 746 | 387 | 989 | 3 850 | 91 | 5 | 33 | 6 | 4 | 139 | 130 | 210 | 8 871 | |
| Michigan | 27 | 4 463 | 165 | 456 | 896 | 1 774 | 654 | 840 | 4 280 | 237 | 38 | 38 | 18 | 12 | 343 | 554 | 87 | 5 294 | |
| Minnesota | 20 | 2 432 | 229 | 163 | 292 | 522 | 300 | 387 | 1 838 | 30 | 7 | 30 | 3 | 4 | 80 | 153 | 13 | 2 149 | |
| Mississippi | 2 | 627 | 18 | 15 | 35 | 91 | 37 | 43 | 289 | | | 60 | | | 65 | 67 | | 371 | |
| Missouri | 8 | 1 479 | 115 | 39 | 148 | 454 | 208 | 323 | 1 287 | 12 | 16 | 43 | | | 71 | 55 | | 1 413 | |
| Montana | 1 | 160 | 46 | | 24 | 47 | 22 | 30 | 170 | | | | | | | 27 | | 202 | |
| Nebraska | 3 | 260 | 41 | 24 | 30 | 66 | 36 | 59 | 240 | | | 5 | 4 | 5 | 14 | 5 | 22 | 287 | |
| Nevada | | | | | | | | | | | | | | | | | | | |
| New Hampshire | 2 | 210 | 14 | 10 | 18 | 51 | 14 | 17 | 124 | | | | | | | 17 | | 141 | |
| New Jersey | 17 | 2,831 | 110 | 296 | 469 | 830 | 585 | 889 | 3,119 | 102 | 13 | 312 | 8 | 2 | 497 | 218 | 20 | 3,858 | |
| New Mexico | 10 | 1 090 | 62 | 40 | 50 | 170 | 155 | 94 | 580 | 9 | | 3 | | | 12 | 32 | 23 | 663 | |
| New York | 69 | 11 016 | 1 150 | 928 | 634 | 3 762 | 2 240 | 3 260 | 12,180 | 490 | 147 | 569 | 110 | 76 | 1,322 | 499 | 302 | 14,393 | |
| North Carolina | 12 | 1 987 | 64 | 204 | 274 | 510 | 380 | 282 | 1 719 | 57 | 40 | 18 | 1 | | 116 | 477 | | 2,312 | |
| North Dakota | 2 | 279 | 36 | 31 | 9 | 48 | 10 | 31 | 170 | 1 | 30 | 4 | | 1 | 36 | 4 | 4 | 214 | |
| Ohio | 20 | 3 606 | 373 | 511 | 533 | 686 | 633 | 871 | 3 567 | 52 | 39 | 175 | 26 | 11 | 303 | 236 | 30 | 4 136 | |
| Oklahoma | 6 | 888 | 20 | 190 | 107 | 262 | 101 | 126 | 902 | 46 | 4 | 29 | 1 | | 80 | 113 | 40 | 1 141 | |
| Oregon | 2 | 409 | 49 | 20 | 31 | 49 | 23 | 61 | 233 | 8 | 6 | 4 | 1 | | 19 | 23 | | 275 | |
| Pennsylvania | 10 | 4 154 | 177 | 168 | 437 | 1 127 | 786 | 633 | 3 528 | 41 | 302 | 968 | 52 | 16 | 1 429 | 202 | 22 | 5 181 | |
| Rhode Island | 3 | 535 | 40 | 52 | 23 | 120 | 101 | 127 | 463 | 15 | 3 | 8 | 2 | 1 | 29 | 38 | | 530 | |
| South Carolina | 7 | 559 | 20 | 40 | 30 | 220 | 91 | 70 | 471 | 7 | 3 | 2 | | | 12 | 16 | | 498 | |
| South Dakota | 2 | 282 | 18 | 7 | 7 | 74 | 23 | 96 | 160 | | | | | | | 24 | | 189 | |
| Tennessee | 6 | 1 112 | 118 | 63 | 40 | 109 | 90 | 262 | 682 | 129 | 20 | 52 | 9 | | 215 | 23 | 1 | 921 | |
| Texas | 20 | 2 491 | 83 | 237 | 524 | 1 463 | 274 | 341 | 2 922 | 119 | 4 | 332 | 1 | | 456 | 33 | 102 | 3 603 | |
| Utah | 1 | 32 | 6 | 3 | | 6 | 9 | 12 | 36 | | | | | | | | | 36 | |
| Vermont | 2 | 127 | | 8 | 18 | 13 | 32 | 38 | 104 | 1 | | | | | 1 | 24 | | 129 | |
| Virginia | 7 | 1 111 | 37 | 81 | 162 | 468 | 109 | 213 | 1 010 | 8 | | 44 | 3 | | 50 | 12 | 11 | 1 088 | |
| Washington | 10 | 1 242 | 50 | 170 | 139 | 254 | 137 | 139 | 889 | 49 | 15 | 180 | 10 | 3 | 207 | 46 | | 1,141 | |
| West Virginia | 7 | 772 | 5 | 145 | 9 | 200 | 168 | 98 | 678 | 17 | | 7 | | 2 | 26 | 62 | | 766 | |
| Wisconsin | 21 | 2 201 | 174 | 204 | 127 | 386 | 259 | 366 | 1 696 | 19 | 2 | 16 | 8 | 3 | 48 | 156 | | 1 800 | |
| Wyoming | 1 | 83 | 3 | 2 | | 14 | 4 | 10 | 33 | | | | | | | | | 33 | |
| Totals | 1 011 | 74 630 | 5 002 | 6 700 | 7 757 | 20 130 | 11 541 | 16 041 | 67 021 | 2 270 | 1 020 | 4 324 | 357 | 188 | 8 164 | 4 965 | 1 945 | 82 095 | |

children. It is generally conceded that the important feature, from an epidemiologic point of view, is the isolation of tuberculous patients who give off tubercle bacilli. Hence, many institutions aim to make adequate provisions for the care of adults and children with open parenchymal lesions before they attempt the hospitalization of other children as a secondary preventive measure.

Every one will agree that adequate isolation facilities are essential in institutions which admit both tuberculous and nontuberculous patients. Even in the independently operated preventoriums which are separate

adults and children come in contact during meals, in their walks to and from wards, on the sanatorium grounds, at entertainments, and through the simultaneous use of solariums. In a few sanatoriums it was observed that children with pulmonary tuberculosis were hospitalized together with other children in the preventorium unit. The need for isolation facilities in the tuberculosis sanatoriums is apparent when one considers that, of the 12,629 children admitted, 1,191 had adult type tuberculosis, 6,659 the childhood type, 824 had extrapulmonary lesions, 3,236 were nontuberculous, and 701 were unclassified.

The use of sanatorium facilities for nontuberculous children is, of course, a secondary development, for the sanatoriums were originally established for the isolation and treatment of tuberculous patients. No one will deny the value of hospital care for undernourished and

Table 13—Number of Physicians in Tuberculosis Sanatoriums

| Control | Number of Sanatoriums | Number of Beds | Average Daily Census | Medical Directors | | Other Physicians | | Total All Physicians |
|-------------|-----------------------|----------------|----------------------|-------------------|-----------|------------------|-------------------------|----------------------|
| | | | | Full time | Part time | Full time | Attending or Consulting | |
| Federal | 18 | 4,103 | 3,179 | 18 | | 83 | 27 | 128 |
| State | 65 | 17,308 | 15,706 | 61 | 4 | 187 | 151 | 403 |
| County | 173 | 20,114 | 18,364 | 106 | 67 | 187 | 813 | 1,171 |
| City | 22 | 7,366 | 7,227 | 12 | 10 | 80 | 221 | 323 |
| City-county | 15 | 2,423 | 2,309 | 8 | 7 | 24 | 64 | 101 |
| Private | 178 | 13,684 | 9,400 | 68 | 90 | 142 | 919 | 1,219 |
| Totals | 471 | 64,997 | 56,325 | 273 | 178 | 703 | 2,100 | 3,740 |

run-down children, but is it not first of all the duty of the sanatoriums to provide for the care of tuberculous patients awaiting hospitalization? Furthermore, since one of the main functions of the tuberculosis sana-

a ratio of 1 52. The ratio of full-time physicians to patients is 1 63 in the state sanatoriums, 1 62 in the county institutions, 1 78 in the municipal sanatoriums, 1 72 in those under city and county control, and 1 45 in the privately owned sanatoriums. By including the part-time medical directors who are regular members of the staff, the ratios in the civilian sanatoriums become 1 62, 1 51, 1 70, 1 60 and 1 32 respectively. The sanatoriums as a group have a ratio of one physician to fifty-eight patients. With the part-time medical directors included, the ratio is 1 49.

Of the tuberculosis sanatoriums, 318 have a full-time medical staff, 120 sanatoriums have one physician on full-time duty, sixty-six have two, forty-four have three, and in eighty-eight institutions there are more than three physicians on full-time employment. Resident pathologists are employed in eleven sanatoriums, and resident roentgenologists in eight.

The table entitled "Medical Staff" is included to show the number of sanatoriums, the average bed capacity, the number of regular staff members, and the number of physicians per institution.

Some of the tuberculosis departments of hospitals have a full-time medical staff, but more commonly the staff physicians share in other hospital duties as well

Table 14—Number of Nonmedical Personnel in Tuberculosis Sanatoriums

| Control | Number of Sanatoriums | Average Daily Census | Number of Nurses | | | | | Dietitians | Graduate Pharmacists | Record Clerks | X-Ray Technicians | Laboratory Technicians | Occupational Therapists | School Teachers | Social Service Workers | Field Nurses | Domestics | Others | Total |
|-----------------------|-----------------------|----------------------|------------------|---------|-----------|-----------|-------|------------|----------------------|---------------|-------------------|------------------------|-------------------------|-----------------|------------------------|--------------|-----------|--------|--------|
| | | | Graduate | Student | Affiliate | Practical | Total | | | | | | | | | | | | |
| Veterans Bureau | 6 | 2,279 | 200 | | | 8 | 207 | 14 | 6 | 13 | 7 | 10 | 19 | 3 | 1 | | 260 | 1,056 | 1,686 |
| Indian Administration | 11 | 730 | 61 | | | 1 | 62 | 2 | 1 | 8 | 6 | 6 | 10 | 2 | | | 72 | 71 | 247 |
| U S P H S | 1 | 217 | 10 | | | | 10 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | | | 17 | 109 | 148 |
| State | 65 | 15,760 | 917 | 308 | 6 | 610 | 1,816 | 50 | 7 | 113 | 61 | 79 | 20 | 75 | 11 | 20 | 1,532 | 3,019 | 6,842 |
| County | 173 | 18,364 | 1,409 | 126 | 66 | 867 | 2,558 | 81 | 7 | 140 | 104 | 110 | 54 | 118 | 44 | 68 | 1,958 | 2,798 | 6,084 |
| City | 22 | 7,227 | 629 | 18 | | 388 | 1,045 | 24 | 8 | 29 | 14 | 27 | 14 | 15 | 8 | 100 | 502 | 2,024 | 3,620 |
| City-county | 15 | 2,809 | 123 | | | 130 | 258 | 10 | 1 | 8 | 9 | 10 | 2 | 15 | 3 | | 294 | 464 | 1,023 |
| Private | 178 | 9,400 | 760 | 104 | 50 | 412 | 1,374 | 74 | 23 | 110 | 84 | 90 | 28 | 32 | 19 | 11 | 1,484 | 1,288 | 4,567 |
| Totals | 471 | 56,325 | 4,258 | 538 | 140 | 2,490 | 7,370 | 207 | 54 | 427 | 290 | 342 | 144 | 269 | 69 | 305 | 6,160 | 10,799 | 26,515 |

toriums is segregation, is it consistent, from an epidemiologic point of view, to place nontuberculous children in the same institution in which there are open cases of pulmonary tuberculosis?

MEDICAL STAFF

The quality of medical service depends on the competence of the medical staff. For this reason it is essential that the medical personnel be selected on the basis of training and experience. Especially is it necessary that medical superintendents or directors should be well qualified in the specialty of tuberculosis, for they are responsible for the welfare of the sanatorium patients, for medical policies, and for the supervision and training of the younger members of the staff.

All together, 3,349 physicians are officially connected with the tuberculosis sanatoriums, as shown in table 13. There are 976 physicians on full-time duty, including 273 medical directors. In addition, 178 medical directors serve on a part-time basis, and 2,195 physicians are listed as members of the attending or consulting staff.

The eighteen federal sanatoriums with an average daily census of 3,179 patients have a full-time staff of 101 physicians, a ratio of one physician to thirty-one patients. Eleven Indian sanatoriums included in this group have fourteen physicians and 730 patients,

In the independently operated preventorium the medical service is mainly on a part-time basis, but the preventorium that are part of a sanatorium system may have physicians assigned for part or full-time service.

NONMEDICAL PERSONNEL

According to table 14 which classifies the nonmedical personnel, there is a total of 26,515 employees in the tuberculosis sanatoriums, exclusive of physicians and

Medical Staff

| Control | Number of Sanatoriums | Average Bed Capacity | Regular Staff Members | Number of Physicians per Institution |
|---------------|-----------------------|----------------------|-----------------------|--------------------------------------|
| Veterans | 6 | 400 | 81 | 13.0 |
| Indian | 11 | 81 | 14 | 1.3 |
| Public Health | 1 | 270 | 0 | 0 |
| Total federal | 18 | 228 | 101 | 5.6 |
| State | 65 | 266 | 202 | 4 |
| County | 173 | 116 | 369 | 2 |
| City | 22 | 330 | 102 | 4.6 |
| City-county | 15 | 161 | 39 | 2.6 |
| Private | 178 | 77 | 300 | 1.7 |
| Totals | 471 | 138 | 1,154 | 2.4 |

dentists. For the care of patients the sanatoriums have a nursing staff of 7,370, exclusive of attendants. Of this number 4,258 are listed as graduates, 538 as student nurses, 140 as affiliates from other hospitals, and

2,436 as practical nurses. The ratio of nurses to patients can be computed for the various classes of sanatoriums by reference to table 14, and the ratio for individual institutions can be ascertained from the state lists of tuberculosis sanatoriums.

Personnel of Civilian Sanatoriums

| Control | Number of Civilian Sanatoriums Employing | | | | | | | | | | | |
|-------------|--|-----------------|------------------|------------------------|-------------------|------------|----------------------|---------------|-------------------------|-----------------|------------------------|--------------|
| | Number of Sanatoriums | Graduate Nurses | Practical Nurses | Laboratory Technicians | X-Ray Technicians | Dietitians | Graduate Pharmacists | Record Clerks | Occupational Therapists | School Teachers | Social Service Workers | Field Nurses |
| State | 65 | 61 | 41 | 50 | 53 | 40 | 7 | 44 | 10 | 34 | 8 | 2 |
| County | 173 | 167 | 125 | 100 | 85 | 71 | 7 | 07 | 32 | 74 | 27 | 65 |
| City | 23 | 22 | 13 | 11 | 11 | 13 | 7 | 16 | 10 | 7 | 6 | 6 |
| City-county | 15 | 12 | 7 | 7 | 8 | 8 | 1 | 6 | 8 | 3 | 3 | 1 |
| Private | 178 | 161 | 54 | 78 | 78 | 64 | 21 | 77 | 24 | 27 | 15 | 6 |
| Totals | 453 | 425 | 288 | 246 | 245 | 196 | 43 | 240 | 107 | 151 | 59 | 78 |

Trained personnel for other sanatorium departments include 257 dietitians, fifty-four graduate pharmacists, 427 record clerks, 290 x-ray technicians, 342 laboratory technicians, 144 occupational therapists, 269 school teachers, eighty-nine social service workers and 305 field nurses. In their community service many sanatoriums are aided by trained employees of local health units, so that the number of social workers and field nurses given does not represent the total personnel available for field service.

The tabulation that appears above shows the number of civilian sanatoriums that employ trained personnel for various services. This indicates that laboratory technicians are employed in 246 sanatoriums, x-ray technicians in 245, dietitians in 196, graduate pharmacists in forty-three, record clerks in 240 institutions, occupational therapists in 107, school teachers in 151, social service workers in fifty-nine, and field nurses in seventy-eight.

An analysis of the employed personnel in tuberculosis departments of hospitals has not been made because of the difficulty in making proportionate allowances where services overlap. It is apparent, however, that in most of the tuberculosis departments the personnel can be augmented whenever necessary by the transfer of employees from other hospital services.

HEALTH SERVICE FOR EMPLOYEES

The potential danger of transmission of infection is of paramount importance in the tuberculosis institutions both from an economic and a medical point of view. It seems essential, therefore, that the tuberculosis hospitals should institute periodic physical and roentgen examinations, not only to safeguard the health of employees but to guard against the employment of persons unfit for hospital service.

The present survey indicates that the sanatorium field is realizing more and more its responsibility with regard to health maintenance. Three hundred and eighty-five sanatoriums and ninety-three of the principal tuberculosis departments gave information about the health service for employees. Of the sanatoriums, 257 require a physical examination, 100 make a physical examination "when necessary," 218 require a roentgenogram of the chest, 102 make a roentgenogram "if indicated," and 123 include the tuberculin test. In fifty-three the physical examination is held only at the beginning of the service, whereas in 198 sanatoriums the

employees are examined on entrance and at regular intervals thereafter. Thirty-one sanatoriums consider a roentgen study essential before the employees enter on their service, 111 make a roentgen examination periodically, and there were seventy-six sanatoriums that failed to specify the frequency of their examinations.

The replies from ninety-three tuberculosis departments indicate that seventy-one require a physical examination, twelve examine the employees "when necessary," fifty-six require roentgen studies, twenty-four make roentgen studies "if indicated," and thirty-two employ the tuberculin test.

In 193 sanatoriums and forty-seven tuberculosis departments both a roentgen and a physical examination are required, and there are ninety-nine sanatoriums and twenty-seven tuberculosis departments that make a tuberculin test in addition.

The health survey is not always extended to all employees, for there were a number of institutions which reported that only nurses are examined.

According to table 15, a roentgen examination of employees is required in 59 per cent of the federal, 52 per cent of the state, 62 per cent of the county, 54 per cent of the city and 27 per cent of the city-county sanatoriums, and in 28 per cent of the sanatoriums under private control. Furthermore, 78 per cent of the federal, 58 per cent of the state, 65 per cent

Table 15—Health Service for Employees

| Control | Number of Sanatoriums Reporting | Number of Sanatoriums Requiring | | Tuberculin Test | Number of Tuberculosis Departments Reporting | Number of Tuberculosis Departments Requiring | | Tuberculin Test |
|-------------|---------------------------------|---------------------------------|----------------------|-----------------|--|--|----------------------|-----------------|
| | | Physical Examination | Roentgen Examination | | | Physical Examination | Roentgen Examination | |
| Federal | 18 | 14 | 10 | 4 | 25 | 24 | 9 | 5 |
| State | 57 | 38 | 34 | 15 | 4 | 3 | 3 | 2 |
| County | 154 | 113 | 107 | 65 | 18 | 10 | 11 | 0 |
| City | 10 | 13 | 12 | 7 | 27 | 21 | 10 | 9 |
| City-county | 12 | 7 | 4 | 8 | 8 | 8 | 1 | 1 |
| Private | 120 | 73 | 51 | 29 | 17 | 11 | 12 | 0 |
| Totals | 385 | 257 | 218 | 123 | 93 | 71 | 50 | 32 |

of the county, 59 per cent of the city, 47 per cent of the city-county and 40 per cent of the private sanatoriums require a physical examination. The table lends itself to a similar analysis of the tuberculosis departments.

GENERAL MEDICAL SERVICE

1 *Admission Procedure*—The admission procedure in tuberculosis hospitals and sanatoriums varies considerably except in the federal institutions, where the eligibility of patients and the method of admission are covered in a uniform manner by specific regulations. In other institutions the patients may apply directly or through the attending physician, tuberculosis clinic, health department, social agencies or a central admission bureau and are admitted on a physician's certificate, on the recommendation of special examiners, on x-ray evidence accompanying the application, or following an examination by the sanatorium staff to substantiate the diagnosis of tuberculosis. To simplify the admission procedure, some of the institutions that comprise a sanatorium system have established a central admission bureau to assist in the classification and assignment of patients. In this manner it is possible to expedite transfers between institutions, readjust

waiting lists, prevent the indiscriminate readmission of patients and maintain a closer check on the local tuberculosis problem

Although most institutions have definite rules covering the eligibility of patients, there are individual variations on the basis of race, nationality, age, sex, memberships and affiliations, and financial requirements, and as regards the form, type and stage of disease. There are, for example, ten sanatoriums for Negroes exclusive of separate departments in other institutions. Five sanatoriums accept only women, eleven are exclusively for men, and eleven sanatoriums and the twenty-nine preventoriums admit only children, viz

| Sanatoriums for Men Only | | Bed Capacity |
|---|-----------------------|--------------|
| Arizona State Elks Association Hosp | Tucson Ariz. | 35 |
| St. Luke's in the Desert Sanatorium | Tucson Ariz. | 35 |
| Costello Home | Denver | 16 |
| Craig Colony | Edgewater Colo | 50 |
| Veterans Administration Facility | Outwood Ky | 370 |
| Bethesda Hospital (col) | Detroit | 85 |
| U. S. Marine Hospital | Fort Stanton N. M. | 250 |
| Soldiers Tubercular Sanatorium | Sulphur Okla | 109 |
| International Printing Pressmen and Assistants Union Sanatorium | Pressmen's Home Tenn | 44 |
| Woodmen of the World War Memorial Hospital | San Antonio Texas | 180 |
| Lake Tomahawk State Camp | Lake Tomahawk Wis | 42 |
| Sanatoriums for Women Only | | |
| Arequipa Sanatorium | Manor Calif | 44 |
| Sunland Sanatorium | Sunland Calif | 60 |
| Sands House | Denver | 47 |
| Holyoke Tuberculosis Sanatorium | Holyoke Mass | 18 |
| Channing Home | Boston | 27 |
| Sanatoriums for Children Only | | |
| Comstock Hospital | Tucson Ariz. | 30 |
| Undercliff Meriden State Tuberculosis Sanatorium | Meriden Conn | 252 |
| The Seaside | Waterford Conn | 100 |
| Children's Tuberculosis Sanatorium | Washington D. C. | 150 |
| Fort Lapwai Tuberculosis Sanatorium | Lapwai Idaho | 132 |
| Sac and Fox Tuberculosis Sanatorium | Toledo, Iowa | 80 |
| North Reading State Sanatorium | North Wilmington Mass | 207 |
| Westfield State Sanatorium | Westfield Mass | 250 |
| Jicarilla Sanatorium | Dulce N. M. | 56 |
| Neponsit Beach Hospital for Children | Rockaway Beach N. Y. | 120 |
| Hillcrest Sanatorium | Charleston W. Va | 42 |
| Sanatoriums for Negroes Only | | |
| McRae Memorial Sanatorium | Alexander Ark | 32 |
| Edgewood Sanatorium | Marshallton Del | 40 |
| Tuberculosis Home for the Colored | West Palm Beach Fla | 10 |
| Maryland Tuberculosis Sanatorium | Henrytown Md | 158 |
| Bethesda Hospital | Detroit | 85 |
| Fairview Sanatorium | Detroit | 60 |
| Good Samaritan Hospital | Detroit | 29 |
| Jefferson County Tuberculosis Hospital | Beaumont Texas | 20 |
| Piedmont Sanatorium | Burkeville Va | 160 |
| Denmar Sanitarium | Denmar W. Va | 85 |

There are nine sanatoriums that admit patients principally on the basis of membership in fraternal or industrial organizations, and two accept patients only for vocational guidance and rehabilitation. Most of the sanatoriums for pulmonary tuberculosis accept all stages of the disease, although a few attempt to limit their admissions to minimal or early cases. Some institutions were originally established for the treatment of recoverable types of tuberculosis. At first this meant that only minimal cases could be accepted, but now with the improved methods of treatment the "recoverable" classification may include also many patients in the moderately advanced and far advanced stages. In some institutions a quota system may be applied to limit the admissions by districts or on the basis of financial support.

2 General Sanatorium Service—In most of the sanatoriums the routine diagnostic study on admission includes a medical history, physical examination, and laboratory and x-ray studies. There is, however, a great variation in the completeness of these examinations. In some institutions the initial examination includes only a brief reference to the medical history, a physical examination limited mainly to the chest, a

urinalysis, and a sputum examination. In others the staff obtains a detailed history to determine the source of infection, early symptoms, mode of onset, and so on, and carries out a complete general examination as well as a special chest study. Roentgenograms are included, flat films or stereoscopic, also a fluoroscopic examination, qualitative urinalysis, repeated sputum examinations, blood counts, hemoglobin determinations, blood sedimentation, and a Wassermann or Kahn test. In addition, some of the sanatoriums make routine blood chemistry studies and basal metabolic ratings. Two hundred and fourteen sanatoriums hold diagnostic conferences to discuss observations, classify patients, and outline further treatment.

Roentgen examinations are routine on admission in 398 sanatoriums, a urinalysis in 395, blood counts in 253, sputum examinations in 405, blood sedimentation in 177, and a serologic test for syphilis in 195. Physical examinations are repeated within three months in 382 sanatoriums and every three months or over in fifteen, and thirty institutions reexamine patients "when necessary." In 167 sanatoriums the roentgen studies are repeated within three months, and 114 report roentgen examinations at intervals of from three to six months. Temperatures are taken once a day in twenty-two sanatoriums, twice daily in 215, and three times or oftener in 200. In nearly all institutions the temperature is taken by mouth, only twenty report the routine use of rectal temperatures.

Although rest has long been considered the basic treatment in tuberculosis, there is still considerable variation in the application of rest therapy, especially as regards rest periods, visiting hours and graduated exercise. In many institutions the patients remain on strict bed rest until all symptoms have disappeared and the physical condition is shown to be satisfactory by roentgen examination. Some sanatoriums, on the other hand, begin mild forms of exercise much earlier. Many institutions have recently placed increased emphasis on the importance of routine rest therapy and have established definite rest hours both in the morning and in the afternoon. One hundred and fifty-one sanatoriums maintain one rest period daily and 273 require two or more periods of enforced rest.

Visiting hours have been restricted in several sanatoriums to avoid the unnecessary disturbance of patients and interference with the methods of treatment. In 280 sanatoriums visiting is permitted daily, whereas in 135 institutions it is restricted to two or three times a week.

MEDICAL FACILITIES

1 Pneumothorax—The increased use of collapse therapy has been one of the main factors responsible for the great progress made in the tuberculosis field during the last twenty years. Of the various forms of collapse, artificial pneumothorax is by far the most popular and has become indispensable in the operation of a scientific and progressive tuberculosis service. Its sphere of usefulness is not limited to the sanatoriums alone but has extended into the general medical field as well.

A total of 406 sanatoriums and 101 of the principal tuberculosis departments report facilities for pneumothorax. The sanatoriums include seventeen federal institutions and fifty-nine state, 160 county, seventeen municipal, twelve city-county and 141 private sanatoriums. In some institutions, where the pneumothorax apparatus is furnished by the visiting staff, the treatments may be administered at the institution or

in the doctors' offices. The technic of pneumothorax administration varies considerably in the different institutions. In some the procedure is in the nature of a major surgical operation requiring a rigid aseptic technic, whereas in others it involves mainly the use of sterile needles and the usual skin preparation.

Table 16 shows the number of special therapeutic procedures carried out in approximately 400 sanatoriums and 100 of the principal tuberculosis departments. During a twelve months period there were 561,567 pneumothorax treatments administered, 29,678 in the federal institutions, 443,927 in the other public institutions, and 87,962 in the tuberculosis institutions under private control. The departments and the sanatoriums administered relatively the same number of pneumothorax treatments, for there were 450,100 treatments given in the 401 sanatoriums of 59,913 beds and 111,467 in the 101 departments in which the bed capacity was 14,170. A group of institutions reported 16,401 initial pneumothorax treatments and 503,573 refills, indicating an annual ratio of approximately 1:30.

Incidentally, 82 tuberculosis departments and 292 sanatoriums report a total of 2,076 oleothorax treatments.

2 *Surgery*—Apparently the centralization of tuberculosis surgery continues to predominate in the sanatoriums which have established affiliations with surgical centers. The distribution of surgical facilities in the various types of sanatoriums are given in the following table.

Surgical Facilities in Various Types of Sanatoriums

| Control | No. of Sanatoriums | Minor Surgery | Major Surgery | Special Chest Surgery | Surgical Affiliation |
|-------------|--------------------|---------------|---------------|-----------------------|----------------------|
| Federal | 18 | 18 | 15 | 13 | 11 |
| State | 65 | 58 | 21 | 25 | 46 |
| County | 173 | 139 | 51 | 59 | 130 |
| City | 22 | 16 | 11 | 9 | 16 |
| City-county | 15 | 11 | 2 | 5 | 12 |
| Private | 178 | 122 | 33 | 40 | 118 |
| Totals | 471 | 364 | 138 | 152 | 333 |

Reports from approximately 400 sanatoriums and 100 of the principal tuberculosis departments indicate that 2,935 thoracoplasties, 929 pneumolyses and 7,695 phrenic nerve operations were performed during a twelve months period. In checking a group of 122 tuberculosis departments of general and other hospitals it was found that 108 have equipment for minor surgery, ninety-four have facilities for major operative work and eighty-five have facilities for special chest surgery. Thirty-nine departments maintain a surgical affiliation with other hospitals.

Table 16—Special Therapeutic Procedures
(Based on Reports Received During 1934)

| | Number of Institutions Reporting | Number of Beds Represented | Total Pneumothorax Treatments | Initial Pneumothorax Treatments | Pneumothorax Refills | Inpatients Receiving Pneumothorax | Outpatients Receiving Pneumothorax | Number of Phrenic Nerve Operations | Thoracoplasties | Pneumolyses | Oleo-thorax |
|-----------------------------------|----------------------------------|----------------------------|-------------------------------|---------------------------------|----------------------|-----------------------------------|------------------------------------|------------------------------------|-----------------|-------------|-------------|
| Sanatoriums | | | | | | | | | | | |
| Federal | 14 | 3,376 | 7,259 | 258 | 7,020 | 230 | 54 | 137 | 68 | 6 | 13 |
| Other public | 246 | 44,038 | 866,183 | 9,093 | 881,003 | 9,626 | 4,963 | 4,702 | 1,766 | 629 | 1,035 |
| Private | 141 | 11,604 | 76,708 | 2,432 | 62,037 | 1,882 | 830 | 1,047 | 378 | 115 | 125 |
| Total sanatoriums | 401 | 59,013 | 450,100 | 12,864 | 400,080 | 11,838 | 5,257 | 5,946 | 2,202 | 760 | 1,173 |
| Departments | | | | | | | | | | | |
| Federal | 23 | 4,644 | 22,419 | 494 | 21,921 | 592 | 121 | 273 | 19 | | 51 |
| Other public | 55 | 7,967 | 77,794 | 3,264 | 71,890 | 1,819 | 1,135 | 1,269 | 629 | 185 | 247 |
| Private | 23 | 1,559 | 11,254 | 289 | 9,676 | 214 | 190 | 207 | 85 | 44 | 5 |
| Total departments | 101 | 14,170 | 111,467 | 4,037 | 103,493 | 2,625 | 1,401 | 1,749 | 783 | 179 | 303 |
| Total sanatoriums and departments | 502 | 74,083 | 561,567 | 16,401 | 503,573 | 14,463 | 6,711 | 7,695 | 2,935 | 929 | 2,076 |

torium field. True, a number of sanatoriums are equipped for major operative procedures, but it is nevertheless still the practice in the majority of institutions to transfer the special chest surgery to nearby surgical centers. Even some of the sanatoriums that have surgical facilities find it difficult to supply a competent surgical staff and provide the volume of operative work necessary to maintain technical proficiency.

There has been a tendency in recent years to construct sanatoriums with complete facilities not only for major operative procedures but also for eye, ear, nose and throat, orthopedic and urologic surgery. Whether this trend will influence the practice of tuberculosis surgery remains to be seen. It is certain, however, that the mounting cost of construction will tend to preserve the present system of centralization.

The sanatoriums do not necessarily refer all types of surgery, although there are many that transfer their patients for phrenic nerve operations as well as for thoracoplasties and pneumolyses. Of the 471 sanatoriums included in this report 364 have made arrangements for minor surgery, 138 have equipment for major operations and 152 report facilities for special chest surgery. On the other hand, there are 333 insti-

3 *Dental Service*—There appears to be little uniformity in the supply of dental facilities in the tuberculosis sanatoriums. For the most part, however, the larger sanatoriums, especially governmental institutions, are equipped for dental service in a fairly complete manner. Many have departments containing several complete dental units, dental laboratory facilities and x-ray equipment and are staffed by competent professional and technical personnel.

On the other hand, there are many departments which are equipped with only a dental chair and depend on the visiting dentist to furnish the necessary instruments. Between these extremes there are all types of variation. More than 40 per cent of the sanatoriums do not have a dental department but call local dentists as necessary.

Thirty institutions maintain a full-time dental staff, either regular salaried dentists or dental interns, and in 284 the dental service is on a definite part-time basis.

Complete dental facilities are furnished in the sanatoriums of the Veterans Bureau and the U. S. Public Health Service but are more limited in the sanatoriums of the Indian Administration, where small institutions predominate. Approximately 74 per cent of the state

sanatoriums report dental departments, 66 per cent of the county sanatoriums, 59 per cent of the municipal sanatoriums, 60 per cent of the city-county sanatoriums and 41 per cent of the private institutions

According to the following tabulation there are special dental facilities in sixteen federal sanatoriums, 73 private institutions and 184 other civilian sanatoriums

Special Dental Facilities

| Control | Number of Sanatoriums | Dental Departments | Sanatoriums Employing Dentists | |
|-------------|-----------------------|--------------------|--------------------------------|-----------|
| | | | Full Time | Part Time |
| Federal | 18 | 16 | 7 | 0 |
| State | 6 | 48 | 8 | 47 |
| County | 173 | 114 | 6 | 116 |
| City | 22 | 13 | 4 | 11 |
| City-county | 15 | 0 | 1 | 0 |
| Private | 178 | 73 | 4 | 92 |
| Totals | 471 | 273 | 30 | 284 |

4 *X-Ray Facilities*—The present survey indicates that 77 per cent of the sanatoriums have roentgenographic equipment, 78 per cent offer fluoroscopic facilities, 67 per cent have stereoscopic equipment, and 22 per cent of the institutions refer part or all of their x-ray work to other hospitals. The following tabulation shows the distribution of x-ray facilities in the sanatorium field

X-Ray Facilities in Sanatoriums

| Control | Number of Sanatoriums | X Ray Equipment | Fluoroscopic Equipment | Stereoscopic Equipment | X Ray Work Referred |
|-------------|-----------------------|-----------------|------------------------|------------------------|---------------------|
| Federal | 18 | 18 | 17 | 17 | 1 |
| State | 6 | 59 | 59 | 51 | 3 |
| County | 173 | 144 | 142 | 132 | 35 |
| City | 22 | 18 | 17 | 15 | 5 |
| City-county | 15 | 10 | 11 | 9 | 5 |
| Private | 178 | 115 | 122 | 92 | 50 |
| Totals | 471 | 304 | 308 | 316 | 105 |

The extent to which these facilities are used is illustrated by the number and frequency of roentgen examinations. Four hundred and thirty-two sanatoriums reported 62,873 patients admitted, 459,316 roentgen examinations and 356,917 fluoroscopic studies during a twelve months period. Consequently, the yearly average is approximately seven roentgen examinations and five and one-half fluoroscopic examinations per patient. As shown in the accompanying table, these averages are nearly the same for all classes of sanatoriums except the federal group, in which the fluoroscopic examinations average slightly more than two per patient

Use of X-Ray Facilities

| Control | Number of Sanatoriums Reporting | Number of Patients Admitted | Number of Roentgen Examinations | Number of Fluoroscopic Examinations |
|-------------|---------------------------------|-----------------------------|---------------------------------|-------------------------------------|
| Federal | 17 | 4,384 | 28,134 | 9,070 |
| State | 59 | 18,434 | 121,654 | 87,416 |
| County | 169 | 18,988 | 105,864 | 129,102 |
| City | 21 | 8,108 | 64,057 | 43,801 |
| City-county | 14 | 2,779 | 17,002 | 21,546 |
| Private | 162 | 10,090 | 62,090 | 65,892 |
| Totals | 432 | 62,873 | 459,316 | 356,917 |

Eighty-four per cent of the sanatoriums require a roentgen examination on admission, 35 per cent repeat the examination within three months, 24 per cent repeat it in from three to six months, and in 27 per cent of the institutions the roentgen study is repeated when

necessary. The frequency of roentgen examination is shown in the following tabulation

Technical personnel is employed in the x-ray departments of thirteen federal and 245 civilian sanatoriums. There are technicians in fifty-three state, ninety-five county, eleven municipal, eight city and county sanatoriums and seventy-eight sanatoriums under private management

As regards professional supervision over the x-ray departments, there is considerable variation. Only eight sanatoriums have resident roentgenologists. In 220 the medical director maintains supervision, and in

Frequency of Roentgen Examination

| Sanatoriums | Required on Admission | Roentgen Examination Repeated | | |
|-------------|-----------------------|-------------------------------|---------------------|----------------|
| | | Within Three Months | Three to Six Months | When Necessary |
| Federal | 17 | 5 | 8 | 2 |
| State | 57 | 17 | 20 | 22 |
| County | 159 | 72 | 41 | 41 |
| City | 20 | 5 | 5 | 7 |
| City-county | 12 | 4 | 4 | 6 |
| Private | 132 | 64 | 33 | 44 |
| Totals | 395 | 167 | 114 | 128 |

144 the medical staff as a whole is responsible for the interpretations. Eighty-seven sanatoriums report the service of a consulting roentgenologist

5 *Laboratory Service*—Although 364 tuberculosis sanatoriums have clinical laboratory facilities, there are relatively few that offer a complete service. Many find it advantageous to refer sputum examinations, bacteriologic studies and serologic studies to the public health laboratories or other departments. In fact, 375 sanatoriums have indicated that part or all of their laboratory work is referred to outside laboratories

Table 17 shows the laboratory facilities available in the tuberculosis sanatoriums. There is equipment for urinalysis in 378 institutions, for blood counts in 349,

Routine Laboratory Tests

| Control | Number of Sanatoriums | Routine Examinations | | | | Blood Sedimentation |
|-------------|-----------------------|----------------------|--------------|---------------------|-----------|---------------------|
| | | Urinalysis | Blood Counts | Sputum Examinations | Serologic | |
| Federal | 18 | 18 | 13 | 17 | 10 | 9 |
| State | 6 | 59 | 39 | 57 | 32 | 38 |
| County | 173 | 154 | 94 | 159 | 89 | 99 |
| City | 22 | 19 | 11 | 20 | 14 | 5 |
| City-county | 15 | 14 | 6 | 14 | 8 | 5 |
| Private | 178 | 131 | 92 | 188 | 43 | 50 |
| Totals | 471 | 395 | 255 | 405 | 195 | 177 |

for sputum examinations in 346, and for blood sedimentation tests in 278. Blood chemistry examinations can be carried out in 169, bacteriologic studies in 209, and basal metabolic ratings in 133. Seventy sanatoriums have facilities for tissue pathology. In eighty-nine institutions there is equipment for serologic tests, and 129 sanatoriums have laboratory animals for bacteriologic studies or research

In a number of sanatoriums there are certain laboratory tests which are considered sufficiently important to be classed as routine procedures. The table entitled "Routine Laboratory Tests" shows the number of institutions in which various laboratory tests are performed as a routine on admission. A urinalysis is routine in 395 sanatoriums, blood counts in 255, sputum examinations in 405, serologic studies in 195, and a blood sedimentation test in 177

Two hundred and seventy-eight sanatoriums report on the amount of laboratory work carried out during a period of twelve months. They admitted 56,033 patients and performed 1,523,953 laboratory examinations, a ratio of 27 examinations per patient. As shown in the next tabulation, the ratio of laboratory examinations to patients admitted is 36 1 in the federal

Ratio of Laboratory Examinations to Patients

| Control | Sanatoriums Reporting | Patients Admitted | Laboratory Examinations | Examinations per Patient |
|-------------|-----------------------|-------------------|-------------------------|--------------------------|
| Federal | 11 | 3,289 | 118,883 | 36 |
| State | 51 | 17,227 | 413,106 | 24 |
| County | 112 | 10,800 | 439,562 | 26 |
| City | 13 | 7,334 | 316,283 | 43 |
| City-county | 11 | 2,210 | 30,100 | 13 |
| Private | 80 | 9,104 | 205,004 | 23 |
| Totals | 278 | 56,033 | 1,523,953 | 27 |

sanatoriums, 24 1 in the state institutions, 26 1 in the county group, 43 1 in the municipally owned sanatoriums, 13 1 in the city-county institutions, and 23 1 in the sanatoriums under private control.

Professional supervision is lacking in most of the laboratory departments, except as it is furnished by the regular medical staff. Only eleven sanatoriums employ

greater, however, for there are many institutions that make no effort whatever to obtain permission for necropsy work. On the other hand, some of the more progressive sanatoriums exceed by far the minimum of 15 per cent that is required in institutions approved by the American Medical Association for educational residencies in tuberculosis.

In the tabulation are shown the number of sanatoriums that have necropsy facilities, the number of deaths and necropsies, and the percentage of necropsies in the various sanatorium classifications.

7 Heliotherapy—Facilities for heliotherapy are quite uniformly present in the sanatorium group. Most of the institutions have made convenient arrangements for sun therapy on porches, on roof solariums or in sun pens. As regards artificial heliotherapy, there is a considerable variation in equipment. Many of the larger sanatoriums, especially those which also conduct a preventorium service, have large and well equipped heliotherapy departments for treatment *en masse*. In others, portable lamps may suffice.

It appears that in the use of heliotherapy the tuberculosis institutions adhere fairly closely to the methods and indications now generally accepted. A few, however, employ heliotherapy as a routine procedure for practically all patients regardless of the type, stage or

Table 17—Laboratory Facilities in Tuberculosis Sanatoriums

| Control | Number of Sanatoriums | Urinalysis | Blood Counts | Sputum Examinations | Blood Sedimentations | Blood Chemistry | Bacteriology | Serology | Tissue Pathology | Laboratory Animals | Basal Metabolism | Refer Examinations |
|-------------|-----------------------|------------|--------------|---------------------|----------------------|-----------------|--------------|----------|------------------|--------------------|------------------|--------------------|
| Federal | 18 | 18 | 18 | 18 | 16 | 8 | 13 | 9 | 8 | 8 | 8 | 11 |
| State | 61 | 68 | 68 | 68 | 52 | 39 | 44 | 11 | 12 | 28 | 26 | 55 |
| County | 173 | 143 | 133 | 128 | 101 | 63 | 69 | 23 | 26 | 41 | 47 | 149 |
| City | 22 | 20 | 16 | 16 | 14 | 12 | 15 | 9 | 8 | 10 | 8 | 18 |
| City-county | 11 | 11 | 10 | 9 | 7 | 3 | 6 | 3 | 1 | 3 | 3 | 13 |
| Private | 178 | 123 | 114 | 117 | 83 | 44 | 62 | 32 | 15 | 39 | 41 | 129 |
| Totals | 471 | 378 | 349 | 346 | 278 | 169 | 299 | 89 | 70 | 129 | 133 | 370 |

resident pathologists, but consultants are available in eighty-five. Thirteen federal and 246 civilian sanatoriums have technical personnel for the laboratory department. Technicians are employed in fifty state, 100 county, eleven municipal, seven city and county, and seventy-eight private sanatoriums.

6 Necropsy Service—Necropsy performance in hospitals has come to be considered an indication of the scientific attitude of the medical staff. From an educational point of view the necropsy is indispensable. It serves to provide a sound foundation on which to build clinical knowledge and by correlation affords a better understanding of the various clinical manifestations of tuberculosis. Especially the younger members of the staff who are lacking in experience will benefit from repeated necropsies even though a certain uniformity of observations may occur. No postmortem examination, however routine in character, is devoid of educational value.

Of the 471 tuberculosis sanatoriums, 124 have facilities for necropsy work. During the annual period considered in this report there were 10,923 deaths reported and 1,869 necropsies, indicating an average necropsy rate of 17 per cent. The incidence of necropsy performance is relatively low in some of the sanatorium groups. In the federal sanatoriums the average necropsy rate is 25 per cent, in the state sanatoriums 11 per cent, in the county group 15 per cent, in the city institutions 37 per cent, in the city and county sanatoriums 10 per cent, and in those operated under private control 9 per cent. Individual variations are still

activity of the disease. Of the 602 institutions that replied to the questionnaire, 440 reported facilities for artificial heliotherapy and a total of 1,589,720 treatments, 1,114,709 for adults, 320,704 for children and 154,307 not classified.

Necropsies

| Control | Number of Sanatoriums | Necropsy Facilities | Deaths Reported | Necropsies Performed | Necropsy Percentage |
|-------------|-----------------------|---------------------|-----------------|----------------------|---------------------|
| Federal | 18 | 8 | 590 | 147 | 25 |
| State | 61 | 30 | 2,116 | 227 | 11 |
| County | 173 | 52 | 4,017 | 653 | 15 |
| City | 22 | 10 | 1,716 | 629 | 37 |
| City-county | 11 | 2 | 373 | 58 | 10 |
| Private | 178 | 22 | 1,911 | 173 | 9 |
| Totals* | 471 | 124 | 10,923 | 1,869 | 17 |

EDUCATIONAL ACTIVITIES IN TUBERCULOSIS INSTITUTIONS

The tuberculosis hospitals and sanatoriums have an important function to perform in the training of physicians, nurses and other personnel for institutional and community needs. At the same time the educational function helps to raise the standards of medical service throughout the tuberculosis field. Thus benefits will accrue to individual patients and to the communities at large.

1 Training of Physicians—As tuberculosis is not a limited specialty but one in which nearly every practitioner participates, it is important that all physicians receive a thorough basic training in tuberculosis.

Undergraduate instruction in tuberculosis is generally considered a responsibility of the medical schools, but the sanatoriums can be of service by contributing clinical and necropsy material for teaching purposes. Similarly, the training of interns is not a function of the sanatorium, since the fifth year in medicine should afford a general training in medicine, surgery, obstetrics and the specialties. Nevertheless sanatoriums can be

Sanatoriums and Hospitals Approved by the American Medical Association for the Training of Resident Physicians in Tuberculosis

| | |
|---|------------------------|
| Arroyo Sanatorium | Livermore Calif |
| Barlow Sanatorium | Los Angeles |
| *Los Angeles County Hospital | Los Angeles |
| Pottenger Sanatorium and Clinic | Monrovia Calif |
| *Santa Clara County Hospital | San Jose Calif |
| Union Printers Home and Tuberculosis Sanatorium | Colorado Springs Colo |
| National Jewish Hospital | Denver |
| Sanatorium of the Jewish Consumptives Relief Society | Spivak Colo |
| Meriden State Tuberculosis Sanatorium | Meriden Conn |
| *New Haven Hospital | New Haven Conn |
| Norwich State Tuberculosis Sanatorium (Uncas on Thames) | Norwich Conn |
| City of Chicago Municipal Tuberculosis Sanatorium | Chicago |
| Macon County Tuberculosis Hospital | Decatur Ill |
| Rockford Municipal Tuberculosis Sanatorium | Rockford Ill |
| Boehne Tuberculosis Hospital | Evansville Ind |
| Indiana State Sanatorium | Rockville Ind |
| Western Maine Sanatorium | Greenwood Mountain, Me |
| *Baltimore City Hospitals | Baltimore |
| Maryland Tuberculosis Sanatorium | State Sanatorium Md |
| Rutland State Sanatorium | Rutland Mass |
| Plymouth County Hospital | South Hanson Mass |
| Middlesex County Sanatorium | Waltham Mass |
| Belmont Hospital | Worcester Mass |
| *University Hospital | Ann Arbor Mich |
| American Legion Hospital | Battle Creek Mich |
| Herman Klefer Hospital | Detroit |
| Michigan State Sanatorium | Howell Mich |
| Jackson County Sanatorium | Jackson Mich |
| Morgan Heights Sanatorium | Marquette Mich |
| William H. Maybury Sanatorium | Northville Mich |
| Nopemling Sanatorium | Nopemling Mich |
| Glen Lake Sanatorium | Oak Terrace Minn |
| City Isolation Hospital | St Louis |
| Mount St. Rose Sanatorium | St Louis |
| Robert Koch Hospital | St Louis |
| New Jersey Sanatorium for Tuberculosis Diseases | Glen Gardner N J |
| *Medical Center of Jersey City | Jersey City N J |
| Hudson County Tuberculosis Hospital and Sanatorium | Secaucus N J |
| *Albany Hospital | Albany N Y |
| Montefiore Hospital Country Sanatorium | Bedford Hills, N Y |
| *Kings County Hospital | Brooklyn |
| Loomis Sanatorium | Loomis N Y |
| Metropolitan Life Insurance Company Sanatorium | Mount McGregor N Y |
| *Bellevue Hospital | New York City |
| *Lenox Hill Hospital | New York City |
| *Metropolitan Hospital | New York City |
| *Montefiore Hospital for Chronic Diseases | New York City |
| Municipal Sanatorium | Otisville N Y |
| New York State Hospital | Ray Brook N Y |
| Iola Monroe County Tuberculosis Sanatorium | Rochester N Y |
| Sea View Hospital | Staten Island N Y |
| Trudeau Sanatorium | Trudeau N Y |
| *Grasslands Hospital | Valhalla N Y |
| North Carolina Sanatorium | Sanatorium N C |
| *City Hospital | Cleveland |
| Ohio State Sanatorium | Mt. Vernon Ohio |
| Sunny Acres Cleveland Tuberculosis Sanatorium | Warrensville Ohio |
| Eagleville Sanatorium for Consumptives | Eagleville Pa |
| *Philadelphia General Hospital | Philadelphia |
| White Haven Sanatorium | White Haven Pa |
| Pine Breeze Sanatorium | Chattanooga Tenn |
| St. Joseph's Sanatorium | El Paso Texas |
| Hopemont Sanatorium | Hopemont W Va |
| Wisconsin State Sanatorium | Statesman Wis |

* Approved also for Interns

of interns. Incidentally, training opportunities in tuberculosis are offered by 159 approved intern hospitals that report the admission of tuberculous patients for temporary or continued treatment.

The tuberculosis hospitals and sanatoriums do have a definite responsibility, however, for postgraduate training in tuberculosis. This applies to short courses for general practitioners, to educational residencies in tuberculosis, and to advanced postgraduate courses.

Perhaps even more important than the training of undergraduates is the establishment of educational residencies in the tuberculosis institutions. A resident in tuberculosis is a physician who has completed his general internship and is continuing for a period of at least twelve months in a sanatorium or tuberculosis department in order to gain supervised experience in the specialty of tuberculosis. During his term of service, the resident should broaden his general knowledge of tuberculosis. He should learn diagnostic methods, the technic of therapeutic procedures and the routine management of a sanatorium service, including the details of rest treatment, the methods of graduated exercise and the management of ambulatory patients.

The diagnostic training involves accurate history taking, careful and systematic examinations, a correlation of physical observations with roentgen and fluoroscopic studies, and the exercise of medical judgment in diagnosis and subsequent therapy. Necropsy performance plays an important part in the diagnostic service, in that it correlates the anatomic and the clinical manifestations of tuberculosis.

Technical training is an essential part of the educational program. The resident should have an opportunity to study the various forms of collapse therapy and should become proficient in the technic of artificial pneumothorax, both initial administration and refills.

Ninety-three sanatoriums and forty-four tuberculosis departments report an educational service for resident physicians. There are twenty-five state, thirty-eight county, seven city, four city-county and nineteen private sanatoriums in this group. The list of the sanatoriums and hospitals approved by the American Medical Association for the training of resident physicians in tuberculosis includes fifteen hospitals (marked by an asterisk) that are also approved for interns.

While the present survey indicates that the training of undergraduates and residents is the most important educational function of the tuberculosis institutions, there are other tendencies coming into prominence which deserve recognition. With increasing frequency the sanatoriums are establishing short courses for the local medical profession, usually of only a few days' duration but of sufficient length to demonstrate the methods of sanatorium routine, diagnostic procedures and therapy. These meetings also serve to develop the interest of the medical profession in the sanatorium work and to give individual physicians a better understanding of the factors involved in the control of tuberculosis.

Similarly, many of the leading tuberculosis sanatoriums have established a close cooperation with the local county medical society, periodically assuming the responsibility for the program of the society meetings. In this way the sanatoriums acquaint the organized medical profession with the aims and functions of the institution and, through a presentation of interesting cases and roentgenograms, are able to demonstrate the accomplishments of a sanatorium service. It is hoped

of assistance in establishing affiliate services in tuberculosis, which adds considerably to the interns' training in medicine.

The replies to the questionnaire indicate that there are thirteen state, eighteen county, seven city, four city-county and ten private sanatoriums which provide facilities for the training of medical students. Twelve state, thirty county, six city, three city-county and twelve private sanatoriums participate in the training

that both the establishment of short courses and the cooperation with local medical societies will continue to develop as a means of general postgraduate training.

There are at present sixty-seven sanatoriums offering postgraduate training of some form. These include two federal, thirteen state, thirty-three county, four city, three city-county and twelve private institutions. The duration of the course is reported as two weeks or less in nine sanatoriums, from two to four weeks in four, and over four weeks in nineteen institutions. Thirty-five did not state the length of training. Two sanatoriums, the New York State Hospital, Ray Brook, and the Trudeau Sanatorium, Trudeau, N. Y., have been approved by the American Medical Association for postgraduate training in tuberculosis. The Trudeau School of Tuberculosis, established in 1916, has rendered noteworthy educational service to physicians engaged in sanatorium work and to other postgraduate students. The course, offered annually, is of from four to six weeks' duration and may be combined with additional study in Saranac Lake or in the chest service of Bellevue Hospital, New York City.

2 Training of Nurses in Tuberculosis—This report does not deal with the needs of nursing education, nor is it concerned with the actual methods of training, but aims chiefly to enumerate the educational opportunities for nurses in the tuberculosis field.

The training schools in tuberculosis institutions may offer (1) combined courses leading to state registration, (2) affiliate courses for nurses from other hospitals, (3) postgraduate training for graduates, (4) courses for practical nurses, and (5) short courses for attendants employed as nursing aids.

Eighteen sanatoriums have established nurses' training schools, the courses varying in length from one to three years.

Nurses Training Schools in Sanatoriums

From twelve to twenty four months

Maryland Tuberculosis Sanatorium
Maryland Tuberculosis Sanatorium
Hospital for Consumptives
Samuel and Nettie Bowne Memorial Hospital
Trudeau Sanatorium
Pennsylvania State Sanatorium for Tuberculosis No. 2
Hamburg State Sanatorium for Tuberculosis
Pennsylvania State Sanatorium for Tuberculosis
Eagleview Sanatorium for Consumptives
White Haven Sanatorium
State Tuberculosis Sanatorium
Piedmont Sanatorium
Catawba Sanatorium
Blue Ridge Sanatorium

Hedryton, Md
State Sanatorium Md
Towson, Md
Poughkeepsie N. Y.
Trudeau N. Y.

Cresson Pa
Hamburg Pa
South Mountain, Pa
Eagleview Pa
White Haven Pa
Sanatorium Texas
Burkeville Va
Catawba Va
Charlottesville Va

More than twenty four months

Rutland State Sanatorium
Essex Sanatorium
North Carolina Sanatorium
Davidson County Tuberculosis Hospital

Rutland Mass
Middleton Mass
Sanatorium N. C.
Nashville Tenn

Seven of the foregoing institutions supplement their training schedule by a general hospital affiliation.

Institutions That Supplement Training Schedule by a General Hospital Affiliation

Maryland Tuberculosis Sanatorium
Rutland State Sanatorium
Essex Sanatorium
Trudeau Sanatorium
North Carolina Sanatorium
White Haven Sanatorium
Davidson County Tuberculosis Hospital

State Sanatorium Md
Rutland Mass
Middleton Mass
Trudeau N. Y.
Sanatorium N. C.
White Haven Pa
Nashville Tenn

Sanatoriums Reporting Affiliate Courses for Nurses from Other Hospitals

| | | |
|--|-----------------------|--------|
| Hillcrest Sanatorium | La Crescenta Calif | 3 mos |
| Arroyo Sanatorium | Livermore Calif | 2 mos |
| Barlow Sanatorium | Los Angeles | 4 mos |
| National Methodist Episcopal Sanatorium | Colorado Springs Colo | |
| City of Chicago Municipal Tuberculosis Sanatorium | Chicago | 3 mos |
| Macon County Tuberculosis Sanatorium | Decatur Ill | 6 wks |
| Hillcrest | Quincy Ill | 6 wks |
| Broadlawn Polk County Public Hospital (Tuberculosis Department) | Des Moines | 2 mos |
| Hillcrest Sanatorium | Topeka Kan | 1 wk |
| Bangor Sanatorium | Bangor Me | |
| North Reading State Sanatorium | North Wilmington Mass | 3 mos |
| Sunshine Sanatorium | Grand Rapids Mich | 2 mos |
| Olen Lake Sanatorium | Oak Terrace Minn | 6 wks |
| Mississippi State Tuberculosis Sanatorium | Sanatorium, Miss | 6 mos |
| Allenwood Sanatorium and Monmouth County Hospital for Tuberculosis | Allenwood N. J. | 2 wks. |
| New Jersey Sanatorium for Tuberculosis Diseases | Glen Gardner N. J. | 6 wks |
| Lakeland Sanatorium | Grenloch N. J. | 3 mos |
| Suffolk Sanatorium | Holtsville N. Y. | 2 wks |
| Sea View Hospital | Staten Island N. Y. | 3 mos |
| Molly Stark Sanatorium | Canton, Ohio | 2 wks |
| Hamilton County Tuberculosis Sanatorium | Cincinnati | 1 mo |
| Tuberculosis League Hospital | Pittsburgh | 1 mo |
| White Haven Sanatorium | White Haven Pa | 6 mos |
| Piedmont Sanatorium | Burkeville Va | 8 mos |
| Catawba Sanatorium | Catawba Va | |
| Blue Ridge Sanatorium | Charlottesville Va | |
| Edgewood Sanatorium | Seattle | 1 mo |
| Mount View Sanatorium | Spokane | 2 mos |
| Muirdale Sanatorium | Wausau Wis | 2 mos |
| Wyoming Tuberculosis Sanatorium | Wauwatosa Wis | 3 mos |
| | Basin Wyo | 2 mos |

The graduate nurse finds limited educational opportunities in the tuberculosis field. According to the reports received there are only five sanatoriums that conduct postgraduate courses for nurses.

Sanatoriums Conducting Postgraduate Courses for Nurses

| | | |
|--|-----------------|-------|
| Arroyo Sanatorium | Livermore Calif | 2 mos |
| Barlow Sanatorium | Los Angeles | |
| Santa Clara County Sanatorium | San Jose Calif | 8 mos |
| Middlesex County Sanatorium | Waltham Mass | 6 mos |
| South Dakota State Sanatorium for Tuberculosis | Sanator S. D. | 6 mos |

Principal Tuberculosis Departments Conducting Nursing Schools

| | |
|---|-------------------------|
| St. Mary's Hospital and Sanatorium | Tucson Ariz |
| San Joaquin General Hospital | French Camp, Calif |
| Fresno County General Hospital | Fresno, Calif |
| San Bernardino County Charity Hospital (affiliate) | |
| San Francisco Hospital (postgraduate) | San Bernardino Calif |
| Glockner Sanatorium and Hospital | San Francisco |
| St. Francis Hospital and Sanatorium | Colorado Springs Colo |
| Mennonite Hospital and Sanatorium | Colorado Springs Colo |
| William Wirt Winchester Hospital (Department of New Haven Hospital) | La Junta Colo |
| Cook County Hospital | West Haven Conn |
| Shreveport Charity Hospital | Chicago |
| Burbank Hospital | Shreveport La |
| State Infirmary | Fitchburg Mass |
| University Hospital | Tewksbury Mass |
| Herman Kleber Hospital (affiliate) | Ann Arbor Mich |
| St. Luke's Hospital | Detroit |
| St. Mary's Hospital | Duluth, Minn |
| Fairview Hospital | Duluth Minn |
| Ancker Hospital | Minneapolis |
| City Isolation Hospital | St. Paul |
| Medical Center of Jersey City | St. Louis |
| St. Joseph Sanatorium and Hospital | Jersey City N. J. |
| St. Vincent's Sanatorium and Hospital | Albuquerque N. M. |
| Kings County Hospital | Santa Fe N. M. |
| Buffalo City Hospital | Brooklyn |
| Lenox Hill Hospital | Buffalo |
| Metropolitan Hospital | New York City |
| Grasslands Hospital | New York City |
| Jefferson Medical College Hospital | New York City |
| Philadelphia General Hospital | Valhalla N. Y. |
| Charles A. Chapin Hospital | Philadelphia |
| Salt Lake General Hospital (affiliate) | Philadelphia |
| Firland Sanatorium and Isolation Hospital | Providence R. I. |
| | Salt Lake City |
| | Richmond Highlands Wash |

Thirty-one sanatoriums report affiliate courses for nurses from other hospitals.

Aside from the sanatoriums there are 740 hospitals with tuberculosis departments of varying size. Nursing schools are conducted in 268 of these hospitals.

including the institutions listed in the accompanying tabulation, which represent some of the principal tuberculosis departments

3 Training of Patients—As long as the tuberculosis institutions continue the hospitalization of nontuberculous children, there will be need for general educational activities comparable to those of the public schools. Naturally, certain limitations will be imposed in accordance with the physical condition of the child, but the objectives of training will remain the same as when the child is at home

Schools for children are maintained in the preventoriums and in 159 tuberculosis sanatoriums. The teaching may be limited to certain grades or may extend through high school. In some institutions the teaching staff is employed privately, in others, by the local department of education. According to reports, there are schools for children in five federal, thirty-two state, eighty-one county, nine municipal and seven city-county sanatoriums, and in twenty-five sanatoriums under private management.

Of even greater importance is the educational service for adults including rehabilitation. The sanatoriums necessarily retain a certain responsibility in the postsanatorium management of patients, from both an economic and a medical point of view. Perhaps only a fourth of the patients discharged are able to return to a normal life, many are permanently incapacitated, and others, although able to work, must limit their activities for many years.

Economically, it is of advantage to reeducate the latter group to a life of economic independence. First of all, these patients must be taught to respect the limits of their physical tolerance, secondly, they must be instructed in occupations that will not tax them beyond their endurance, and, thirdly, they must be assisted financially, if necessary, to live a normal life and avoid a reactivation of the disease. Efforts made to eliminate the need of further hospitalization are well worth while when one considers the cost of prolonged sanatorium care.

While many institutions favor the employment of graduated exercise to insure a complete physical recovery, there are others which lack the necessary housing facilities and funds to carry out such a plan. In some, the pressure of a waiting list may prevent hospitalization after the stage of "quiescence" has been reached, and in others, in which definite limitations have been placed on the hospital service, the patients may be discharged even earlier.

Two hundred and forty-one sanatoriums reported on the use of graduated exercise. Two required half an hour of exercise before discharge, nineteen one hour, fifty-four two hours, eighty-six from three to six hours, and nine from six to eight hours. Eight sanatoriums expressed their exercise requirements in terms of from one to three months, and three required exercise over a period of from four to six months. In eleven sanatoriums daily walks up to three miles were required, while in seven the exercise was extended from three to eight miles. Thirty-nine other sanatoriums that indicated the use of graduated exercise failed to state the amount.

The exercise program is combined with educational activities in many institutions. There are forty-five sanatoriums conducting schools for adults, 141 offer various forms of occupational therapy, and fifty-three have industrial rehabilitation courses. The extent to which these facilities are provided by the various

classes of sanatoriums is shown in the accompanying tabulation.

Two sanatoriums have been established primarily for rehabilitation, and there are others which combine a

Educational Facilities for Patients

| Sanatoriums | Schools for Adults | Occupational Therapy Departments | Industrial Rehabilitation |
|---------------|--------------------|----------------------------------|---------------------------|
| Federal | 3 | 12 | 1 |
| State | 6 | 20 | 8 |
| County | 23 | 61 | 26 |
| City | 5 | 10 | 4 |
| City-county | 2 | 2 | 2 |
| Private | 6 | 26 | 12 |
| Totals | 45 | 141 | 53 |

convalescent colony with the regular sanatorium service. On the whole, however, there are relatively few sanatoriums offering vocational training—far too few to cope successfully with the problem of postsanatorium care. The sanatoriums in the accompanying list, which report facilities for industrial rehabilitation, may differ widely in their methods and scope of training.

Sanatoriums Reporting Facilities for Industrial Rehabilitation

| | |
|---|----------------------|
| Wish Lah Sanatorium | Auberry Calif. |
| Humboldt County School for the Tuberculous | Eureka Calif. |
| Stony Brook Retreat | Keene Calif. |
| Hillcrest Sanatorium | La Crescenta Calif. |
| Arroyo Sanatorium | Livermore Calif. |
| Bret Hart Sanatorium | Murphy Calif. |
| Oliver View Sanatorium | Oliver View, Calif. |
| Independent Order of Foresters California Tuberculosis Sanatorium | Pacifica Calif. |
| Harrier Health Home | Redwood City Calif. |
| Santa Clara County Sanatorium | San Jose Calif. |
| Welman Jara Sanatorium | Welman Calif. |
| L. J. Patients Tubercular Home | Denver |
| National Jewish Hospital | Denver |
| Sanatorium of the Jewish Consumptives Relief Society | Sprink Colo |
| City of Chicago Municipal Tuberculosis Sanatorium | Chicago |
| Rockford Municipal Tuberculosis Sanatorium | Rockford Ill. |
| Lake County Tuberculosis Sanatorium | Crown Point Ind. |
| Sunnyside Sanatorium | Oakland Ind. |
| State Sanatorium for Tuberculosis | Oakdale Ia. |
| Central New England Sanatorium | Rutland Mass. |
| Middlesex County Sanatorium | Waltham Mass. |
| Calhoun County Public Hospital | Battle Creek Mich. |
| Michigan State Sanatorium | Howell, Mich. |
| Jackson County Sanatorium | Jackson Mich. |
| Ingham Sanatorium | Lansing Mich. |
| Morgan Heights Sanatorium | Marquette Mich. |
| East Lawn Sanatorium | Northville Mich. |
| Pine Crest Sanatorium | Powers Mich. |
| Minnesota State Sanatorium | Ah-Gwah-Ching Minn. |
| Nopeming Sanatorium | Nopeming Minn. |
| Glen Lake Sanatorium | Oak Terrace Minn. |
| Pokegama Sanatorium | Pokegama Minn. |
| Robert Koch Hospital | St. Louis |
| Pembroke Sanatorium | Pembroke N. H. |
| New Jersey Sanatorium for Tuberculosis Diseases | Clon Gardner N. J. |
| Valley View Sanatorium | Paterson N. J. |
| Essex Mountain Sanatorium | Verona N. J. |
| U. S. Marine Hospital | Ft. Stanton N. M. |
| Potts Memorial Hospital | Livingston N. Y. |
| Municipal Sanatorium | Otisville N. Y. |
| Sea View Hospital | Staten Island, N. Y. |
| Hamilton County Tuberculosis Sanatorium | Cincinnati |
| Oregon State Tuberculosis Hospital | Salem Ore. |
| White Haven Sanatorium | White Haven Pa. |
| Pinhaven Sanatorium | Navy Yard S. C. |
| Mount Washington Sanatorium | Eau Claire Wis. |
| Lake Tomahawk State Camp | Lake Tomahawk, Wis. |
| Lakeview Sanatorium | Madison Wis. |
| Morningside Sanatorium | Madison Wis. |
| Oak Sanatorium | Pewaukee Wis. |
| Wisconsin State Sanatorium | Stevens Wis. |
| Mulriddle Sanatorium | Wauwatosa Wis. |
| Wyoming Tuberculosis Sanatorium | Basin Wyo. |

This list indicates that some effort is being made toward vocational rehabilitation in nineteen states, although in some only one or a few sanatoriums participate. Five of these states report an organized rehabilitation service under the direction of the state bureau of vocational education or corresponding agency. Reports from departments of health indicate that in

eight other states vocational guidance is being attempted on a smaller scale by departments of education, local tuberculosis associations, and other organizations.

In a well balanced sanatorium service there must be proper emphasis on prevention, therapy and rehabilitation. Apparently the latter has failed to keep step with the other phases of tuberculosis control.

Another feature of the educational service in tuberculosis sanatoriums is the personal instruction given

employed in seventy-eight civilian sanatoriums, and social service workers in fifty-nine. Their work is supplemented, however, in various localities by the field activities of the departments of health.

MEDICAL RESEARCH

Medical research is a commendable feature of the sanatorium service. It stimulates educational activities, develops new methods of diagnosis and therapy, aids

Table 18—Medical Records in Tuberculosis Sanatoriums

| Control | Number of Sanatoriums | Record Departments | Statistical Reports | Record Clerks | Medical History | Social History | Physical Examination | Reexamination Data | Progress Notes | Laboratory Reports | X Ray Reports | Pneumothorax Record | Heliotherapy Record | Exercise Record | Operative Reports | Weight Record | Nurses' Notes | Temperature and Pulse Records |
|-------------|-----------------------|--------------------|---------------------|---------------|-----------------|----------------|----------------------|--------------------|----------------|--------------------|---------------|---------------------|---------------------|-----------------|-------------------|---------------|---------------|-------------------------------|
| Federal | 18 | 16 | 17 | 11 | 18 | 13 | 18 | 18 | 18 | 18 | 18 | 16 | 15 | 11 | 16 | 18 | 16 | 18 |
| State | 62 | 53 | 50 | 44 | 60 | 56 | 60 | 60 | 59 | 59 | 59 | 56 | 44 | 38 | 50 | 58 | 55 | 60 |
| County | 173 | 140 | 120 | 97 | 158 | 148 | 160 | 157 | 145 | 150 | 156 | 150 | 123 | 103 | 121 | 157 | 146 | 161 |
| City | 28 | 10 | 16 | 16 | 20 | 17 | 21 | 20 | 19 | 21 | 20 | 16 | 16 | 11 | 18 | 18 | 18 | 21 |
| City-county | 15 | 13 | 11 | 6 | 13 | 12 | 13 | 18 | 13 | 13 | 13 | 13 | 10 | 9 | 12 | 12 | 13 | 13 |
| Private | 178 | 182 | 93 | 77 | 140 | 120 | 143 | 140 | 136 | 140 | 136 | 134 | 92 | 84 | 105 | 142 | 133 | 160 |
| Totals | 471 | 387 | 323 | 250 | 409 | 360 | 415 | 408 | 390 | 410 | 402 | 335 | 300 | 250 | 322 | 403 | 353 | 433 |

patients on the general principles of tuberculosis therapy and prevention. From the reports it appears that 207 sanatoriums conduct group instruction for patients, and in 238 institutions the medical staff

Tuberculosis Sanatoriums Reporting Research Departments

| | |
|--|-----------------------|
| Pamsetgaaf Sanatorium | Prescott Ariz |
| Hill Crest Sanatorium | La Crescenta Calif |
| Arroyo Sanatorium | Livermore Calif |
| Barlow Sanatorium | Los Angeles |
| Pottenger Sanatorium and Clinic | Monrovia, Calif |
| Olivia View Sanatorium | Olivia View Calif |
| Veterans Administration Facility | San Fernando Calif |
| Cragmor Sanatorium | Colorado Springs Colo |
| National Jewish Hospital | Denver |
| Norwich State Tuberculosis Sanatorium | Norwich Conn |
| Laurel Heights State Tuberculosis Sanatorium | Shelton Conn |
| The Seaside | Watford Conn |
| City of Chicago Municipal Tuberculosis Sanatorium | Chicago |
| Macon County Tuberculosis Sanatorium | Decatur Ill |
| Boehne Tuberculosis Hospital | Evansville Ind |
| Bangor Sanatorium | Bangor Me |
| Central Maine Sanatorium | Fairfield Me |
| Rutland State Sanatorium | Rutland Mass |
| Veterans Administration Facility | Rutland Heights Mass |
| William H. Maybury Sanatorium | Northville Mich |
| Pine Crest Sanatorium | Oshkosh Mich |
| Oken Lake Sanatorium | Oak Terrace Minn |
| Jasper County Tuberculosis Hospital | Webb City Mo |
| Lakeland Sanatorium | Glenloch, N J |
| Hudson County Tuberculosis Hospital and Sanatorium | Secaucus N J |
| Valmora Sanatorium | Valmora N J |
| Potts Memorial Hospital | Livingston N Y |
| Loomis Sanatorium | Loomis N Y |
| Seton Hospital | New York City |
| J. N. Adam Memorial Hospital | Perryburg N Y |
| Summit Park Sanatorium | Pomona N Y |
| New York State Hospital | Ray Brook, N Y |
| National Variety Artists Lodge | Saratoga Lake N Y |
| Sea View Hospital | Statens Island N Y |
| Trudeau Sanatorium | Trudeau, N Y |
| Veterans Administration Facility | Oteen N C |
| Edwin Shaw Sanatorium | Akron Ohio |
| Hamilton County Tuberculosis Sanatorium | Cincinnati |
| Rocky Glen Sanatorium | McConnelsville Ohio |
| Licking County Tuberculosis Sanatorium | Newark Ohio |
| Eagleview Sanatorium for Consumptives | Eagleview Pa |
| Tuberculosis League Hospital | Pittsburgh |
| Rhode Island State Sanatorium | Wallum Lake R I |
| Davidson County Tuberculosis Hospital | Nashville Tenn |
| Blue Ridge Sanatorium | Charlottesville Va |
| Hopewell Sanatorium | Hopewell Va |
| Lake View Sanatorium | Madison Wis |
| Morningside Sanatorium | Madison Wis |
| Muirdale Sanatorium | Wauwatosa Wis |

in maintaining high standards of medical service and, in general, contributes toward the progress of medicine. In the tuberculosis sanatoriums, research takes the form of clinical investigative work or experimental laboratory studies allied to, or independent of, the clinical activities. Only a few institutions have special departments and personnel for research, but in some of the sanatoriums the regular medical staff undertakes research problems of a clinical nature. Research activities are reported in the forty-nine sanatoriums listed in the accompanying tabulation, of which three are federal, nine state, fifteen county, four city institutions, and eighteen privately owned. In this connection it should be mentioned that the Committee on Medical Research of the National Tuberculosis Association, through annual financial grants, helps to extend and coordinate research in tuberculosis.

MEDICAL LIBRARY FACILITIES

The need of medical library facilities in the tuberculosis institutions is generally recognized. The medical staff, in order to function efficiently, must have ready access to text and reference books on tuberculosis as well as on other specialties of medicine and surgery. It is perhaps of even greater importance that medical journals be available, since the new developments in medicine are usually recorded in medical periodicals long before they appear in book form. A medical library is particularly essential in institutions undertaking the training of young physicians and has been made a requirement for residency approval in tuberculosis. Many tuberculosis institutions make provision in the annual budget for the purchase of books and medical journals. Others, however, depend largely on the private collections of books and journals supplied by the superintendent and other members of the staff. Medical libraries have been established in fifteen federal, forty-four state, seventy-five county, ten municipal, five city-county and sixty-four private sanatoriums.

RECORDS

On the whole, the tuberculosis institutions observe closely the general principles involved in the preparation of administrative, statistical and clinical records, but there are many variations in the methods and forms employed and in the completeness of the data recorded.

participates in educational courses for the public at large. One should also consider the educational service of the sanatorium field nurse and the social service worker. When properly organized under medical supervision, the field service becomes a distinct asset to an institution and the community. Field nurses are

Table 19—Replacement Valuation of Tuberculosis Institutions

| State | Estimated Valuation | | | | | | | | | | Total Valuation | |
|----------------|---------------------|----------|-----------------|------|-------|---------------|----------|-------|------|-------|-----------------|------------------|
| | Sanatoriums | | | | | Preventoriums | | | | | Number of Beds | Total |
| | Number | Reopened | Value | Rep. | Value | Number | Reopened | Value | Rep. | Value | | |
| Alabama | 3 | 167 | \$ 493,000.00 | | | | | | | | 462 | \$ 1,092,565.67 |
| Arizona | 11 | 392 | 820,000.00 | | | | | | | | 1,518 | 2,059,913.73 |
| Arkansas | 2 | 560 | 820,840.28 | | | | | | | | 1,034 | 1,034,478.49 |
| California | 30 | 3,723 | 7,127,710.07 | | | | | | | | 7,889 | 18,684,694.63 |
| Colorado | 17 | 1,743 | 9,657,887.84 | | | | | | | | 2,001 | 10,692,064.29 |
| Connecticut | 7 | 1,676 | 4,060,868.16 | | | | | | | | 1,015 | 6,511,717.07 |
| Delaware | 2 | 161 | 355,973.83 | | | | | | | | 183 | 44,164.00 |
| Dist. Columbia | 2 | 370 | 1,125,000.00 | | | | | | | | 668 | 2,647,600.13 |
| Florida | 1 | 66 | 2,000,000.00 | | | | | | | | 330 | 3,357,830.20 |
| Georgia | 5 | 645 | 636,243.60 | | | | | | | | 1,235 | 642,694.51 |
| Idaho | 1 | 132 | 322,201.88 | | | | | | | | 504 | 18,016,110.27 |
| Illinois | 23 | 2,797 | 7,856,007.50 | | | | | | | | 1,680 | 8,010,432.42 |
| Indiana | 1 | 357 | 4,068,592.83 | | | | | | | | 981 | 3,040,173.87 |
| Iowa | 6 | 774 | 2,240,010.26 | | | | | | | | 789 | 789,663.62 |
| Kansas | 2 | 328 | 807,820.12 | | | | | | | | 571 | 2,250,812.69 |
| Kentucky | 3 | 574 | 2,066,076.71 | | | | | | | | 1,003 | 4,297,615.30 |
| Louisiana | 3 | 326 | 620,631.01 | | | | | | | | 1,043 | 3,413,143.61 |
| Maine | 4 | 452 | 1,030,676.83 | | | | | | | | 578 | 1,939,241.38 |
| Maryland | 1 | 1,360 | 3,548,483.00 | | | | | | | | 1,000 | 4,811,246.40 |
| Massachusetts | 22 | 3,501 | 13,066,282.09 | | | | | | | | 6,360 | 19,069,201.56 |
| Michigan | 21 | 3,803 | 10,569,102.36 | | | | | | | | 4,901 | 18,065,158.94 |
| Minnesota | 14 | 1,883 | 6,781,633.70 | | | | | | | | 2,885 | 10,567,768.58 |
| Mississippi | 2 | 827 | 2,080,000.00 | | | | | | | | 772 | 3,014,507.67 |
| Missouri | 6 | 1,944 | 3,216,026.00 | | | | | | | | 2,600 | 0,356,180.68 |
| Montana | 1 | 150 | 277,818.00 | | | | | | | | 290 | 687,392.57 |
| Nebraska | 1 | 160 | 400,000.00 | | | | | | | | 307 | 660,201.31 |
| Nevada | 2 | 210 | 650,000.00 | | | | | | | | 18 | 68,657.71 |
| New Hampshire | 2 | 2,411 | 14,690,424.04 | | | | | | | | 270 | 1,026,894.34 |
| New Jersey | 14 | 750 | 1,833,126.23 | | | | | | | | 3,300 | 18,612,068.77 |
| New Mexico | 7 | 859 | 89,961,462.51 | | | | | | | | 1,633 | 4,700,828.29 |
| New York | 51 | 8,859 | 89,961,462.51 | | | | | | | | 14,583 | 63,290,844.89 |
| North Carolina | 14 | 2,042 | 4,086,808.46 | | | | | | | | 2,031 | 0,002,067.65 |
| North Dakota | 1 | 235 | 620,000.00 | | | | | | | | 341 | 887,487.63 |
| Ohio | 19 | 3,148 | 12,101,702.88 | | | | | | | | 4,670 | 17,784,554.95 |
| Oklahoma | 6 | 888 | 2,277,463.35 | | | | | | | | 1,040 | 2,943,384.13 |
| Oregon | 3 | 474 | 687,446.02 | | | | | | | | 623 | 25,719,739.59 |
| Pennsylvania | 16 | 4,140 | 17,265,192.53 | | | | | | | | 6,293 | 1,150,840.00 |
| Rhode Island | 2 | 495 | 900,000.00 | | | | | | | | 297 | 1,150,840.00 |
| South Carolina | 6 | 539 | 684,704.81 | | | | | | | | 1,572 | 3,893,693.17 |
| South Dakota | 1 | 192 | 750,000.00 | | | | | | | | 280 | 8,010,768.77 |
| Tennessee | 7 | 1,124 | 2,246,000.00 | | | | | | | | 1,110 | 2,371,647.11 |
| Texas | 16 | 1,890 | 4,386,717.13 | | | | | | | | 63 | 8,237,947.56 |
| Utah | | | | | | | | | | | | 322,647.07 |
| Vermont | 2 | 127 | 650,000.00 | | | | | | | | 171 | 730,000.00 |
| Virginia | 7 | 1,123 | 2,773,047.55 | | | | | | | | 1,495 | 3,733,621.10 |
| Washington | 7 | 421 | 676,531.08 | | | | | | | | 1,471 | 4,034,446.65 |
| West Virginia | 7 | 772 | 2,064,500.00 | | | | | | | | 2,068 | 2,068,502.41 |
| Wisconsin | 18 | 1,706 | 5,860,800.15 | | | | | | | | 2,407 | 8,237,947.56 |
| Wyoming | 1 | 33 | 200,583.93 | | | | | | | | 63 | 322,647.07 |
| Totals | 413 | 60,268 | \$50,930,494.01 | | | | | | | | 65,108 | \$888,937,777.30 |

Table 20—Valuation of Sanatoriums According to Size and Control

| Control | Less Than 25 Beds | | | | | | | | | | 100 Beds and Over | | | | | | | | | |
|---------|----------------------|---------------------------|--------------------|----------------------|---------------------------|--------------------|----------------------|---------------------------|--------------------|----------------------|---------------------------|--------------------|----------------------|---------------------------|--------------------|----------------------|---------------------------|--------------------|----------------------|---------------------------|
| | 25-40 Beds | | | | | 50-99 Beds | | | | | 100 Beds and Over | | | | | Total Sanatoriums | | | | |
| | No. of Beds Reported | Average Valuation per Bed | Valuation Reported | No. of Beds Reported | Average Valuation per Bed | Valuation Reported | No. of Beds Reported | Average Valuation per Bed | Valuation Reported | No. of Beds Reported | Average Valuation per Bed | Valuation Reported | No. of Beds Reported | Average Valuation per Bed | Valuation Reported | No. of Beds Reported | Average Valuation per Bed | Valuation Reported | No. of Beds Reported | Average Valuation per Bed |
| Federal | 196 | \$ 1,710.20 | \$ 336,292.78 | 120 | \$ 733.33 | \$ 88,000.00 | 311 | \$ 431,000.18 | \$ 134,000.00 | 2,540 | \$ 3,570.25 | \$ 9,080,000.00 | 1,471 | \$ 2,000.84 | \$ 2,944,000.00 | 2,001 | \$ 1,000.00 | \$ 2,001,000.00 | 2,001 | \$ 1,000.00 |
| County | 176 | \$ 1,543.35 | \$ 271,000.00 | 164 | \$ 830,292.74 | \$ 134,000.00 | 311 | \$ 431,000.18 | \$ 134,000.00 | 2,540 | \$ 3,570.25 | \$ 9,080,000.00 | 1,471 | \$ 2,000.84 | \$ 2,944,000.00 | 2,001 | \$ 1,000.00 | \$ 2,001,000.00 | 2,001 | \$ 1,000.00 |
| City | 24 | \$ 1,588.41 | \$ 38,000.00 | 25 | \$ 80,000.00 | \$ 2,000.00 | 242 | \$ 500,401.01 | \$ 122,000.00 | 392 | \$ 1,480,312.26 | \$ 580,000.00 | 461 | \$ 1,710,000.00 | \$ 788,000.00 | 10 | \$ 100.00 | \$ 1,000.00 | 10 | \$ 100.00 |
| Private | 843 | \$ 1,020.83 | \$ 860,800.00 | 1,231 | \$ 1,133,890.90 | \$ 1,393,411.23 | 3,260 | \$ 7,841,325.87 | \$ 25,500,000.00 | 3,260 | \$ 7,841,325.87 | \$ 25,500,000.00 | 3,260 | \$ 7,841,325.87 | \$ 25,500,000.00 | 3,260 | \$ 7,841,325.87 | \$ 25,500,000.00 | 3,260 | \$ 7,841,325.87 |
| Totals | 813 | \$ 1,588.41 | \$ 1,020,802.76 | 2,018 | \$ 3,502,496.02 | \$ 2,798,393.00 | 7,096 | \$ 21,638,104.01 | \$ 62,748.43 | 18,017 | \$ 15,803,783.06 | \$ 284,930,978.80 | 11,162 | \$ 2,312,061.00 | \$ 26,042,883.05 | 65,108 | \$ 850,042,883.05 | \$ 55,937,777.30 | 65,108 | \$ 850,042,883.05 |

An analysis of the reports of the tuberculosis sanatoriums, as shown in table 18, indicates that 387 institutions have record departments, 250 employ special record personnel, and 325 prepare periodic administrative and statistical reports. The clinical records include a medical history in 409 sanatoriums, a social history in 360, a record of the physical examination in 415, reexamination data in 408, progress notes in 390, laboratory reports in 410, x-ray reports in 402, and a pneumothorax record in 385. Heliotherapy records are included in 300 sanatoriums, exercise charts in 256, operative reports in 322, weight charts in 405, nurses' notes in 383, and temperature and pulse charts in 433.

From the inspection reports it was ascertained that the clinical records are fairly complete in 370 institutions, definitely incomplete in fifty-seven, and entirely lacking in forty-four except for nurses' notes and temperature and pulse charts. The present survey indicates that in approximately one fifth of the sanatoriums the clinical and statistical records are inadequate and in many instances entirely lacking.

The lack of uniformity in records is partly due to the fact that many institutions do not have standard record forms but use charts that have been prepared or modified to suit individual needs. In the future, the new and complete record forms devised by the Committee on Record Standardization of the American Sanatorium Association will serve to establish uniform clinical records and comparable statistical data.

There is still some confusion in the methods of classification of patients, although the majority of institutions follow the system advocated by the National Tuberculosis Association and the American Sanatorium Association. In some sanatoriums the statistical data are difficult to interpret because both adults and children are classified together according to types of disease. Since both adults and children are subject to the same forms and types of tuberculosis, there should be little difficulty in classifying them separately, somewhat in the following manner:

| Diagnosis | Adults | Children | Total |
|------------------------|--------|----------|-------|
| Pulmonary tuberculosis | | | |
| Minimal | | | |
| Moderately advanced | | | |
| Far advanced | | | |
| Childhood tuberculosis | | | |
| Other forms | | | |
| Miliary | | | |
| Meningeal | | | |
| Glandular | | | |
| Bone and joint | | | |
| Etc | | | |
| Non-tuberculous | | | |
| Unclassified | | | |

COST OF TUBERCULOSIS HOSPITALIZATION

1 *Valuation of Tuberculosis Institutions*—The replacement value of buildings, equipment and land is shown in table 19. In all, 501 tuberculosis institutions representing 71,260 beds, or 74.8 per cent of the total capacity, reported a valuation of \$241,984,951.41. This would indicate that the sanatoriums, tuberculosis departments and preventoriums in the United States represent a sum of approximately \$328,937,777.36. The sanatoriums alone listed \$200,950,434.61 as the value of 60,258 beds, an average of \$3,334.83 per bed. By adding the cost of 4,739 additional beds the total estimated cost is \$216,754,217.67, a sum similar to the 1931 estimate of the National Tuberculosis Association. The data from the tuberculosis departments were not complete because many of the hospitals had difficulty in separating their financial reports by services. However, \$40,000,751.80 was reported as the value of 10,487 beds, or \$3,814.31 per bed. On this basis it is

estimated that the 28,534 beds in the tuberculosis departments have a value of \$108,837,730.69. Twelve preventoriums with a capacity of 515 beds indicated a cost of \$1,033,765 or \$2,007 per bed. Accordingly, the sum of \$3,345,829 represents the valuation of the twenty-nine preventoriums that are operated as independent institutions.

An analysis was made of the sanatorium group to illustrate replacement costs on the basis of size and according to institutional control. This shows that the sanatoriums of less than twenty-five beds average \$1,988 per bed, those of 25 to 49 beds \$2,298, the institutions of from fifty to ninety-nine beds average \$2,745, and the sanatoriums of 100 beds or over represent a valuation of \$3,498 per bed.

The Veterans hospitals operated principally for the treatment of tuberculosis average approximately \$4,000 per bed. The sanatoriums of the Indian Administration average \$2,331, the state and local public sanatoriums are valued at \$3,423 per bed, and the sanatoriums under private control represent a cost of \$3,070 per bed. Some of the sanatoriums built within the last few years show a relatively high cost of construction, averaging around \$10,000 per bed. The highest cost, \$13,043 per bed, was reported by a non-federal public sanatorium.

2 *Annual Maintenance Cost*—Tuberculosis as an economic problem is of major significance, for the cost of tuberculosis hospitalization in the United States exceeds seventy million dollars a year. Five hundred and eight tuberculosis institutions, representing 73,089 beds, or 76.7 per cent of the total capacity, reported an annual maintenance cost of \$55,234,882.25 exclusive of capital additions. On the basis of bed capacity, therefore, the maintenance cost would equal approximately \$75,906,582.41 a year. In 410 sanatoriums with a capacity of 60,701 beds the annual maintenance cost was \$42,822,213.06. This would indicate an expenditure of \$45,852,869.22 for the entire group. Similarly it is estimated that the tuberculosis departments expend \$29,311,492.05 annually and the preventoriums \$742,221.14.

By computing the annual maintenance on the basis of the average daily per capita costs, results are obtained that substantiate these figures. Five hundred and ninety-two institutions reported a daily average of 69,042 patients, or 25,193,760 treatment days. In 563 other tuberculosis hospitals a day's census of patients was 12,910, which on an annual basis would equal 4,712,150 hospital days. Accordingly, at the average rate of \$2.44 per patient daily, the cost of 29,905,910 treatment days amounts to \$72,970,420.40. Furthermore, the same 1,155 institutions had 81,652 patients present on the day of reporting, and this number considered as a daily average would represent 29,802,980 treatment days and an annual maintenance cost of \$72,719,271.20.

Operating expenditures exclusive of capital additions are presented by states in table 21.

3 *Daily Per Capita Costs*—Reports from 410 sanatoriums, eighty-nine tuberculosis departments and fifteen preventoriums show that the tuberculosis institutions operate on an average daily per capita cost of \$2.44. The sanatoriums average \$2.37 daily, the tuberculosis departments \$2.95, and the preventoriums \$1.39. Federal hospitals for the treatment of tuberculosis have an average daily per capita cost of \$3.20. In this group the Veterans Bureau hospitals average \$3.98, the hospitals of the Indian Administration

Table 21—Annual Maintenance Cost of Tuberculosis Institutions
(Exclusive of Capital Additions)

| State | Reported Maintenance Cost | | | | | | | | | | Estimated Maintenance Cost | | | | Total Maintenance Cost | | | | |
|----------------------|---------------------------|---------------|-----------------|------------------|---------------|-----------------|------------------|---------------|---------------|------------------|----------------------------|----------------|------------------|-----------------|------------------------|----------------------------------|-----------------|--------|-----------------|
| | Sanatoriums | | | | | Departments | | | | | Sanatoriums | | Departments | | Preventoriums | Total Estimated Maintenance Cost | | | |
| | Number Reporting | Beds Reported | Cost Reported | Number Reporting | Beds Reported | Cost Reported | Number Reporting | Beds Reported | Cost Reported | Number Reporting | Beds Reported | Cost Reported | Number Reporting | Beds Reported | Cost Reported | Number of Beds | | | |
| Alabama | 4 | 242 | \$ 112,833.63 | 2 | 323 | \$ 483,871.66 | 1 | 13 | \$ 3,084.76 | 2 | 14 | \$ 100.20 | 106 | 201 | \$ 341.00 | 402 | | | |
| Arizona | 14 | 533 | 324,150.17 | 10 | 1,702 | 1,733,550.62 | 3 | 110 | 39,550.57 | 373 | 388 | 300.00 | 129 | 137 | 616.23 | 1,518 | | | |
| Arkansas | 2 | 503 | 2,100,000.00 | 10 | 1,702 | 1,733,550.62 | 3 | 110 | 39,550.57 | 373 | 388 | 300.00 | 129 | 137 | 616.23 | 1,518 | | | |
| California | 25 | 3,425 | 2,429,755.54 | 4 | 734 | 1,041,247.88 | 2 | 82 | 161,884.24 | 214 | 210 | 831.00 | 103 | 103 | 450.00 | 780 | | | |
| Colorado | 16 | 1,663 | 1,100,131.51 | 2 | 82 | 161,884.24 | 2 | 82 | 161,884.24 | 214 | 210 | 831.00 | 103 | 103 | 450.00 | 780 | | | |
| Connecticut | 7 | 1,675 | 1,611,573.81 | 2 | 82 | 161,884.24 | 2 | 82 | 161,884.24 | 214 | 210 | 831.00 | 103 | 103 | 450.00 | 780 | | | |
| Delaware | 2 | 101 | 147,000.00 | 1 | 100 | 40,210.00 | 1 | 100 | 40,210.00 | 106 | 201 | 341.00 | 106 | 201 | 341.00 | 183 | | | |
| District of Columbia | 2 | 370 | 79,000.00 | 1 | 100 | 40,210.00 | 1 | 100 | 40,210.00 | 106 | 201 | 341.00 | 106 | 201 | 341.00 | 183 | | | |
| Florida | 1 | 66 | 39,573.00 | 2 | 69 | 31,254.95 | 1 | 13 | 3,084.76 | 129 | 137 | 616.23 | 129 | 137 | 616.23 | 680 | | | |
| Georgia | 5 | 646 | 326,277.66 | 1 | 24 | 26,444.20 | 1 | 24 | 26,444.20 | 61 | 61 | 63.00 | 61 | 61 | 63.00 | 380 | | | |
| Idaho | 1 | 132 | 73,300.00 | 1 | 24 | 26,444.20 | 1 | 24 | 26,444.20 | 61 | 61 | 63.00 | 61 | 61 | 63.00 | 380 | | | |
| Illinois | 2 | 3,467 | 2,504,625.48 | 2 | 82 | 161,884.24 | 2 | 82 | 161,884.24 | 214 | 210 | 831.00 | 103 | 103 | 450.00 | 780 | | | |
| Indiana | 8 | 1,307 | 741,306.62 | 2 | 82 | 161,884.24 | 2 | 82 | 161,884.24 | 214 | 210 | 831.00 | 103 | 103 | 450.00 | 780 | | | |
| Iowa | 0 | 714 | 6,541,066.27 | 1 | 100 | 40,210.00 | 1 | 100 | 40,210.00 | 106 | 201 | 341.00 | 106 | 201 | 341.00 | 183 | | | |
| Kansas | 3 | 388 | 293,217.88 | 1 | 100 | 40,210.00 | 1 | 100 | 40,210.00 | 106 | 201 | 341.00 | 106 | 201 | 341.00 | 183 | | | |
| Kentucky | 3 | 674 | 631,910.82 | 1 | 100 | 40,210.00 | 1 | 100 | 40,210.00 | 106 | 201 | 341.00 | 106 | 201 | 341.00 | 183 | | | |
| Louisiana | 3 | 328 | 116,877.57 | 1 | 100 | 40,210.00 | 1 | 100 | 40,210.00 | 106 | 201 | 341.00 | 106 | 201 | 341.00 | 183 | | | |
| Maine | 4 | 482 | 419,010.12 | 1 | 100 | 40,210.00 | 1 | 100 | 40,210.00 | 106 | 201 | 341.00 | 106 | 201 | 341.00 | 183 | | | |
| Maryland | 8 | 1,360 | 712,606.67 | 1 | 100 | 40,210.00 | 1 | 100 | 40,210.00 | 106 | 201 | 341.00 | 106 | 201 | 341.00 | 183 | | | |
| Massachusetts | 21 | 3,478 | 3,210,816.61 | 0 | 834 | 1,218,460.23 | 1 | 30 | 22,268.24 | 423 | 423 | 423.00 | 423 | 423 | 423.00 | 1,560 | | | |
| Michigan | 22 | 3,250 | 2,006,837.36 | 4 | 994 | 680,410.66 | 4 | 994 | 680,410.66 | 622 | 622 | 622.00 | 622 | 622 | 622.00 | 5,350 | | | |
| Minnesota | 16 | 1,960 | 1,436,865.05 | 4 | 277 | 473,406.10 | 1 | 80 | 68,701.57 | 246 | 246 | 246.00 | 246 | 246 | 246.00 | 4,901 | | | |
| Mississippi | 2 | 627 | 270,000.00 | 1 | 67 | 42,796.23 | 1 | 67 | 42,796.23 | 460 | 460 | 460.00 | 460 | 460 | 460.00 | 2,885 | | | |
| Missouri | 6 | 1,244 | 681,282.48 | 1 | 67 | 42,796.23 | 1 | 67 | 42,796.23 | 460 | 460 | 460.00 | 460 | 460 | 460.00 | 2,885 | | | |
| Montana | 1 | 150 | 68,070.20 | 2 | 100 | 58,911.00 | 2 | 100 | 58,911.00 | 110 | 110 | 110.00 | 110 | 110 | 110.00 | 200 | | | |
| Nebraska | 1 | 100 | 63,133.10 | 2 | 100 | 58,911.00 | 2 | 100 | 58,911.00 | 110 | 110 | 110.00 | 110 | 110 | 110.00 | 200 | | | |
| Nevada | 2 | 210 | 152,073.60 | 3 | 363 | 252,210.83 | 3 | 363 | 252,210.83 | 75 | 75 | 75.00 | 75 | 75 | 75.00 | 230 | | | |
| New Hampshire | 13 | 2,393 | 2,164,873.57 | 3 | 363 | 252,210.83 | 3 | 363 | 252,210.83 | 75 | 75 | 75.00 | 75 | 75 | 75.00 | 230 | | | |
| New Jersey | 0 | 681 | 410,710.07 | 3 | 437 | 410,404.47 | 3 | 437 | 410,404.47 | 189 | 189 | 189.00 | 189 | 189 | 189.00 | 18 | | | |
| New Mexico | 6 | 910 | 811,300.43 | 11 | 2,117 | 2,404,880.20 | 2 | 42 | 10,900.60 | 531 | 531 | 531.00 | 531 | 531 | 531.00 | 18 | | | |
| New York | 12 | 1,965 | 1,431,116.40 | 1 | 14 | 7,300.00 | 1 | 14 | 7,300.00 | 487 | 487 | 487.00 | 487 | 487 | 487.00 | 230 | | | |
| North Carolina | 1 | 265 | 163,041.84 | 2 | 694 | 623,380.00 | 1 | 60 | 35,000.00 | 170 | 170 | 170.00 | 170 | 170 | 170.00 | 230 | | | |
| North Dakota | 18 | 2,658 | 2,068,926.99 | 2 | 694 | 623,380.00 | 1 | 60 | 35,000.00 | 170 | 170 | 170.00 | 170 | 170 | 170.00 | 230 | | | |
| Ohio | 6 | 888 | 410,774.73 | 5 | 831 | 510,140.29 | 1 | 100 | 27,117.10 | 263 | 263 | 263.00 | 263 | 263 | 263.00 | 230 | | | |
| Oklahoma | 3 | 474 | 293,532.21 | 1 | 60 | 35,000.00 | 1 | 60 | 35,000.00 | 170 | 170 | 170.00 | 170 | 170 | 170.00 | 230 | | | |
| Oregon | 16 | 4,140 | 2,356,246.20 | 2 | 130 | 37,210.78 | 2 | 130 | 37,210.78 | 263 | 263 | 263.00 | 263 | 263 | 263.00 | 230 | | | |
| Pennsylvania | 10 | 410 | 277,001.22 | 1 | 60 | 35,000.00 | 1 | 60 | 35,000.00 | 170 | 170 | 170.00 | 170 | 170 | 170.00 | 230 | | | |
| Rhode Island | 2 | 463 | 277,001.22 | 1 | 60 | 35,000.00 | 1 | 60 | 35,000.00 | 170 | 170 | 170.00 | 170 | 170 | 170.00 | 230 | | | |
| South Carolina | 6 | 539 | 232,913.18 | 2 | 130 | 37,210.78 | 2 | 130 | 37,210.78 | 263 | 263 | 263.00 | 263 | 263 | 263.00 | 230 | | | |
| South Dakota | 1 | 192 | 133,026.70 | 1 | 60 | 35,000.00 | 1 | 60 | 35,000.00 | 170 | 170 | 170.00 | 170 | 170 | 170.00 | 230 | | | |
| Tennessee | 0 | 1,112 | 460,841.36 | 3 | 514 | 473,072.78 | 1 | 50 | 11,233.00 | 123 | 123 | 123.00 | 123 | 123 | 123.00 | 623 | | | |
| Texas | 14 | 1,766 | 802,034.11 | 1 | 32 | 21,500.00 | 1 | 32 | 21,500.00 | 123 | 123 | 123.00 | 123 | 123 | 123.00 | 623 | | | |
| Utah | 2 | 127 | 94,137.20 | 1 | 44 | 28,434.91 | 1 | 44 | 28,434.91 | 123 | 123 | 123.00 | 123 | 123 | 123.00 | 623 | | | |
| Vermont | 1 | 123 | 631,181.03 | 1 | 62 | 17,280.00 | 1 | 62 | 17,280.00 | 123 | 123 | 123.00 | 123 | 123 | 123.00 | 623 | | | |
| Virginia | 7 | 580 | 338,204.05 | 3 | 650 | 670,283.03 | 3 | 650 | 670,283.03 | 123 | 123 | 123.00 | 123 | 123 | 123.00 | 623 | | | |
| Washington | 7 | 772 | 202,601.50 | 1 | 33 | 32,031.00 | 1 | 33 | 32,031.00 | 123 | 123 | 123.00 | 123 | 123 | 123.00 | 623 | | | |
| West Virginia | - | 1,800 | 1,403,802.64 | 1 | 33 | 32,031.00 | 1 | 33 | 32,031.00 | 123 | 123 | 123.00 | 123 | 123 | 123.00 | 623 | | | |
| Wisconsin | - | 1,800 | 1,403,802.64 | 1 | 33 | 32,031.00 | 1 | 33 | 32,031.00 | 123 | 123 | 123.00 | 123 | 123 | 123.00 | 623 | | | |
| Wyoming | 1 | 33 | 32,031.00 | 1 | 33 | 32,031.00 | 1 | 33 | 32,031.00 | 123 | 123 | 123.00 | 123 | 123 | 123.00 | 623 | | | |
| Totals | 410 | 60,701 | \$44,322,213.06 | 86 | 11,850 | \$12,172,833.05 | 15 | 538 | \$230,810.14 | \$45,234,862.23 | 4,290 | \$3,020,030.10 | 10,634 | \$17,138,639.00 | 1,129 | \$6,024,403.00 | \$50,671,000.10 | 96,108 | \$78,000,682.41 |

approximately \$235, and the other federal hospitals \$366. The state and local public institutions operate on an average daily per capita cost of \$211, and the private institutions average \$296 a day.

Considering the sanatoriums as a group, it was found that the lowest daily per capita cost was \$0.50, the first quartile \$1.73, the mean \$2.20, the third quartile \$2.73, and the highest cost \$6.74. The federal sanatoriums average \$2.75 per patient daily, the state sanatoriums \$2.01, the county \$2.10, the city \$2.04, those under city and county control \$1.74, and the private sanatoriums \$2.94.

The tuberculosis departments, which frequently share in the maintenance of a complete hospital service,

from the federal government, 170 receive state funds, 294 county funds, 105 city support, twenty-four receive income from fraternal organizations, eight from industrial agencies, fifty-two from endowments, 104 from gifts, and 254 are supported in part or entirely by pay patients. Approximately 157 institutions have two sources of income, and 105 obtain their financial support from at least three different sources.

In the sanatorium group there are eighteen institutions maintained by the federal government and five civilian sanatoriums that receive federal aid. The states maintain sixty-five sanatoriums and contribute to the support of fifty-five county, three city, one city and county, and twenty-one private sanatoriums. The

Table 22—Daily Per Capita Costs of Tuberculosis Institutions

| Control | Sanatorium* | | | | | | Departments | | | | | | Preventorium Average | All Institutions Average |
|-------------|------------------------------|------------------------|--------|--------|--------|---------|-----------------------------|------------------------|--------|--------|--------|---------|----------------------|--------------------------|
| | No of Institutions Reporting | No of Beds Represented | Low | Mean | High | Average | No of Departments Reporting | No of Beds Represented | Low | Mean | High | Average | | |
| Federal | 14 | 2,673 | \$1.46 | \$2.61 | \$4.57 | \$2.50 | 17 | 3,438 | \$1.93 | \$3.46 | \$5.73 | \$3.57 | | \$3.20 |
| State | 62 | 17,808 | 1.06 | 1.90 | 4.28 | 2.01 | 8 | 425 | 0.90 | 1.60 | 3.00 | 1.90 | | 2.00 |
| County | 102 | 19,402 | 0.50 | 2.12 | 5.18 | 2.10 | 25 | 2,464 | 0.51 | 2.22 | 4.14 | 2.20 | \$1.29 | 2.09 |
| City | 20 | 7,140 | 0.65 | 2.00 | 3.16 | 2.04 | 25 | 4,253 | 0.74 | 2.42 | 5.43 | 2.72 | | 2.42 |
| City-county | 10 | 2,423 | 0.92 | 1.61 | 2.51 | 1.74 | 2 | 405 | 2.87 | | 3.00 | 2.90 | 1.31 | 1.82 |
| Private | 137 | 11,678 | 0.65 | 2.71 | 6.74 | 2.94 | 17 | 1,037 | 1.06 | 3.53 | 8.90 | 3.03 | 1.43 | 2.96 |
| Totals | 410 | 60,603 | \$0.50 | \$2.20 | \$6.74 | \$2.37 | 89 | 12,200 | \$0.51 | \$2.76 | \$8.93 | \$2.95 | \$1.39 | \$2.44 |

Table 23—Sources of Income of Tuberculosis Institutions

| Type of Institution | Number of Institutions Receiving Income from | | | | | | | | | Number of Institutions Reporting |
|---------------------|--|-------------|--------------|------------|-------------------------|---------------------|------------|-------|----------|----------------------------------|
| | Federal Government | State Funds | County Funds | City Funds | Fraternal Organizations | Industrial Agencies | Endowments | Gifts | Patients | |
| Sanatoriums | | | | | | | | | | |
| Federal | 18 | | | | | | | | | 18 |
| State | 1 | 60 | 14 | 5 | 3 | 1 | 1 | 1 | 19 | 65 |
| County | 1 | 50 | 173 | 7 | 2 | | 3 | 8 | 52 | 173 |
| City | 2 | 3 | 1 | 22 | | | | | 2 | 22 |
| City-county | 1 | | 10 | 10 | | | | 2 | 4 | 15 |
| Private | 1 | 21 | 44 | 21 | 17 | 0 | 39 | 66 | 149 | 178 |
| Totals | 23 | 140 | 247 | 70 | 22 | 0 | 43 | 77 | 236 | 471 |
| Departments | | | | | | | | | | |
| Federal | 24 | | | | | | | | | 24 |
| State | | 5 | | | | | | | | 5 |
| County | | 9 | 20 | | | | | | 4 | 20 |
| City | | 3 | 4 | 27 | | 1 | 1 | 1 | 4 | 27 |
| City-county | | | 1 | 1 | | | | | | 1 |
| Private | | 4 | 6 | 2 | 2 | 1 | 3 | 8 | 15 | 10 |
| Totals | 24 | 21 | 36 | 30 | 2 | 2 | 4 | 6 | 23 | 101 |
| Preventorium* | | | | | | | | | | |
| County | | 1 | 6 | 2 | | | | | | 6 |
| City-county | | 1 | 3 | 3 | | | | 1 | | 2 |
| Private | | 2 | 3 | 3 | | | 5 | 20 | 5 | 21 |
| Totals | | 4 | 11 | 5 | | | 5 | 21 | 5 | 29 |
| Grand totals | 47 | 170 | 294 | 105 | 24 | 8 | 52 | 104 | 254 | 601 |

reflect a higher per capita cost. The lowest reported was \$0.51, the mean \$2.76, the highest daily per capita cost \$8.96, and the average \$2.95. Table 22 shows the low, mean, high, and average daily per capita costs of the sanatoriums and tuberculosis departments, the average of the preventoriums, and the average cost for all institutions.

4 *Sources of Income*—In considering the cost of tuberculosis hospitalization it is of interest to analyze the sources of income of the various institutions and to determine the number of patients who paid for part or all of their hospital care. The analysis shown in table 23 is based on information from all the sanatoriums and the preventoriums and from 101 of the principal tuberculosis departments, in all 601 institutions. Forty-seven obtain part or all of their income

counties operate 173 sanatoriums and help to maintain seventy-four others, including fourteen state sanatoriums, one city, fifteen city and county, and forty-four under private control. City funds maintain twenty-two municipal sanatoriums and aid in the maintenance of five state, seven county, fifteen city and county, and twenty-one private sanatoriums. Endowments and gifts aid mainly the private sanatoriums, although a few state and county institutions receive aid from these sources. Eight sanatoriums are maintained by fraternal organizations, which also contribute to the support of sixteen others, and there are six sanatoriums receiving income from industrial agencies. Patients contribute toward the maintenance of nineteen state, fifty-two county, two municipal, four city and county, and 149 sanatoriums under private manage-

ment One private sanatorium receives aid from the federal government, twenty-one state funds, forty-four county support, twenty-one city support, seventeen are aided by fraternal organizations, five by industrial agencies, and thirty-nine receive income from endowments, sixty-six from gifts, and 149 from patients. By reference to table 23, similar analyses can be made of the tuberculosis departments and the preventoriums. Practically all the preventoriums operated under private management receive part or all of their income from gifts, which include private donations, public subscriptions, income from seal sales, and funds obtained through the activities of women's auxiliaries, Junior

GROUP CLASSIFICATIONS

1 *Federal Tuberculosis Departments and Sanatoriums*—The federal hospitals, although listed under one classification, constitute separate homogeneous groups serving a restricted population. Each group is under a single administration except in the case of the Indian hospitals, the general management of which is a function of the U S Department of the Interior and the medical supervision a responsibility of the U S Public Health Service.

In most of the federal services the tuberculosis problem remains fairly constant because of the continual replacement of personnel eligible for hospitaliza-

Table 24—Paying Status of Patients in Tuberculosis Institutions

| State | Patients Admitted in Tax Supported Institutions | | | | Patients Admitted in Private Institutions | | | | Patients Admitted in Both Groups | | | Number of Patients Considered | Percent of Total Admissions |
|----------------------|---|----------|----------|----------------|---|----------|----------|----------------|----------------------------------|----------|----------|-------------------------------|-----------------------------|
| | Free | Part Pay | Full Pay | Total Patients | Free | Part Pay | Full Pay | Total Patients | Free | Part Pay | Full Pay | | |
| Alabama | 805 | 30 | 17 | 8,2 | 48 | | | 48 | 8,3 | 30 | 17 | 900 | 82 |
| Arizona | 1,191 | | | 1,191 | 71 | 217 | 178 | 466 | 1,262 | 217 | 178 | 1,657 | 75 |
| Arkansas | 572 | 192 | 17 | 781 | | | | | 572 | 192 | 17 | 781 | 94 |
| California | 5,569 | 101 | 25 | 0,080 | 20 | 333 | 396 | 704 | 5,880 | 529 | 421 | 6,830 | 68 |
| Colorado | | | | | 717 | 64 | 141 | 922 | 717 | 64 | 141 | 922 | 37 |
| Connecticut | 17 | 467 | | 484 | 0 | 99 | 119 | 224 | 23 | 566 | 119 | 708 | 42 |
| Delaware | 104 | 3 | 2 | 109 | | | | | 104 | 3 | 2 | 109 | 73 |
| District of Columbia | 601 | 2 | 2 | 605 | | | | | 601 | 2 | 2 | 605 | 59 |
| Florida | 109 | | | 109 | | | | | 109 | | | 109 | 12 |
| Georgia | 1,102 | 38 | 10 | 1,150 | 23 | | | 23 | 1,130 | 38 | 10 | 1,178 | 77 |
| Idaho | 216 | | | 216 | | | | | 216 | | | 216 | 75 |
| Illinois | 3,043 | | 15 | 3,058 | 130 | 74 | 461 | 665 | 3,173 | 74 | 476 | 3,723 | 88 |
| Indiana | 734 | 208 | 250 | 1,192 | | | | | 734 | 208 | 250 | 1,192 | 70 |
| Iowa | 164 | 15 | 172 | 351 | | | | | 164 | 15 | 172 | 351 | 40 |
| Kansas | 426 | | | 426 | | | | | 426 | | | 426 | 57 |
| Kentucky | 1,462 | 64 | 54 | 1,580 | | | | | 1,462 | 64 | 54 | 1,580 | 84 |
| Louisiana | 274 | | | 274 | 170 | 28 | 23 | 221 | 444 | 28 | 23 | 495 | 59 |
| Maine | | | | | 12 | 11 | 1 | 24 | 12 | 11 | 1 | 24 | 4 |
| Maryland | 1,512 | 2 | 15 | 1,529 | 39 | 2 | | 41 | 1,551 | 4 | 15 | 1,570 | 70 |
| Massachusetts | 1,419 | 12 | 8 | 1,439 | 200 | 106 | 133 | 439 | 1,609 | 118 | 141 | 1,928 | 40 |
| Michigan | 2,540 | 8 | 91 | 2,639 | 0 | 3 | 280 | 283 | 2,540 | 11 | 377 | 2,918 | 50 |
| Minnesota | 1,102 | 57 | 65 | 1,224 | 100 | 10 | 34 | 144 | 1,207 | 67 | 99 | 1,433 | 54 |
| Mississippi | | | | | 35 | | | 35 | 35 | | | 35 | 9 |
| Missouri | 1,829 | 17 | 25 | 1,871 | 240 | 187 | 29 | 456 | 2,069 | 204 | 54 | 2,327 | 67 |
| Montana | 106 | | | 106 | | | | | 106 | | | 106 | 60 |
| Nebraska | 203 | 16 | | 219 | | | | | 203 | 16 | | 219 | 56 |
| Nevada | | | | | | | | | | | | | |
| New Hampshire | 43 | 8 | | 51 | 81 | 4 | 1 | 86 | 124 | 12 | 1 | 137 | 89 |
| New Jersey | 3,028 | 211 | 118 | 3,357 | 112 | | | 112 | 3,140 | 211 | 118 | 3,469 | 73 |
| New Mexico | 337 | | | 337 | 24 | 69 | 145 | 238 | 361 | 69 | 145 | 575 | 38 |
| New York | 16,220 | 301 | 264 | 16,784 | 1,617 | 672 | 404 | 2,693 | 17,846 | 673 | 663 | 19,487 | 83 |
| North Carolina | 1,534 | 623 | 29 | 2,186 | 4 | 84 | 124 | 212 | 1,538 | 712 | 163 | 2,413 | 84 |
| North Dakota | 210 | | 17 | 227 | | | | | 210 | | 17 | 227 | 76 |
| Ohio | 2,743 | 520 | 65 | 3,328 | | | 189 | 189 | 2,743 | 520 | 254 | 3,523 | 60 |
| Oklahoma | 1,108 | 3 | 15 | 1,126 | 5 | 40 | 47 | 92 | 1,113 | 43 | 62 | 1,218 | 73 |
| Oregon | 181 | 0 | | 181 | | | | | 181 | 0 | | 181 | 22 |
| Pennsylvania | 5,611 | 46 | | 5,657 | 468 | 667 | 230 | 1,365 | 6,079 | 713 | 235 | 7,027 | 77 |
| Rhode Island | 435 | 72 | 3 | 510 | 27 | 5 | | 32 | 462 | 77 | 3 | 542 | 66 |
| South Carolina | 412 | 24 | 0 | 436 | 51 | 26 | | 77 | 463 | 50 | 0 | 513 | 63 |
| South Dakota | 103 | | | 103 | | | | | 103 | | | 103 | 20 |
| Tennessee | 392 | 60 | | 452 | 221 | 14 | 60 | 295 | 613 | 74 | 60 | 747 | 63 |
| Texas | 2,442 | 217 | 98 | 2,757 | 180 | 181 | 523 | 784 | 2,622 | 348 | 621 | 3,541 | 78 |
| Utah | 41 | 3 | | 44 | | | | | 41 | 3 | | 44 | 29 |
| Vermont | 116 | 12 | 9 | 137 | 77 | 4 | 2 | 83 | 193 | 16 | 11 | 220 | 61 |
| Virginia | 423 | 426 | 11 | 860 | 123 | 0 | 27 | 150 | 546 | 432 | 38 | 1,016 | 71 |
| Washington | 845 | 01 | 11 | 847 | | 1 | 100 | 101 | 845 | 02 | 111 | 1,048 | 89 |
| West Virginia | 73 | 606 | 61 | 740 | 83 | 1 | | 84 | 156 | 607 | 61 | 824 | 79 |
| Wisconsin | 1,893 | 110 | 69 | 2,072 | 01 | | 20 | 81 | 1,954 | 110 | 89 | 2,153 | 63 |
| Wyoming | 23 | 3 | | 31 | | | | | 23 | 3 | | 31 | 67 |
| Totals | 63,856 | 4,678 | 1,544 | 70,078 | 4,004 | 2,863 | 3,078 | 11,505 | 68,820 | 7,541 | 5,222 | 81,583 | |

League members, antituberculosis associations, the American Legion, community chest organizations, and other local agencies.

Table 24 reveals the paying status of patients. Data were obtained from 290 tax supported and 130 private institutions, representing a total of 81,583 patients, or 67 per cent of the admissions reported by all sanatoriums, tuberculosis departments and preventoriums. The tabulations indicate that 84.4 per cent of the patients receive free treatment, 9.2 per cent pay in part, and 6.4 per cent pay full rates. Of the 70,078 patients considered in the tax supported institutions, 63,856 received free care, 4,678 were part pay, and 1,544 full pay. The private institutions reported on the paying status of 11,505 patients. Of these, 4,964 received free care, 2,863 were part pay, and 3,678 paid full rates.

tion, but in the Veterans Bureau the problem should decrease year by year and be self limited unless other classes of beneficiaries are added in the future.

In presenting a statistical analysis of the tuberculosis service in federal hospitals, it should be mentioned that part of the survey was affected by changes in various institutions incident to the federal economy regulations. Reallocation of services, transfer of patients, and other changes made it difficult at times to avoid a duplication of statistical data.

Tuberculosis patients were admitted in 169 federal hospitals, including sixty-five operated by the Veterans Bureau, fifty-two by the Indian Administration, twenty-six by the U S Public Health Service, thirteen by the U S Army, ten by the U S Navy, and three by other federal agencies. There are eighteen sanatoriums exclusively for tuberculosis and 151 departments, some of

which are conducted principally for the treatment of tuberculous patients

Apparently a large number of federal hospitals admit tuberculous patients for diagnosis and temporary care and transfer them later to institutions especially equipped for prolonged tuberculosis hospitalization. The U S Army, for example, transfers its tuberculous patients mainly to the Fitzsimons General Hospital, Denver, and the William Beaumont General Hospital, El Paso, Texas. The U S Navy has no hospital primarily for tuberculosis but utilizes the facilities of the army hospital in Denver. Twenty-six hospitals of the U S Public Health Service have departments for tuberculosis, but only one, the U S Marine Hospital, Fort Stanton, N M., is operated exclusively for the treatment of tuberculous patients. In recent years the Veterans Bureau has decentralized its tuberculosis service to some extent, although it still operates thirteen hospitals principally for tuberculosis.

The U S Department of the Interior can be credited with marked improvements in the tuberculosis service for Indians. Since the survey began the department has opened three new sanatoriums in Arizona and New Mexico, and one has recently been completed in connection with the Minnesota State Sanatorium. Still other hospitals have recently been constructed for the Indian Administration, although not primarily for tuberculosis. The new sanatoriums have replaced old units closed or destroyed by fire within the last few years. Apparently there is need of further construction to replace some of the old sanatorium units still in use.

The number of beds for tuberculosis in the federal hospitals is 10,940, including 328 for children. The sanatoriums have 4,103 beds and the departments 6,837. The Veterans hospitals report 7,734 beds, the Indian hospitals 1,471, the U S Public Health Service 783, the U S Army 630, the U S Navy 176, and other federal institutions 146.

According to the accompanying tabulation there were 15,523 tuberculous patients admitted in the federal departments and sanatoriums, 10,406 discharged and 1,466 deaths. The average daily census of patients was 6,333 and there were 8,375 patients present on the day of reporting.

The federal sanatoriums include six Veterans hospitals, one operated by the U S Public Health Service, and eleven sanatoriums of the Indian Administration. They have a total capacity of 4,103 beds: 2,940 in the sanatoriums of the Veterans Bureau, 893 in the Indian service, and 270 in the tuberculosis sanatorium operated by the U S Public Health Service. The federal sanatoriums admitted 5,078 patients during a twelve months period, treated 7,719, discharged 4,617, and had 590 deaths. The average daily census was 3,179, and there were 3,442 patients present on the day of reporting. The waiting list totaled 150, although at the same time there were 676 vacancies. The average length of stay as reported by fifteen sanatoriums was 172 days.

Seventeen of the federal sanatoriums report facilities for pneumothorax and eighteen have equipment for minor surgery, fifteen for major surgery and thirteen for special chest surgery. Eleven maintain surgical affiliations with other hospitals. Dental departments are furnished in sixteen, including seven which have a full-time dental staff. All the federal sanatoriums have laboratory and x-ray facilities, seventeen have fluoroscopic and stereoscopic equipment, and eight have

necropsy facilities. In necropsy performance the federal sanatoriums with a rate of 25 per cent are surpassed only by the municipal sanatorium group, which reports 37 per cent. The Indian sanatoriums report 16 per cent, the sanatorium operated by the U S Public Health Service 63 per cent, and the sanatoriums of the Veterans Bureau 25 per cent.

There is a considerable variation as regards medical personnel. The six Veterans hospitals exclusively for tuberculosis have eighty-one regular staff members, a ratio of 13.5 per institution. The sanatorium of the U S Public Health Service has six, and the Indian sanatoriums with fourteen regular staff members average only 1.3 per institution. There is considerable variation in the average size of the sanatorium groups, however, and on the basis of capacity the Veterans group has one physician to thirty-six beds, the Indian sanatoriums one to sixty-four, and the sanatorium of the U S Public Health Service one to forty-five. The ratio of physicians to patients is 1.52 in the Indian sanatoriums, 1.36 in the sanatorium of the U S Public Health Service, and 1.28 in the Veterans group.

The federal sanatoriums employ 330 graduate nurses. The ratio of nurses to patients is 1.9 in the Veterans

Federal Departments and Sanatoriums

| | Number of Sanatoriums | Capacity | Number of Departments | Capacity | Total Admis- sions | Patients Discharged | Number of Deaths | Patients Present | Daily Average |
|---------------|--------------------------|----------|--------------------------|----------|-----------------------|------------------------|---------------------|---------------------|---------------|
| Control | | | | | | | | | |
| Veterans | 6 | 2,940 | 59 | 4,794 | 10,493 | 7,969 | 1,250 | 5,772 | 4,445 |
| Indian | 11 | 893 | 41 | 575 | 2,633 | 1,271 | 67 | 1,966 | 1,028 |
| Public health | 1 | 270 | 2 | 513 | 738 | 263 | 47 | 605 | 398 |
| Army | | | 13 | 630 | 1,197 | 903 | 102 | 468 | 402 |
| Navy | | | 10 | 176 | 851 | | | 90 | |
| Other | | | 3 | 140 | 111 | | | 171 | |
| Totals | 18 | 4,103 | 121 | 6,837 | 15,523 | 10,406 | 1,466 | 8,375 | 6,333 |

group, 1.12 in the Indian sanatoriums, and 1.21 in the tuberculosis hospital of the U S Public Health Service. The total number of employees exclusive of physicians and dentists is 2,079: 1,686 in the Veterans sanatoriums, 146 in the Public Health Service hospital, and 247 in the sanatoriums of the Indian Administration.

The federal tuberculosis departments and sanatoriums, the total valuation of which is approximately \$39,241,495.87, operate on an average daily per capita cost of \$3.20 and have an annual maintenance cost of \$10,553,236.85. The sanatoriums alone represent a valuation of \$12,497,984.18. Their average daily per capital cost is \$2.75 and their maintenance expenditure approximately \$3,150,921.25 a year.

2 State Sanatoriums — There are 65 state sanatoriums with a total capacity of 17,308 beds: 13,333 for adults, 3,170 for children, and 805 unassigned. The institutions vary in size from thirty-two to 1,035 beds and have an average capacity of 266 beds. Twelve states are without a state sanatorium, twenty-one states have one each, six have two, five have three, Maryland, Massachusetts and New York have four each, and Connecticut has five. Three of the sanatoriums in New York were not in operation at the time of the survey.

The total valuation of the state sanatoriums is \$51,046,657.48, based on the general average of \$2,949.31 per bed. These institutions operate on an average daily per capita cost of \$2.01 and expend annually about \$11,559,389.40.

Four hundred and three physicians are connected with the state sanatoriums: sixty-one full-time medical

directors, four part-time medical directors, 187 full-time staff physicians, and 151 attending and consulting physicians. With a regular staff of 252 physicians, the sanatoriums average four physicians per institution and one for every sixty-two patients.

The state sanatoriums have 8,084 other employees: 917 graduate nurses, 308 student nurses, six affiliates, 615 practical nurses, fifty dietitians, seven graduate pharmacists, 113 record clerks, sixty-five x-ray technicians, seventy-nine laboratory technicians, twenty occupational therapists, seventy-five school teachers, eleven social service workers, twenty-five field nurses and 4,551 general employees. The reports show that graduate nurses are employed in sixty-one sanatoriums, practical nurses in forty-one, x-ray technicians in fifty-three, laboratory technicians in fifty, dietitians in forty, and graduate pharmacists in seven. Record clerks are employed in forty-four, occupational therapists in nine-

toriums have a low necropsy percentage: 2,116 deaths and 227 necropsies (11 per cent).

As shown in table 25 the state sanatoriums admitted 19,028 patients: 13,390 adults, 3,541 children, and 1,557 not classified. There were 34,623 patients treated, 18,406 discharged, 15,947 patients present on the day of reporting, and a daily average of 15,756 throughout the year. The average length of stay was 166 days. There were 1,361 vacancies, and the waiting list totaled 6,108.

3 County Sanatoriums—The county sanatoriums constitute the largest group of tuberculosis institutions. They number 173 and have a total capacity of 20,114 beds, 16,029 for adults, 3,165 for children and 920 unassigned. The variation in bed capacity is from ten to 917 beds and the average capacity 116.

These institutions admitted 20,845 patients: 14,128 adults, 3,764 children and 2,953 not classified. They

Table 25—State Sanatoriums Classified by States

| State | Number of Sanatoriums | Bed Capacity | | | Patients Admitted | | | Patients Discharged (Including Deaths) | Number of Deaths | Patients Treated | Patients Present | Waiting List | Daily Average |
|----------------|-----------------------|--------------|----------|---------|-------------------|----------|---------|--|------------------|------------------|------------------|--------------|---------------|
| | | Adults | Children | Total | Adults | Children | Total | | | | | | |
| Arkansas | 2 | 408 | 88 | 556 | 594 | 150 | 740 | 771 | 41 | 1,315 | 564 | 171 | 555 |
| Connecticut | 5 | 1,041 | 442 | 1,483 | 807 | 236 | 1,043 | 1,027 | 220 | 2,367 | 1,330 | 164 | 1,314 |
| Delaware | 2 | 117 | 44 | 161 | 77 | 32 | 109 | 63 | 31 | 233 | 139 | 60 | 120 |
| Georgia | 1 | 224 | 113 | 337 | 701 | 205 | 906 | 674 | 47 | 906 | 233 | 540 | 500 |
| Indiana | 1 | 117 | 94 | 211 | 103 | 86 | 189 | 182 | 4 | 371 | 206 | 130 | 240 |
| Iowa | 1 | 363 | 363 | 726 | 213 | 213 | 426 | 222 | 56 | 576 | 333 | 75 | 264 |
| Kansas | 1 | 230 | 32 | 262 | 163 | 36 | 199 | 101 | 26 | 422 | 284 | 68 | 264 |
| Kentucky | 1 | 80 | 80 | 160 | 146 | 146 | 292 | 98 | 7 | 178 | 74 | 172 | 88 |
| Louisiana | 1 | 96 | 96 | 192 | 80 | 6 | 86 | 91 | 16 | 178 | 89 | 79 | 89 |
| Maine | 3 | 371 | 42 | 413 | 220 | 42 | 262 | 486 | 83 | 890 | 410 | 91 | 429 |
| Maryland | 4 | 715 | 120 | 835 | 844 | 128 | 972 | 1,161 | 200 | 2,042 | 884 | 107 | 887 |
| Massachusetts | 4 | 476 | 700 | 1,176 | 464 | 480 | 944 | 1,011 | 116 | 2,139 | 1,104 | 113 | 1,146 |
| Michigan | 2 | 761 | 85 | 846 | 327 | 30 | 357 | 404 | 78 | 1,017 | 628 | 4 | 642 |
| Minnesota | 1 | 300 | 300 | 600 | 278 | 278 | 556 | 263 | 50 | 525 | 265 | 4 | 510 |
| Mississippi | 1 | 450 | 450 | 900 | 273 | 87 | 360 | 332 | 20 | 649 | 317 | 333 | 333 |
| Missouri | 1 | 850 | 40 | 890 | 431 | 30 | 461 | 434 | 53 | 798 | 388 | 88 | 387 |
| Montana | 1 | 120 | 30 | 150 | 159 | 37 | 196 | 202 | 36 | 346 | 136 | 50 | 137 |
| Nebraska | 1 | 127 | 33 | 160 | 159 | 159 | 318 | 160 | 21 | 317 | 157 | 20 | 184 |
| New Hampshire | 1 | 110 | 110 | 220 | 61 | 61 | 122 | 64 | 7 | 147 | 63 | 3 | 80 |
| New Jersey | 1 | 300 | 120 | 420 | 333 | 189 | 522 | 538 | 16 | 624 | 406 | 37 | 441 |
| New York | 41 | 300 | 300 | 600 | 547 | 50 | 597 | 473 | 15 | 770 | 297 | 50 | 301 |
| North Carolina | 1 | 410 | 68 | 478 | 606 | 569 | 1,175 | 628 | 24 | 1,043 | 450 | 174 | 435 |
| North Dakota | 1 | 215 | 50 | 265 | 162 | 38 | 200 | 174 | 29 | 428 | 249 | 97 | 230 |
| Ohio | 1 | 240 | 240 | 480 | 399 | 399 | 798 | 390 | 631 | 631 | 232 | 231 | 231 |
| Oklahoma | 1 | 635 | 635 | 1,270 | 802 | 63 | 865 | 820 | 108 | 1,739 | 577 | 302 | 568 |
| Oregon | 2 | 120 | 409 | 529 | 208 | 35 | 243 | 275 | 61 | 679 | 403 | 80 | 268 |
| Pennsylvania | 3 | 1,030 | 485 | 1,515 | 1,804 | 1,068 | 2,872 | 2,690 | 290 | 4,908 | 2,403 | 1,000 | 2,301 |
| Rhode Island | 1 | 263 | 67 | 330 | 340 | 40 | 380 | 383 | 60 | 794 | 388 | 7 | 410 |
| South Carolina | 1 | 229 | 48 | 277 | 210 | 57 | 267 | 207 | 31 | 492 | 200 | 38 | 234 |
| South Dakota | 1 | 192 | 102 | 294 | 101 | 101 | 202 | 93 | 20 | 308 | 90 | 38 | 160 |
| Texas | 1 | 650 | 162 | 812 | 1,597 | 347 | 1,944 | 1,030 | 26 | 2,647 | 697 | 373 | 697 |
| Vermont | 2 | 127 | 127 | 254 | 137 | 137 | 274 | 129 | 38 | 243 | 116 | 13 | 113 |
| Virginia | 3 | 720 | 40 | 760 | 290 | 58 | 348 | 880 | 117 | 1,622 | 762 | 168 | 684 |
| West Virginia | 1 | 668 | 80 | 748 | 540 | 52 | 592 | 666 | 80 | 1,248 | 600 | 121 | 573 |
| Wisconsin | 2 | 282 | 282 | 564 | 196 | 196 | 392 | 211 | 30 | 468 | 201 | 24 | 237 |
| Wyoming | 1 | 31 | 31 | 62 | 31 | 31 | 62 | 31 | 10 | 46 | 20 | 20 | 20 |
| Totals | 60 | 13,333 | 3,170 | 17,503* | 13,930 | 3,541 | 19,028* | 18,406 | 2,116 | 34,623 | 15,947 | 6,108 | 15,756 |

* Partly unclassified

† Three not in operation at time of survey

teen, school teachers in thirty-four, social service workers in eight, and field nurses in two of the sanatoriums. The total nursing staff is 1,846 and the ratio of nurses to patients 1:9.

Fifty-nine sanatoriums report facilities for pneumothorax, fifty-eight for minor surgery, twenty-one for general major surgery, and twenty-six for special chest surgery. Forty-six maintain surgical affiliations with other hospitals. Dental departments are furnished in forty-eight institutions, eight of which have a full-time staff. Roentgenographic equipment is available in fifty-nine, fluoroscopic facilities in fifty-nine, clinical laboratory departments in fifty-eight, and necropsy facilities in thirty. Fifty-five sanatoriums refer part of their laboratory work and three have affiliations for x-ray service. Fifty-nine sanatoriums, which admitted 18,434 patients, reported 121,654 roentgen examinations and 87,416 fluoroscopic studies. Similarly, fifty-one sanatoriums with 17,227 admissions had 413,106 laboratory examinations. As a group, the state sana-

tories treated 38,000, discharged 19,827 and had 4,017 deaths. They maintained a daily average of 18,364 and had 18,440 patients present on the day of reporting. The waiting list totaled 1,637 patients while, at the same time, there were 1,674 vacancies. The average length of stay in this group was 173 days.

The county sanatoriums are served by a regular staff of 360 physicians—approximately two per institution. There are 106 full-time medical directors and sixty-seven part-time and 187 resident physicians on a full-time basis. The ratio of physicians to patients is 1:51, not counting a group of 813 attending or consulting physicians.

The nursing staff has 2,558 members: 1,499 graduates, 126 student nurses, sixty-six affiliates and 867 practical nurses. The ratio of nurses to patients is therefore, approximately 1:7. Graduate nurses are employed in 167 county sanatoriums and practical nurses in 128. The total number of employees is 8,084 exclusive of physicians and dentists. The personnel

for special departments includes eighty-one dietitians, seven graduate pharmacists, 145 record clerks, 104 x-ray technicians, 119 laboratory technicians, fifty-four occupational therapists, 118 school teachers, forty-four social service workers and ninety-eight field nurses. Laboratory technicians are employed in 100 institutions, x-ray technicians in ninety-five, dietitians in seventy-one, graduate pharmacists in seven, record clerks in ninety-seven, occupational therapists in fifty-two, school teachers in seventy-five, social service workers in twenty-seven, and field nurses in sixty-five of the county sanatoriums.

One hundred and sixty sanatoriums have facilities for pneumothorax and 139 have equipment for minor surgery, fifty-one for major surgery and fifty-nine for special chest surgery. A surgical affiliation is maintained in 130. Dental departments are reported in 114 institutions, including six which have a full-time dental staff. General roentgenographic equipment is furnished in 144 sanatoriums, fluoroscopic facilities in

for children and 193 unassigned. These institutions vary in size from eighteen to 1,446 beds and the average capacity is 335 beds. Together, they represent a valuation of \$29,701,719.30, or \$4,032.82 per bed. The annual maintenance cost of this group is approximately \$5,381,224.20, with an average daily per capita cost of \$2.04.

Pneumothorax facilities are provided in seventeen of these sanatoriums, and equipment for minor surgery in sixteen, for general major surgery in eleven and for special chest surgery in nine. Sixteen institutions maintain surgical affiliations with other hospitals. Four of the sanatoriums that report a dental department have a full-time dental staff. General roentgenographic equipment is furnished in eighteen institutions, fluoroscopic facilities in seventeen, stereoscopic equipment in fifteen and clinical laboratory facilities in nineteen. Ten municipal sanatoriums have necropsy facilities. The necropsy rate, 37 per cent, is the highest percentage in any of the sanatorium groups.

Table 26—County Sanatoriums Classified by States

| State | Number of Sanatoriums | Bed Capacity | | | Patients Admitted | | | Patients Discharged (Including Deaths) | Number of Deaths | Patients Treated | Patients Present | Waiting List | Daily Average |
|----------------|-----------------------|--------------|----------|---------|-------------------|----------|---------|--|------------------|------------------|------------------|--------------|---------------|
| | | Adults | Children | Total | Adults | Children | Total | | | | | | |
| Alabama | 3 | 140 | 36 | 182 | 225 | 13 | 238 | 224 | 63 | 353 | 138 | 62 | 129 |
| Arizona | 2 | 82 | | 82 | 70 | 2 | 72 | 60 | 15 | 102 | 70 | | 80 |
| California | 10 | 1,036 | 504 | 2,300* | 1,363 | 410 | 2,000* | 2,000 | 291 | 4,969 | 2,147 | 127 | 2,193 |
| Florida | 2 | 76 | | 76 | 48 | | 48 | 36 | 9 | 111 | 68 | 22 | 60 |
| Georgia | 1 | 80 | | 80 | 27 | | 27 | 2 | | 38 | 25 | | 26 |
| Illinois | 16 | 1,181 | 137 | 1,486* | 1,225 | 85 | 1,310 | 1,293 | 209 | 2,478 | 1,178 | 171 | 1,153 |
| Indiana | 8 | 988 | 208 | 1,146 | 720 | 349 | 1,339* | 1,371 | 214 | 2,892 | 1,046 | 121 | 982 |
| Iowa | 4 | 301 | 30 | 331 | 221 | 23 | 337* | 4 | 363 | 70 | 618 | 277 | 239 |
| Kansas | 1 | 60 | | 60 | | | 67 | 63 | 19 | 104 | 41 | | 48 |
| Kentucky | 1 | 68 | 22 | 90 | 118 | | 116 | 111 | 12 | 206 | 83 | 3 | 91 |
| Massachusetts | 7 | 1,128 | 20 | 1,176* | 882 | 6 | 991* | 962 | 275 | 2,073 | 1,101 | 89 | 1,108 |
| Michigan | 11 | 600 | 109 | 809* | 475 | 147 | 887* | 838 | 133 | 1,450 | 693 | 45 | 717 |
| Minnesota | 18 | 1,323 | 89 | 1,494* | 782 | 96 | 1,094* | 1,094 | 203 | 2,582 | 1,458 | 57 | 1,443 |
| Missouri | 2 | 118 | | 118 | 110 | | 131* | 117 | 50 | 102 | 120 | 29 | 117 |
| New Jersey | 9 | 1,599 | 218 | 1,817 | 1,413 | 450 | 2,237* | 2,216 | 668 | 4,042 | 1,731 | 77 | 1,719 |
| New York | 28 | 2,248 | 827 | 3,075 | 2,233 | 1,831 | 3,792* | 3,758 | 560 | 6,556 | 2,837 | 125 | 2,892 |
| North Carolina | 7 | 386 | 70 | 486* | 333 | 55 | 434* | 395 | 67 | 768 | 415 | 47 | 433 |
| Ohio | 14 | 1,639 | 539 | 2,178 | 1,579 | 310 | 2,261* | 2,024 | 500 | 4,093 | 2,144 | 219 | 2,019 |
| Oregon | 1 | | 89 | 89 | | | 65 | | | | | | 30 |
| Pennsylvania | 3 | 263 | 74 | 337 | 342 | 70 | 412 | 411 | 104 | 745 | 334 | 68 | 332 |
| South Carolina | 3 | 96 | 16 | 106* | 112 | 14 | 223* | 98 | 22 | 211 | 98 | 89 | 160 |
| Tennessee | 1 | 249 | 51 | 300 | 196 | 83 | 279 | 219 | 51 | 501 | 228 | 0 | 230 |
| Texas | 2 | 84 | 18 | 102 | 115 | 11 | 126 | 135 | 31 | 222 | 102 | 5 | 96 |
| Washington | 5 | 333 | 67 | 675* | 350 | 68 | 621* | 401 | 66 | 916 | 521 | 47 | 509 |
| West Virginia | 2 | 44 | 5 | 49 | | | 73 | 60 | 10 | 80 | 45 | 6 | 41 |
| Wisconsin | 17 | 1,406 | 120 | 1,610 | 1,125 | 235 | 1,672* | 1,465 | 289 | 2,956 | 1,517 | 75 | 1,503 |
| Totals | 173 | 16,029 | 3,166 | 20,114* | 14,128 | 3,784 | 20,843* | 19,821 | 4,017 | 28,000 | 18,440 | 1,637 | 18,364 |

Partly unclassified

142 and stereoscopic equipment in 132. Thirty-five institutions refer part or all of their x-ray work to other hospitals. In 169 of the sanatoriums there were 18,988 patients admitted, 165,864 roentgen examinations, and 129,192 fluoroscopic studies. Laboratory facilities are available in 144 institutions and necropsy facilities in fifty-two. One hundred and forty-nine county sanatoriums refer part or all of their laboratory work. In 112 institutions reporting 16,809 patients admitted there were 436,562 laboratory examinations performed, or twenty-six per patient. The necropsy rate is 15 per cent, 4,017 deaths and 635 necropsies.

The financial reports indicate that the county sanatorium group operates on an average daily per capita cost of \$2.10 and has an annual maintenance expenditure of approximately \$14,076,006. The total valuation of the county sanatoriums at \$3,737.64 per bed is \$75,178,890.96.

4 Municipal Sanatoriums—Municipally owned sanatoriums are confined to the District of Columbia and the states of Illinois, Maryland, Massachusetts, Michigan, Missouri, New York, Ohio, Pennsylvania and Virginia. There are twenty-two city sanatoriums, with a capacity of 7,365 beds. 6,171 for adults, 1,001

for children and 193 unassigned. These institutions vary in size from eighteen to 1,446 beds and the average capacity is 335 beds. Together, they represent a valuation of \$29,701,719.30, or \$4,032.82 per bed. The annual maintenance cost of this group is approximately \$5,381,224.20, with an average daily per capita cost of \$2.04.

One hundred and two physicians are connected regularly with the municipal sanatoriums—twelve medical directors on full-time duty, ten on part-time, and eighty full-time resident physicians. The ratio of physicians to patients is 1.70 and the average staff membership is 4.6 per institution. The nursing staff in this sanatorium group totals 1,045: 629 graduates, eighteen affiliates and 398 practical nurses. With an average daily census of 7,227, the ratio of nurses to patients is approximately 1.7. The total number of employees is 3,920 exclusive of physicians and dentists. There are twenty-four dietitians employed, eight graduate pharmacists, twenty-nine record clerks, fourteen x-ray technicians, twenty-seven laboratory technicians, fourteen occupational therapists, fifteen school teachers, eight social service workers and 160 field nurses.

The municipal sanatoriums admitted 8,346 patients, treated 15,403, discharged 8,307 and had 1,716 deaths. The daily average according to table 27 was 7,227, and on the day of reporting there were 7,014 patients present. There were 351 vacancies and 228 patients on the waiting list. The average length of stay in this sanatorium group is 170 days per patient.

5 *City-County Sanatoriums*—The city-county institutions constitute the smallest sanatorium group. The sanatoriums, fifteen in all, are located in California, Georgia, Illinois, Kansas, Kentucky, New York, Ohio, Pennsylvania, South Carolina, Tennessee and Texas. Georgia has two, Tennessee two, Texas three, and the other states one each. These institutions vary in size from twenty-four to 462 beds and have an average bed capacity of 161. Their total capacity is 2,423 beds, 1,919 for adults, 480 for children and twenty-four unassigned.

The valuation of the city-county group is reported as \$6,369,848.93, or \$2,628.91 per bed, and the annual

ten of the city-county sanatoriums and necropsy facilities in two. The necropsy rate is only 10 per cent, 573 deaths and fifty-eight necropsies.

A summary of the statistical data as represented in table 28 shows that there were 2,824 patients admitted, 5,113 treated, 2,813 discharged and 573 deaths. The average length of stay in the city-county sanatoriums was 165 days. There were 392 patients on the waiting list and 107 vacancies. The daily average was 2,309, a figure similar to the census of 2,316 patients on the day of reporting.

6 *Private Sanatoriums*—The private sanatoriums comprise a heterogeneous group. They represent

Table 27—Municipal Sanatoriums Classified by States

| State | Number of Sanatoriums | Bed Capacity | | | Patients Admitted | | | Patients Discharged (Including Deaths) | Number of Deaths | Patients Treated | Patients Present | Waiting List | Daily Average |
|----------------------|-----------------------|--------------|----------|--------|-------------------|----------|--------|--|------------------|------------------|------------------|--------------|---------------|
| | | Adults | Children | Total | Adults | Children | Total | | | | | | |
| District of Columbia | 2 | 220 | 150 | 370 | 210 | 122 | 332 | 209 | 84 | 546 | 355 | 30 | 255 |
| Illinois | 2 | 1,140 | 150 | 1,290 | 907 | 934 | 1,841 | 1,018 | 228 | 3,096 | 1,273 | 17 | 1,218 |
| Maryland | 1 | 179 | | 179 | 452 | | 452 | 394 | 170 | 557 | 163 | 5 | 163 |
| Massachusetts | 4 | 744 | | 744 | 552 | | 552 | 690* | 265 | 1,386 | 783 | 20 | 724 |
| Michigan | 2 | 675 | 160 | 835* | 601 | 187 | 788 | 805 | 75 | 1,741 | 940 | | 941 |
| Missouri | 2 | 632 | 30 | 668 | 534 | | 534 | 526 | 154 | 1,189 | 662 | | 633 |
| New York | 5 | 2,081 | 428 | 2,509 | 2,811 | 334 | 3,145 | 3,281 | 635 | 5,835 | 2,380 | 90 | 2,687 |
| Ohio | 1 | | | 48 | | | 32 | | | | | | 44 |
| Pennsylvania | 1 | 246 | 44 | 290 | 221 | 52 | 273 | 281 | 69 | 540 | 278 | 66 | 275 |
| Virginia | 2 | 254 | 24 | 278 | 114 | 10 | 124* | 241 | 46 | 484 | 230 | | 237 |
| Totals | 22 | 6,171 | 1,001 | 7,365* | 6,402 | 1,645 | 8,346* | 8,307 | 1,716 | 15,403 | 7,014 | 298 | 7,227 |

* Partly unclassified

maintenance cost is approximately \$1,466,445.90. The average daily per capita cost is \$1.74.

The regular medical staff has thirty-nine members, or 2.6 per institution. The ratio of physicians to patients is 1:60. The medical director serves on a full-time basis in eight of the sanatoriums.

The nursing staff totals 258 and includes 123 graduates and 135 practical nurses. On the basis of a daily average census of 2,309, the ratio of nurses to patients is 1:9. The total number of employees is 1,023 and includes ten dietitians, one graduate pharmacist, eight record clerks, nine x-ray technicians, ten laboratory

several types of ownership and control and vary greatly in size, type of construction and equipment. In completeness of hospital service they differ widely. Some are hardly beyond the nursing home stage, others, on the contrary, are equipped and staffed to offer a complete and scientific sanatorium service. A few have also gained national prominence because of their scientific accomplishments and their contributions to the progress of medicine.

There are in all 178 private sanatoriums, with a total capacity of 13,684 beds, 8,731 for adults, 892 for children and 4,061 unassigned. They have an average

Table 28—City-County Sanatoriums Classified by States

| State | Number of Sanatoriums | Bed Capacity | | | Patients Admitted | | | Patients Discharged (Including Deaths) | Number of Deaths | Patients Treated | Patients Present | Waiting List | Daily Average |
|----------------|-----------------------|--------------|----------|--------|-------------------|----------|--------|--|------------------|------------------|------------------|--------------|---------------|
| | | Adults | Children | Total | Adults | Children | Total | | | | | | |
| California | 1 | 82 | | 82 | 93 | | 93 | 85 | | 160 | 81 | | 80 |
| Georgia | 2 | 178 | 40 | 242* | | | 212 | 180 | 66 | 428 | 237 | 207 | 231 |
| Illinois | 1 | 110 | | 110 | 92 | 9 | 101 | 122 | 16 | 215 | 104 | 20 | 99 |
| Kansas | 1 | 50 | 10 | 60 | 73 | 87 | 160 | 158 | 116 | 198 | 43 | 0 | 42 |
| Kentucky | 1 | 314 | 90 | 404 | 434 | 88 | 522 | 1,003 | 116 | 1,003 | 500 | 45 | 502 |
| New York | 1 | 83 | 52 | 135 | 75 | 81 | 156 | 104 | 25 | 240 | 132 | 3 | 135 |
| Ohio | 1 | 354 | 108 | 462 | 335 | 121 | 456 | 454 | 34 | 849 | 423 | 27 | 419 |
| Pennsylvania | 1 | 55 | 2 | 57 | 95 | 4 | 99 | 103 | 10 | 153 | 53 | 18 | 53 |
| South Carolina | 1 | 26 | | 26 | | | 31 | 28 | 0 | 53 | 24 | 4 | 20 |
| Tennessee | 2 | 385 | 118 | 503 | 332 | 73 | 405 | 409 | 147 | 816 | 400 | 32 | 408 |
| Texas | 3 | 282 | 60 | 342 | 533 | 106 | 639 | 653 | 130 | 962 | 329 | 30 | 320 |
| Totals | 15 | 1,919 | 480 | 2,423* | 2,062 | 519 | 2,824* | 2,813 | 573 | 5,113 | 2,816 | 300 | 2,309 |

* Partly unclassified

technicians, two occupational therapists, fifteen school teachers, three social service workers and nine field nurses.

Twelve municipal sanatoriums have facilities for pneumothorax and eleven are equipped for minor surgery, two for general major surgery and five for special chest surgery. Twelve institutions maintain surgical affiliations. Dental departments are furnished in nine sanatoriums, but only one has a full-time dental staff. Ten institutions supply roentgenographic equipment, eleven have fluoroscopic facilities, nine have stereoscopic equipment, and five refer x-ray work to other hospitals. Laboratory equipment is provided in

capacity of seventy-seven beds, the lowest of any group, and vary in size from eight to 487 beds. The capacity is less than twenty-five beds in twenty-eight institutions, from twenty-five to forty-nine beds in forty-four, from fifty to ninety-nine beds in fifty-six, and 100 beds or over in fifty.

One hundred and forty-one sanatoriums which have facilities for pneumothorax report a total of 76,708 treatments. There is equipment for minor surgery in 122, for major surgery in thirty-eight, and for special chest surgery in forty. On the other hand, 118 sanatoriums maintain surgical affiliations. Seventy-three institutions have dental departments, with four main

taining a full-time dental staff X-ray equipment is furnished in 115 of the private sanatoriums, fluoroscopic facilities in 122, and stereoscopic equipment in ninety-two Fifty-six refer x-ray work to other hospitals In 152 institutions there were 10,090 patients admitted, 62,605 x-ray examinations carried out, and 65,892 fluoroscopic studies

Laboratory facilities are furnished in 115 sanatoriums and necropsy facilities in twenty-two Eighty institutions reported 9,104 patients admitted and a total of 208,904 laboratory examinations The private institutions show the lowest necropsy rate of any sanatorium group, namely, 9 per cent 1,911 deaths and 173 necropsies

In the private sanatoriums the ratio of physicians to patients is 1 32 The regular staff of 300 members includes sixty-eight medical directors on full-time duty, ninety on part-time duty and 142 resident physicians

The valuation of the private sanatorium group is \$42,022,469 28, or \$3,070 92 per bed These institutions operate on an average daily per capita cost of \$2 94 and expend annually about \$10,183,719

7 Tuberculosis and Isolation Hospitals—Twenty-six "tuberculosis and isolation" hospitals are included in the list of tuberculosis departments Many of them are operated principally for the treatment of tuberculosis and might well be listed as sanatoriums were it not for the fact that the sanatorium classification has been reserved for those institutions which treat tuberculosis only

Table 30, which lists each institution by name and also the principal features of the tuberculosis service, shows that the tuberculosis and isolation hospitals have a total capacity of 2,556 beds 2,131 for adults, 137 for children and 288 unassigned The admissions for a year total 4,456 including 2,280 adults, 128 children

Table 29—Private Sanatoriums Classified by States

| State | Number of Sanatoriums | Bed Capacity | | | Patients Admitted | | | Patients Discharged (Including Deaths) | Number of Deaths | Patients Treated | Patients Present | Waiting List | Daily Average |
|----------------|-----------------------|--------------|----------|--------|-------------------|----------|---------|--|------------------|------------------|------------------|--------------|---------------|
| | | Adults | Children | Total | Adults | Children | Total | | | | | | |
| Alabama | 1 | 60 | | 60 | 45 | 3 | 48 | 52 | 21 | 89 | 37 | | 33 |
| Arizona | 12 | 150 | 30 | 180* | 235 | 49 | 284* | 208 | 30 | 467 | 201 | 6 | 192 |
| California | 24 | 400 | 18 | 418* | 1,026 | 5 | 1,031* | 1,017 | 136 | 1,827 | 960 | 49 | 908 |
| Colorado | 17 | 1,025 | 112 | 1,137* | 736 | 80 | 816* | 1,139 | 132 | 2,098 | 1,034 | 120 | 1,033 |
| Connecticut | 2 | 192 | | 192 | 76 | | 76 | 263 | 4 | 440 | 170 | | 173 |
| Florida | 1 | | | 10 | | | | | | | 5 | | |
| Georgia | 1 | 26 | | 26 | 28 | 1 | 29 | 25 | | 36 | 16 | | 16 |
| Illinois | 7 | 348 | 32 | 380* | 576 | 43 | 619* | 620 | 64 | 983 | 348 | 6 | 351 |
| Louisiana | 2 | 200 | 30 | 230 | 189 | 17 | 206 | 171 | 62 | 283 | 101 | | 110 |
| Maine | 1 | 30 | | 30 | 24 | | 24 | 29 | 2 | 44 | 15 | | 14 |
| Maryland | 3 | 227 | 48 | 275 | 86 | | 86 | 302 | 63 | 556 | 250 | 27 | 252 |
| Massachusetts | 7 | 273 | 44 | 317* | 225 | 20 | 245* | 278 | 34 | 509 | 230 | 7 | 238 |
| Michigan | 6 | 638 | 62 | 700 | 682 | 21 | 703 | 632 | 197 | 1,278 | 598 | | 611 |
| Minnesota | 2 | 76 | | 76 | 53 | | 53 | 69 | 9 | 78 | 22 | | 35 |
| Mississippi | 1 | 47 | | 47 | 30 | | 30 | 41 | 14 | 69 | 28 | | 30 |
| Missouri | 2 | 189 | 32 | 221 | 28 | 83 | 207* | 248 | 60 | 416 | 170 | 10 | 169 |
| New Hampshire | 1 | 75 | 20 | 95 | | | | 66 | 77 | 10 | 168 | | 86 |
| New Jersey | 6 | 174 | | 231* | 166 | 1 | 167* | 180 | 19 | 317 | 125 | 50 | 143 |
| New Mexico | 5 | 230 | 10 | 240 | 162 | | 162* | 203 | 31 | 346 | 221 | | 219 |
| New York | 20 | 2,416 | 165 | 2,581* | 2,392 | 110 | 2,502* | 3,110 | 565 | 5,324 | 2,243 | 63 | 2,387 |
| North Carolina | 14 | 149 | | 149* | 68 | 1 | 69* | 166 | 25 | 361 | 273 | 5 | 306 |
| Ohio | 4 | 252 | 10 | 262* | 147 | | 147* | 215 | 51 | 430 | 219 | 2 | 109 |
| Oklahoma | 1 | | | 60 | | | | 92 | 4 | 107 | 19 | | 14 |
| Oregon | 1 | | | 60 | 104 | | 104 | 110 | | 148 | 38 | | 31 |
| Pennsylvania | 9 | 765 | 97 | 862* | 951 | 41 | 992* | 1,532 | 155 | 2,338 | 618 | 72 | 817 |
| Rhode Island | 1 | 60 | | 60 | 32 | | 32 | 29 | 14 | 77 | 47 | 2 | 47 |
| South Carolina | 1 | 70 | | 70 | 41 | | 41 | 44 | 4 | 76 | 40 | 18 | 30 |
| Tennessee | 4 | 179 | 90 | 269* | 202 | 67 | 269* | 270 | 64 | 547 | 259 | 27 | 203 |
| Texas | 11 | 270 | | 270* | 665 | 11 | 676* | 661 | 71 | 881 | 529 | | 491 |
| Virginia | 2 | 40 | 20 | 60* | 104 | 52 | 156 | 171 | 6 | 240 | 69 | 4 | 64 |
| Washington | 3 | 16 | | 16* | 238 | 3 | 241* | 237 | 33 | 317 | 74 | | 87 |
| West Virginia | 2 | 34 | 51 | 85 | 23 | 21 | 44* | 44 | 6 | 118 | 70 | 6 | 68 |
| Wisconsin | 2 | 20 | | 20* | 75 | 6 | 81 | 76 | 11 | 163 | 78 | 1 | 83 |
| Totals | 178 | 8,731 | 892 | 9,623* | 9,485 | 587 | 10,072* | 12,453 | 1,911 | 21,104 | 9,420 | 476 | 9,400 |

* Partly unclassified

Other attending or consulting physicians increase the entire staff membership to 1,217

The nursing staff totals 1,324 760 graduates, 104 students, fifty affiliates and 410 practical nurses An average daily census of 9,490 indicates that the ratio of nurses to patients is approximately 1 7 Other trained personnel includes seventy-four dietitians, twenty-three graduate pharmacists 110 record clerks eighty-four x-ray technicians, ninety laboratory technicians, twenty-eight occupational therapists, thirty-two school teachers, nineteen social service workers and eleven field nurses The total number of employees exclusive of physicians and dentists is 4,567

Table 29 shows that the private sanatoriums admitted 14,480 patients 9,485 adults 587 children and 4,408 not classified There were 21,104 patients treated 12,453 discharged and 1,911 deaths The average length of stay was considerably less than in other sanatorium groups, 151 days The private sanatoriums had 9,420 patients present on the day of reporting, a waiting list of 476, and 4,264 vacancies

and 2,048 unclassified There were 3,952 patients discharged, 2,306 patients were present on the day of reporting, and the average daily census was 2,134

Twelve of the hospitals have a full-time staff of forty-five physicians, seventeen employ 459 graduate nurses, and ten are also served by a group of seventy-five student, affiliate and practical nurses The total number of employees in seventeen of the principal hospitals is 1,410, exclusive of physicians

Eighteen hospitals in this group have laboratory departments, fifteen have x-ray equipment, and fourteen have fluoroscopic facilities Apparatus for the administration of artificial pneumothorax is furnished in fourteen

8 Tuberculosis Departments of General Hospitals—As shown in the early part of this report, there are 418 tuberculosis departments connected with general hospitals A considerable number are regular sanatorium units operated in conjunction with the main hospital service Eighty-six hospitals have separate buildings for tuberculosis, in 175 the tuberculosis

departments occupy separate wards or floors, but in 157 the degree of segregation is not known. Three hundred and eleven departments of general hospitals have a capacity of less than twenty-five beds, thirty-eight vary from twenty-five to forty-nine beds, thirty-three have from fifty to ninety-nine beds, and in thirty-six the capacity is 100 beds or over.

Table 31 lists ninety-three of the principal tuberculosis departments of general hospitals which were requested to supply the special data included in the tuberculosis questionnaire. These institutions have a total capacity of 11,942 beds, 9,551 for adults, 701 for children and 1,690 unassigned. They admitted 26,128 patients including 20,583 adults, 885 children and 4,660 not classified. There were 24,627 patients discharged during a twelve months period. This group of hospitals maintained a daily average of 8,927 and on the day of reporting had 9,664 patients under treatment.

Seventy hospitals reported a full-time staff of 373 physicians, an average of five per institution. The

extent to which tuberculosis activities have developed in other hospital fields.

Throughout the survey, every effort was made to obtain as accurate information as possible. The inspection reports were supplemented by a comprehensive tuberculosis questionnaire and the data on the hospitalization of children were later rechecked to determine accurately the classes of patients admitted.

The report is mainly a compilation of factual data and lends itself to comparative studies on the basis of previous surveys. It does not attempt to cover every phase of the tuberculosis service but deals mostly with features that can readily be subjected to a statistical analysis.

This report is presented in the hope that it will be useful to the medical profession, the hospital field and those who are intimately connected with the tuberculosis service in the United States. The completeness of the report is in a large measure due to the loyal and harmonious cooperation of the American Sanatorium

Table 30—Tuberculosis-Isolation Hospitals

| Name | Location | Bed Capacity for Tuberculosis | | | Patients Admitted | | | Patients Discharged | Patients Present | Daily Average | Full Time Staff | Graduate Nurses | Other Nurses | Employees | X-Ray Facilities | Fluoroscopic Facilities | Laboratory Facilities | Pneumothorax Facilities |
|---|-------------------------|-------------------------------|------------|--------------|-------------------|------------|---------------|---------------------|------------------|---------------|-----------------|-----------------|--------------|------------|------------------|-------------------------|-----------------------|-------------------------|
| | | Adults | Children | Total | Adults | Children | Total | | | | | | | | | | | |
| Englewood Hospital | Bridgeport Conn | 34 | 0 | 40 | 89 | 0 | 89 | 93 | 24 | 36 | 12 | 12 | 1 | 21 | No | No | No | No |
| Municipal Hospital | Greenwich Conn | 10 | | 16 | 21 | | 21 | 21 | | 8 | | | 1 | 9 | No | No | No | No |
| Board of Health Hospital | Brookline Mass | | | 30 | | | 23 | 10 | 22 | 20 | | 5 | 1 | 6 | No | No | No | No |
| Lowell Tuberculosis Hospital | Lowell Mass | 54 | | 54 | 75 | 4 | 79 | 67 | 51 | 46 | | 13 | 18 | Yes | Yes | Yes | Yes | Yes |
| Malden Contagious Hospital | Malden Mass | | | 16 | | | 40 | | 10 | | | | | Yes | No | No | No | No |
| Barnstable County Sanatorium | Pocasset Mass | 25 | | 28 | | | 177 | 142 | 41 | 39 | 2 | 7 | 12 | Yes | Yes | Yes | Yes | Yes |
| Somerville Contagious Hospital | Somerville Mass | | | 20 | | | 3 | | | | | | | Yes | No | No | No | No |
| Health Department Hospitals | Springfield Mass | 46 | | 46 | 70 | | 70 | 68 | 40 | 35 | | 9 | 10 | Yes | Yes | Yes | Yes | Yes |
| Belmont Hospital | Worcester Mass | 150 | | 150 | | | 199 | 104 | 104 | 114 | 3 | 32 | 15 | Yes | Yes | Yes | Yes | Yes |
| Herman Kiefer Hospital | Detroit | 761 | | 761 | | | 1,347 | 1,292 | 741 | 720 | 15 | 178 | 26 | 237 | Yes | Yes | Yes | Yes |
| Fairmount Hospital | Kalamazoo Mich | 64 | 11 | 75 | 62 | 14 | 76 | 71 | 52 | 55 | 1 | 6 | 8 | 24 | No | No | No | No |
| Saginaw County Contagious Hosp | Saginaw Mich | | | 2 | | | 4 | | 24 | | | | | No | No | No | No | No |
| Sunnyslope Hospital | St Joseph Mo | | | 9 | | | 12 | | | | | | | No | No | No | No | No |
| City Isolation Hospital | St Louis | 07 | | 07 | 131 | | 131 | 133 | 07 | 07 | 1 | 3 | 7 | 100 | Yes | Yes | Yes | Yes |
| Detention Hospital | Great Falls, Mont | | | 10 | | | 12 | | | | | | | No | No | No | No | No |
| Essex County Hospital for Contagious Diseases | Belleville, N. J. | | | 30 | | | | | 10 | | | | | Yes | Yes | Yes | Yes | Yes |
| Passaic Municipal Hospital | Passaic N. J. | | | 4 | | | 3 | | | | | | | No | No | No | No | No |
| Paterson City Hospital | Paterson N. J. | 30 | | 30 | 12 | | 12 | 14 | 17 | 10 | | 1 | 14 | 14 | No | No | No | No |
| Bergen Pines | Bergen County Hosp | 100 | 70 | 220 | 200 | 87 | 292 | 250 | 230 | 208 | 5 | 30 | 0 | 92 | Yes | Yes | Yes | Yes |
| Trenton Municipal Hospital | Trenton N. J. | 108 | | 108 | 58 | | 58 | 36 | 77 | 57 | 4 | 0 | 18 | Yes | Yes | Yes | Yes | Yes |
| Kingston Avenue Hospital | Brooklyn | | | 20 | | | 100 | | 71 | | | | | Yes | Yes | Yes | Yes | Yes |
| Riverside Hospital | New York City | 284 | | 284 | 679 | | 679 | 677 | 338 | 339 | 7 | 75 | 197 | Yes | Yes | Yes | Yes | Yes |
| Willard Parker Hospital | New York City | 134 | | 134 | 660 | | 660 | 594 | 108 | 99 | 2 | 12 | 27 | Yes | Yes | Yes | Yes | Yes |
| Municipal Hospital | Johnstown Pa | | | 12 | | | 4 | | | | | | | No | No | No | No | No |
| Charles V. Chapin Hospital | Providence R. I. | | | 60 | 150 | | 150 | 140 | 53 | 60 | 2 | 2 | 8 | Yes | Yes | Yes | Yes | Yes |
| Firland Sanat. and Isolation Hospital | Richmond Highlands Wash | 200 | 50 | 250 | 63 | 20 | 83 | 132 | 223 | 212 | 1 | 52 | 3 | 76 | Yes | Yes | Yes | Yes |
| Totals | | 2,131 | 137 | 2,268 | 2,280 | 128 | 4,408* | 3,902 | 2,306 | 2,134 | 45 | 450 | 75 | 870 | 15 | 14 | 18 | 11 |

* Partly unclassified

total number of employees exclusive of physicians is 6,785 and includes 1,406 graduate nurses and 717 student, affiliate and practical nurses. These figures cannot be used for comparative purposes, however, for some of the institutions included the entire hospital personnel, whereas others listed only the employees attached to the tuberculosis service.

Eighty-six of this group have x-ray, fluoroscopic and pneumothorax facilities. Laboratory equipment is furnished in eighty-nine.

In all, the tuberculosis departments of general hospitals have a capacity of 14,601 beds. They admitted 37,079 patients during a twelve months period and had 11,318 patients under treatment on the day of reporting.

SUMMARY

1 *General Statement*—The main purpose of this report has been to present to the medical profession a picture of the tuberculosis hospitalization in the United States. The study, therefore, has not dealt with the sanatoriums alone but has been concerned with the

Association, the National Tuberculosis Association and the hospital and sanatorium superintendents, who so generously responded with an unprecedented record of 98.9 per cent returns.

2 *Extent of Tuberculosis Hospitalization*—The report is based on information supplied by 6,200 hospitals including 471 sanatoriums, 740 tuberculosis departments and twenty-nine preventoriums. The total capacity for tuberculosis is 95,198 beds, 64,997 in the sanatoriums, 28,534 in the tuberculosis departments and 1,667 in the preventorium group.

The sanatoriums, tuberculosis departments and preventoriums admitted 121,706 patients during a twelve months period. The number of patients discharged is approximately 118,700 on the basis of 97,381 patients discharged in institutions representing 82 per cent of the bed capacity. The average daily census of patients receiving treatment for tuberculosis is approximately 82,000 for institutions representing 97 per cent of the bed capacity reported, 81,652 patients under treatment. Similarly, from the daily average reported it is esti-

Table 31—General Hospitals Having Exceptional Facilities for Tuberculosis

| Name | Location | Bed Capacity for Tuberculosis | | | Patients Admitted | | | Patients Discharged | Patients Present | Daily Average | Full Time Staff | Graduate Nurses | Other Nurses | Other Employees | X Ray Facilities | Fluoroscopic Facilities | Laboratory Facilities | Pneumothorax Facilities |
|---|-------------------------|-------------------------------|----------|-------|-------------------|----------|-------|---------------------|------------------|---------------|-----------------|-----------------|--------------|-----------------|------------------|-------------------------|-----------------------|-------------------------|
| | | Adults | Children | Total | Adults | Children | Total | | | | | | | | | | | |
| Veterans Administration Facility | Tuskegee Ala | 24 | | 24 | | | 505 | 224 | 10 | 60 | 4 | 11 | | 12 | Yes | Yes | Yes | Yes |
| St Mary's Hospital and Sanatorium | Tucson Ariz | | | 50 | | | 229 | 189 | 35 | 40 | | 6 | | 27 | Yes | Yes | Yes | Yes |
| Southern Methodist Hosp and Sanat | Tucson Ariz | | | 80 | | | | | | | | | | 231 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Whipple Ariz | 275 | | 275 | 627 | | 627 | 629 | 342 | 312 | 11 | 4 | 1 | 263 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Little Rock Ark | 300 | | 300 | | | | | | | | | | 231 | Yes | Yes | Yes | Yes |
| Pinalaki County Hospital | Arlington Calif | 22 | 8 | 30 | 88 | 11 | 97 | 87 | 84 | 75 | 2 | 8 | 1 | 10 | Yes | Yes | Yes | Yes |
| Riverside County Hospital | Fort Bidwell, Calif | 83 | | 30 | 28 | | 28 | 29 | 23 | 26 | 1 | 3 | 1 | 4 | | | Yes | No |
| Fort Bidwell Sanatorium | French Camp Calif | 30 | | 55 | 138 | | 138 | 128 | 42 | 53 | 2 | 3 | 5 | 14 | Yes | Yes | Yes | Yes |
| San Joaquin General Hospital | Fresno Calif | 50 | 8 | 92 | | | 165 | 151 | 94 | 90 | 3 | 6 | 6 | 10 | Yes | Yes | Yes | Yes |
| Fresno County General Hospital | Livermore Calif | 84 | | 318 | 304 | | 804 | 330 | 236 | 215 | 10 | 32 | | 184 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Los Angeles | 718 | 45 | 201* | | | 1216 | 1163 | 252 | | 3 | 25 | 25 | | Yes | Yes | Yes | Yes |
| Los Angeles County Hospital | Merced Calif | 123 | | 60 | 25 | 42 | 67 | 49 | 34 | | 1 | 3 | 1 | 4 | No | No | No | No |
| Merced General Hospital | Orange Calif | 26 | 24 | 92 | 84 | 50 | 134 | 102 | 92 | 85 | 1 | 3 | 8 | 11 | Yes | Yes | Yes | Yes |
| Orange County Hospital | Rose Calif | 79 | 13 | 18 | 51 | | 51 | 43 | 18 | 14 | | | 3 | 6 | Yes | Yes | Yes | Yes |
| Rose General Hospital | San Bernardino, Calif | | | 63 | 66 | 18 | 84 | 91 | 48 | 46 | 1 | 3 | 7 | 16 | Yes | Yes | Yes | Yes |
| San Bernardino County Charity Hosp | San Diego Calif | 45 | 18 | 163 | 22 | 185 | 164 | 172 | 168 | 2 | 9 | 17 | 13 | Yes | Yes | Yes | Yes | |
| San Diego County General Hospital | San Francisco | 145 | 40 | 415 | 766 | | 766 | 770 | 380 | 380 | | 29 | 37 | | Yes | Yes | Yes | Yes |
| San Francisco Hospital | San Francisco | 365 | 60 | 53 | 85 | | 95 | 89 | 65 | 50 | 6 | 4 | | 213 | Yes | Yes | Yes | Yes |
| U S Marine Hospital | San Leandro, Calif | | | 153 | 413 | | 413 | 411 | 150 | 150 | 2 | 7 | 10 | 19 | Yes | Yes | Yes | Yes |
| Fairmont Hospital of Alameda County | San Mateo Calif | | | 44 | 41 | 3 | 44 | 40 | 41 | 41 | 1 | 4 | 2 | 7 | Yes | Yes | Yes | Yes |
| Community Hospital of San Mateo County | Santa Barbara Calif | 44 | | 56 | 61 | 12 | 63 | 64 | 53 | 54 | 1 | 4 | 6 | 5 | No | Yes | Yes | Yes |
| Santa Barbara General Hospital | Santa Cruz, Calif | 60 | | 16 | 30 | 4 | 34 | 30 | 13 | 15 | | | 2 | 2 | Yes | Yes | Yes | Yes |
| Santa Cruz County Hospital | Ventura Calif | | | 40 | | | 44 | 61 | 32 | 25 | | | 2 | 7 | Yes | Yes | Yes | Yes |
| Ventura County Hospital | West Los Angeles Calif. | 250 | | 250 | 423 | | 423 | 539 | 130 | 225 | 7 | 18 | | 61 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Colorado Springs Colo | | | 62 | 1 | | 70 | 50 | | | 1 | 30 | 30 | | Yes | Yes | Yes | Yes |
| Glockner Sanatorium and Hospital | Colorado Springs Colo | | | 75 | | | 62 | 62 | 40 | 41 | | | 5 | | Yes | Yes | Yes | Yes |
| St Francis Hospital and Sanatorium | Colorado Springs Colo | 100 | | 100 | | | 50 | 53 | 55 | 67 | 3 | 10 | 4 | 19 | Yes | Yes | Yes | Yes |
| Union Printers Home and Tuberculo- sis Sanatorium | Del Norte Colo | | | 10 | 6 | | 6 | 2 | 8 | | | 1 | | | No | Yes | Yes | Yes |
| St Joseph Hospital and Sanatorium | Denver | 80 | | 80 | 178 | | 178 | 183 | 64 | 64 | | | | | Yes | Yes | Yes | Yes |
| Denver General Hospital | Denver | 636 | | 536 | | | 915 | 903 | 447 | 402 | 46 | 9 | 163 | 623 | Yes | Yes | Yes | Yes |
| Fitzsimons General Hospital | La Junta Colo | 18 | | 18 | 7 | | 7 | 8 | 14 | 14 | | | 2 | 3 | Yes | Yes | Yes | Yes |
| Mennonite Hospital and Sanatorium | West Haven Conn | 42 | | 42 | 110 | | 110 | 110 | 42 | 40 | 2 | 15 | 4 | 41 | Yes | Yes | Yes | Yes |
| Wm Wirt Winchester Hospital (Dept of New Haven Hospital) | Washington D C | 80 | 20 | 100 | 283 | 38 | 321 | 290 | 82 | 63 | 1 | 4 | 6 | 10 | Yes | Yes | Yes | Yes |
| Gallinger Municipal Hospital | Jacksonville Fla | 37 | | 37 | | | 61 | 79 | 28 | 33 | 0 | | | | Yes | Yes | Yes | Yes |
| Duval County Hospital | Largo Fla | 18 | | 18 | | | | 10 | | | | | 2 | 2 | Yes | No | No | No |
| Piñellas County Home | Miami Fla | 32 | | 32 | 62 | | 62 | 61 | 33 | 25 | 2 | 4 | | | Yes | Yes | Yes | Yes |
| James M. Jackson Memorial Hospital | Boise Idaho.. | 24 | | 24 | 19 | | 19 | 24 | 12 | 16 | 2 | 24 | | 78 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Chicago | 377 | | 327 | 1,240 | | 1,240 | 1,242 | 335 | 328 | 5 | 38 | | | Yes | Yes | Yes | Yes |
| Cook County Hospital | Hines Ill | 240 | | 250 | 491 | | 491 | 476 | 200 | 250 | 5 | 19 | | 27 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Alexandria La | 157 | | 157 | 390 | | 390 | 328 | 91 | 95 | 15 | 37 | | 258 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Shreveport La | | | 50 | 183 | | 183 | 183 | 50 | 50 | | 3 | | | Yes | Yes | Yes | Yes |
| Shreveport Charity Hospital | Lewiston Me | 16 | | 16 | | | 33 | 18 | | 10 | 1 | 4 | 139 | Yes | Yes | Yes | Yes | |
| Central Maine General Hospital | Fall River, Mass | 103 | 7 | 110 | 82 | 21 | 104 | 108 | 75 | 105 | 2 | 0 | 12 | 30 | Yes | Yes | Yes | Yes |
| Fall River General Hospital | Fitchburg Mass | 36 | | 36 | 32 | | 32 | 39 | 10 | 27 | | | | 2 | Yes | Yes | Yes | Yes |
| Burbank Hospital | Tewksbury Mass | 280 | | 280 | 244 | | 244 | 232 | 190 | | 2 | 15 | 9 | 1 | Yes | Yes | Yes | Yes |
| State Infirmary | Ann Arbor Mich | | | 85 | 523 | 12 | 540 | 442 | 98 | 92 | 7 | 30 | 0 | 9 | Yes | Yes | Yes | Yes |
| University Hospital | Detroit | | | 60 | 169 | | 169 | 177 | 23 | 67 | 4 | 12 | 0 | 10 | Yes | Yes | Yes | Yes |
| Lincoln Hospital | Ironwood, Mich | 60 | | 60 | 36 | | 36 | 30 | 44 | 47 | 1 | 4 | 1 | | Yes | Yes | Yes | Yes |
| Grand View Hospital | Duluth Minn | 20 | 6 | 25 | 100 | 5 | 105 | 108 | 17 | 15 | 1 | 4 | 3 | | Yes | Yes | Yes | Yes |
| St. Luke's Hospital | Duluth Minn | | | 28 | 89 | 9 | 93 | 98 | 16 | 16 | 1 | 2 | 4 | | Yes | Yes | Yes | Yes |
| St Mary's Hospital | Fort Snelling Minn | 104 | | 104 | 250 | | 250 | 244 | 163 | 175 | 12 | 15 | | 47 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Minneapolis | | | 30 | 101 | | 101 | 104 | 3 | 6 | | 2 | 0 | 8 | Yes | Yes | Yes | Yes |
| Fairview Hospital | St Paul | | | 215 | 222 | | 222 | 183 | 226 | 221 | | | | | Yes | Yes | Yes | Yes |
| Ancker Hospital | St Louis | 62 | | 62 | 371 | | 371 | 349 | 48 | 41 | 5 | 1 | 5 | | Yes | Yes | Yes | Yes |
| St Louis City Hospital | St Louis | 40 | | 40 | 268 | | 268 | 220 | 38 | 30 | 4 | 4 | 7 | 12 | Yes | Yes | Yes | Yes |
| St Louis City Hospital No 2 | Omaha | 6 | 0 | 60 | 00 | 1 | 93 | 87 | 82 | 80 | 1 | 8 | 4 | 13 | Yes | Yes | Yes | Yes |
| Douglas County Hospital | Winnebago Neb | 15 | | 15 | 60 | 10 | 60 | 50 | 10 | 13 | 2 | | | 0 | Yes | Yes | Yes | Yes |
| Winnebago Indian Hospital | Jersey City, N J | 75 | | 75 | 303 | 2 | 305 | 377 | 88 | 79 | 2 | 11 | 4 | 23 | Yes | Yes | Yes | Yes |
| Medical Center of Jersey City | Albuquerque N M | | | 60 | 84 | | 84 | 68 | 49 | 34 | | | | | Yes | Yes | Yes | No |
| St Joseph Sanatorium and Hospital | Albuquerque N M | | | 80 | 125 | | 125 | 102 | 55 | 47 | | 7 | 2 | 20 | Yes | Yes | Yes | Yes |
| Southwestern Presbyterian Sanatorium | Albuquerque N M | 105 | | 105 | 247 | | 247 | 189 | 107 | 100 | 10 | 28 | | 67 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Fort Bayard N M | 391 | | 321 | 144 | | 144 | 135 | 109 | 85 | 9 | 20 | | 100 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Las Vegas N M | | | 20 | 7 | | 7 | 0 | 8 | 6 | | 5 | | 4 | Yes | Yes | Yes | Yes |
| St Anthony's Sanitarium and Hosp | Santa Fe N M | | | 20 | 4 | | 4 | 11 | 4 | 8 | | 8 | 22 | 38 | Yes | Yes | Yes | Yes |
| St Vincent's Sanatorium and Hosp | Albany N Y | | | 120 | 145 | 2 | 147 | 150 | 138 | 69 | 2 | 7 | 19 | 23 | Yes | Yes | Yes | Yes |
| Albany Hospital | Brooklyn | 200 | | 200 | 1,457 | | 1,457 | 1,340 | 103 | 103 | 3 | 18 | 24 | 30 | Yes | Yes | Yes | Yes |
| Kings County Hospital | Buffalo | 2 2 | 2 | 374 | 457 | 27 | 484 | 456 | 311 | 317 | 3 | 23 | 27 | | Yes | Yes | Yes | Yes |
| Buffalo City Hospital | Mount McGregor N Y | 254 | | 254 | | | 73 | 83 | 177 | 155 | 7 | 31 | | 191 | Yes | Yes | Yes | Yes |
| Metropolitan Life Insurance Company Sanatorium | New York City | 174 | | 174 | 3,394 | | 3,394 | 3,363 | 204 | 217 | 6 | 31 | 10 | | Yes | Yes | Yes | Yes |
| Bellerue Hospital | New York City | 44 | | 44 | | | 143 | 169 | 44 | 35 | 1 | 6 | | | Yes | Yes | Yes | Yes |
| Lenox Hill Hospital | New York City | 240 | 28 | 308 | 1,121 | 108 | 1,229 | 1,225 | 447 | 409 | 5 | 57 | 82 | 109 | Yes | Yes | Yes | Yes |
| Metropolitan Hospital | New York City | 164 | | 164 | 264 | | 364 | 360 | 165 | 164 | 6 | 8 | 23 | 9 | Yes | Yes | Yes | Yes |
| Montefiore Hospital for Chronic Dis- eases | New York City | 150 | | 150 | 48 | | 48 | 52 | 135 | 171 | 4 | 57 | | 201 | Yes | Yes | Yes | Yes |
| U S Marine Hospital | New York City | 62 | | 62 | | | | 59 | 59 | 59 | 7 | 83 | | 410 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Valhalla N Y | 253 | 80 | 333 | 325 | 131 | 456 | 427 | 316 | 300 | 0 | 54 | 26 | 102 | Yes | Yes | Yes | Yes |
| Grasslands Hospital | Belmont N D | 14 | | 14 | | | 49 | 39 | 7 | 10 | 1 | 6 | 1 | 6 | No | No | No | No |
| Turtle Mountain Hospital | Cleveland.. | 354 | | 354 | 570 | | 570 | 550 | 354 | 351 | 4 | 75 | | 75 | Yes | Yes | Yes | Yes |
| City Hospital | Dayton Ohio | 250 | | 250 | 532 | | 532 | 536 | 176 | 185 | 5 | 26 | 25 | 41 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Applawall Pa | 181 | | 181 | 370 | | 370 | 311 | 177 | 170 | 10 | 47 | | 250 | Yes | Yes | Yes | Yes |
| Veterans Administration Facility | Mayview Pa | 152 | | 133</ | | | | | | | | | | | | | | |

Table 32—Tuberculosis Departments of Hospitals According to Type of Service

| State | General | | | | Tuberculosis Isolation | | | | Nervous and Mental | | | | Orthopedic | | | | Hospital Departments of Institutions | | | | Other | | | | | |
|----------------------|------------------------|----------------|---------------------------|-------------------|------------------------|----------------|---------------------------|-------------------|------------------------|----------------|---------------------------|-------------------|------------------------|----------------|---------------------------|-------------------|--------------------------------------|----------------|---------------------------|-------------------|------------------------|----------------|---------------------------|-------------------|-----|---|
| | Number of Institutions | Total Capacity | Capacity for Tuberculosis | Patients Admitted | Number of Institutions | Total Capacity | Capacity for Tuberculosis | Patients Admitted | Number of Institutions | Total Capacity | Capacity for Tuberculosis | Patients Admitted | Number of Institutions | Total Capacity | Capacity for Tuberculosis | Patients Admitted | Number of Institutions | Total Capacity | Capacity for Tuberculosis | Patients Admitted | Number of Institutions | Total Capacity | Capacity for Tuberculosis | Patients Admitted | | |
| Alabama | 4 | 1,677 | 53 | 889 | 3 | 5,237 | 80 | 4 | 3 | 5,237 | 80 | 4 | 1 | 87 | 87 | 84 | 1 | 87 | 87 | 84 | 1 | 87 | 87 | 84 | | |
| Arizona | 15 | 1,687 | 685 | 1,177 | 2 | 4,413 | 123 | 5 | 2 | 4,413 | 123 | 5 | 67 | 2 | 98 | 98 | 30 | 2 | 98 | 98 | 30 | 2 | 98 | 98 | 30 | |
| Arkansas | 3 | 870 | 81 | 70 | 6 | 16,337 | 317 | 44 | 6 | 16,337 | 317 | 44 | 67 | 4 | 271 | 81 | 33 | 4 | 271 | 81 | 33 | 2 | 149 | 6 | 21 | |
| California | 28 | 15,204 | 2,561 | 5,202 | 2 | 3,819 | 34 | 4 | 2 | 3,819 | 34 | 4 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | |
| Colorado | 13 | 2,801 | 900 | 1,340 | 2 | 2,111 | 56 | 113 | 2 | 2,111 | 56 | 113 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | |
| Connecticut | 3 | 922 | 48 | 249 | 2 | 211 | 56 | 113 | 2 | 211 | 56 | 113 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | |
| Delaware | 5 | 2,645 | 140 | 730 | 1 | 978 | 146 | 30 | 1 | 978 | 146 | 30 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | |
| District of Columbia | 0 | 1,161 | 118 | 282 | 1 | 4,123 | 48 | 8 | 1 | 4,123 | 48 | 8 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | |
| Florida | 4 | 643 | 34 | 48 | 2 | 7,116 | 512 | 8 | 2 | 7,116 | 512 | 8 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | |
| Georgia | 6 | 638 | 72 | 89 | 11 | 31,004 | 834 | 149 | 58 | 11 | 31,004 | 834 | 149 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Idaho | 10 | 8,108 | 710 | 2,002 | 5 | 8,166 | 170 | 58 | 5 | 8,166 | 170 | 58 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | |
| Illinois | 4 | 424 | 8 | 63 | 7 | 10,283 | 145 | 23 | 23 | 7 | 10,283 | 145 | 23 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Indiana | 4 | 1,375 | 50 | 230 | 3 | 4,430 | 100 | 16 | 16 | 3 | 4,430 | 100 | 16 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Iowa | 4 | 1,665 | 67 | 274 | 2 | 4,270 | 222 | 10 | 10 | 2 | 4,270 | 222 | 10 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Kansas | 10 | 1,246 | 12 | 279 | 2 | 4,270 | 222 | 10 | 10 | 2 | 4,270 | 222 | 10 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Kentucky | 6 | 1,246 | 12 | 279 | 2 | 4,270 | 222 | 10 | 10 | 2 | 4,270 | 222 | 10 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Louisiana | 4 | 3,301 | 577 | 513 | 2 | 3,301 | 577 | 513 | 2 | 3,301 | 577 | 513 | 2 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Maine | 7 | 783 | 30 | 106 | 2 | 3,060 | 58 | 10 | 10 | 2 | 3,060 | 58 | 10 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Maryland | 1 | 378 | 20 | 30 | 6 | 7,401 | 163 | 68 | 68 | 6 | 7,401 | 163 | 68 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Massachusetts | 11 | 5,084 | 450 | 510 | 11 | 10,965 | 327 | 62 | 62 | 11 | 10,965 | 327 | 62 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Michigan | 11 | 3,614 | 383 | 1,103 | 3 | 1,501 | 861 | 1,487 | 28 | 3 | 1,501 | 861 | 1,487 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Minnesota | 10 | 3,323 | 564 | 910 | 0 | 9,221 | 262 | 167 | 167 | 0 | 9,221 | 262 | 167 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Mississippi | 1 | 23 | 4 | 6 | 2 | 3,400 | 241 | 87 | 87 | 2 | 3,400 | 241 | 87 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Missouri | 10 | 2,996 | 207 | 1,063 | 0 | 11,222 | 264 | 87 | 87 | 0 | 11,222 | 264 | 87 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Montana | 6 | 537 | 100 | 114 | 1 | 36 | 10 | 12 | 12 | 1 | 36 | 10 | 12 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Nebraska | 7 | 1,033 | 141 | 225 | 2 | 277 | 76 | 143 | 87 | 2 | 277 | 76 | 143 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Nevada | 4 | 251 | 18 | 24 | 2 | 277 | 76 | 143 | 87 | 2 | 277 | 76 | 143 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| New Hampshire | 2 | 278 | 10 | 10 | 1 | 1,030 | 20 | 20 | 20 | 1 | 1,030 | 20 | 20 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| New Jersey | 8 | 2,129 | 133 | 694 | 4 | 9,109 | 338 | 63 | 63 | 4 | 9,109 | 338 | 63 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| New Mexico | 14 | 1,428 | 667 | 910 | 5 | 1,460 | 307 | 305 | 305 | 5 | 1,460 | 307 | 305 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| New York | 80 | 18,684 | 2,631 | 7,012 | 3 | 1,166 | 400 | 1,469 | 1,469 | 3 | 1,166 | 400 | 1,469 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| North Carolina | 4 | 171 | 7 | 17 | 20 | 6,180 | 1,712 | 577 | 577 | 20 | 6,180 | 1,712 | 577 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| North Dakota | 5 | 207 | 21 | 94 | 2 | 4,104 | 110 | 3 | 3 | 2 | 4,104 | 110 | 3 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Ohio | 18 | 7,078 | 846 | 1,934 | 2 | 2,784 | 43 | 3 | 3 | 2 | 2,784 | 43 | 3 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Oklahoma | 10 | 1,201 | 88 | 338 | 10 | 20,440 | 510 | 53 | 53 | 10 | 20,440 | 510 | 53 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Oregon | 5 | 834 | 74 | 122 | 3 | 3,521 | 35 | 10 | 10 | 3 | 3,521 | 35 | 10 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Pennsylvania | 29 | 10,207 | 736 | 2,933 | 1 | 60 | 12 | 4 | 4 | 1 | 60 | 12 | 4 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Rhode Island | 3 | 1,381 | 33 | 33 | 17 | 25,783 | 1,170 | 601 | 601 | 17 | 25,783 | 1,170 | 601 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| South Carolina | 5 | 747 | 130 | 202 | 1 | 265 | 60 | 150 | 150 | 1 | 265 | 60 | 150 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| South Dakota | 4 | 342 | 105 | 242 | 3 | 3,464 | | | | 3 | 3,464 | | | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Tennessee | 5 | 1,194 | 79 | 129 | 3 | 4,045 | 229 | 35 | 35 | 3 | 4,045 | 229 | 35 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Texas | 16 | 3,041 | 585 | 818 | 7 | 11,213 | 232 | 47 | 47 | 7 | 11,213 | 232 | 47 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Utah | 5 | 519 | 54 | 123 | 3 | 4,045 | 229 | 35 | 35 | 3 | 4,045 | 229 | 35 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Vermont | 1 | 135 | 27 | 27 | 7 | 11,213 | 232 | 47 | 47 | 7 | 11,213 | 232 | 47 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Virginia | 4 | 1,783 | 20 | 72 | 4 | 8,075 | 100 | 150 | 150 | 4 | 8,075 | 100 | 150 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Washington | 13 | 2,285 | 481 | 579 | 3 | 3,013 | 33 | 0 | 0 | 3 | 3,013 | 33 | 0 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| West Virginia | 3 | 350 | 22 | 83 | 3 | 2,371 | 15 | 23 | 23 | 3 | 2,371 | 15 | 23 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Wisconsin | 11 | 4,104 | 337 | 653 | 8 | 5,637 | 90 | 23 | 23 | 8 | 5,637 | 90 | 23 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Wyoming | 2 | 75 | 17 | 20 | 2 | 983 | 15 | 2 | 2 | 2 | 983 | 15 | 2 | 67 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 | 2 | 103 | 5 | 7 |
| Totals | 418 | 131,253 | 14,468 | 37,124 | 20 | 5,658 | 2,656 | 4,156 | 103 | 360,757 | 9,478 | 2,453 | 574 | 21 | 3,670 | 435 | 674 | 65 | 5,184 | 1,322 | 1,866 | 17 | 3,101 | 375 | 628 | |

mated that the daily census is 81,952. The accuracy of these figures is again demonstrated by the reports on the number of patients treated. With a daily census of 81,652 patients and 121,706 admissions, there should be approximately 203,358 patients treated during the year. Actually 166,818 were treated in institutions representing 82 per cent of the bed capacity, indicating a total of 203,436 for the entire group. Unfortunately, the number of readmissions and transfers is not known.

3 Cost of Tuberculosis Hospitalization—The sanatoriums, tuberculosis departments and preventoriums represent a total replacement valuation of approximately \$328,937,777.36, or a general average of \$3,455.30 per bed. The sanatorium group averages \$3,335 per bed, with the institutions of 100 beds or over averaging \$3,498. In view of these figures it appears that it should be possible to keep the cost of sanatorium construction well below \$6,000 or \$7,000 per bed. To expend from \$8,000 to \$12,000 per bed, as some institutions have done, seems an unwarranted extravagance in the use of public and private funds. By limiting construction to essential needs, there will be more funds available for the actual care of patients.

The annual cost of tuberculosis hospitalization in the United States exceeds \$70,000,000, a sum that emphasizes the magnitude of the tuberculosis problem as it still exists. The average cost of maintaining a tuberculous patient in the sanatoriums is \$2.37 a day, in the tuberculosis departments \$2.95, and in the preventoriums \$1.39.

4 Tuberculosis Hospitalization in General Hospitals—The tuberculosis departments of general hospitals, 418 in all, have a capacity of 14,601 beds. Many of them are regular sanatorium units, whereas others admit patients primarily for diagnosis and temporary care. As a whole, the group plays an important part in the control of tuberculosis for there were 37,079 tuberculous patients admitted in general hospitals during a one year period.

The practice of supplementing sanatorium facilities with tuberculosis departments in general hospitals has been indorsed by the American Medical Association, the American Hospital Association and the National Tuberculosis Association. The endorsement, however, embodies a requirement of adequate segregation for the protection of other patients and personnel. General hospitals continually admitting patients in need of segregation would benefit by the establishment of an isolation department not only for contagious diseases but also for tuberculosis, meningitis, encephalitis, pneumonia and other respiratory infections. By providing facilities of this type, general hospitals would be in position to offer complete community service.

5 Preventorium Service—The prevention of tuberculosis among children has been a subject of much concern during recent years. Local agencies have worked diligently to provide for the care of undernourished children and tuberculous contacts, summer camps have been established as a general health measure, preventoriums have been built, and many sanatoriums have entered into the preventive phase of tuberculosis control. Thus, there are at present 230 sanatoriums which admit children including 161 where childhood tuberculosis, contacts and other nontuberculous children are accepted.

The sanatoriums reported on the condition of 12,629 children and showed that 6,659 had the childhood type, 824 were extrapulmonary cases, 3,236 were nontuber-

culous, and 701 were unclassified. The preventoriums in reporting on 2,479 patients showed that twelve were adult type tuberculosis, 424 childhood type, twenty-four extrapulmonary, 1,326 nontuberculous and 693 unclassified.

The preventorium service today is the culmination of a well organized antituberculosis program. In invading the sanatorium field it should not be permitted to interfere with the primary function of the sanatoriums, which is the hospitalization of tuberculous patients. The preventorium service defeats its own purpose when it allows the admission of tuberculous contacts and childhood tuberculosis to the exclusion of open pulmonary cases.

6 Rehabilitation—Rehabilitation has not kept pace with the preventive and curative phases of the sanatorium service. Only fifty-three sanatoriums have made efforts to establish vocational rehabilitation as an aid to economic recovery. Two hundred and forty-one sanatoriums, however, have instituted programs of graduated exercise to insure a complete physical recovery and restore patients to a normal social life. In only five states is there an organized rehabilitation service under a bureau of vocational education. The problem, as a whole, is well worthy of further study. It is concerned with the cost of tuberculosis hospitalization and with the responsibility of individual institutions in the postsanatorium care of patients. Likewise, it involves the community's responsibility toward patients who remain physically handicapped and unable to compete on even terms in industry and other occupations.

7 Medical Staff—The tuberculosis sanatoriums have a regular staff of 1,154 physicians and report an attending or consulting staff of 2,195. Twenty-six tuberculosis and isolation hospitals report a full-time staff of forty-five physicians, and ninety-three tuberculosis departments of general hospitals have 373 on full-time duty. The ratio of physicians to patients is 1:28 in the Veterans hospitals exclusively for tuberculosis, 1:52 in the Indian sanatoriums and 1:36 in the tuberculosis hospital operated by the U. S. Public Health Service. In the civilian sanatoriums the ratio is 1:62 in the state institutions, 1:51 in the county, 1:70 in the municipal, 1:60 in the city and county, and 1:32 in the private sanatoriums.

In fifty-two sanatoriums the medical staff participates in the training of medical students. Interns receive tuberculosis training in sixty-three sanatoriums and in 159 approved internship hospitals. Ninety-three sanatoriums and forty-four tuberculosis departments afford training for resident physicians, and sixty-seven sanatoriums offer postgraduate courses. Undoubtedly, many other sanatoriums are in position to establish centers of postgraduate training.

8 Medical Facilities—It has been shown in the report that 406 sanatoriums have facilities for pneumothorax, 364 have equipment for minor surgery, 138 for major surgery and 152 for special chest surgery. Three hundred and thirty-three sanatoriums maintain surgical affiliations with other institutions. Dental departments are furnished in 273 sanatoriums, x-ray equipment in 350, fluoroscopic facilities in 363, and stereoscopic equipment in 316. One hundred and five refer part or all of their x-ray work to other hospitals. Three hundred and eighty-one sanatoriums have clinical laboratory facilities, but 375 refer part or all of their laboratory work to outside departments. Only 124 have facilities for necropsy work.

SUMMARY BY STATES

ALABAMA

In 1934 there were 2942 cases of tuberculosis reported in Alabama, 1611 deaths from pulmonary tuberculosis and 1734 deaths from all forms. The tuberculosis death rate which averaged 101.5 per hundred thousand during the period 1915 to 1924 and 83.6 from 1925 to 1934 decreased to 62.6 in 1934. At present the state department of public health has 9,257 cases of adult type tuberculosis on record.

Alabama has 462 beds for tuberculosis. 242 sanatorium beds, 53 in three general hospitals operated by the federal government, 80 in state mental hospitals and 87 in a state penal institution. There are 426 beds for adults and 36 for children. During the annual period covered by this report there were 969 tuberculous patients admitted, 286 in the sanatoriums, 521 in the federal hospitals, 98 in state institutions and 64 in a private general hospital. At present there are 327 patients under treatment, 175 in the sanatoriums, 43 in the federal hospitals, 66 in the state mental institutions and 42 in the state convict tuberculosis hospital.

There are four sanatoriums in the state, three county and one private. Two sanatoriums have x-ray facilities and three have laboratory equipment. All have facilities for artificial pneumothorax. There were 1,245 pneumothorax treatments given during a twelve months period. Only one sanatorium reports an outpatient department but the state operates an efficient diagnostic service in the form of traveling clinics which can examine more than 5,000 patients annually.

The tuberculosis institutions in Alabama have a replacement valuation of approximately \$1,450,565.67. Their annual maintenance expenditure is \$338,853.63. The sanatoriums are valued at \$611,415.93 and expend annually about \$112,858.63.

One new sanatorium has been opened since the survey was completed, namely the Morgan County Sanatorium, Decatur, an institution of fifteen beds.

ARIZONA

Reports from the state board of health indicate that Arizona had 1,042 deaths from pulmonary tuberculosis in 1934 and 1,075 deaths from all forms. The tuberculosis death rate was 334 in 1923 and 237.3 in 1933. New cases of tuberculosis reported in 1934 total 1,178. The high mortality rate from tuberculosis is of course attributable to the fact that a large number of patients enter the state on account of the favorable climatic conditions.

Arizona has 1,518 beds for tuberculosis, 805 sanatorium beds, ten beds in a separate preventorium and 703 beds in tuberculosis departments of other hospitals. There are eighteen sanatoriums in the state, four Indian, two county and twelve private.

The federal sanatoriums have 256 beds, the county sanatoriums 82 and the private sanatoriums 467. Eight of the sanatoriums have x-ray facilities, nine have fluoroscopic equipment, seven have clinical laboratories and nine have facilities for pneumothorax. A total of 2,829 pneumothorax treatments was reported.

Sixteen general hospitals have a capacity of 703 beds for tuberculosis. These include two Veterans hospitals with 575 beds, three county institutions with 25 beds and four private hospitals with 103 beds. Seven general hospitals of the Indian Administration which did not specify the number of beds for tuberculosis admitted 204 tuberculous patients and had 43 under treatment on the day of reporting.

During the twelve months period covered by this report there were 2,209 tuberculous patients admitted, 1,018 in the sanatoriums and 1,191 in the tuberculosis departments. The average daily census of patients was 788 and there were 1,004 patients present in all tuberculosis institutions on the day of reporting. The Veterans hospitals admitted 627 tuberculous patients, the sanatoriums and hospital departments of the Indian Administration admitted 696, the county sanatoriums and hospitals admitted 103 and the sanatoriums and tuberculosis departments under private control admitted 783.

Only one sanatorium has an outpatient department. Three tuberculosis clinics were reported, however, one in Phoenix, one in Tucson and one in Prescott.

The tuberculosis institutions in Arizona have a replacement valuation of approximately \$5,716,949.59. Their annual maintenance expenditure is \$1,357,390.45. The sanatoriums are valued at \$2,306,331.90 and expend annually about \$480,768.29.

One new sanatorium has been opened since the survey was completed, namely the Welfare Sanatorium, Tempe, a federal institution of 110 beds.

ARKANSAS

The Arkansas State Board of Health reported 1,450 new cases of tuberculosis in 1933, 1,011 deaths from pulmonary tuberculosis and 1,071 deaths from all forms. The tuberculosis death rate at that time was 54 per hundred thousand.

Arkansas has 790 beds for tuberculosis, 556 sanatorium beds and 234 beds in tuberculosis departments of other hospitals. There are two sanatoriums in the state, one for white and one for Negro patients. These institutions operated by the state have 556 beds including thirty-two in the Negro division.

Three federal hospitals have eighty-two beds for tuberculosis, the state hospital for mental diseases has 100, a state penal institution has eight and two county hospitals have forty-four.

The sanatoriums are staffed by full-time medical personnel. They have x-ray, fluoroscopic and laboratory equipment and have facilities for artificial pneumothorax. A total of 4,354 pneumothorax treatments was reported.

During the twelve months period covered by this report there were 834 patients admitted, 1,378 treated and 801 discharged. The average daily census of patients was 570 and there were 653 patients present

in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 749 patients and the tuberculosis departments 85.

The larger state sanatorium conducts an outpatient department. The state tuberculosis association and county health officers cooperate in school surveys and tuberculosis clinics throughout the state. Approximately 6,000 children were tuberculin tested in 1934. Regular tuberculosis clinics are maintained in Little Rock (Pulaski County). In the other counties there are diagnostic clinics occasionally.

The tuberculosis institutions in Arkansas have a replacement valuation of approximately \$1,632,475.48. Their annual maintenance expenditure is \$511,012.30. The sanatoriums are valued at \$820,840.28 and expend annually about \$270,635.80.

CALIFORNIA

Reports from the state board of health show that California had 4,115 deaths from pulmonary tuberculosis in 1934 and 4,609 deaths from all forms. The tuberculosis death rate was 74.8. New cases of tuberculosis reported in 1934 total 8,793.

California has 7,389 beds for tuberculosis, 4,016 sanatorium beds, 418 beds in separate preventoriums and 2,955 beds in tuberculosis departments of other hospitals. There are thirty-six sanatoriums in the state, one federal, ten county, one city and county, and twenty-four private. Additional tuberculosis facilities are available in thirty-eight general hospitals (2,551 beds), one orthopedic hospital, six mental institutions (317 beds), three penal institutions (sixty-five beds), one industrial hospital, one county institution (sixteen beds) and one convalescent hospital (six beds).

Federal hospitals have 1,102 beds for tuberculosis. These include four Veterans hospitals (884 beds), one army hospital (twenty beds), three naval hospitals (145 beds), a United States Marine Hospital (fifty-three beds) and three Indian hospitals, one of which reported thirty beds for tuberculosis.

The county sanatoriums have a capacity of 2,300 beds, and there are 1,268 beds for tuberculosis in twenty general hospitals under county control and sixteen beds in the tuberculosis unit of a county home. One sanatorium under city and county control has eighty-two beds and a general hospital under the same management has 415.

The bed capacity in twenty-four private sanatoriums is 1,390. Ten other private institutions including seven general hospitals have twenty-eight beds for tuberculosis.

Of the thirty-six sanatoriums, twenty-six have x-ray facilities, twenty-eight have fluoroscopic equipment, thirty have clinical laboratories and thirty-one have facilities for pneumothorax. A total of 31,226 pneumothorax treatments were reported.

During the twelve months period covered by this report there were 10,093 patients admitted, 13,702 treated and 8,010 discharged. The average daily census of patients was 5,518 and there were 6,037 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 3,948 patients, the tuberculosis departments 5,369 and the preventoriums 776. In 1934 the state subsidized 4,118 patients in twenty-eight county sanatoriums and hospitals.

Twelve sanatoriums report an outpatient department. This service is supplemented by tuberculosis clinics and school surveys conducted by county and city health units.

The tuberculosis institutions in California have a replacement valuation of approximately \$18,586,626.03. Their annual maintenance expenditure is \$5,978,423.44. The sanatoriums are valued at \$10,061,468.87 and expend annually about \$2,846,682.40.

COLORADO

Reports from the state tuberculosis association indicate that Colorado had 819 deaths from pulmonary tuberculosis in 1933 and 873 deaths from all forms. The tuberculosis death rate was 168.5 in 1923 and 83.0 in 1933. New cases of tuberculosis reported in 1934 total 846.

Colorado has 2,691 beds for tuberculosis, 1,743 sanatorium beds and 948 in tuberculosis departments of other hospitals. There are no public sanatoriums in the state of Colorado but seventeen private sanatoriums are in operation which vary in capacity from sixteen to 301 beds. Three federal hospitals admit tuberculous patients. These include one Indian hospital, the Veterans Administration Facility at Fort Lyon, recently converted into a mental hospital and the Fitzsimons General Hospital which has 536 beds for tuberculosis.

A state hospital for mental diseases has thirty-four tuberculosis beds and a state penal institution reports five. One county hospital reports seven beds for tuberculosis and a general hospital under city and county control has eighty. Nine general hospitals which are privately owned have allocated 286 beds to the tuberculosis service.

Of the seventeen sanatoriums, eleven have x-ray facilities, twelve have fluoroscopic equipment, eleven have clinical laboratories and fifteen have pneumothorax facilities. A total of 5,382 pneumothorax treatments was reported.

During the twelve months period covered by this report there were 2,507 patients admitted and 2,350 discharged. The average daily census of patients was 1,681 and there were 1,819 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 1,137 patients and the tuberculosis departments 1,370. The sanatoriums discharged 1,139 patients including 132 deaths; they maintained a daily average of 1,033 and had 1,034 patients present on the day of reporting.

Four sanatoriums conduct outpatient departments. The city of Denver maintains a tuberculosis clinic and there are other clinics throughout the state sponsored by the state tuberculosis association and local medical societies. Permanent tuberculosis clinics are also conducted by physicians in Colorado Springs and Pueblo.

The tuberculosis institutions in Colorado have a replacement valuation of approximately \$10 632 096 32. Their annual maintenance expenditure is \$2,566,029 89. The sanatoriums are valued at \$7 527,837 84 and expend annually about \$1 304 950 51.

One new sanatorium has been opened since the survey was completed namely the Black Forest Sanitarium, Colorado Springs a federal institution of fifty beds.

CONNECTICUT

Reports from the state tuberculosis association indicate that Connecticut had 654 deaths from pulmonary tuberculosis in 1934 and 723 deaths from all forms. The tuberculosis death rate was 75.2 in 1925 and 42.6 in 1934. New cases of tuberculosis reported in 1934 total 1,312.

Connecticut has 1 915 beds for tuberculosis 1 675 sanatorium beds and 240 beds in tuberculosis departments of other hospitals. There are seven sanatoriums in the state, five state institutions and two privately owned.

The state sanatoriums have 1 483 beds and the private sanatoriums have 192.

Other institutions that have tuberculosis departments include three general hospitals with forty eight beds two tuberculosis and isolation hospitals with fifty-six beds and two mental institutions with 136 beds for tuberculosis.

During the twelve months period covered by this report there were 1 676 patients admitted, 3 082 treated and 1 521 discharged. The average daily census of patients was 1 571 and there were 1 674 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 1 314 patients and the tuberculosis departments 362.

All sanatoriums have x ray, fluoroscopic and laboratory facilities, and six are equipped for pneumothorax. (One sanatorium admits extra pulmonary cases only.) A total of 14 686 pneumothorax treatments was reported.

The state sanatoriums conduct outpatient and diagnostic clinics under the auspices of the state tuberculosis commission. Districts are assigned to each institution, so that the entire state is covered. In five cities the tuberculosis clinics are operated by local agencies.

The tuberculosis institutions in Connecticut have a replacement valuation of approximately \$5 511 717 67. Their annual maintenance expenditure is \$1 835,263 55. The sanatoriums are valued at \$4 550 808 16 and expend annually about \$1 511,573 81.

DELAWARE

The Delaware State Board of Health reported 155 deaths from all forms of tuberculosis in 1934 at which time the tuberculosis death rate was 65 per hundred thousand. In that same year there were 178 new cases of tuberculosis reported.

Delaware has two state sanatoriums, one for white and one for Negro patients. Their capacity is 121 and forty beds, respectively. This includes forty four beds for children. Tuberculous patients are also admitted in the state mental hospital and there are twenty two beds available in a private preventorium.

During the twelve months period covered by this report there were 149 patients admitted 268 treated and 93 discharged. The average daily census of patients was 149, and there were 152 patients present on the day of reporting. The sanatoriums admitted 109 patients, and the state mental hospital five.

The state sanatoriums maintained a daily average of 129 and had a census of 139 patients when reporting. They discharged 93 patients and had 31 deaths. Both institutions are equipped for pneumothorax and reported 3 783 treatments.

The larger institution conducts an outpatient department and there are tuberculosis clinics throughout the state conducted by the sanatorium staff and the state health department.

The tuberculosis institutions in Delaware have a replacement valuation of approximately \$400 127 83. Their annual maintenance expenditure is \$156 790. The sanatoriums are valued at \$355 973 83 and expend annually about \$147 000.

DISTRICT OF COLUMBIA

The District of Columbia has 666 beds for tuberculosis 220 in the Tuberculosis Hospital 150 in the Children's Tuberculosis Sanatorium 100 in the Gallinger Municipal Hospital 50 in three general hospitals under federal control and 146 in a federal hospital for mental diseases.

These institutions and two private hospitals admitted 1,107 patients. Of this number 417 were admitted to the federal hospitals which draw their patients from outside areas. The Gallinger Municipal Hospital admitted 321 tuberculous patients, the Tuberculosis Hospital admitted 210 and the Children's Sanatorium (recently opened) had received 122.

Reports from the District Board of Health and the local tuberculosis association indicate that there were 520 deaths from pulmonary tuberculosis in 1934 and 609 from all forms. In 1924 the tuberculosis death rate was 115.0 per hundred thousand. It increased to 123.0 in 1934. There were 1 138 new cases of tuberculosis reported in the District in 1934.

The sanatoriums and tuberculosis departments have a replacement valuation of approximately \$2 647 606 13 and expend annually about \$327 051 80. The sanatoriums are valued at \$1 125 000. Plans are now in progress for a new tuberculosis sanatorium for adults.

A summer camp for children is maintained by the local tuberculosis association which also cooperates with the health department in providing a tuberculosis clinic service for children.

FLORIDA

Florida has 330 beds for tuberculosis. There are three sanatoriums in the state two county and one private which have a capacity of eighty-six beds. Two private preventoria have forty-six beds and there are 198 beds in the tuberculosis departments of two federal hospitals three state institutions two county hospitals a county home, three municipal hospitals and three private hospitals.

Recently a number of small county sanatoriums have opened with federal aid and the Florida Tuberculosis Board has filed application for federal funds to construct five district tuberculosis hospitals.

Reports indicate that Florida had 959 deaths from pulmonary tuberculosis in 1933 and 1 039 deaths from all forms. The tuberculosis death rate, which was 87.2 in 1927 decreased to 66.9 in 1933. There were 661 new cases of tuberculosis reported in 1933 and 603 in 1934. During the annual period covered by this report the sanatoriums admitted forty eight patients the tuberculosis departments 312 and the preventoria 520.

GEORGIA

Georgia has 1,285 beds for tuberculosis 645 sanatorium beds (153 for children), 13 beds in a separate preventorium and 627 beds in tuberculosis departments of other hospitals. There are five sanatoriums, one state one county, two city and county, and one private. Two mental institutions, one state and one federal have 512 beds for tuberculosis two penal institutions one state and one federal, have eighty-one beds and four general hospitals three federal and one private, have thirty four beds.

Reports from the state tuberculosis association show 3 647 new cases reported in 1934 and 1,736 deaths from all forms of tuberculosis. The tuberculosis death rate was 81.5 in 1920 and 57.7 in 1934.

There were 1,501 patients admitted 1 222 in the sanatoriums 251 in the tuberculosis departments and 28 in the preventorium. The sanatoriums maintained a daily average of 553 patients and had 561 present on the day of reporting. They treated 1,458 patients discharged 910 and had 109 deaths. A day's census in all tuberculosis institutions was 1 109.

Three sanatoriums maintain x ray departments four have laboratory equipment and four have pneumothorax facilities. A total of 4 459 pneumothorax treatments was administered.

The state sanatorium maintains an outpatient department, and a field control survey has been established by the state department of public health. In 1934 there were 185 clinics held in 222 counties and 10 635 examinations made.

The sanatoriums are valued at \$936 243 50 and expend annually about \$325,277 65. All tuberculosis facilities in the state are valued at \$3 337 320 26 and the annual maintenance expenditure in the sanatoriums and tuberculosis departments is approximately \$972 448 16.

IDAHO

Idaho has one sanatorium a 132 bed institution for Indian children. There are twenty four tuberculosis beds in the Veterans Administration Facility at Boise and twelve beds in the Idaho State Soldiers Home Hospital. Three general hospitals have forty eight beds for tuberculosis. The admission of tuberculous patients is also reported by two other general hospitals.

The state department of public welfare and the state tuberculosis association reported 109 deaths from pulmonary tuberculosis in 1934 and 130 deaths from all forms. The tuberculosis mortality rate was 46.4 in 1921, 36.5 in 1933 and 29.13 in 1934.

During the annual period under consideration there were 197 tuberculous patients admitted in the Indian sanatorium nineteen in the Veterans Administration Facility, and seventy in private general hospitals. There were 171 tuberculous patients present in these institutions on the day of reporting.

ILLINOIS

Reports from the state board of health and the state tuberculosis association indicate that Illinois had 3 711 deaths from pulmonary tuberculosis in 1934 and 4 102 deaths from all forms. The tuberculosis death rate was 52 per hundred thousand in 1934. New cases of tuberculosis reported in 1934 total 9 743.

Illinois has 5 404 beds for tuberculosis 3 478 sanatorium beds 24 beds in a separate preventorium and 1 902 in tuberculosis departments of other hospitals. There are twenty six sanatoriums in the state sixteen county, two municipal one city and county, and seven private.

The county sanatoriums have 1 486 beds the municipal sanatoriums 1 299 the city and county sanatoriums 110 and the private sanatoriums 583.

Other institutions that have tuberculosis departments include nineteen general hospitals (710 beds) three orthopedic hospitals (225 beds) eleven mental institutions (934 beds) and three penal institutions (thirty three beds).

During the twelve months period covered by this report there were 6 430 patients admitted 9 281 treated and 5 833 discharged. The average daily census of patients was 3 600 and there were 4 935 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 3 920 patients and the tuberculosis departments 2 510.

Of the twenty six sanatoriums twenty three have x ray facilities twenty two have fluoroscopic equipment twenty four have laboratory departments and twenty four have facilities for pneumothorax. These institutions reported a total of 17 143 pneumothorax treatments. Sixteen sanatoriums have outpatient departments. The City of Chicago Municipal Tuberculosis Sanitarium which also operates the Municipal Home for Open Cases has recently established a pneumothorax clinic in the old Iroquois Memorial Hospital Chicago. Tuberculosis clinics are carried out in the majority of counties by the sanatorium staffs.

The tuberculosis institutions in Illinois have a replacement valuation of approximately \$18 616 110.27. Their annual maintenance expenditure is \$4 894 161 49. The sanatoriums are valued at \$10 126 690 59 and expend annually about \$2 902 685 54.

INDIANA

Indiana has 1,586 beds for tuberculosis 1,357 sanatorium beds and 229 in tuberculosis departments of other hospitals. There are nine sanatoriums in the state one state and eight county.

The state sanatorium has 211 beds and the county sanatoriums have 1 146.

There are facilities for tuberculosis in four general hospitals five mental institutions (179 beds) and three penal institutions (forty-two beds). The tuberculosis departments represent four federal hospitals, seven state institutions and one private hospital.

Reports from the state board of health and the state tuberculosis association indicate that Indiana had 1 552 deaths from pulmonary tuberculosis in 1934 and 1 788 deaths from all forms. The tuberculosis death rate was 54.2 in 1934. New cases of tuberculosis reported in 1934 total 1 723.

During the twelve months period covered by this report there were 1 698 patients admitted 1 542 in the sanatoriums and 156 in the tuberculosis departments. The sanatoriums averaged 1 182 patients per day they treated 2 763 discharged 1 553 and had 218 deaths. There were 1 401 patients present in all tuberculosis institutions on the day of reporting.

All the sanatoriums have equipment for x ray and fluoroscopic examinations and eight maintain laboratory departments. All are equipped for pneumothorax and reported a total of 7 741 treatments. Seven maintain outpatient departments. Tuberculosis clinics are carried out by the sanatorium staffs and the state department of health. Sixty-five clinics were reported in fifty-three counties. Home visits are made by public health nurses in seventy-seven counties.

The tuberculosis institutions in Indiana have a replacement valuation of approximately \$5 432 341.42. Their annual maintenance expenditure is \$1 011 911.77. The sanatoriums are valued at \$4 558 862.83 and expend annually about \$776 671.52.

IOWA

Reports from the state tuberculosis association indicate that Iowa had 520 deaths from pulmonary tuberculosis in 1934 and 619 deaths from all forms. The tuberculosis death rate was 24.9 in 1934. New cases of tuberculosis reported in 1934 total 455.

Iowa has 981 beds for tuberculosis 774 sanatorium beds and 207 in tuberculosis departments of other hospitals. There are six sanatoriums in the state one Indian one state and four county.

The Indian sanatorium has eighty beds the state sanatorium 363 and the county institutions 331.

There are tuberculosis departments in four general hospitals (fifty beds) seven mental institutions (145 beds) and two penal institutions (twelve beds). Two federal hospitals report seventy-seven beds and five state institutions 130.

During the annual period covered by this report there were 881 patients admitted 1 324 treated and 641 discharged. The average daily census of patients was 660 and there were 976 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 618 patients and the tuberculosis departments 263.

All the sanatoriums have x ray fluoroscopic laboratory and pneumothorax equipment. They administered a total of 5 075 pneumothorax treatments. One sanatorium reports an outpatient department. A tuberculosis clinic is conducted at the Broadlawn Polk County Public Hospital and eighteen clinics were conducted by the tuberculosis association in 1934 in cooperation with county medical societies.

The tuberculosis institutions in Iowa have a replacement valuation of approximately \$3 040 173.87. Their annual maintenance expenditure is \$766 837.02. The sanatoriums are valued at \$2 250 610.25 and expend annually about \$554 196.27.

KANSAS

Kansas has 571 beds for tuberculosis 388 sanatorium beds and 183 in tuberculosis departments of other hospitals. There are three sanatoriums one state one county and one city and county.

The state sanatorium has 268 beds and the other sanatoriums have sixty beds each. Tuberculosis facilities are also available in four federal hospitals four state institutions and nine private hospitals. This group contains ten general hospitals three mental institutions two penal institutions one Indian school and one convalescent hospital.

Reports from the state department of health indicate that Kansas had 478 deaths from pulmonary tuberculosis in 1934 and 533 deaths from all forms. The tuberculosis death rate was 41.7 in 1924 and 27.9 in 1934. New cases of tuberculosis reported in 1934 total 902.

There were 742 patients admitted 426 in the sanatoriums and 316 in the tuberculosis departments. The sanatoriums treated 754 discharged 401 and maintained an average daily census of 354. There were 542 patients present in all tuberculosis institutions on the day of reporting.

The state sanatorium maintains an outpatient department and conducts monthly tuberculosis clinics at Lawrence and in other localities with the cooperation of the state tuberculosis association.

The tuberculosis institutions in Kansas have a replacement valuation of approximately \$1 765 936.23. Their annual maintenance expenditure is \$451 204.63. The sanatoriums are valued at \$1 067 916.22 and expend annually about \$263 217.88.

KENTUCKY

The state of Kentucky has 1 206 beds for tuberculosis 949 sanatorium beds and 257 in tuberculosis departments of other hospitals. There are four sanatoriums in the state one federal one state one county and one city and county.

The federal sanatorium has 375 beds the state 80 the county 90 and the city and county 404. There are 112 beds for children. Seven general hospitals admit tuberculous patients one county institution has twenty beds for tuberculosis and two mental institutions have 222.

There were 2 092 deaths from pulmonary tuberculosis in 1933 and 2 315 deaths from all forms according to a report from the state tuberculosis association. The tuberculosis death rate was 87.4 in 1933. New cases of tuberculosis reported in 1934 total 1 310.

During the twelve months period covered by this report there were 1 884 tuberculous patients admitted 2 389 treated and 1 442 discharged. The average daily census of patients was 914 and there were 1 077

patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 1 580 patients and the tuberculosis departments 304.

The sanatoriums are all equipped with x ray fluoroscopic, laboratory and pneumothorax facilities. They reported 10 487 pneumothorax treatments. Two maintain outpatient departments and reports indicate that seventy-one county health departments are also conducting tuberculosis clinics. One hundred and sixty health nurses are available for home visits and clinic service.

The tuberculosis institutions in Kentucky have a replacement valuation of approximately \$4 297 518.30. Their annual maintenance expenditure is \$1 050 491.57. The sanatoriums are valued at \$3 317 238.83 and expend annually about \$786 488.32.

LOUISIANA

The Louisiana State Board of Health reported 1 398 deaths from pulmonary tuberculosis in 1934 and 1 313 deaths from all forms. The tuberculosis death rate was 113.4 in 1924 and 70.2 in 1934. New cases of tuberculosis reported in 1934 total 1 599.

Louisiana has 1 053 beds for tuberculosis 326 sanatorium beds and 727 in tuberculosis departments of other hospitals. There are three sanatoriums one state and two private.

The state sanatorium has ninety-six beds and the private sanatoriums have 230.

Four general hospitals have 577 beds for tuberculosis and two state mental institutions are hospitalizing at present 200 tuberculous patients. The state charity hospitals at New Orleans and Shreveport have a combined tuberculosis capacity of 371 beds the United States Marine Hospital at New Orleans has 49 beds for tuberculosis and the Veterans Administration Facility at Alexandria has 157 beds.

During the twelve months period covered by this report there were 836 patients admitted 1 084 treated and 761 discharged. The average daily census of patients was 343 and there were 566 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 297 patients and the tuberculosis departments 539.

The tuberculosis institutions in Louisiana have a replacement valuation of approximately \$3 413 143.61. Their annual maintenance expenditure is \$844 565.82. The sanatoriums are valued at \$820 851 and expend annually about \$116 267.57.

The Gowen Sanatorium Shreveport a private institution of fifteen beds has been opened since the survey was completed.

MAINE

The Department of Health and Welfare of the State of Maine reported 300 deaths from pulmonary tuberculosis in 1933 and 367 deaths from all forms. The tuberculosis death rate was 68.4 in 1924 and 45.5 in 1933. New cases of tuberculosis reported in 1934 total 640.

Maine has 576 beds for tuberculosis including eighty-one for children. There are four sanatoriums in the state with a capacity of 483 beds. The three state sanatoriums have 452 beds and one private sanatorium has thirty.

Tuberculosis facilities are also available in three mental institutions and seven general hospitals three federal and four private.

During the twelve months period covered by this report there were 616 patients admitted 939 treated and 515 discharged. The average daily census of patients was 459 and there were 498 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 491 patients and the tuberculosis departments 125.

All the sanatoriums have x ray fluoroscopic, laboratory and pneumothorax facilities. A total of 3 563 pneumothorax treatments was administered. Outpatient departments are maintained in three of the sanatoriums. Additional tuberculosis clinics and school surveys were inaugurated in January 1935.

The tuberculosis institutions in Maine have a replacement valuation of approximately \$1 389 221.38. Their annual maintenance expenditure is \$516 171.62. The sanatoriums are valued at \$1 030 675.58 and expend annually about \$419 610.12.

MARYLAND

The state department of health reported 1 233 deaths from pulmonary tuberculosis in 1934 and 1 384 deaths from all forms. The tuberculosis death rate was 121.8 in 1925 and 78.1 in 1934. New cases of tuberculosis reported in 1934 total 2 590.

Maryland has 1 550 beds for tuberculosis 1 350 sanatorium beds and 200 in tuberculosis departments of other hospitals. There are eight sanatoriums four state owned one municipal and three private.

The state sanatoriums have 896 beds the municipal 179 and the private sanatoriums 275.

Tuberculosis facilities are also available in a general hospital of the United States Public Health Service, a Veterans hospital for mental diseases four state mental institutions two penal institutions and three private hospitals.

During the twelve months period covered by this report there were 2 064 patients admitted 1 956 in the sanatoriums and 108 in the tuberculosis departments. The sanatoriums treated 3 155 patients, discharged 1 857 and maintained an average daily census of 1 302. There were 1 537 patients present in all tuberculosis institutions on the day of reporting.

Seven of the sanatoriums have x ray fluoroscopic laboratory and pneumothorax facilities. None of the sanatoriums report an outpatient department but many participate in the clinic service throughout the state. There were 458 clinics held in 1934 and 41 355 home visits were made by health nurses.

The tuberculosis institutions in Maryland have a replacement valuation of approximately \$4 311 346.40. Their annual maintenance expenditure is \$917 955.57. The sanatoriums are valued at \$3 548 483 and expend annually about \$712 505.57.

MASSACHUSETTS

Reports from the department of public health indicate that Massachusetts had 1,902 deaths from pulmonary tuberculosis in 1934 and 2,116 deaths from all forms. The tuberculosis death rate was 86.1 in 1934 and 48.7 in 1934. New cases of tuberculosis reported in 1934 total 3,580.

Massachusetts has 5,350 beds for tuberculosis, 4,063 sanatorium beds, 30 beds in a separate preventorium and 1,257 beds in tuberculosis departments of other hospitals. There are twenty-three sanatoriums in the state, one federal, four state, seven county, four municipal and seven private.

The federal sanatorium has 472 beds, the state sanatoriums have 1,341, the county sanatoriums 1,176, the municipal sanatoriums 744 and the private sanatoriums 430. The sanatorium list does not include the tuberculosis division of the Fall River General Hospital or the tuberculosis departments of five isolation and tuberculosis hospitals, namely the Board of Health Hospital, Brookline, the Lowell Tuberculosis Hospital, the Barnstable County Sanatorium, Pocasset, the Health Department Hospitals, Springfield and Belmont Hospital, Worcester. These six hospitals have a total capacity of 845 beds. Their tuberculosis departments, which have a combined capacity of 418 beds, admitted 651 patients, treated 992, discharged 594 and maintained an average daily census of 359. They had 333 patients present on the day of reporting.

Twenty-seven other hospitals have facilities for tuberculosis, including ten state institutions for mental diseases (327 beds). There is one preventorium, a private institution of thirty beds.

During the twelve months period covered by this report there were 4,858 patients admitted, 8,323 treated and 4,342 discharged. The average daily census of patients was 3,992 and there were 4,679 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 3,426 patients, the tuberculosis departments 1,237 and the preventorium 195.

Of the twenty-three sanatoriums, eighteen have x-ray facilities, seven teen fluoroscopic equipment, nineteen laboratory departments and twenty-one pneumothorax facilities. These institutions administered 25,795 pneumothorax treatments. In addition there were 4,437 pneumothorax treatments given in the six hospitals mentioned.

Thirteen sanatoriums report outpatient departments and the state and county sanatoriums maintain fifteen diagnostic consultation clinics in their respective territories. In addition all cities of 50,000 or over are required to provide diagnostic tuberculosis clinics.

Massachusetts has recently completed a noteworthy tuberculosis survey under the ten year Chadwick plan (1924-1934). More than 400,000 school children were tuberculin tested, 103,000 received a roentgen examination and 117,000 were given a physical examination. Arrangements have been made to continue the survey of school children.

The tuberculosis institutions in Massachusetts have a replacement valuation of approximately \$19,099,201.56. Their annual maintenance expenditure is \$5,296,884.85. The sanatoriums are valued at \$14,640,324.81 and expend annually about \$3,623,509.61.

MICHIGAN

Michigan had 1,909 deaths from pulmonary tuberculosis in 1934 and 2,199 deaths from all forms. The tuberculosis death rate was 66.7 in 1934 and 43.2 in 1934. New cases of tuberculosis reported in 1934 total 3,575.

There are 4,991 beds for tuberculosis, 3,355 sanatorium beds, 20 beds in a separate preventorium and 1,616 beds in tuberculosis departments of other hospitals. The sanatoriums, twenty-three in all, include two state, eleven county, two municipal and eight private institutions.

The state sanatoriums have 866 beds, the county 809, the municipal 980 and the private 700. Eleven general hospitals report 383 beds for tuberculosis, nine mental institutions 224, one penal institution 90, an ear, nose and throat hospital 58 and three tuberculosis and isolation hospitals 861.

During the twelve months period covered by this report there were 5,914 patients admitted, 8,890 treated and 5,084 discharged. The average daily census of patients was 3,927 and there were 4,273 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 2,735 patients and the tuberculosis departments 3,179.

Nearly all the sanatoriums have x-ray, fluoroscopic laboratory and pneumothorax facilities and thirteen reported an outpatient clinic service. The sanatoriums administered 38,629 pneumothorax treatments and six tuberculosis departments gave 16,898.

The tuberculosis institutions in Michigan have a replacement valuation of approximately \$18,065,158.94. Their annual maintenance expenditure is \$3,508,299.47. The sanatoriums are valued at \$10,742,513.77 and expend annually about \$2,023,979.31.

MINNESOTA

Reports from the state department of health show that Minnesota had 796 deaths from pulmonary tuberculosis in 1934 and 921 deaths from all forms. The tuberculosis death rate was 69.49 in 1934 and 30.4 in 1934. New cases of tuberculosis reported in 1934 total 3,575.

Minnesota has 2,885 beds for the treatment of tuberculosis, 1,960 sanatorium beds, 80 beds in a separate preventorium and 845 beds in tuberculosis departments of other hospitals. There are sixteen sanatoriums, one state, thirteen county and two private.

The state sanatorium has 390 beds, the county sanatoriums have 1,494 and the private sanatoriums seventy-six. There are 364 beds for tuberculosis in ten general hospitals, 262 in six mental hospitals and nineteen in two penal institutions. A county preventorium has eighty beds.

During the twelve months period covered by this report there were 6,626 patients admitted, 4,535 treated and 2,177 discharged. The average daily census of patients was 2,266 and there were 2,569 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 1,454 patients, the tuberculosis departments 1,141 and the preventorium 31.

All the sanatoriums have x-ray, fluoroscopic laboratory and pneumothorax facilities except the private sanatorium for rehabilitation and

two county sanatoriums that lack fluoroscopic equipment. The sanatoriums administered 14,152 pneumothorax treatments, and five other hospitals reported 3,184.

Nine sanatoriums report outpatient departments, but practically all carry on tuberculosis clinics and school surveys in their respective districts.

The tuberculosis facilities in Minnesota have a replacement valuation of approximately \$10,507,788.08. The annual maintenance expenditure for tuberculosis is approximately \$2,510,550.72. The sanatoriums are valued at \$6,988,618 and expend annually about \$1,435,865.05.

The United States Department of the Interior has recently constructed a new sanatorium for Indians as an annex to the Minnesota State Sanatorium.

MISSISSIPPI

Mississippi has 772 beds for tuberculosis, 527 sanatorium beds and 245 in tuberculosis departments of other hospitals. There are two sanatoriums, one state and one private, with 480 and 47 beds respectively.

A federal hospital for Indians has four beds for tuberculosis and two state institutions for mental diseases have 241.

During the twelve months period covered by this report there were 401 tuberculosis patients admitted, 718 treated and 373 discharged. The average daily census of patients was 340 and there were 586 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 395 patients and the tuberculosis departments six.

The tuberculosis facilities in Mississippi have a replacement valuation of approximately \$3,014,507.67. The sanatoriums are valued at \$2,080,000 and expend annually about \$279,550.00.

MISSOURI

Reports from the state board of health and the state tuberculosis association show that Missouri had 2,248 deaths from tuberculosis in 1934 and a tuberculosis death rate of 61.56 per hundred thousand. New cases of tuberculosis reported in 1934 total 2,751.

Missouri has 2,050 beds for tuberculosis, 1,412 sanatorium beds, 85 beds in a separate preventorium and 553 beds in tuberculosis departments of other hospitals. There are seven sanatoriums, one state, two county, two municipal and two private.

The state sanatorium has 405 beds, the county sanatoriums have 118, the municipal 668 and the private 221. Tuberculosis facilities are available in two Veterans hospitals, a United States Marine Hospital and a mental hospital operated by the United States Department of Justice. Five mental institutions, four state and one municipal, have 264 beds for tuberculosis, two tuberculosis and isolation hospitals have 76 and other hospitals report 126. A preventorium under private management has eighty-five beds.

All but one sanatorium have x-ray, fluoroscopic and laboratory equipment. Six reported facilities for pneumothorax and a total of 12,984 treatments.

During the twelve months period covered by this report there were 3,461 patients admitted, 1,398 in the sanatoriums, 1,913 in the tuberculosis departments and 150 in the preventorium. The sanatoriums averaged 1,274 patients per day and there were 1,917 patients present in all tuberculosis institutions on the day of reporting.

The tuberculosis facilities in Missouri have a replacement valuation of approximately \$6,055,189.58. The annual cost of tuberculosis hospitalization is approximately \$1,379,664.51. The sanatoriums are valued at \$3,775,277.28 and expend annually about \$799,799.76.

MONTANA

Montana has one sanatorium, a state institution of 150 beds, including thirty for children. Four Indian hospitals have sixty beds for tuberculosis, a Veterans hospital has forty and there are ten in a tuberculosis and isolation hospital operated under city and county control.

The sanatorium admitted 196 patients and the tuberculosis department 126. The federal hospitals admitted 109.

The state sanatorium has a full time medical staff and is equipped for x-ray, fluoroscopic laboratory and pneumothorax procedures. It reported a total of 1,050 pneumothorax treatments.

Provisional reports of the United States Census Bureau indicate that the 1933 tuberculosis mortality rate in Montana was 45.9 per hundred thousand and from pulmonary tuberculosis and 52.5 from all forms.

The tuberculosis facilities in Montana have a replacement valuation of approximately \$697,392.87. The state sanatorium is valued at \$277,818 and expends annually about \$98,070.30.

NEBRASKA

Reports from the state department of health indicate that Nebraska had 260 deaths from pulmonary tuberculosis in 1933 and 303 deaths from all forms. The tuberculosis death rate was 32.3 in 1933 and 21.7 in 1933.

Nebraska has 307 beds for tuberculosis, 160 sanatorium beds and 147 in tuberculosis departments of other hospitals. There is a state sanatorium which has 127 beds for adults and thirty for children. A county hospital maintains a tuberculosis department of ninety beds and there are facilities for tuberculosis in four general hospitals. Two federal hospitals have forty beds for tuberculosis and six beds are available in a penal institution.

The sanatorium has a full time medical staff and is equipped with x-ray, fluoroscopic laboratory and pneumothorax facilities.

During the twelve months period covered by this report there were 388 patients admitted, 557 treated and 297 discharged. The average daily census of patients was 247 and there were 278 patients present in all tuberculosis institutions on the day of reporting. The sanatorium admitted 159 patients and the tuberculosis departments 229.

The tuberculosis facilities in Nebraska have a replacement valuation of approximately \$960,201.31. The state sanatorium is valued at \$400,000 and expends annually about \$63,131.10.

NEVADA

The Nevada State Board of Health reports approximately 200 known cases of tuberculosis in the state. In 1934 there were seventy-five deaths from pulmonary tuberculosis and eighty-four from all forms. The tuberculosis death rate in 1933 was 94.6 per hundred thousand on the basis of United States Census reports.

Tuberculous patients are admitted in three general county hospitals and in one hospital of the Indian Administration. Two of the county hospitals reported eighteen beds for tuberculosis, seven patients admitted and all three had ten tuberculous patients under treatment at the time of reporting.

NEW HAMPSHIRE

New Hampshire has 230 beds for tuberculosis, 210 sanatorium beds and twenty in tuberculosis departments of other hospitals. There are two sanatoriums, one state and one private, with a capacity of 110 and 100 beds respectively.

Tuberculous patients are also admitted in two general hospitals and one mental institution.

During the twelve months period covered by this report there were 153 patients admitted, 315 treated and 141 discharged. The average daily census of patients was 176 and there were 196 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 137 patients and the tuberculosis departments sixteen.

Provisional reports of the United States Census Bureau indicate that in 1933 the mortality rate from tuberculosis in New Hampshire was 38.0 per hundred thousand.

The tuberculosis institutions in New Hampshire have a replacement valuation of approximately \$1,026,286.34. Their annual maintenance expenditure is \$173,518.66. The sanatoriums are valued at \$950,000 and expend annually about \$152,973.66.

NEW JERSEY

Reports from the state board of health and the state tuberculosis association indicate that New Jersey had 2,038 deaths from pulmonary tuberculosis in 1934 and 2,230 deaths from all forms. The tuberculosis death rate was 90.14 in 1923 and 54.97 in 1933. New cases of tuberculosis reported in 1934 total 4,103.

New Jersey has 3,595 beds for tuberculosis, 2,468 sanatorium beds, 247 beds in a separate preventorium and 880 in tuberculosis departments of other hospitals. There are sixteen sanatoriums, one state, nine county and six private.

The state sanatorium has 420 beds, the county sanatoriums have 1,817 and the private sanatoriums 231. In addition, there are 397 beds in five tuberculosis and isolation hospitals, 338 in four mental institutions, 133 in eight general hospitals and twelve in two penal institutions. There is one preventorium aside from the sanatorium units for children.

During the twelve months period covered by this report there were 4,793 tuberculous patients admitted, 7,098 treated and 4,240 discharged. The average daily census of patients was 2,841 and there were 3,270 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 3,040 patients, the tuberculosis departments 1,133 and the preventorium 620.

Twelve sanatoriums have x-ray and fluoroscopic equipment, eleven have laboratory departments and thirteen have pneumothorax facilities. A total of 36,087 pneumothorax treatments was reported by the sanatoriums and 5,989 by other hospitals.

Tuberculosis clinics are maintained in all parts of the state under the supervision of the state and county sanatoriums, health departments and other agencies.

The tuberculosis institutions of New Jersey have a replacement valuation of approximately \$18,512,088.77. Their annual maintenance expenditure is \$3,111,003.17. The sanatoriums are valued at \$14,880,509.60 and expend annually about \$2,217,783.07.

NEW MEXICO

A report from the state bureau of public health indicates that New Mexico had 475 deaths from pulmonary tuberculosis in 1933 and 511 deaths from all forms. The tuberculosis death rate was 191.3 in 1929 and 122.6 in 1933. New cases of tuberculosis reported in 1933 total 670. These figures do not include Indians.

New Mexico has 1,553 beds for tuberculosis, 870 sanatorium beds and 683 in tuberculosis departments of other hospitals. There are eight sanatoriums in the state, one operated by the United States Public Health Service, two by the Indian Administration and five by private agencies. The federal sanatoriums have 430 beds and the private sanatoriums 440. Fourteen general hospitals have 667 beds for tuberculosis. These include two Veterans hospitals (426 beds), six Indian hospitals and six private institutions.

During the twelve months period covered by this report there were 1,508 patients admitted, 664 in the sanatoriums and 844 in the tuberculosis departments. The federal sanatoriums and departments admitted 533. The average daily census of patients was 857 and there were 958 patients present in all tuberculosis institutions on the day of reporting.

The tuberculosis facilities in New Mexico have a replacement valuation of approximately \$4,700,828.26. The annual maintenance cost is approximately \$1,219,158.98. The sanatoriums are valued at \$2,116,589.21 and expend annually about \$550,051.01.

NEW YORK

New York has 14,582 beds for tuberculosis, 9,650 sanatorium beds, 252 beds in separate preventoriums and 4,680 in tuberculosis departments of other hospitals. There are sixty sanatoriums in the state, two federal, four state, twenty-eight county, five municipal, one city and county and twenty private.

The federal sanatoriums have 999 beds, the state 300, the county 3,075, the municipal 2,509, the city and county 135 and the private 2,632.

(Three new state sanatoriums were not in operation at the time of the survey.)

Other institutions that have tuberculosis departments include thirty-six general hospitals (2,031 beds), four orthopedic (sixty beds), three tuberculosis and isolation hospitals (490 beds), twenty-six mental institutions (1,712 beds), four penal institutions (201 beds), two chronic hospitals (164 beds), and one convalescent hospital (twenty-two beds).

These departments represent seven federal hospitals, twenty-eight state institutions, four county hospitals, one city and county hospital, fourteen municipal institutions and twenty-two private hospitals.

Reports from the state department of health and the New York City Health Department indicate that New York had 6,849 deaths from pulmonary tuberculosis in 1934 (3,950 in New York City) and 7,575 deaths from all forms (4,420 in New York City). The tuberculosis death rate in 1934 was 52.5 in upstate New York and 59.1 in New York City. New cases of tuberculosis reported in 1934 total 16,902 (10,722 in New York City).

During the twelve months period covered by this report there were 24,331 patients admitted, 32,960 treated and 20,639 discharged. The average daily census of patients was 11,850 and there were 13,249 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 11,631 patients, the tuberculosis departments 11,854 and four preventoriums 846.

Of the sixty sanatoriums, fifty-one have x-ray equipment, fifty fluoroscopic facilities, forty-six laboratory departments and fifty-two pneumothorax facilities. A total of 73,462 pneumothorax treatments was reported by the sanatoriums and 30,956 by other hospitals.

Twenty-seven sanatoriums maintain outpatient departments. There are sixty-nine permanent tuberculosis clinics in the state of New York according to the report of the state department of health. In addition, fourteen county tuberculosis hospitals conduct clinics in their respective districts and the state department of health maintains an itinerant clinic service in twenty-six rural counties. The state department held 152 clinics in 1934 and made 6,177 examinations. In fifty-nine upstate clinics there were 44,477 examinations. In all 84,343 examinations were made by the state department of health, the municipal and county tuberculosis hospitals and local dispensaries. The Department of Health of New York City reported 54,601 patients treated in the tuberculosis clinics in 1934 and a total of 127,357 visits.

The tuberculosis institutions in New York have a replacement valuation of approximately \$63,230,844.88. Their annual maintenance expenditure is \$13,732,149.81. The sanatoriums are valued at \$47,489,262.24 and expend annually about \$8,494,022.07.

NORTH CAROLINA

North Carolina had 1,891 deaths from pulmonary tuberculosis in 1934 and 2,092 deaths from all forms. The tuberculosis death rate was 94.7 in 1924 and 63.4 in 1934. New cases of tuberculosis reported in 1934 total 2,136.

The total number of beds for tuberculosis is 2,625, 2,452 sanatorium beds and 173 in tuberculosis departments of other hospitals. There are twenty-three sanatoriums in the state, one federal, one state, seven county and fourteen private.

The federal sanatorium has 850 beds, the state sanatoriums 484, the county sanatoriums 486 and the private sanatoriums 632.

Tuberculosis facilities are available also in five general hospitals, two mental institutions (110 beds), one orthopedic hospital and a county home.

During the twelve months period covered by this report there were 2,865 patients admitted, 4,189 treated and 2,445 discharged. The average daily census of patients was 1,841 and there were 1,889 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 2,836 patients and the tuberculosis departments twenty-nine.

Of the twenty-three sanatoriums, eleven have x-ray facilities, twelve fluoroscopic equipment, eight laboratory departments and thirteen pneumothorax facilities. Five sanatoriums maintain outpatient departments. The state sanatorium conducts a daily diagnostic clinic and examines approximately 3,000 patients annually. It was also reported that three physicians employed to conduct diagnostic clinics in various parts of the state examine annually about 3,000 adults and 25,000 school children.

The tuberculosis institutions in North Carolina have a replacement valuation of approximately \$6,062,967.65. Their annual maintenance expenditure is \$1,952,389.67. The sanatoriums are valued at \$5,403,090.81 and expend annually about \$1,774,675.42.

NORTH DAKOTA

A report from the state department of public health indicates that North Dakota had 133 deaths from pulmonary tuberculosis in 1933 and 167 deaths from all forms. The tuberculosis death rate was 41.8 in 1924 and 24.16 in 1933. New cases of tuberculosis reported in 1933 total 380.

North Dakota has 341 beds for tuberculosis, 265 sanatorium beds and seventy-six in tuberculosis departments of other hospitals. There is one sanatorium, a state-owned institution which has 215 beds for adults and fifty for children. In addition, there are eighteen beds for tuberculosis in two Indian hospitals, forty-five in two state hospitals for mental diseases and ten in a penal institution. Three private general hospitals accept tuberculous patients.

During the twelve months period covered by this report there were 300 patients admitted, 477 treated and 213 discharged. The average daily census of patients was 249 and there were 279 patients present in all tuberculosis institutions on the day of reporting. The sanatorium admitted 200 patients and the tuberculosis departments 100.

The tuberculosis facilities in North Dakota have a replacement valuation of approximately \$887,487.65. The annual cost of tuberculosis hospitalization is approximately \$234,031.34. The sanatorium is valued at \$620,000 and expends annually about \$163,041.84.

OHIO

Ohio has 4 670 beds for tuberculosis 3,214 sanatorium beds, 60 beds in a separate preventorium and 1 396 in tuberculosis departments of other hospitals There are twenty-one sanatoriums one state fourteen county one municipal one city and county and four private

The state sanatorium has 240 beds, the county sanatoriums 2 178 the municipal sanatoriums 48 the city and county sanatoriums 462 and the private sanatoriums 286

There are additional tuberculosis facilities in three federal hospitals (273 beds) thirteen state institutions a county home three general city hospitals and fifteen private institutions

Fourteen general hospitals reported 808 beds for tuberculosis and five state institutions for mental diseases reported 519 beds

Of the twenty-one sanatoriums twenty have x ray departments fluoroscopic equipment clinical laboratories and pneumothorax facilities The sanatoriums administered 30 496 pneumothorax treatments

The Ohio State Department of Health reported 3 506 deaths from all forms of tuberculosis in 1934 The tuberculosis death rate was 76.14 in 1925 and 49.96 in 1934 New cases of tuberculosis reported in 1934 total 7 010

During the twelve months period covered by this report there were 5 908 patients admitted 7,861 treated and 4 183 discharged The average daily census of patients was 3 509 and there were 4 198 patients present in all tuberculosis institutions on the day of reporting The sanatoriums admitted 3 444 patients, the tuberculosis departments 2 264 and one preventorium 200

Twelve sanatoriums maintain outpatient departments. The state department of health reported ten diagnostic chest clinics in nine counties during 1933

The tuberculosis institutions in Ohio have a replacement valuation of approximately \$17 784 715 98 Their annual maintenance expenditure is \$3 641 486 75 The sanatoriums are valued at \$12 324,801 99 and expend annually about \$2,269 524 75

OKLAHOMA

Reports from the state department of public health and the state tuberculosis association indicate that Oklahoma had 1 219 deaths from pulmonary tuberculosis in 1933 and 1 255 deaths from all forms The tuberculosis death rate was 49.2 in 1933 New cases of tuberculosis reported in 1933 total 861

Oklahoma has 1 076 beds for tuberculosis 888 sanatorium beds and 188 in tuberculosis departments of other hospitals. There are six sanatoriums in the state, two Indian three state and one private. The federal sanatoriums have 225 beds the state sanatoriums have 603 and the private sanatorium has sixty beds

Tuberculosis facilities are also available in ten general hospitals a state penal institution and three mental hospitals (100 beds)

Five sanatoriums have x ray fluoroscopic and laboratory facilities and all have pneumothorax equipment A total of 5,079 pneumothorax treatments were reported

There were 1 677 patients admitted in one year 2 258 treated and 1 141 discharged The average daily census of patients was 769 and there were 922 patients present in all tuberculosis institutions on the day of reporting The sanatoriums admitted 1 218 patients and the tuberculosis departments 459

Four sanatoriums maintain an outpatient department The Oklahoma Tuberculosis and Health Association makes school surveys in cooperation with local agencies In the past two and one-half years 70 000 tuberculin tests have been made

The tuberculosis institutions in Oklahoma have a replacement valuation of approximately \$2 994 554 95 Their annual maintenance expenditure is \$612 897 73 The sanatoriums are valued at \$2 277 463 35 and expend annually about \$419 774 73

OREGON

Oregon has 622 beds for tuberculosis 513 sanatorium beds and 109 in tuberculosis departments of other hospitals There are four sanatoriums two state one county and one private

The state sanatoriums have 409 beds the county sanatorium has thirty nine and the private sanatorium has sixty five There are additional facilities for tuberculosis in five general hospitals and three mental institutions

Reports from the state board of health and the state tuberculosis association indicate that Oregon had 289 deaths from pulmonary tuberculosis in 1934 and 349 deaths from all forms The tuberculosis death rate was 65 in 1925 and 35.7 in 1933 New cases of tuberculosis reported in 1934 total 567

During the twelve months period covered by this report there were 594 patients admitted 827 treated and 385 discharged The average daily census of patients was 468 and there were 610 patients present in all tuberculosis institutions on the day of reporting The sanatoriums admitted 462 patients and the tuberculosis departments 132

Three of the sanatoriums have x ray fluoroscopic laboratory and pneumothorax facilities They administered 3,967 pneumothorax treatments during the year

The two state sanatoriums maintain outpatient departments and there are approximately eight tuberculosis clinics throughout the state. The University of Oregon Medical School conducts three tuberculosis clinics a week in Portland

The tuberculosis institutions in Oregon have a replacement valuation of approximately \$1 243 264 13 Their annual maintenance expenditure is \$403 015 40 The sanatoriums are valued at \$827 503.58 and expend annually about \$291 043 15

PENNSYLVANIA

The Pennsylvania Tuberculosis Society reported 4 517 deaths from pulmonary tuberculosis in 1934 and 4 965 deaths from all forms The tuberculosis death rate was 86.6 in 1923 and 50.6 in 1934 New cases of tuberculosis reported in 1934 total 5 653

Pennsylvania has 6,293 beds for tuberculosis 4 189 sanatorium beds 100 beds in a separate preventorium and 2 004 beds in tuberculosis departments of other hospitals There are seventeen sanatoriums three state three county one municipal one city and county and nine private

The state sanatoriums have 2 415 beds the county sanatoriums have 337 the municipal sanatorium has 290 the city and county sanatorium has fifty seven and the private sanatoriums have 1 090 beds

Tuberculosis patients were also admitted in five federal hospitals fifteen state institutions six county institutions three municipal hospitals a city and county institution and twenty six private hospitals Seventeen mental hospitals report 1,170 beds for tuberculosis and two penal institutions have twenty two

During the twelve months period covered by this report there were 9 133 patients admitted 11 900 treated and 7 570 discharged The average daily census of patients was 4 594 and there were 5 553 patients present in all tuberculosis institutions on the day of reporting The sanatoriums admitted 5,213 patients the tuberculosis departments 3 686 and one preventorium 234

Thirteen sanatoriums have x ray equipment, fourteen have fluoroscopic apparatus fifteen have laboratory departments and sixteen have pneumothorax facilities The sanatoriums reported 20 717 pneumothorax treatments and other hospitals reported 4 020

Five of the sanatoriums report outpatient departments There are 117 tuberculosis clinics in Pennsylvania. The state department of health conducts eighty five the Philadelphia City Department of Health eleven the Pittsburgh City Department of Health three the Tuberculosis League of Pittsburgh four the Berks County Sanatorium one the Delaware County Tuberculosis Society one and the Lancaster General Hospital one and various hospitals and agencies in Philadelphia conduct eleven

The tuberculosis institutions in Pennsylvania have a replacement valuation of approximately \$25 749 730 59 Their annual maintenance expenditure is \$4 111 546 33 The sanatoriums are valued at \$17,338 585 93 and expend annually about \$2 383 463 60

RHODE ISLAND

Reports from the state board of health indicate that Rhode Island had 285 deaths from pulmonary tuberculosis in 1934 and 315 deaths from all forms The tuberculosis death rate was 88.6 in 1924 and 43.6 in 1934 New cases of tuberculosis reported in 1934 total 1 014

Rhode Island has 605 beds for tuberculosis 495 sanatorium beds sixty in tuberculosis departments of other hospitals and fifty in a separate preventorium There are two sanatoriums one state and one private

The state sanatorium has 430 beds and the private sanatorium sixty five Tuberculosis facilities are also available in one mental hospital one penal institution three general hospitals and one isolation and tuberculosis hospital (sixty beds)

During the twelve months period covered by this report there were 854 patients admitted 1,325 treated and 552 discharged The average daily census of patients was 569 and there were 620 patients present in all tuberculosis institutions on the day of reporting The sanatoriums admitted 412 patients the tuberculosis departments 191, and the preventorium 251

The state sanatorium maintains an outpatient department and there are tuberculosis clinics in every important center of population in the state

The tuberculosis institutions in Rhode Island have a replacement valuation of approximately \$1,150 350 Their annual maintenance expenditure is \$376 335 87 The sanatoriums are valued at \$900 000 and expend annually about \$277 601 22

SOUTH CAROLINA

South Carolina has 675 beds for tuberculosis 539 sanatorium beds and 136 in tuberculosis departments of other hospitals. There are six sanatoriums one state, three county one city and county and one private

The state sanatorium has 277 beds the county sanatoriums have 166 the city and county sanatorium has twenty six and the private sanatorium has seventy Provisions are made for tuberculosis in a mental institution and in five general hospitals (136 beds)

The South Carolina Tuberculosis Association reported 1 080 deaths from pulmonary tuberculosis in 1933 and 1 094 deaths from all forms The tuberculosis death rate was 91.0 in 1926 and 62.6 in 1933 New cases of tuberculosis reported in 1934 total 1 019

During the twelve months period covered by this report there were 767 patients admitted 969 treated and 505 discharged The average daily census of patients was 507 and there were 530 patients present in all tuberculosis institutions on the day of reporting The sanatoriums admitted 565 patients and the tuberculosis departments 202

Permanent tuberculosis clinics are maintained at the state sanatorium and in seven counties

The tuberculosis facilities in South Carolina have a replacement valuation of approximately \$923,812 31 The annual maintenance expenditure is approximately \$285 868 96 The sanatoriums are valued at \$684 704 81 and expend annually about \$232 213 18

SOUTH DAKOTA

South Dakota has 297 beds for tuberculosis 192 in the state sanatorium and 105 in four general hospitals

The state tuberculosis association reported 249 deaths from all forms of tuberculosis in 1934 The tuberculosis death rate was 40.42 in 1933 and 35.31 in 1934 New cases of tuberculosis reported in 1934 total 180

During the twelve months period covered by this report there were 343 patients admitted and 540 treated. The average daily census of patients was 203 and there were 266 patients present in all tuberculosis institutions on the day of reporting. The sanatorium admitted 101 patients and the tuberculosis departments 242.

The tuberculosis facilities in South Dakota have a replacement valuation of approximately \$1,150,503.29. The annual maintenance expenditure is approximately \$241,854.95. The sanatorium is valued at \$750,000 and expends annually about \$133,993.70.

TENNESSEE

Tennessee has 1,572 beds for tuberculosis: 1,124 sanatorium beds, 398 in tuberculosis departments of other hospitals and fifty in a separate preventorium. There are seven sanatoriums in the state: one county, two city and county and four private.

The county sanatorium has 300 beds; the city and county sanatoriums have 503 and the private sanatoriums have 521.

Five general hospitals report seventy-nine beds for tuberculosis: three mental institutions, 229 beds and one penal institution, ninety beds.

A report from the state department of health indicates that Tennessee had 2,291 deaths from pulmonary tuberculosis in 1933 and 2,589 deaths from all forms. The tuberculosis death rate was 95.7 in 1933. New cases of tuberculosis reported in 1933 total 2,269.

During the twelve months period covered by this report there were 1,208 patients admitted, 1,943 treated and 995 discharged. The average daily census of patients was 891 and there were 1,209 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 979 patients, the tuberculosis departments 197 and the preventorium 32.

Four sanatoriums maintain outpatient departments and the state department of health conducts periodic clinics in all counties having a full-time health service. Special tuberculosis studies have been made in three representative counties of the state. Approximately 50,000 persons were examined in the tuberculosis clinics from 1927 to 1934 inclusive.

Six sanatoriums have x-ray fluoroscopic and laboratory facilities and all have pneumothorax equipment. They reported a total of 5,335 pneumothorax treatments during a one-year period.

The tuberculosis institutions in Tennessee have a replacement valuation of approximately \$3,803,098.17. Their annual maintenance expenditure is \$889,385.97. The sanatoriums are valued at \$2,245,000 and expend annually about \$469,307.47.

TEXAS

A report from the state department of health indicates that Texas had 3,391 deaths from pulmonary tuberculosis in 1934 and 3,772 deaths from all forms. The tuberculosis death rate was 71.4 in 1933. New cases of tuberculosis reported in 1934 total 3,036.

Texas has 2,865 beds for the treatment of tuberculosis: 1,971 sanatorium beds and 894 in tuberculosis departments of other hospitals. There are seventeen sanatoriums: one state, two county, three city and county and eleven private.

The state sanatorium has 718 beds; the county sanatoriums have 102; the city and county sanatoriums have 342 and the private sanatoriums have 809.

Fifteen general hospitals report 586 beds for tuberculosis: seven mental institutions, 232 beds; one penal institution, four beds; and one county home, seventy-two beds.

During the twelve months period covered by this report there were 4,679 patients admitted, 3,685 in the sanatoriums and 994 in the tuberculosis departments. The sanatoriums treated 4,712 patients, discharged 3,389 and maintained an average daily census of 1,599. There were 2,341 patients present in all tuberculosis institutions on the day of reporting.

Two of the sanatoriums report outpatient departments. Ten have x-ray facilities; thirteen have fluoroscopic equipment; thirteen maintain laboratory departments and sixteen have pneumothorax facilities. The sanatoriums reported 7,569 pneumothorax treatments during a twelve-month period.

The tuberculosis institutions in Texas have a replacement valuation of approximately \$8,049,766.70. Their annual maintenance expenditure is \$1,810,081.19. The sanatoriums are valued at \$4,636,829.75 and expend annually about \$946,653.41.

UTAH

Reports from the state board of health and the state tuberculosis association indicate that Utah had eighty-six deaths from pulmonary tuberculosis in 1934 and ninety-three deaths from all forms. The tuberculosis death rate was 39.1 in 1920 and 18.3 in 1934. New cases of tuberculosis reported in 1934 total 141.

Utah has no sanatoriums but has fifty-four beds for tuberculosis in five general hospitals.

The tuberculosis departments admitted 126 patients during the twelve-month period covered by this report. The average daily census of patients was twenty-five and there were fifty patients present on the day of reporting.

The state department of health and the state tuberculosis association conduct tuberculosis clinics in various parts of the state.

VERMONT

A report from the state board of health shows that Vermont had 156 deaths from pulmonary tuberculosis in 1934 and 188 deaths from all forms. The tuberculosis death rate was 78 in 1924 and 52 in 1934. New cases of tuberculosis reported in 1934 total 113.

Vermont has 171 beds for tuberculosis: 127 in two state sanatoriums and forty-four in a separate preventorium.

During the twelve-month period covered by this report there were 247 patients admitted, 368 treated and 210 discharged. The average daily census of patients was 157 and there were 161 patients present on the day of reporting. The sanatoriums admitted 137 patients and the preventorium eighty-three. A private general hospital admitted twenty-seven.

The tuberculosis institutions in Vermont have a replacement valuation of approximately \$730,000. Their annual maintenance expenditure is \$122,472.11. The sanatoriums are valued at \$650,000 and expend annually about \$94,137.20.

VIRGINIA

A report from the state board of health indicates that Virginia had 1,744 deaths from pulmonary tuberculosis in 1934 and 2,034 deaths from all forms in 1933. The tuberculosis death rate was 114.6 in 1925 and 83.3 in 1933. New cases of tuberculosis reported in 1934 total 3,876.

Virginia has 1,425 beds for tuberculosis: 1,123 sanatorium beds and 302 in tuberculosis departments of other hospitals. There are seven sanatoriums: three state, two municipal and two private.

The state sanatoriums have 760 beds; the municipal 278 and the private eighty-five. Tuberculosis facilities are also available in four general hospitals, four mental institutions, a city home and one penal institution.

During a twelve-month period there were 1,668 patients admitted, 1,361 in the sanatoriums and 307 in the tuberculosis departments. The sanatoriums treated 2,346, discharged 1,292 and maintained an average daily census of 985. There were 1,229 patients present in all tuberculosis institutions on the day of reporting.

In 1933 the state conducted tuberculosis clinics in eleven cities and eighty-seven counties. There were a total of 8,364 examinations and 1,664 x-ray studies.

The tuberculosis institutions in Virginia have a replacement valuation of approximately \$3,734,627.10. Their annual maintenance expenditure is \$855,274.18. The sanatoriums are valued at \$2,773,047.85 and expend annually about \$581,181.68.

WASHINGTON

Reports from the state board of health and the state tuberculosis association indicate that Washington had 744 deaths from pulmonary tuberculosis in 1933 and 857 deaths from all forms. The tuberculosis death rate was 76.7 in 1923 and 53.6 in 1933. New cases of tuberculosis reported in 1934 total 1,544.

The state of Washington has 1,531 beds for tuberculosis: 51 sanatorium beds and 780 in tuberculosis departments of other hospitals. There are nine sanatoriums in the state: one Indian, five county and three private.

The federal sanatorium has forty beds; the county sanatoriums have 575 and the private sanatoriums have 136. In addition, the Firland Sanatorium and Isolation Hospital has 250 beds; two Veterans hospitals have 174 beds for tuberculosis; two hospitals of the United States Public Health Service have 61 and an Indian hospital for general cases and tuberculosis has 268. There are twenty-seven beds for tuberculosis in a state hospital for mental diseases. Eight private hospitals reported the admission of tuberculous patients.

During a twelve-month period there were 1,477 patients admitted, 2,316 treated and 1,235 discharged. The average daily census of patients was 1,183 and there were 1,284 patients present in all tuberculosis institutions on the day of reporting. The sanatoriums admitted 786 patients and the tuberculosis departments 691.

Four sanatoriums report outpatient departments and there are tuberculosis clinics in various parts of the state conducted by the sanatorium staffs, tuberculosis association and local health authorities.

The tuberculosis institutions in Washington have a replacement valuation of approximately \$4,034,445.65. Their annual maintenance expenditure is \$1,145,685.14. The sanatoriums are valued at \$1,776,027.23 and expend annually about \$478,838.61.

One new sanatorium has been opened since the survey was completed, namely the Blue Mountain Sanatorium, Walla Walla, a county institution of thirty-six beds.

WEST VIRGINIA

A report from the state department of health shows that West Virginia had 932 deaths from tuberculosis in 1933. The tuberculosis death rate was 77.7 in 1926 and 52.7 in 1933. There were 1,395 new cases of tuberculosis reported last year.

West Virginia has 849 beds for tuberculosis: 772 sanatorium beds and seventy-seven in tuberculosis departments of other hospitals. There are seven sanatoriums: three state, two county and two private.

The state sanatoriums have 648 beds; the county forty-nine and the private sanatoriums seventy-five. There are additional tuberculosis facilities in a general Veterans hospital, three state institutions for mental diseases, a state penal institution and two private general hospitals.

During a twelve-month period there were 930 patients admitted, 1,971 in the sanatoriums and 133 in the tuberculosis departments. The sanatoriums treated 1,441 patients, discharged 766 and maintained an average daily census of 692. There were 802 patients present in all tuberculosis institutions on the day of reporting.

Two of the sanatoriums report outpatient departments and there are additional tuberculosis clinics conducted by the state tuberculosis association.

The tuberculosis institutions in West Virginia have a replacement valuation of approximately \$2,358,202.41. Their annual maintenance expenditure is \$441,690.20. The sanatoriums are valued at \$2,064,500 and expend annually about \$362,591.95.

WISCONSIN

Reports from the state board of health and the state tuberculosis association indicate that Wisconsin had 1,006 deaths from pulmonary tuberculosis in 1934 and 1,117 deaths from all forms. The tuberculosis death rate was 66.5 in 1923 and 36.5 in 1934. New cases of tuberculosis reported in 1934 total 1,753.

Wisconsin has 2,497 beds for tuberculosis: 1,989 sanatorium beds and 508 in tuberculosis departments of other hospitals and 116 in a separate preventorium. There are twenty-one sanatoriums: two state, seventeen county and two private.

The state sanatoriums have 282 beds; the county 1,610 and the private ninety-seven. A Veterans hospital has 254 beds for tuberculosis and three

Indian hospitals have thirty seven. Provisions have also been made for tuberculous patients in five state institutions six county institutions and five private hospitals.

During the twelve months period covered by this report there were 2730 patients admitted 1949 in the sanatoriums 684 in the tuberculosis departments and ninety seven in the preventorium. The sanatoriums treated 3557 discharged 1744 and maintained an average daily census of 1843. There were 2198 patients present in all tuberculosis institutions on the day of reporting.

Seventeen of the sanatoriums have x-ray fluoroscopic and laboratory equipment and twenty have pneumothorax facilities. A total of 11991 pneumothorax treatments was administered during the year.

Seven of the sanatoriums report outpatient departments. In addition there are tuberculosis clinics conducted by the Wisconsin Anti Tuberculosis Association local health departments and county medical societies. In 1933 there were 275 clinics held in fifty four communities.

The tuberculosis institutions in Wisconsin have a replacement valuation of approximately \$8,237,947.56. Their annual maintenance expenditure is \$1,923,595.94. The sanatoriums are valued at \$6,509,923.30 and expend annually about \$1,469,293.94.

WYOMING

Wyoming has sixty five beds for tuberculosis thirty three in a state sanatorium and thirty two in tuberculosis departments of other hospitals. A Veterans Administration Hospital for mental diseases has fifteen beds for tuberculosis and a general Indian hospital has seventeen. Some provision has also been made for tuberculosis in the state hospital for mental diseases and in a private general hospital.

The sanatorium has a full time medical director. It is equipped for x-ray fluoroscopic and laboratory examinations and for pneumothorax therapy. The sanatorium maintains an outpatient department, and the medical director conducts tuberculosis clinics throughout the state in cooperation with the state tuberculosis association and local health agencies.

During the annual period covered by this report there were fifty nine patients admitted for tuberculosis thirty-one in the sanatorium and twenty-eight in the tuberculosis departments. The sanatorium treated forty six patients and maintained a daily average of twenty eight. The state board of health reported a tuberculosis death rate of 30.3 per hundred thousand in 1933.

The state sanatorium has a valuation of \$200,588.93 and its maintenance expenditure is approximately \$32,000 a year.

TUBERCULOSIS HOSPITALS AND SANATORIUMS, DEPARTMENTS AND PREVENTORIUMS

The following list contains the names and statistics concerning

471 hospitals and sanatoriums Page 1899

740 tuberculosis department of hospitals Page 1909

29 institutions classified as preventoriums Page 1915

The statistics were obtained by inspection and by questionnaires returned during the year 1934 for the twelve months next preceding the date of questionnaire.

TUBERCULOSIS HOSPITALS AND SANATORIUMS

| County | Bed Capacity | | | Patients Admitted | | | Patients Discharged (including Deaths) | Patients Present Waiting List | Daily Average | Deaths | Physi- cians | | Nurses | Total Employees* | Med cal Facilities | | | | Total Pneumo- thorax Treatments | Outpatient Department | | |
|---|--------------|----------|-------|-------------------|----------|-------|---|----------------------------------|---------------|--------|-----------------|-----------------------------|--------|------------------|-----------------------|-------|-------|--------------|------------------------------------|--------------------------|------------|--------------|
| | Adults | Children | Total | Adults | Children | Total | | | | | Regular Staff | Attending and Consulting | | | Graduate | Other | X-Ray | Fluoroscopic | | | Laboratory | Pneumothorax |
| ALABAMA | | | | | | | | | | | | | | | | | | | | | | |
| Etowah County Tuberculosis Sanator- ium Alabama City | 22 | 22 | 44 | 9 | 9 | 18 | 10 | 21 | 4 | 21 | 4 | 1 | 3 | 2 | 3 | 8 | No | No | No | Yes | 50 | No |
| Jefferson Sanatorium Birmingham | 80 | 20 | 100 | 182 | 182 | 364 | 154 | 74 | 68 | 70 | 58 | 1 | 15 | 2 | 1 | 28 | Yes | Yes | Yes | Yes | 819 | No |
| Mobile County Tuberculosis Sanatorium Mobile | 30 | 10 | 40 | 34 | 13 | 47 | 30 | 43 | | 33 | 1 | 1 | 6 | 4 | 2 | 15 | No | No | Yes | Yes | 75 | Yes |
| Private Montgomery Tuberculosis Sanatorium Montgomery | 60 | | 60 | 40 | 3 | 43 | 52 | 37 | | 33 | 21 | 1 | 6 | 3 | 0 | 9 | Yes | Yes | Yes | Yes | 301 | No |
| Totals | 206 | 36 | 242 | 200 | 16 | 216 | 276 | 175 | 62 | 162 | 84 | 4 | 30 | 17 | 6 | 60 | 2 | 2 | 3 | 4 | 1,240 | 1 |
| ARIZONA | | | | | | | | | | | | | | | | | | | | | | |
| Federal—U.S.A. | | | | | | | | | | | | | | | | | | | | | | |
| Fort Defiance Sanat. Fort Defiance | 150 | | 150 | 57 | 10 | 67 | 70 | 31 | | 19 | 19 | 1 | 1 | 2 | 0 | 3 | Yes | Yes | Yes | No | | No |
| Phoenix Indian Sanatorium Phoenix | 30 | | 30 | 33 | 5 | 38 | 207 | 146 | | 97 | 0 | 1 | 0 | 8 | 0 | 31 | Yes | Yes | Yes | Yes | 416 | No |
| San Xavier Indian Sanatorium Tucson | 30 | 15 | 45 | 24 | 71 | 95 | 6 | 33 | | 34 | 0 | 1 | 0 | 3 | 1 | 14 | Yes | Yes | Yes | Yes | 82 | Yes |
| Winslow Sanatorium Winslow County | 30 | | 30 | 24 | 71 | 95 | 60 | 30 | 5 | 14 | 5 | 1 | 2 | 4 | 1 | 10 | Yes | Yes | Yes | Yes | | No |
| Maricopa County Tuberculosis Hospital Phoenix | 37 | | 37 | | | | 37 | | | 37 | | 1 | 3 | 0 | 2 | 5 | No | No | No | No | | No |
| Pima County Hospital, Tucson | 40 | | 40 | 70 | 2 | 72 | 60 | 42 | | 43 | 15 | 1 | 0 | 4 | 0 | 9 | No | No | No | No | | No |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Helen Lee Sanatorium Phoenix | 80 | | 80 | 13 | | 13 | 7 | 13 | | 0 | 2 | 0 | 5 | 1 | 1 | 4 | No | No | No | No | 60 | No |
| Phoenix Sanatorium Phoenix | 30 | | 30 | | | | 30 | | | 20 | | 1 | 2 | 1 | 0 | 2 | Yes | Yes | Yes | Yes | | No |
| St. Luke's Home Phoenix | 30 | | 30 | | | | 69 | 21 | | 22 | 4 | 1 | 4 | 4 | 0 | 18 | Yes | Yes | No | Yes | 200 | No |
| Pamsetgaaf Sanatorium Prescott | 30 | | 30 | 40 | | 40 | 40 | 10 | | 10 | 2 | 3 | 1 | 0 | 1 | 13 | Yes | Yes | Yes | Yes | 200 | No |
| Anson Rest Home Tucson | 30 | | 30 | 25 | | 25 | 10 | 10 | | 10 | 5 | 1 | 4 | 3 | 2 | 10 | No | No | No | No | | No |
| Arizona State Elks Assn Hosp. Tucson | 30 | | 30 | 33 | | 33 | 20 | 10 | | 15 | 7 | 1 | 2 | 3 | 1 | 7 | No | No | No | No | 4 | No |
| Barfield Sanatorium Tucson | 30 | | 30 | 22 | | 22 | 18 | | | 12 | 1 | 0 | 2 | 0 | 1 | 10 | No | No | No | Yes | | No |
| Comstock Hospital Tucson | 30 | | 30 | 49 | | 49 | 29 | 20 | 0 | 20 | 0 | 1 | 0 | 2 | 0 | 0 | No | No | No | No | | No |
| Hillcrest Sanatorium Tucson | 30 | | 30 | 16 | | 16 | 23 | 9 | | 10 | 2 | 1 | 0 | 3 | 0 | 8 | No | No | No | No | | No |
| Reardon Sanatorium Tucson | 30 | | 30 | 23 | | 23 | 24 | 20 | | 18 | 2 | 1 | 7 | 1 | 0 | 8 | No | Yes | No | Yes | 58 | No |
| St. Luke's in the Desert Sanat. Tucson | 30 | | 30 | 23 | | 23 | 24 | 20 | | 18 | 2 | 1 | 7 | 1 | 0 | 8 | No | Yes | No | Yes | 58 | No |
| Southern Pacific Sanatorium Tucson | 30 | | 30 | 23 | | 23 | 24 | 20 | | 18 | 2 | 1 | 7 | 1 | 0 | 8 | No | Yes | No | Yes | 58 | No |
| Totals | 447 | 40 | 487 | 414 | 143 | 557 | 701 | 520 | 11 | 436 | 74 | 20 | 41 | 48 | 0 | 194 | 8 | 0 | 7 | 0 | 2,820 | 1 |
| ARKANSAS | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| McRae Memorial Sanat. (col.) Alexander | 32 | | 32 | 44 | | 44 | 41 | 32 | 78 | 32 | 10 | 2 | 4 | 4 | 0 | 0 | Yes | Yes | Yes | Yes | 70 | Yes |
| Arkansas Tuberculosis Sanatorium State Sanatorium | 430 | 68 | 498 | 504 | 100 | 604 | 730 | 532 | 03 | 523 | 31 | 0 | 0 | 6 | 43 | 200 | Yes | Yes | Yes | Yes | 4,284 | No |
| Totals | 462 | 68 | 530 | 504 | 100 | 604 | 771 | 564 | 1.1 | 550 | 41 | 8 | 4 | 10 | 43 | 200 | 2 | 2 | 2 | 2 | 4,354 | 1 |
| CALIFORNIA | | | | | | | | | | | | | | | | | | | | | | |
| Federal—U.S.A. | | | | | | | | | | | | | | | | | | | | | | |
| Veterans Admin Facility San Fernando County | 244 | | 244 | 320 | | 320 | 320 | 240 | | 214 | 40 | 0 | 1 | 24 | 0 | 171 | Yes | Yes | Yes | Yes | 441 | Yes |
| Ahwahnee Tri County Tuberculosis San- atorium Ahwahnee | 82 | 26 | 108 | 70 | 30 | 100 | 94 | 100 | 3 | 99 | 5 | 2 | 0 | 11 | 0 | 26 | Yes | Yes | Yes | Yes | | No |
| Wahwah Sanatorium, Auberry | 32 | 34 | 66 | 46 | 40 | 86 | 91 | 68 | 3 | 72 | 2 | 1 | 0 | 5 | 0 | 28 | Yes | Yes | Yes | Yes | 342 | No |
| Humboldt County School for the Tuber- culous Eureka | 100 | | 100 | 25 | 12 | 37 | 67 | 45 | | 52 | 1 | 2 | 6 | 0 | 20 | 20 | Yes | Yes | Yes | Yes | 217 | Yes |
| Stony Brook Retreat Keene | 140 | 40 | 180 | 109 | | 109 | 107 | 93 | 10 | 97 | 23 | 2 | 0 | 4 | 2 | 31 | Yes | Yes | Yes | Yes | 644 | No |
| Arroyo Sanatorium Livermore | 140 | | 140 | | | | 241 | 174 | | 176 | 10 | 4 | 0 | 10 | 10 | 50 | Yes | Yes | Yes | Yes | 2,900 | Yes |

Does not include physicians
* Partly unclear listed.

TUBERCULOSIS HOSPITALS AND SANATORIUMS—Continued

| | Bed Capacity | | | Patients Admitted | | | Patients Discharged (Including Deaths) | Patients Present | Waiting List | Daily Average | Deaths | Physicians | | Nurses | Total Employees* | Medical Facilities | | | | Total Pneumo- thorax Treatments | Outpatient Department | |
|---|--------------|----------|-------|-------------------|----------|-------|---|------------------|--------------|---------------|--------|---------------|--------------------------|--------|------------------|--------------------|-------|-------|--------------|------------------------------------|--------------------------|------------|
| | Adults | Children | Total | Adults | Children | Total | | | | | | Regular Staff | Attending and Consulting | | | Graduate | Other | X Ray | Fluoroscopic | | | Laboratory |
| FLORIDA | | | | | | | | | | | | | | | | | | | | | | |
| County | | | | | | | | | | | | | | | | | | | | | | |
| St Johns Tuberculosis Cottage St Augustine | | | 10 | | | | | 5 | | | | 1 | 1 | 0 | 1 | 1 | No | No | No | No | No | |
| Hillsboro County Tuberculosis Sanatorium Tampa | 66 | | 66 | 46 | | 46 | 36 | 63 | 22 | 60 | 9 | 1 | 0 | 2 | 2 | 16 | No | No | No | | 50 | |
| Private Tuberculosis Home for the Colored West Palm Beach | | | 10 | | | | | 0 | | | | 0 | 2 | 1 | 0 | 2 | No | No | No | No | No | |
| Totals | 66 | | 86 | 43 | | 45 | 36 | 73 | 22 | 60 | 9 | 2 | 3 | 3 | 4 | 19 | 0 | 0 | 0 | 0 | 50 | |
| GEORGIA | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| State Tuberculosis Sanatorium Alto | 224 | 113 | 337 | 701 | 200 | 900 | 674 | 293 | 440 | 280 | 43 | 4 | 1 | 20 | 27 | 157 | Yes | Yes | Yes | Yes | 3,724 | |
| County | | | | | | | | | | | | | | | | | | | | | | |
| Muscogee County Tuberculosis Sanatorium Columbus | 80 | | 30 | 27 | | 27 | 20 | 23 | | 96 | | 1 | 0 | 3 | 1 | 4 | No | No | Yes | Yes | 28 | |
| City | | | | | | | | | | | | | | | | | | | | | | |
| Battle Hill Sanatorium Atlanta | 176 | 40 | 216 | | | 167 | 146 | 206 | 200 | 211 | 61 | 3 | 0 | 1 | 20 | 48 | Yes | Yes | Yes | Yes | 473 | |
| Hopewell Sanatorium Macon | | | 24 | | | 40 | 40 | 21 | 7 | 20 | 5 | 1 | 0 | 0 | 3 | 3 | No | No | No | No | 84 | |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Fairhaven Tuberculosis Sanat., Athens | 36 | | 36 | 26 | 1 | 27 | 20 | 16 | 0 | 16 | | 1 | 0 | 1 | 3 | 4 | Yes | Yes | Yes | Yes | 150 | |
| Totals | 466 | 133 | 645 | 754 | 206 | 1,222 | 910 | 561 | 752 | 533 | 109 | 10 | 1 | 20 | 60 | 213 | 8 | 3 | 4 | 4 | 4,439 | |
| IDAHO | | | | | | | | | | | | | | | | | | | | | | |
| Federal—U.S.I.A. | | | | | | | | | | | | | | | | | | | | | | |
| Fort Lapwai Sanatorium Lapwai | | | 132 | 122 | | 197 | 134 | 131 | | 114 | 6 | 2 | 0 | 7 | 0 | 34 | Yes | Yes | Yes | Yes | 189 | |
| Totals | | | 132 | 122 | | 197 | 134 | 131 | | 114 | 6 | 2 | 0 | 7 | 0 | 34 | 1 | 1 | 1 | 1 | 189 | |
| ILLINOIS | | | | | | | | | | | | | | | | | | | | | | |
| County | | | | | | | | | | | | | | | | | | | | | | |
| Kane County Spring Brook Sanatorium Aurora | 55 | 30 | 85 | 68 | 14 | 82 | 79 | 84 | 17 | 81 | 11 | 1 | 0 | 3 | 5 | 20 | Yes | Yes | Yes | Yes | 730 | |
| Elm Grove Sanatorium Bushnell | 30 | | 38 | 32 | | 32 | 27 | 31 | | 26 | 8 | 1 | 1 | 3 | 1 | 12 | No | No | Yes | Yes | 143 | |
| Macon County Tuberculosis Sanatorium Decatur | | | 60 | 52 | | 52 | 48 | 64 | 23 | 57 | 1 | 2 | 9 | 0 | 4 | 22 | Yes | Yes | Yes | Yes | 97 | |
| DeKalb County Tuberculosis Sanatorium DeKalb | 18 | 27 | 45 | 10 | 11 | 21 | 16 | 44 | | 43 | 4 | 1 | 0 | 0 | 4 | 12 | Yes | Yes | No | | Yes | |
| Madison County Tuberculosis Sanatorium Edwardsville | 70 | 20 | 90 | 114 | 18 | 132 | 146 | 76 | 60 | 70 | 19 | 1 | 0 | 4 | 4 | 40 | Yes | Yes | Yes | Yes | 787 | |
| Morgan County Tuberculosis Sanatorium Jacksonville | | | 40 | 30 | 6 | 41 | 42 | 20 | | 22 | 10 | 1 | 0 | 2 | 3 | 13 | Yes | Yes | Yes | Yes | 120 | |
| Will County Tuberculosis Sanat Joliet | 60 | 20 | 100 | 43 | 7 | 50 | 67 | 83 | | 70 | 14 | 1 | 2 | 2 | 8 | 30 | No | No | Yes | Yes | No | |
| Oak Knoll Sanatorium Mackinaw | 45 | | 45 | 56 | | 56 | 54 | 30 | | 30 | 13 | 1 | 0 | 1 | 5 | 12 | Yes | No | Yes | Yes | 138 | |
| Woodford County Tuberculosis Sanatorium Minonk | 11 | | 11 | 7 | | 7 | | 6 | | 6 | | 1 | 0 | 2 | 0 | 3 | No | No | Yes | No | No | |
| Fairview Sanatorium Normal | 50 | | 50 | 12 | | 12 | 20 | 20 | 23 | 24 | 3 | 1 | 0 | 4 | 2 | 10 | Yes | Yes | Yes | Yes | 390 | |
| Cook County Tuberculosis Hospital Oak Forest | 694 | 40 | 634 | 500 | 26 | 524 | 681 | 409 | | 498 | 191 | 6 | 5 | 7 | 41 | 93 | Yes | Yes | Yes | Yes | 963 | |
| Highland Ottawa | 60 | | 60 | 46 | 1 | 47 | 41 | 38 | 12 | 29 | | 1 | 0 | 3 | 3 | 14 | Yes | Yes | Yes | Yes | 30 | |
| Livingson County Sanat Pontiac | 36 | | 36 | 40 | | 40 | 46 | 37 | 2 | 36 | 2 | 1 | 0 | 1 | 3 | 12 | Yes | Yes | Yes | Yes | No | |
| Hillcrest Quincy | 50 | | 50 | 46 | | 46 | 39 | 44 | 3 | 43 | 4 | 1 | 0 | 4 | 3 | 16 | Yes | Yes | Yes | Yes | 170 | |
| Rock Island County Tuberculosis Sanatorium Rock Island | 76 | | 76 | 74 | | 74 | 74 | 76 | 14 | 58 | 14 | 1 | 0 | 7 | 2 | 21 | Yes | Yes | Yes | Yes | 92 | |
| The Outlook, Urbana | | | 48 | 20 | | 29 | 23 | 36 | 6 | 30 | 6 | 1 | 0 | 1 | 7 | 20 | Yes | Yes | No | Yes | No | |
| City | | | | | | | | | | | | | | | | | | | | | | |
| City of Chicago Municipal Tuberculosis Sanatorium Chicago | 1,000 | 136 | 1,206 | 830 | 890 | 1,720 | 1,504 | 1,180 | | 1,126 | 216 | 22 | 10 | 110 | 203 | 500 | Yes | Yes | Yes | Yes | 6,206 | |
| Peoria Municipal Tuberculosis Sanatorium Peoria | 70 | 23 | 93 | 77 | 39 | 116 | 114 | 0 | 17 | 92 | 12 | 2 | 8 | 14 | 1 | 56 | Yes | Yes | Yes | Yes | 2,461 | |
| City | | | | | | | | | | | | | | | | | | | | | | |
| Rockford Municipal Tuberculosis Sanatorium Rockford | 110 | | 110 | 92 | 9 | 101 | 122 | 104 | 20 | 99 | 16 | 2 | 0 | 10 | 4 | 42 | Yes | Yes | Yes | Yes | 900 | |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Fox River Sanatorium Batavia | 50 | | 50 | | | 40 | 38 | 48 | 6 | 40 | | 3 | 1 | 5 | 5 | 0 | 20 | Yes | Yes | Yes | Yes | 700 |
| Chicago Fresh Air Hospital Chicago | 100 | | 100 | 86 | 1 | 87 | 80 | 20 | | 21 | 21 | 2 | 0 | 5 | 1 | 20 | Yes | Yes | Yes | Yes | 520 | |
| Edward Sanatorium Naperville | | | 88 | 103 | | 103 | 101 | 59 | | 50 | | 0 | 2 | 4 | 14 | 3 | 37 | Yes | Yes | Yes | Yes | 892 |
| Ottawa Tuberculosis Sanat. Ottawa | | | 115 | 137 | 7 | 144 | 138 | 84 | | 84 | 15 | 2 | 5 | 11 | 2 | 33 | Yes | Yes | Yes | Yes | 628 | |
| Palmer Sanatorium Springfield | 60 | | 60 | 90 | 4 | 99 | 86 | 36 | | 37 | 4 | 2 | 4 | 2 | 7 | 23 | Yes | Yes | Yes | Yes | 190 | |
| Winfield Sanatorium Winfield | 68 | 32 | 120 | 90 | 31 | 120 | 122 | 79 | | 89 | 0 | 1 | 4 | 2 | 5 | 23 | Yes | Yes | Yes | Yes | 600 | |
| Zane Sanatorium Winfield | 50 | | 50 | 60 | | 60 | 50 | 27 | | 20 | 6 | 2 | 3 | 2 | 5 | 16 | Yes | Yes | Yes | Yes | 200 | |
| Totals | 2,779 | 328 | 3,476 | 2,800 | 1,071 | 3,920 | 3,903 | 2,913 | 214 | 2,821 | 607 | 62 | 74 | 224 | 326 | 1,133 | 23 | 22 | 24 | 24 | 17,147 | |
| INDIANA | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| Indiana State Sanatorium Rockville | 117 | 64 | 211 | 103 | 86 | 189 | 182 | 206 | 100 | 200 | 4 | 4 | 0 | 16 | 0 | 92 | Yes | Yes | Yes | Yes | 971 | |
| County | | | | | | | | | | | | | | | | | | | | | | |
| Ella B. Kehrer Hospital Anderson | 40 | 10 | 50 | | | 50 | 85 | 43 | | 72 | 20 | 1 | 0 | 2 | 3 | 18 | Yes | Yes | No | Yes | 100 | |
| Lake County Tuberculosis Sanatorium Crown Point | 188 | 17 | 205 | 149 | 22 | 171 | 172 | 203 | 34 | 202 | 41 | 3 | 0 | 17 | 8 | 74 | Yes | Yes | Yes | Yes | 1,331 | |
| Roehne Tuberculosis Hosp., Evansville | 84 | 31 | 115 | 131 | 110 | 246 | 263 | 110 | | 91 | 29 | 2 | 0 | 9 | 15 | 60 | Yes | Yes | Yes | Yes | 408 | |
| Irene Byron Tuberculosis Sanatorium Fort Wayne | 167 | 33 | 200 | | | 219 | 214 | 166 | 10 | 141 | 47 | 4 | 4 | 12 | 12 | 72 | Yes | Yes | Yes | Yes | 340 | |
| William Ross Sanatorium LaFayette | 40 | | 40 | 56 | | 56 | 56 | 30 | | 26 | | 0 | 1 | 5 | 4 | 3 | 16 | Yes | Yes | Yes | Yes | 1,220 |
| Sunnyside Sanatorium Oaklandon | 199 | 62 | 261 | 150 | 79 | 229 | 200 | 201 | 61 | 261 | 21 | 4 | 42 | 23 | 8 | 84 | Yes | Yes | Yes | Yes | 2,184 | |
| Smith Eateh Memorial Hosp. Richmond | 50 | | 50 | 21 | 1 | 22 | 6 | 19 | 9 | 15 | 1 | 1 | 11 | 2 | 2 | 11 | Yes | Yes | Yes | Yes | 8 | |
| Healthwin Hospital, South Bend | 160 | 50 | 215 | 183 | 132 | 315 | 319 | 208 | 0 | 202 | 50 | 3 | 0 | 24 | 4 | 82 | Yes | Yes | Yes | Yes | 1,124 | |
| Totals | 1,055 | 302 | 1,357 | 823 | 430 | 1,542 | 1,553 | 1,201 | 271 | 1,162 | 218 | 23 | 71 | 100 | 55 | 509 | 0 | 9 | 8 | 9 | 7,741 | |

* Does not include physicians

† Partly unclassified

TUBERCULOSIS HOSPITALS AND SANATORIUMS—Continued

| | Bed Capacity | | | Patients Admitted | | | Patients Discharged (Including Deaths) | Patients Present | Waiting List | Daily Average | Deaths | Physicians | | Nurses | Total Employees* | Medical Facilities | | | | Total Tubercu- losis Patients in Department | | |
|--|--------------|----------|-------|-------------------|----------|-------|---|------------------|--------------|---------------|--------|---------------|--------------------------|--------|------------------|--------------------|--------------|------------|--------------|---|--------|-----|
| | Adults | Children | Total | Adults | Children | Total | | | | | | Regular Staff | Attending and Consulting | | | X-Ray | Fluoroscopic | Laboratory | Pneumothorax | | | |
| IOWA | | | | | | | | | | | | | | | | | | | | | | |
| Federal—U.S.I.A. | | | | | | | | | | | | | | | | | | | | | | |
| Sac and Fox Tuberculosis Sanatorium Toledo | | 80 | 80 | | | 48 | 50 | 70 | | 81 | | 1 | 1 | 5 | 0 | 24 | Yes | Yes | Yes | Yes | No | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| State Sanat for Tuberculosis Oakdale County | | | 303 | 213 | | 213 | 222 | 303 | 70 | 340 | 18 | 5 | 0 | 8 | 50 | 171 | Yes | Yes | Yes | Yes | 3,326 | No |
| Pine Knoll Sanitarium Davenport | 80 | 20 | 100 | | | 118 | 110 | 82 | | 60 | 10 | 1 | 0 | 7 | 0 | 20 | Yes | Yes | Yes | Yes | | |
| Broadlawns Polk County Public Hos- pital Tuberculosis Dept Des Moines | 100 | | 100 | 68 | | 68 | 70 | 50 | | 52 | 21 | 4 | 2 | 4 | 6 | 41 | Yes | Yes | Yes | Yes | 533 | No |
| Sunny Crest Sanatorium Dubuque | 70 | | 70 | 90 | | 90 | 91 | 68 | | 60 | 13 | 1 | 0 | 4 | 4 | 18 | Yes | Yes | Yes | Yes | 1,130 | |
| Sunnyslope Sanatorium, Ottumwa | 51 | 4 | 55 | 63 | 23 | 80 | 87 | 71 | 8 | 61 | 21 | 1 | 13 | 1 | 10 | 20 | Yes | Yes | Yes | Yes | 151 | Yes |
| Totals | 301 | 110 | 714 | 434 | 23 | 618 | 641 | 700 | 83 | 660 | 128 | 13 | 16 | 29 | 70 | 300 | 6 | 6 | 6 | 6 | 5,073 | 1 |
| KANSAS | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| State Sanat for Tuberculosis Norton County | 236 | 32 | 268 | 163 | 36 | 199 | 191 | 264 | 88 | 264 | 26 | 5 | 8 | 8 | 23 | 141 | Yes | Yes | Yes | Yes | 3,380 | Yes |
| Sedgwick County Tuberculosis Sanato- rium Wichita | 60 | | 60 | | | 67 | 52 | 41 | | 48 | 10 | 1 | 0 | 4 | 3 | 15 | No | No | No | Yes | 73 | No |
| City County | | | | | | | | | | | | | | | | | | | | | | |
| Hillcrest Sanatorium, Topeka | 50 | 10 | 60 | 73 | 87 | 160 | 108 | 43 | 6 | 42 | 10 | 2 | 0 | 4 | 5 | 20 | Yes | Yes | No | Yes | 150 | No |
| Totals | 346 | 42 | 388 | 236 | 123 | 420 | 401 | 348 | 94 | 354 | 60 | 8 | 14 | 16 | 36 | 176 | 2 | 2 | 1 | 3 | 3,560 | 1 |
| KENTUCKY | | | | | | | | | | | | | | | | | | | | | | |
| Federal—U.S.V.B. | | | | | | | | | | | | | | | | | | | | | | |
| Veterans Admin Facility Outwood | 370 | | 370 | 790 | | 790 | 727 | 281 | 15 | 270 | 39 | 9 | 0 | 38 | 0 | 260 | Yes | Yes | Yes | Yes | 267 | Yes |
| State | | | | | | | | | | | | | | | | | | | | | | |
| State Tuberculosis Sanat Louisville County | 80 | | 80 | 146 | | 146 | 98 | 74 | 172 | 51 | 7 | 3 | 5 | 12 | 3 | 37 | Yes | Yes | Yes | Yes | 2,033 | No |
| Julius Marks Sanatorium Lexington | 68 | 22 | 90 | 116 | | 116 | 111 | 93 | 3 | 91 | 12 | 2 | 11 | 3 | 7 | 39 | Yes | Yes | Yes | Yes | 671 | No |
| City County | | | | | | | | | | | | | | | | | | | | | | |
| Waverly Hills Sanat, Waverly Hills | 314 | 00 | 404 | 434 | 88 | 522 | 506 | 500 | 40 | 502 | 110 | 8 | 1 | 21 | 61 | 230 | Yes | Yes | Yes | Yes | 7,210 | Yes |
| Totals | 837 | 112 | 949 | 1,402 | 88 | 1,580 | 1,442 | 948 | 1,788 | 914 | 174 | 22 | 17 | 74 | 71 | 571 | 4 | 4 | 4 | 4 | 10,457 | 2 |
| LOUISIANA | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| Greenwell Springs Sanatorium, Greenwell Springs | 90 | | 90 | 80 | 0 | 91 | 70 | 50 | 70 | 88 | 16 | 1 | 0 | 3 | 11 | 38 | Yes | No | No | Yes | 36 | No |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Orleans Tuberculosis Hosp New Orleans | 100 | | 100 | 96 | | 96 | 57 | 30 | | 40 | 23 | 1 | 2 | 5 | 0 | 9 | No | No | No | No | 100 | No |
| Pines Sanatorium Shreveport | 100 | 30 | 130 | 93 | 17 | 110 | 114 | 60 | | 70 | 39 | 1 | 8 | 5 | 3 | 23 | Yes | Yes | Yes | Yes | 100 | No |
| Totals | 290 | 30 | 326 | 274 | 23 | 297 | 290 | 190 | 70 | 198 | 78 | 3 | 10 | 13 | 14 | 70 | 2 | 1 | 1 | 2 | 186 | 0 |
| MAINE | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| Central Maine Sanatorium Fairfield | 184 | | 184 | | | 200 | 215 | 168 | | 173 | 50 | 3 | 1 | 10 | 8 | 90 | Yes | Yes | Yes | Yes | 1,356 | Yes |
| Western Maine Sanatorium Greenwood Mountain | 111 | 39 | 150 | 109 | 42 | 151 | 164 | 129 | 10 | 144 | 24 | 3 | 3 | 13 | 4 | 84 | Yes | Yes | Yes | Yes | 957 | Yes |
| Northern Maine Sanat Presque Isle | 70 | 42 | 112 | 111 | | 111 | 107 | 113 | 11 | 112 | 0 | 2 | 1 | 11 | 5 | 47 | Yes | Yes | Yes | Yes | 1,000 | No |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Bangor Sanatorium Bangor | 30 | | 30 | 24 | | 24 | 20 | 15 | | 14 | 2 | 2 | 0 | 2 | 3 | 13 | Yes | Yes | Yes | Yes | 255 | Yes |
| Totals | 401 | 81 | 482 | 244 | 42 | 491 | 510 | 420 | 21 | 443 | 80 | 10 | 5 | 40 | 20 | 234 | 4 | 4 | 4 | 4 | 3,563 | 3 |
| MARYLAND | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| Maryland Tuberculosis Sanatorium (col.) Henryton | 128 | 30 | 158 | | | 212 | 200 | 157 | 60 | 156 | 77 | 2 | 0 | 5 | 16 | 60 | Yes | Yes | Yes | Yes | | No |
| Maryland Tuberculosis Sanatorium Mt Wilson | 133 | 42 | 175 | 83 | 38 | 123 | 118 | 174 | 10 | 170 | 20 | 2 | 2 | 15 | 4 | 60 | Yes | Yes | Yes | Yes | 618 | No |
| Maryland Tuberculosis Sanat Salisbury | | | 68 | 72 | 8 | 80 | 76 | 50 | 2 | 53 | 13 | 0 | 1 | 3 | | 17 | Yes | Yes | Yes | Yes | 75 | No |
| Maryland Tuberculosis Sanatorium State Sanatorium | 400 | 54 | 510 | 687 | 82 | 709 | 707 | 508 | 30 | 503 | 90 | 6 | 3 | 13 | 30 | 150 | Yes | Yes | Yes | Yes | 1,501 | No |
| City | | | | | | | | | | | | | | | | | | | | | | |
| Baltimore City Hospitals (Tuberculosis Department) Baltimore | 179 | | 179 | 402 | | 452 | 391 | 163 | 5 | 163 | 170 | 4 | 7 | 8 | 17 | 30 | Yes | Yes | Yes | Yes | 1,100 | No |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Allegheny County Tuberculosis Sanato- rium Cumberland | 20 | | 20 | 41 | | 41 | 32 | 9 | | 12 | 14 | 1 | 0 | 0 | 1 | 4 | No | No | No | No | 270 | No |
| Mount Pleasant Reisterstown | 60 | | 60 | 40 | | 40 | 37 | 57 | 1 | 53 | 12 | 3 | 10 | 3 | 4 | 21 | Yes | Yes | Yes | Yes | 1,225 | No |
| Hospital for Consumptives Towson | 142 | 48 | 190 | | | 234 | 233 | 193 | 26 | 187 | 27 | 4 | 0 | 14 | 18 | 68 | Yes | Yes | Yes | Yes | | 0 |
| Totals | 1,121 | 174 | 1,300 | 1,382 | 123 | 1,506 | 1,837 | 1,316 | 139 | 1,902 | 432 | 23 | 28 | 59 | 90 | 444 | 7 | 7 | 7 | 7 | 4,880 | 0 |
| MASSACHUSETTS | | | | | | | | | | | | | | | | | | | | | | |
| Federal—U.S.V.B. | | | | | | | | | | | | | | | | | | | | | | |
| Veterans Administration Facility Rut- land Heights | 472 | | 472 | 503 | | 503 | 300 | 348 | 33 | 281 | 09 | 10 | 1 | 34 | 0 | 234 | Yes | Yes | Yes | Yes | 800 | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| Lakewood State Sanat Middleboro | 100 | 198 | 304 | 127 | 70 | 202 | 216 | 282 | | 283 | 25 | 6 | 6 | 18 | 53 | 177 | Yes | Yes | Yes | Yes | | Yes |
| North Reading State Sanatorium North Wilmington | | 297 | 297 | 200 | 200 | 200 | 277 | 240 | 0 | 240 | 16 | 5 | 0 | 20 | 0 | 101 | Yes | Yes | Yes | Yes | 370 | Yes |
| Rutland State Sanatorium Rutland | 300 | | 370 | 357 | | 357 | 360 | 300 | 0 | 342 | 02 | 8 | 3 | 17 | 50 | 201 | Yes | Yes | Yes | Yes | 4,830 | Yes |
| Westfield State Sanatorium Westfield County | | 270 | 270 | 140 | | 140 | 103 | 217 | 0 | 201 | 10 | 6 | 3 | 13 | 23 | 134 | Yes | Yes | Yes | Yes | 496 | Yes |
| Bristol County Tuberculosis Hospital Attleboro | 50 | 10 | 60 | 82 | 0 | 88 | 87 | 60 | 0 | 60 | 19 | 2 | 0 | 5 | 9 | 56 | Yes | Yes | Yes | Yes | 178 | Yes |
| Hampshire County Sanat Haydenville | 100 | | 100 | 94 | | 94 | 103 | 81 | 0 | 81 | 40 | 2 | 2 | 0 | 11 | 34 | Yes | Yes | Yes | Yes | 576 | Yes |
| Essex Sanatorium Middleton | 360 | | 360 | 300 | | 300 | 307 | 336 | 0 | 342 | 07 | 6 | 11 | 33 | 01 | 170 | Yes | Yes | Yes | Yes | 3,225 | Yes |
| Norfolk County Hosp, South Braintree | 188 | | 188 | 119 | | 119 | 100 | 137 | 4 | 137 | 20 | 4 | 7 | 14 | 18 | 82 | Yes | Yes | Yes | Yes | 1,114 | Yes |
| Plymouth County Hosp South Hanson | 114 | 16 | 136 | | | 103 | 89 | 114 | | 112 | 20 | 4 | 1 | 6 | 20 | 74 | Yes | Yes | Yes | Yes | 1,473 | Yes |
| Middlesex County Sanat Waltham | 202 | | 202 | 169 | | 169 | 174 | 232 | 83 | 208 | 36 | 0 | 6 | 13 | 20 | 100 | Yes | Yes | Yes | Yes | 4,614 | Yes |
| Worcester County Sanat Worcester | 130 | | 130 | 118 | | 118 | 97 | 116 | 2 | 107 | 27 | 4 | 10 | 24 | 0 | 81 | Yes | Yes | Yes | Yes | 520 | Yes |

* Does not include physicians
† Partly unclassified

MASSACHUSETTS—Continued

MICHIGANMINNESOTAMISSISSIPPIMISSOURI

Does not include physicians
† Partly unclassified

TUBERCULOSIS HOSPITALS AND SANATORIUMS—Continued

| City | Bed Capacity | | | Patients Admitted | | | Patients Discharged (Including Deaths) | Patients Present | Waiting List | Daily Average | Deaths | Physicians | | Nurses | Total Employees* | Medical Facilities | | | | Total Pneumothorax Treatments Outpatient | Per Patient |
|---|--------------|----------|-------|-------------------|----------|-------|---|------------------|--------------|---------------|--------|---------------|--------------------------|--------|------------------|--------------------|--------------|------------|--------------|--|-------------|
| | Adults | Children | Total | Adults | Children | Total | | | | | | Regular Staff | Attending and Consulting | | | X Ray | Fluoroscopic | Laboratory | Pneumothorax | | |
| MISSOURI—Continued | | | | | | | | | | | | | | | | | | | | | |
| Kansas City Tuberculosis Hospital Kansas City | 168 | | 168 | 168 | | 168 | 202 | 163 | | 160 | 62 | 1 | 2 | 23 | 2 | 88 | Yes | Yes | Yes | No | No |
| Robert Koch Hospital St. Louis | 464 | 36 | 500 | 336 | | 336 | 324 | 409 | | 493 | 92 | 8 | 16 | 18 | 58 | 213 | Yes | Yes | Yes | Yes | 4,200 |
| Private | | | | | | | | | | | | | | | | | | | | | |
| Jewish Sanatorium, Robertson | 54 | 22 | 80 | 26 | 33 | 59 | 59 | 40 | 0 | 49 | 4 | 2 | 32 | 1 | 10 | 38 | Yes | Yes | Yes | Yes | 318 |
| Mount St. Rose Sanatorium, St. Louis | 130 | | 130 | | | 208 | 180 | 170 | 16 | 120 | 50 | 2 | 4 | 11 | 8 | 92 | Yes | Yes | Yes | Yes | 1,267 |
| Totals | 1,205 | 117 | 1,412 | 1,101 | 68 | 1,368 | 1,320 | 1,710 | 133 | 1,274 | 323 | 20 | 58 | 64 | 130 | 643 | 0 | 0 | 6 | 6 | 12,961 |
| MONTANA | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | |
| Montana State Tuberculosis Sanitarium Deer Lodge | 120 | 30 | 150 | 150 | 37 | 106 | 202 | 136 | 56 | 137 | 36 | 3 | 0 | 9 | 5 | 62 | Yes | Yes | Yes | Yes | 1,030 |
| Totals | 120 | 30 | 150 | 150 | 37 | 106 | 202 | 136 | 56 | 137 | 36 | 3 | 0 | 9 | 5 | 62 | 1 | 1 | 1 | 1 | 1,030 |
| NEBRASKA | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | |
| Hospital for the Tuberculous Kearney | 127 | 33 | 160 | 150 | | 150 | 160 | 157 | 2 | 154 | 21 | 3 | 2 | 3 | 12 | 58 | Yes | Yes | Yes | Yes | 385 |
| Totals | 127 | 33 | 160 | 150 | | 150 | 160 | 157 | 2 | 154 | 21 | 3 | 2 | 3 | 12 | 58 | 1 | 1 | 1 | 1 | 385 |
| NEW HAMPSHIRE | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | |
| New Hampshire State Sanat. for the Treatment of Tuberculosis, Glencliff | 110 | | 110 | 51 | | 51 | 64 | 93 | 3 | 90 | 7 | 2 | 1 | 5 | 4 | 40 | Yes | Yes | Yes | Yes | 868 |
| Private | | | | | | | | | | | | | | | | | | | | | |
| Pembroke Sanatorium, Pembroke | 70 | 20 | 100 | | | 86 | 77 | 80 | | 86 | 10 | 1 | 10 | 0 | 2 | 22 | No | No | No | Yes | 18 |
| Totals | 180 | 20 | 210 | 51 | | 137 | 141 | 173 | 3 | 176 | 17 | 3 | 11 | 14 | 6 | 62 | 1 | 1 | 1 | 2 | 886 |
| NEW JERSEY | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | |
| New Jersey Sanatorium for Tuberculosis Diseases, Glen Gardner | 400 | 120 | 420 | 383 | 150 | 522 | 508 | 400 | 37 | 441 | 18 | 8 | 4 | 21 | 54 | 108 | Yes | Yes | Yes | Yes | 15,000 |
| County | | | | | | | | | | | | | | | | | | | | | |
| Allenwood Sanatorium and Monmouth County Hospital for Tuberculosis, Allenwood | 102 | | 102 | | | 121 | 132 | 163 | 3 | 85 | 48 | 1 | 4 | 12 | 2 | 20 | Yes | Yes | Yes | Yes | 200 |
| Lakeland Sanatorium, Grenloch | 172 | 78 | 250 | 260 | 99 | 359 | 310 | 231 | 12 | 224 | 60 | 3 | 12 | 20 | 10 | 80 | Yes | Yes | Yes | Yes | 1,300 |
| Shongum Mountain Sanatorium, Morristown | 52 | | 52 | 40 | 2 | 42 | 43 | 51 | 8 | 52 | 15 | 1 | 0 | 5 | 4 | 24 | Yes | Yes | Yes | Yes | 511 |
| Fairview Sanatorium, New Lisbon | 121 | | 121 | 134 | | 134 | 137 | 102 | 0 | 109 | 40 | 2 | 0 | 12 | 0 | 33 | Yes | Yes | Yes | Yes | 779 |
| Atlantic County Hospital for Tuberculosis Diseases, Northfield | 50 | | 50 | 72 | 1 | 73 | 73 | 48 | 15 | 49 | 29 | 1 | 11 | 5 | 0 | 23 | Yes | Yes | No | Yes | 530 |
| Valley View Sanatorium, Paterson | 230 | | 230 | 278 | 0 | 284 | 278 | 210 | | 221 | 64 | 5 | 43 | 15 | 14 | 99 | Yes | Yes | Yes | Yes | 2,955 |
| Bonnie Burn Sanat. Scotch Plains | 201 | 140 | 341 | 342 | | 342 | 300 | 360 | 0 | 360 | 93 | 6 | 9 | 11 | 32 | 160 | Yes | Yes | Yes | Yes | 5,617 |
| Hudson County Tuberculosis Hospital and Sanatorium, Secaucus | 207 | | 207 | | | 243 | 169 | 200 | | 207 | 116 | 4 | 0 | 21 | 0 | 191 | Yes | Yes | Yes | Yes | 5,010 |
| Essex Mountain Sanatorium, Verona | 414 | | 414 | 432 | | 432 | 434 | 407 | 30 | 412 | 188 | 6 | 58 | 30 | 0 | 246 | Yes | Yes | Yes | Yes | 4,835 |
| Private | | | | | | | | | | | | | | | | | | | | | |
| Browns Mills Nursing Cottage, Browns Mills | 51 | | 51 | 54 | 1 | 55 | 54 | 54 | 0 | 40 | 5 | 1 | 1 | 4 | 1 | 14 | No | No | No | Yes | No |
| Deborah Sanatorium, Browns Mills | 40 | | 40 | 112 | | 112 | 108 | 38 | 50 | 44 | 1 | 2 | 16 | 4 | 0 | 16 | Yes | Yes | Yes | Yes | 351 |
| Vrs. Leonard's Manor Nursing Cottage, Browns Mills | | | | 27 | | 20 | | | | 23 | | | | | | | No | No | No | No | No |
| Sycamore Hall Sanat., Browns Mills | 18 | | 18 | | | | | | | | | 2 | 0 | 2 | 1 | 8 | No | No | No | No | No |
| The Pines Sanatorium, Chatsworth | 30 | | 30 | | | | | | | | | 1 | 1 | | | 8 | No | No | No | No | No |
| Idyllease Sanatorium, Newfoundland | 60 | | 60 | | | 44 | 38 | 31 | 0 | 31 | 10 | 2 | 2 | 2 | 2 | 10 | Yes | Yes | Yes | Yes | 122 |
| Totals | 2,073 | 288 | 2,468 | 2,022 | 560 | 3,040 | 2,904 | 2,262 | 164 | 2,303 | 700 | 45 | 166 | 170 | 120 | 1,091 | 12 | 12 | 11 | 13 | 26,081 |
| NEW MEXICO | | | | | | | | | | | | | | | | | | | | | |
| Federal—U. S. P. H. S. | | | | | | | | | | | | | | | | | | | | | |
| U. S. Marine Hospital, Ft. Stanton | 270 | | 270 | 166 | | 166 | 122 | 202 | | 217 | 16 | 6 | 2 | 10 | | 140 | Yes | Yes | Yes | Yes | 1,215 |
| County | | | | | | | | | | | | | | | | | | | | | |
| Albuquerque Indian Sanatorium, Albuquerque | | | 104 | 178 | | 178 | 70 | 103 | | 70 | | 2 | 1 | 11 | | 23 | Yes | Yes | Yes | Yes | 234 |
| Hearilla Sanatorium, Dulce | | 66 | 50 | | 10 | 16 | 20 | 71 | | 71 | | 1 | 0 | 4 | 1 | 23 | Yes | No | Yes | Yes | Yes |
| Private | | | | | | | | | | | | | | | | | | | | | |
| Hillcrest Sanatorium, Albuquerque | | | 80 | | | 115 | | 62 | | 62 | | 0 | 7 | 4 | 2 | 20 | Yes | Yes | No | No | No |
| Methodist Deaconess Sanat., Albuquerque | | | 65 | 96 | | 96 | 70 | 50 | | 50 | 16 | 0 | 9 | 3 | 2 | 17 | No | No | No | No | No |
| Holy Cross Sanatorium, Deming | 160 | | 160 | 50 | | 50 | 76 | 40 | | 53 | 11 | 1 | 3 | 8 | 3 | 62 | Yes | Yes | Yes | Yes | 200 |
| Sunmount Sanatorium, Santa Fe | | | 50 | | | 44 | 41 | 24 | | 10 | 1 | 2 | 1 | 2 | 1 | 21 | Yes | Yes | Yes | Yes | Yes |
| Valmora Sanatorium, Valmora | 70 | 10 | 80 | | | 54 | 60 | 40 | | 30 | 3 | 1 | 3 | 4 | 0 | 27 | Yes | Yes | Yes | Yes | 163 |
| Totals | 500 | 66 | 570 | 436 | 10 | 664 | 470 | 597 | | 577 | 47 | 13 | 26 | 40 | 9 | 338 | 7 | 6 | 6 | 6 | 1,971 |
| NEW YORK | | | | | | | | | | | | | | | | | | | | | |
| Federal—U. S. V. B. | | | | | | | | | | | | | | | | | | | | | |
| Veterans Admin. Facility, Castle Point | 470 | | 470 | 477 | | 477 | 486 | 460 | | 470 | 131 | 12 | 3 | 44 | 0 | 270 | Yes | Yes | Yes | Yes | 2,180 |
| Veterans Admin. Facility, Sunmount | 320 | | 320 | 348 | | 348 | 370 | 350 | 7 | 330 | 70 | 12 | 1 | 59 | 0 | 274 | Yes | Yes | Yes | Yes | No |
| State | | | | | | | | | | | | | | | | | | | | | |
| Herman M. Biggs Tuberculosis Sanatorium, Ithaca | | | | | | | | | | | | | | | | | | | | | |
| Tuberculosis Hospital, Mt. Morris | | | | | | | | | | | | | | | | | | | | | |
| New York State Tuberculosis Hospital, Oneonta | | | | | | | | | | | | | | | | | | | | | |
| New York State Hospital, Ray Brook | 300 | | 300 | | | 482 | 473 | 29 | 50 | 301 | 15 | 8 | | 17 | | 150 | Yes | Yes | Yes | Yes | 3,000 |
| County | | | | | | | | | | | | | | | | | | | | | |
| Montgomery Sanatorium, Amsterdam | 60 | 12 | 72 | 88 | 10 | 103 | 114 | 73 | | 76 | 18 | 2 | 9 | 7 | 3 | 25 | Yes | Yes | Yes | Yes | 454 |
| Pleasant Valley Sanatorium, Bath | 33 | 12 | 45 | 42 | 12 | 54 | 55 | 32 | 12 | 36 | 11 | 1 | 5 | 8 | 0 | 18 | Yes | No | No | Yes | 276 |
| Newton Memorial Hospital, Cassadaga | 120 | 60 | 180 | 163 | 35 | 198 | 133 | 171 | 1 | 169 | 21 | 3 | 3 | 14 | 3 | 79 | Yes | Yes | Yes | Yes | 2,304 |
| Broome County Tuberculosis Hospital, Chenango Bridge | 78 | 42 | 120 | 79 | 40 | 119 | 105 | 96 | 3 | 106 | 19 | 2 | 20 | 11 | 5 | 53 | Yes | Yes | Yes | Yes | 557 |

* Does not include physicians

† Partly unclassified

TUBERCULOSIS HOSPITALS AND SANATORIUMS—Continued

| | Bed Capacity | | | Patients Admitted | | | Patients Discharged (Including Deaths) | Patients Present | Waiting List | Daily Average | Deaths | Physicians | | Nurses | Total Employees* | Medical Facilities | | | | Total Pneu- mothorax Treatments | Outpatient Department | | | | | | | | | | | | | | | | | | | | | | |
|--|--------------|----------|-------|-------------------|----------|-------|---|------------------|--------------|---------------|--------|---------------|--------------------------|--------|------------------|--------------------|-------|-------|--------------|------------------------------------|--------------------------|------------|--------------|-------|-------|-------|--------|--------|-------|-----|-------|-------|-------|-----|-----|-----|-------|----|----|----|----|--------|----|
| | Adults | Children | Total | Adults | Children | Total | | | | | | Regular Staff | Attending and Consulting | | | Graduate | Other | X Ray | Fluoroscopic | | | Laboratory | Pneumothorax | | | | | | | | | | | | | | | | | | | | |
| NEW YORK—Continued | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Delaware County Tuberculosis Sanatorium Delhi | 28 | 4 | 32 | 31 | 6 | 37 | 30 | 24 | | 28 | 8 | 1 | 6 | 4 | 3 | 14 | Yes | Yes | Yes | Yes | 164 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Chemung County Sanatorium Elmira | 36 | | 36 | | | 59 | 72 | 35 | 1 | 31 | 17 | 1 | | 4 | 1 | 11 | Yes | Yes | Yes | Yes | 345 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Nassau County Sanat Farmingdale | 255 | 101 | 356 | 359 | 466 | 825 | 508 | 357 | 3 | 341 | 71 | 0 | 7 | 34 | 6 | 185 | Yes | Yes | Yes | Yes | 5,426 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Westmont Sanatorium Glens Falls | 40 | 8 | 48 | 35 | 0 | 41 | 33 | 60 | 3 | 58 | 10 | 1 | | 3 | 3 | 25 | Yes | Yes | Yes | Yes | | Yes | | | | | | | | | | | | | | | | | | | | | |
| Oak Mount Sanatorium Holcomb | 37 | 8 | 45 | | | 80 | 07 | 50 | | 40 | 15 | 1 | | 3 | 3 | 19 | Yes | Yes | Yes | Yes | 127 | No | | | | | | | | | | | | | | | | | | | | | |
| Suffolk Sanatorium, Holtzville | 54 | 50 | 104 | 47 | 63 | 110 | 109 | 103 | 27 | 104 | 10 | 3 | 5 | 6 | 5 | 38 | Yes | Yes | Yes | Yes | 696 | | | | | | | | | | | | | | | | | | | | | | |
| Ulster County Tuberculosis Hospital Kingston | 56 | | 56 | | | 89 | 88 | 50 | 2 | 50 | 18 | 2 | 8 | 5 | 8 | 34 | Yes | Yes | Yes | Yes | 822 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Nagara County Sanatorium Lockport | 120 | 60 | 200 | 61 | 77 | 138 | 142 | 210 | 3 | 203 | 45 | 4 | 4 | 25 | 10 | 110 | Yes | Yes | Yes | Yes | 1,432 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Saratoga County Tuberculosis Hospital Middle Grove | 50 | 40 | 90 | 82 | 102 | 184 | 194 | 62 | 12 | 86 | 13 | 1 | 4 | 2 | 11 | 29 | Yes | Yes | No | Yes | | No | | | | | | | | | | | | | | | | | | | | | |
| Otego County Sanatorium Mt Vision | 28 | | 28 | 25 | 1 | 26 | 26 | 15 | | 17 | 4 | 1 | 2 | 3 | 2 | 8 | Yes | Yes | Yes | Yes | 6 | No | | | | | | | | | | | | | | | | | | | | | |
| Estelle and Walter O Odell Memorial Sanat for Tuberculosis, Newburgh | 50 | | 50 | 54 | 2 | 56 | 63 | 45 | 3 | 48 | 15 | 1 | 1 | 5 | 0 | 10 | Yes | Yes | Yes | Yes | 326 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Rocky Crest Sanatorium Olean | 40 | | 40 | 54 | 10 | 64 | 74 | 36 | | 41 | 7 | 1 | 7 | 2 | 3 | 23 | Yes | Yes | No | Yes | 676 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Columbia County Tuberculosis Sanatorium Philmont | 46 | 28 | 76 | 48 | 13 | 61 | 70 | 50 | | 60 | 7 | 1 | 2 | 9 | | 30 | Yes | Yes | Yes | Yes | 180 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Summit Park Sanatorium Pomona | 50 | | 50 | 44 | | 44 | 44 | 50 | 3 | 50 | 6 | 1 | 10 | 2 | 6 | 24 | Yes | Yes | Yes | Yes | 1,071 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Oswego County Sanatorium, Richland | 80 | 30 | 116 | 82 | 28 | 110 | 108 | 99 | | 98 | 18 | 1 | 8 | 10 | 4 | 40 | Yes | Yes | Yes | Yes | 53 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Iola Monroe County Tuberculosis Sanatorium Rochester | 270 | 130 | 400 | 340 | 307 | 647 | 630 | 395 | 10 | 390 | 62 | 7 | | 45 | 18 | 211 | Yes | Yes | Yes | Yes | 2,564 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Pine Crest Sanatorium Salisbury Center | 62 | 28 | 90 | 48 | 10 | 58 | 47 | 88 | 8 | 90 | 9 | 1 | 4 | 6 | 6 | 35 | Yes | Yes | Yes | Yes | 279 | | | | | | | | | | | | | | | | | | | | | | |
| Glenridge Sanatorium Schenectady | 84 | 48 | 132 | 64 | 27 | 111 | 122 | 66 | 7 | 122 | 23 | 3 | 20 | 6 | 11 | | Yes | Yes | Yes | Yes | 377 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Chenango County Tuberculosis Hospital Sherburne | 37 | | 37 | 34 | 2 | 36 | 30 | 28 | 1 | 35 | 8 | 1 | 5 | 2 | 4 | 8 | Yes | Yes | Yes | Yes | | | | | | | | | | | | | | | | | | | | | | | |
| Onondaga Sanatorium Syracuse | 203 | 50 | 253 | 179 | 54 | 233 | 239 | 233 | 3 | 236 | 58 | 4 | 18 | 19 | 120 | Yes | Yes | Yes | Yes | 1,149 | Yes | | | | | | | | | | | | | | | | | | | | | | |
| Tompkins County Tuberculosis Hospital Trumansburg | 20 | 10 | 30 | 0 | 6 | 15 | 24 | 23 | | 26 | 8 | 1 | 3 | 4 | 5 | 10 | No | No | No | No | 105 | No | | | | | | | | | | | | | | | | | | | | | |
| Oneida County Tuberculosis Sanatorium Utica | 108 | 24 | 132 | 102 | 13 | 115 | 115 | 128 | 13 | 120 | 33 | 3 | 8 | 16 | 6 | 64 | Yes | Yes | Yes | Yes | 4,368 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Jefferson County Sanat Watertown | 50 | 28 | 78 | 42 | 17 | 59 | 59 | 80 | 8 | 80 | 8 | 2 | 1 | 7 | 4 | 80 | Yes | Yes | Yes | Yes | 672 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Pawling Sanatorium, Wyantaskill | 118 | 34 | 152 | 111 | 19 | 130 | 136 | 122 | 2 | 132 | 23 | 3 | 7 | 7 | 9 | | Yes | Yes | Yes | Yes | | Yes | | | | | | | | | | | | | | | | | | | | | |
| City | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Municipal Sanatorium, Otisville | 388 | | 388 | 547 | | 547 | 547 | 390 | | 330 | 1 | 8 | 30 | 24 | 0 | 256 | Yes | Yes | Yes | Yes | 5,091 | No | | | | | | | | | | | | | | | | | | | | | |
| J N Adam Memorial Hosp Perrysburg | 384 | 116 | 500 | 361 | 50 | 417 | 439 | 259 | | 418 | 7 | 7 | 16 | 23 | 224 | Yes | Yes | Yes | Yes | 1,178 | No | | | | | | | | | | | | | | | | | | | | | | |
| Neponset Beach Hospital for Children Rockaway Beach | | 120 | 120 | | 23 | 25 | 31 | 115 | | 119 | 3 | 1 | 2 | 6 | 21 | 77 | Yes | No | Yes | Yes | | No | | | | | | | | | | | | | | | | | | | | | |
| Sea View Hospital Staten Island | 1,234 | 192 | 1,426 | 1,816 | 203 | 2,019 | 2,174 | 1,642 | 60 | 1,706 | 604 | 1 | 161 | 160 | 1,209 | Yes | Yes | Yes | Yes | 22,406 | Yes | | | | | | | | | | | | | | | | | | | | | | |
| Gray Oaks Hospital Yonkers | 53 | | 53 | 87 | | 87 | 90 | 44 | | 48 | 27 | 1 | 7 | 6 | 4 | 21 | Yes | Yes | No | Yes | | | | | | | | | | | | | | | | | | | | | | | |
| City County | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Samuel W Bowne Memorial Hospital Poughkeepsie | 83 | 52 | 135 | 73 | 31 | 100 | 104 | 132 | 3 | 135 | 28 | 3 | 12 | 4 | 3 | 47 | Yes | Yes | Yes | Yes | 522 | No | | | | | | | | | | | | | | | | | | | | | |
| Private | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Montefiore Hospital Country Sanatorium, Bedford Hills | 230 | | 230 | 249 | | 249 | 261 | 208 | 10 | 226 | 3 | 4 | 3 | 10 | 13 | 111 | Yes | Yes | Yes | Yes | 2,423 | No | | | | | | | | | | | | | | | | | | | | | |
| Brooklyn Home for Consumptives Brooklyn | 97 | 12 | 109 | 69 | 6 | 75 | 82 | 104 | 16 | 109 | 23 | 2 | 13 | 6 | 1 | 46 | Yes | Yes | Yes | Yes | 504 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Sanatorium Gabriels Gabriels | 132 | | 132 | 74 | | 74 | 84 | 73 | | 85 | 4 | 2 | 3 | 8 | 0 | 29 | Yes | Yes | Yes | Yes | 327 | No | | | | | | | | | | | | | | | | | | | | | |
| Stony Wold Sanat. Lake Kusaqua | 127 | 18 | 145 | 93 | 10 | 103 | 122 | 131 | | 140 | 1 | 5 | 22 | 14 | 0 | 78 | Yes | Yes | Yes | Yes | 3,743 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Workmen's Circle Sanatorium Liberty | 100 | | 100 | 96 | | 96 | 106 | 37 | | 45 | 2 | 2 | 2 | 4 | | 38 | Yes | Yes | Yes | Yes | 635 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Potts Memorial Hospital Livingston | 65 | | 65 | 24 | | 24 | 25 | 53 | 25 | 54 | 2 | 2 | 4 | 2 | 1 | 22 | Yes | Yes | Yes | Yes | 544 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Loomis Sanatorium Loomis | 128 | | 128 | 147 | | 147 | 163 | 101 | | 99 | 8 | 0 | 1 | 14 | 5 | 100 | Yes | Yes | Yes | Yes | 1,680 | No | | | | | | | | | | | | | | | | | | | | | |
| St Joseph's Hospital for Consumptives New York City | 293 | | 293 | 558 | | 558 | 581 | 907 | | 256 | 147 | 2 | 5 | 9 | 20 | 102 | Yes | Yes | Yes | No | | No | | | | | | | | | | | | | | | | | | | | | |
| Beton Hospital New York City | 350 | 101 | 451 | 630 | 75 | 705 | 477 | 461 | | 360 | 147 | 7 | 13 | 10 | 12 | 171 | Yes | Yes | Yes | Yes | 1,628 | Yes | | | | | | | | | | | | | | | | | | | | | |
| St John's Hospital Ogdensburg | 40 | | 40 | 43 | | 43 | 40 | 39 | | 34 | 8 | 1 | 12 | 5 | 11 | 13 | Yes | Yes | No | Yes | 506 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Dr Shervell's Sanatorium Otisville | | | 15 | | | 15 | 20 | 5 | | 6 | | | | | | 1 | Yes | Yes | Yes | Yes | | No | | | | | | | | | | | | | | | | | | | | | |
| Sunnyside Health Farm Otisville | 10 | | 10 | 10 | | 10 | 11 | 4 | | 4 | | | | | | | No | No | No | No | | No | | | | | | | | | | | | | | | | | | | | | |
| Samuel and Nettie Bowne Hospital Poughkeepsie | 50 | | 50 | 46 | | 46 | 51 | 33 | | 32 | 13 | 1 | 2 | 9 | 1 | 36 | Yes | Yes | Yes | Yes | 250 | No | | | | | | | | | | | | | | | | | | | | | |
| National Variety Artists Lodge Saranac Lake | 75 | | 75 | 40 | | 40 | 85 | 57 | | 47 | 12 | 4 | 2 | 5 | 2 | 43 | Yes | Yes | Yes | Yes | 780 | No | | | | | | | | | | | | | | | | | | | | | |
| Northwoods Sanatorium Saranac Lake | | | 75 | | | 39 | 39 | 23 | | 24 | 4 | 2 | 3 | | | 13 | No | No | No | Yes | 200 | | | | | | | | | | | | | | | | | | | | | | |
| Reception Hospital Saranac Lake | | | 20 | | | 43 | 40 | 18 | 3 | 16 | 3 | 1 | 9 | 2 | 2 | 10 | No | Yes | No | Yes | | No | | | | | | | | | | | | | | | | | | | | | |
| St Mary's of the Lake Saranac Lake | 20 | | 20 | | | 42 | 14 | 17 | | 19 | | | | | | 6 | No | No | No | Yes | | No | | | | | | | | | | | | | | | | | | | | | |
| Trudeau Sanatorium Trudeau | 180 | | 180 | 237 | | 237 | 278 | 172 | | 180 | 5 | 5 | 5 | 22 | 20 | 114 | Yes | Yes | Yes | Yes | 1,073 | No | | | | | | | | | | | | | | | | | | | | | |
| St Anthony's Hospital Woodhaven | 400 | | 400 | | | 578 | 590 | 375 | | 375 | 201 | 2 | 5 | 25 | | 100 | Yes | Yes | Yes | Yes | | No | | | | | | | | | | | | | | | | | | | | | |
| House of Rest at Sprain Ridge Yonkers | 78 | 24 | 100 | 71 | 19 | 90 | 80 | 65 | | 68 | 1 | 1 | 2 | 1 | 6 | 36 | No | No | No | No | | No | | | | | | | | | | | | | | | | | | | | | |
| Totals | | | | | | | | | | | | | | | | | | | | | | 8,127 | 1,462 | 9,589 | 8,336 | 1,506 | 11,631 | 11,691 | 8,734 | 328 | 9,202 | 2,033 | 1,061 | 311 | 746 | 469 | 4,913 | 51 | 60 | 46 | 52 | 73,462 | 27 |
| NORTH CAROLINA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Federal—U S V B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Veterans Admin Facility Oteen | 850 | | 850 | 1,203 | | 1,203 | 1,325 | 670 | 25 | 667 | 100 | 29 | 1 | 80 | 8 | 456 | Yes | Yes | Yes | Yes | 765 | Yes | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| North Carolina Sanat for the Treatment of Tuberculosis Sanatorium | 416 | 68 | 484 | 547 | 59 | 606 | 559 | 459 | 174 | 433 | 24 | 8 | 11 | 10 | 34 | 202 | Yes | Yes | Yes | Yes | 3,600 | Yes | | | | | | | | | | | | | | | | | | | | | |
| County | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hallifax County Tuberculosis Sanatorium Halifax | 23 | | 23 | 25 | 4 | 29 | 31 | 13 | 0 | 16 | | 1 | 2 | 1 | 4 | 0 | No | No | No | No | | No | | | | | | | | | | | | | | | | | | | | | |
| Scott Parker Sanatorium Henderson | 14 | | 14 | | | 10 | 9 | 12 | 0 | 11 | | 3 | 1 | 0 | 1 | 3 | Yes | No | No | No | 47 | No | | | | | | | | | | | | | | | | | | | | | |
| Meckenburg Sanatorium Huntersville | 122 | 40 | 162 | 102 | 21 | 123 | 114 | 151 | | 147 | 32 | 2 | 4 | 5 | 9 | 40 | Yes | Yes | Yes | Yes | 222 | No | | | | | | | | | | | | | | | | | | | | | |
| Gulford County Sanat Jamestown | 70 | 30 | 109 | 72 | 30 | 102 | 100 | 107 | 22 | 104 | 16 | 2 | 0 | 0 | 6 | 37 | Yes | Yes | Yes | Yes | 600 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Wilkes County Tuberculosis Hut North Wilkesboro | 14 | | 14 | | | 11 | | | | 6 | | | | | | 1 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Edgecombe County Tuberculosis Sanatorium Tarboro | 134 | | 134 | | | 25 | 135 | 132 | 25 | 131 | 16 | 3 | 0 | 12 | 1 | 41 | Yes | Yes | Yes | Yes | 660 | Yes | | | | | | | | | | | | | | | | | | | | | |
| Forsyth County Sanat Winston Salem | | | 30 | 134 | | 134 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Private | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ambler Heights Sanat Asheville | | | 25 | | | 42 | | 14 | | 15 | | 1 | 5 | 3 | 0 | 14 | Yes | Yes | No | No | | No | | | | | | | | | | | | | | | | | | | | | |
| Elmhurst Cottage Sanat Asheville | 23 | | 23 | 20 | | 20 | 14 | 15 | | 15 | 5 | | | | | 4 | No | No | No | No | 91 | No | | | | | | | | | | | | | | | | | | | | | |

Does not include physicians

† Partly unclassified

‡ Includes medical directors of three state sanatoriums not in operation at time of survey

TUBERCULOSIS HOSPITALS AND SANATORIUMS—Continued

| | Bed Capacity | | | Patients Admitted | | | Patients Discharged (Including Deaths) | Patients Present | Waiting List | Daily Average | Deaths | Physicians | | Nurses | Total Employees* | Medical Facilities | | | | Total Pnuemo- thorax Treatments Outpatient Department | |
|--|--------------|----------|-------|-------------------|----------|-------|---|------------------|--------------|---------------|--------|---------------|--------------------------|--------|------------------|--------------------|-------|-------|--------------|--|------------|
| | Adults | Children | Total | Adults | Children | Total | | | | | | Regular Staff | Attending and Consulting | | | Graduate | Other | X Ray | Fluoroscopic | | Laboratory |
| NORTH CAROLINA—Continued | | | | | | | | | | | | | | | | | | | | | |
| Fairview Cottage Sanit. Asheville | | | 130 | | | 36 | | 18 | 0 | 25 | | | | 2 | 0 | 12 | No | No | No | No | |
| Royce Cottage Sanitarium Asheville | | | 30 | | | 15 | | 7 | | 18 | | | | 1 | 0 | 6 | No | No | No | No | |
| St. Joseph's Sanatorium Asheville | | | 96 | | | 83 | | 48 | | 61 | | 1 | 0 | 8 | 0 | 25 | Yes | Yes | Yes | Yes | No |
| Sunset Heights Asheville | | | 35 | | | 47 | | 7 | | 14 | 1 | 0 | 10 | 2 | 0 | 7 | No | No | No | Yes | No |
| Violet Hill Sanatorium Asheville | | | 37 | | | 22 | | 17 | | 22 | | 1 | 0 | 3 | 0 | 10 | No | No | No | Yes | No |
| Zephyr Hill Sanatorium Asheville | | | 30 | | | 33 | | 23 | | 21 | | 1 | 3 | 3 | 0 | 9 | No | Yes | No | | |
| Hillcroft Sanatorium Bltmore | | | 50 | | | 27 | | 30 | 17 | 0 | 17 | 5 | 6 | 3 | 0 | 10 | No | No | No | Yes | No |
| Cragmont Sanatorium Black Mountain | 30 | | 30 | 23 | | 23 | 14 | 15 | 0 | 15 | 0 | 1 | 2 | 2 | 0 | 11 | No | Yes | Yes | Yes | No |
| Fellowship Sanatorium of the Royal League Black Mountain | | | 25 | | | 6 | | 18 | | 15 | | 1 | 2 | 1 | | 6 | Yes | Yes | No | No | No |
| Edgemont Sanatorium Hendersonville | | | 24 | | | | | | | 8 | | 1 | | | | | | | | | |
| Pine-Crest Manor Sanat. Southern Pine | 60 | | 60 | | | 117 | 87 | 44 | 0 | 3 | 3 | 2 | | 6 | | 90 | Yes | Yes | Yes | Yes | 630 |
| Wilmington Red Cross Sanitarium Wil- mington | 30 | | 36 | 2 | 1 | 26 | 21 | 30 | 5 | 2 | 11 | 2 | 2 | 4 | 0 | 11 | Yes | Yes | Yes | Yes | 912 |
| Totals | 1,801 | 138 | 2,452 | 2,251 | 115 | 2,836 | 2,445 | 1,817 | 251 | 1,841 | 282 | 59 | 48 | 103 | 65 | 979 | 11 | 12 | 8 | 13 | 7,887 |
| NORTH DAKOTA | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | |
| North Dakota State Tuberculosis Sana- torium San Haven | 215 | 50 | 265 | 162 | 78 | 200 | 174 | 240 | 07 | 239 | 20 | 4 | 1 | 28 | 2 | 124 | Yes | Yes | Yes | Yes | 2,991 |
| Totals | 215 | 50 | 265 | 162 | 78 | 200 | 174 | 240 | 07 | 239 | 20 | 4 | 1 | 28 | 2 | 124 | 1 | 1 | 1 | 1 | 2,991 |
| OHIO | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | |
| Ohio State Sanatorium Mt. Vernon | 240 | | 240 | 390 | | 390 | 390 | 232 | | 231 | | 1 | 3 | 6 | 1 | 56 | Yes | Yes | Yes | Yes | 2,075 |
| County | | | | | | | | | | | | | | | | | | | | | |
| Edwin Shaw Sanatorium Akron | 118 | 90 | 208 | 123 | | 123 | 117 | 207 | | 211 | 18 | 3 | 13 | 20 | 2 | 150 | Yes | Yes | Yes | Yes | 2,478 |
| Pleasant View Sanatorium, Amherst | 46 | 50 | 96 | 03 | 0 | 102 | 89 | 96 | 54 | 07 | 10 | 2 | | 6 | 8 | 40 | Yes | Yes | Yes | Yes | 821 |
| Molly Stark Sanatorium Canton | 123 | 39 | 167 | 101 | 42 | 233 | 241 | 125 | | 157 | 51 | 12 | 13 | 9 | 19 | 89 | Yes | Yes | Yes | Yes | 2,605 |
| Mount Logan Sanatorium Chillicothe | 58 | | 58 | 46 | 1 | 47 | 40 | 50 | 40 | 52 | 11 | 1 | 2 | 4 | 1 | 18 | Yes | Yes | Yes | Yes | 687 |
| Hamilton County Tuberculosis Sana- torium Cincinnati | 498 | 138 | 634 | 511 | 111 | 622 | 500 | 619 | 66 | 561 | 145 | 11 | 17 | 20 | 83 | 336 | Yes | Yes | Yes | Yes | 4,636 |
| Franklin County Sanatorium Columbus | 160 | 50 | 210 | 171 | 50 | 236 | 213 | 209 | 13 | 205 | 63 | 2 | 19 | 11 | 7 | 71 | Yes | Yes | Yes | Yes | 1,436 |
| Stillwater Sanatorium Dayton | 64 | 30 | 94 | | | 131 | 131 | 94 | 50 | 93 | 21 | 2 | 5 | 7 | 8 | 39 | Yes | Yes | Yes | Yes | 1,210 |
| District Tuberculosis Hospital Lima | 110 | 19 | 129 | 07 | 12 | 109 | 106 | 100 | | 107 | 29 | 2 | 4 | 14 | 6 | 61 | Yes | Yes | Yes | Yes | 731 |
| Licking County Tuberculosis Sana- torium Newark | 52 | 4 | 56 | 120 | 4 | 124 | 73 | 50 | | 51 | 2 | 11 | 7 | 4 | | 27 | Yes | Yes | Yes | Yes | 167 |
| Belmont Sanatorium, St. Clairsville | 50 | | 50 | 41 | | 41 | 41 | 53 | | 54 | 15 | 1 | | 5 | 0 | 26 | Yes | Yes | Yes | Yes | 174 |
| Clark County Tuberculosis Sanatorium Springfield | 95 | 25 | 120 | | | 105 | 103 | 219 | 0 | 110 | 22 | 2 | 5 | 9 | 8 | 40 | Yes | Yes | Yes | Yes | 293 |
| Lucas County Tuberculosis Hospital Toledo | 96 | 94 | 190 | 111 | 72 | 183 | 175 | 150 | | 163 | 40 | 1 | 35 | 3 | 17 | 27 | Yes | Yes | Yes | Yes | 816 |
| Trumbull County Tuberculosis Sana- torium Warren | 48 | | 48 | 75 | 10 | 85 | 64 | 48 | | 47 | 18 | 1 | | 6 | 1 | 23 | Yes | Yes | Yes | Yes | 542 |
| Mahoning Tuberculosis Sanatorium Youngstown | 112 | | 112 | | | 130 | 131 | 112 | 50 | 111 | 30 | 1 | 1 | 13 | 0 | 50 | Yes | Yes | Yes | Yes | 1,074 |
| City | | | | | | | | | | | | | | | | | | | | | |
| Convalescent Tuberculosis Hospital Cleveland | | | 48 | | | 32 | | | | 44 | | 1 | | 1 | | | No | No | No | No | |
| City County | | | | | | | | | | | | | | | | | | | | | |
| Sunny Acres Cleveland Tuberculosis San- atorium Warrensville | 351 | 108 | 462 | 335 | 121 | 476 | 454 | 423 | 27 | 419 | 34 | 7 | 0 | 27 | 11 | 196 | Yes | Yes | Yes | Yes | 8,882 |
| Private | | | | | | | | | | | | | | | | | | | | | |
| Oak Ridge Sanatorium Green Springs | 90 | 10 | 100 | 74 | | 74 | 31 | 47 | | 30 | 17 | 2 | | 6 | 0 | 22 | Yes | Yes | Yes | Yes | 491 |
| Rocky Glen Sanatorium McConnellsville | 114 | 6 | 120 | | | 116 | 119 | 110 | 2 | 107 | 33 | 3 | 15 | | | 57 | Yes | Yes | Yes | Yes | 490 |
| Avalon Sanatorium Mt. Vernon | | | 18 | | | 33 | | 14 | | 17 | | 2 | | 3 | 1 | 6 | Yes | Yes | Yes | Yes | No |
| Mount Royal Sanat. North Royalton | 48 | | 48 | 73 | | 73 | 60 | 48 | | 40 | | 2 | 8 | 6 | | 26 | Yes | Yes | Yes | Yes | 1,069 |
| Totals | 2,455 | 663 | 3,214 | 2,460 | 437 | 3,444 | 3,092 | 3,018 | 308 | 2,912 | 685 | 61 | 142 | 108 | 183 | 1,360 | 20 | 20 | 20 | 20 | 30,486 |
| OKLAHOMA | | | | | | | | | | | | | | | | | | | | | |
| Federal—U. S. I. A. | | | | | | | | | | | | | | | | | | | | | |
| Shawnee Indian Sanatorium Shawnee | 150 | | 150 | 203 | | 203 | 183 | 123 | 30 | 124 | 14 | 2 | 7 | 0 | 0 | 35 | Yes | Yes | Yes | Yes | 271 |
| Choctaw Chickasaw Sanat., Tallhina | 30 | 45 | 75 | 24 | 34 | 58 | 43 | 72 | 20 | 60 | 0 | 1 | 3 | 4 | 0 | 23 | Yes | Yes | Yes | Yes | 156 |
| State | | | | | | | | | | | | | | | | | | | | | |
| Western Oklahoma Tuberculosis Sana- torium Clinton | 228 | | 228 | 404 | | 404 | 388 | 225 | 203 | 222 | 80 | 3 | 8 | 5 | 10 | 60 | Yes | Yes | Yes | Yes | 1,819 |
| Soldiers Tubercular Sanat., Sulphur | 109 | | 109 | 98 | | 98 | 63 | 105 | 0 | 94 | 0 | 2 | 2 | 5 | 4 | 51 | Yes | Yes | Yes | Yes | 600 |
| Eastern Oklahoma State Tuberculosis Sanatorium Tallhina | 198 | 68 | 266 | 300 | 63 | 363 | 360 | 247 | 149 | 250 | 19 | 3 | | 2 | 21 | 71 | Yes | Yes | Yes | Yes | 1,040 |
| Private | | | | | | | | | | | | | | | | | | | | | |
| Farm Sanatorium Oklahoma City | | | 90 | 2 | | 92 | 90 | 10 | | 14 | 4 | 2 | | 1 | 4 | 12 | No | No | No | Yes | 1,183 |
| Totals | 715 | 113 | 888 | 1,110 | 99 | 1,218 | 1,141 | 791 | 407 | 709 | 120 | 13 | 20 | 20 | 39 | 252 | 5 | 5 | 5 | 5 | 5,079 |
| OREGON | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | |
| Oregon State Tuberculosis Hosp. Salem | | | 270 | 155 | 35 | 100 | 174 | 286 | 60 | 202 | 39 | 3 | 5 | 10 | 3 | 81 | Yes | Yes | Yes | Yes | 2,170 |
| Eastern Oregon Tuberculosis Hospital, The Dalles | 139 | | 139 | 103 | | 103 | 101 | 137 | 21 | 136 | 22 | 1 | 4 | 14 | | 47 | Yes | Yes | Yes | Yes | 1,221 |
| County | | | | | | | | | | | | | | | | | | | | | |
| Multnomah County Tuberculosis Pa- vilion Troutdale | | | 39 | | | 65 | | | | 39 | | 2 | | 4 | | 10 | No | No | No | No | |
| Private | | | | | | | | | | | | | | | | | | | | | |
| Portland Open Air Sanat. Milwaukie | | | 60 | 104 | | 104 | 110 | 83 | 0 | 31 | | 1 | | 5 | 8 | 22 | Yes | Yes | Yes | Yes | 573 |
| Totals | 139 | | 513 | 362 | 35 | 492 | 385 | 441 | 80 | 468 | 61 | 7 | 9 | 33 | 6 | 160 | 3 | 3 | 2 | 3 | 3,907 |
| PENNSYLVANIA | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | |
| Pennsylvania State Sanatorium for Tu- berculosis No. 2, Oresson | 570 | 270 | 840 | 458 | 435 | 893 | 897 | 828 | 332 | 852 | 104 | 6 | 7 | 13 | 45 | 296 | Yes | Yes | Yes | Yes | 2,006 |
| Hamburg State Sanatorium for Tuber- culosis Hamburg | 540 | | 540 | 497 | | 497 | 510 | 552 | 285 | 545 | 129 | 6 | 6 | 15 | 12 | 234 | Yes | Yes | Yes | Yes | 1,200 |

* Does not include physicians
† Partly unclassified

TUBERCULOSIS HOSPITALS AND SANATORIUMS—Continued

| | Bed Capacity | | | Patients Admitted | | | Patients Discharged (Including Deaths) | Patients Present | Waiting List | Daily Average | Deaths | Physicians | | Nurses | | Total Employees | Medical Facilities | | | | Total Pneu- mothorax Treatments | Outpatient Department |
|---|--------------|----------|-------|-------------------|----------|-------|---|------------------|--------------|---------------|--------|---------------|--------------------------|----------|-------|-----------------|--------------------|--------------|------------|--------------|---------------------------------------|--------------------------|
| | Adults | Children | Total | Adults | Children | Total | | | | | | Regular Staff | Attending and Consulting | Graduate | Other | | X Ray | Fluoroscopic | Laboratory | Pneumothorax | | |
| PENNSYLVANIA—Continued | | | | | | | | | | | | | | | | | | | | | | |
| Pennsylvania State Sanatorium for Tuberculosis South Mountain | 820 | 215 | 1,035 | 849 | 573 | 1,422 | 1,202 | 1,023 | 473 | 934 | 63 | 7 | 5 | 13 | 37 | 30 | Yes | Yes | Yes | Yes | 2,730 | Yes |
| County | | | | | | | | | | | | | | | | | | | | | | |
| Beaver County Sanatorium Monaca | 63 | | 63 | 122 | | 122 | 125 | 68 | 10 | 63 | 37 | 1 | 10 | 1 | 9 | 80 | Yes | Yes | Yes | Yes | 373 | No |
| Berk County Tuberculosis Sanatorium Reading | 80 | 54 | 134 | 100 | 61 | 161 | 165 | 133 | 23 | 132 | 25 | 2 | 15 | 13 | 0 | 43 | Yes | Yes | Yes | Yes | 630 | Yes |
| Lackawanna County Tuberculosis Hospital Scranton | 120 | 20 | 140 | 120 | 9 | 129 | 121 | 138 | 25 | 137 | 42 | 1 | 1 | 5 | 7 | 50 | No | No | Yes | Yes | 1,600 | |
| City | | | | | | | | | | | | | | | | | | | | | | |
| Leech Farm Sanatorium Pittsburgh | 246 | 44 | 290 | 231 | 52 | 273 | 231 | 278 | 66 | 275 | 69 | 3 | 3 | 18 | 0 | 79 | Yes | Yes | Yes | Yes | 338 | No |
| City County | | | | | | | | | | | | | | | | | | | | | | |
| Rossmore Sanatorium Lancaster | 55 | 2 | 57 | 90 | 4 | 90 | 103 | 53 | 18 | 53 | 15 | 2 | 27 | 6 | 0 | 19 | No | Yes | Yes | Yes | 200 | No |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Devitt's Camp for Tuberculosis Allenwood | 110 | | 110 | 201 | | 201 | 186 | 72 | 0 | 74 | | 3 | 2 | 9 | 4 | 46 | Yes | Yes | Yes | Yes | 1,820 | Yes |
| Eagleville Sanatorium for Consumptives Eagleville | | | 183 | 107 | 31 | 198 | 210 | 189 | 40 | 170 | 24 | 3 | 36 | 15 | 21 | 100 | Yes | Yes | Yes | Yes | 2,023 | Yes |
| Lonnie Home Sanatorium Erie | 16 | | 16 | 23 | | 23 | 23 | 17 | 0 | 16 | 1 | 1 | 1 | 0 | 4 | 4 | No | No | No | Yes | 304 | No |
| Grand View Sanatorium Oil City | 53 | | 53 | 25 | 4 | 29 | 30 | 10 | 0 | 13 | | 1 | 7 | 3 | 0 | 12 | Yes | Yes | Yes | Yes | 44 | No |
| Home for Consumptives Philadelphia | 80 | 25 | 105 | | | 84 | 89 | 100 | 12 | 92 | 26 | 3 | 4 | 8 | 12 | 61 | Yes | Yes | Yes | Yes | 662 | |
| Rush Hospital for Consumption and Allied Diseases Philadelphia | 106 | 72 | 178 | | | 541 | 446 | 80 | 20 | 72 | | 1 | 29 | 12 | 8 | 63 | Yes | Yes | Yes | Yes | 162 | No |
| Tuberculosis League Hospital Pittsburgh | 100 | | 150 | 192 | 6 | 198 | 191 | 148 | | 147 | 22 | 4 | 7 | 6 | 32 | 85 | Yes | Yes | Yes | Yes | 4,046 | Yes |
| Sunnyrest Sanatorium White Haven | | | 40 | 5 | | 5 | 5 | 0 | | 3 | | | 13 | 1 | | 4 | No | No | No | No | | |
| White Haven Sanatorium White Haven | 200 | | 250 | 338 | | 338 | 302 | 217 | 0 | 220 | 82 | 6 | 17 | 14 | 26 | 124 | Yes | Yes | Yes | Yes | 1,169 | No |
| Totals | 3,200 | 702 | 4,189 | 3,413 | 1,175 | 5,213 | 5,026 | 3,888 | 1,304 | 3,808 | 630 | 60 | 189 | 153 | 213 | 1,606 | 13 | 14 | 15 | 16 | 20,717 | 6 |
| RHODE ISLAND | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| Rhode Island State Sanatorium, Wallum Lake | 363 | 67 | 430 | 340 | 40 | 380 | 383 | 353 | 7 | 415 | 65 | 7 | 4 | 7 | 43 | 150 | Yes | Yes | Yes | Yes | 9,894 | Yes |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| St. Joseph's Sanatorium Hills Grove | 60 | | 60 | 32 | | 32 | 29 | 47 | 2 | 47 | 14 | 2 | 0 | 2 | 2 | 20 | No | No | No | No | | No |
| Totals | 423 | 67 | 495 | 372 | 40 | 412 | 412 | 435 | 9 | 462 | 79 | 9 | 4 | 9 | 45 | 170 | 1 | 1 | 1 | 1 | 9,894 | 1 |
| SOUTH CAROLINA | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| South Carolina Sanatorium State Park | 229 | 48 | 277 | 210 | 57 | 267 | 267 | 225 | | 254 | 31 | 4 | 3 | 8 | 11 | 90 | Yes | Yes | Yes | Yes | 1,601 | Yes |
| County | | | | | | | | | | | | | | | | | | | | | | |
| Florence-Darlington Tuberculosis Sanatorium Florence | 46 | | 46 | 53 | 4 | 57 | 31 | 45 | 39 | 43 | 20 | 2 | 8 | 5 | 3 | 13 | Yes | Yes | Yes | Yes | 1,500 | Yes |
| Greenville County Sanatorium Greenville | 54 | 16 | 70 | | | 100 | | | | 67 | | 1 | 0 | 8 | 2 | 20 | Yes | Yes | Yes | Yes | | |
| Pinehaven Sanatorium, Navy Yard | 50 | | 50 | 50 | 10 | 60 | 67 | 53 | 50 | 50 | 2 | 1 | 8 | 5 | 0 | 10 | Yes | Yes | Yes | Yes | 570 | Yes |
| City County | | | | | | | | | | | | | | | | | | | | | | |
| Camp Alice Sumter County Tuberculosis Sanatorium Sumter | 20 | | 20 | | | 31 | 23 | 24 | 4 | 20 | 6 | 1 | 1 | 2 | 0 | 5 | No | No | No | No | | No |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Ridgewood Tuberculosis Camp Ridge wood | 70 | | 70 | 41 | | 41 | 44 | 40 | 13 | 30 | 4 | 1 | 5 | 3 | 3 | 18 | No | No | No | Yes | 93 | Yes |
| Totals | 470 | 64 | 539 | 363 | 71 | 500 | 437 | 387 | 106 | 464 | 63 | 10 | 20 | 31 | 19 | 166 | 4 | 4 | 4 | 5 | 3,821 | 4 |
| SOUTH DAKOTA | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| South Dakota State Sanatorium for Tuberculosis Sanatorium | 102 | | 102 | 101 | | 101 | 93 | 200 | 38 | 160 | 20 | 2 | 0 | 5 | 20 | 80 | Yes | Yes | Yes | Yes | 200 | No |
| Totals | 102 | | 102 | 101 | | 101 | 93 | 200 | 38 | 160 | 20 | 2 | 0 | 5 | 20 | 80 | 1 | 1 | 1 | 1 | 200 | 0 |
| TENNESSEE | | | | | | | | | | | | | | | | | | | | | | |
| County | | | | | | | | | | | | | | | | | | | | | | |
| Davidson County Tuberculosis Hospital Nashville | 249 | 51 | 300 | 106 | 83 | 279 | 270 | 228 | 90 | 230 | 51 | 7 | 4 | 13 | 20 | 80 | Yes | Yes | Yes | Yes | 4,340 | Yes |
| City County | | | | | | | | | | | | | | | | | | | | | | |
| Beverly Hills Sanatorium Knoxville | 130 | 28 | 163 | 128 | 23 | 156 | 184 | 120 | 0 | 142 | 44 | 2 | 0 | 3 | 12 | 40 | Yes | Yes | Yes | Yes | 315 | Yes |
| Oakville Memorial Sanatorium Oakville | 200 | 90 | 340 | 204 | 40 | 249 | 225 | 250 | 32 | 256 | 103 | 4 | 0 | 21 | 0 | 90 | Yes | Yes | Yes | Yes | | Yes |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Pine Breeze Sanatorium Chattanooga | 130 | 90 | 220 | 162 | 67 | 229 | 231 | 220 | 27 | 213 | 69 | 3 | 10 | 11 | 14 | 63 | Yes | Yes | Yes | Yes | 168 | Yes |
| Officer Sanatorium Monterey | | | 12 | | | 26 | 20 | 6 | 0 | 6 | | 1 | 0 | 1 | 1 | 4 | No | No | No | Yes | 100 | No |
| International Printing Pressmen and Assistants Union Sanatorium Pressmen's Home | 44 | | 44 | 10 | | 10 | 10 | 18 | 0 | 20 | 5 | 2 | 0 | 3 | 0 | 15 | Yes | Yes | Yes | Yes | 103 | No |
| Wautauga Sanatorium Ridgeway | | | 40 | 30 | | 30 | 16 | 15 | 0 | 14 | | 1 | 3 | 2 | 0 | 9 | Yes | Yes | Yes | Yes | 200 | No |
| Totals | 813 | 200 | 1,124 | 730 | 223 | 970 | 964 | 837 | 134 | 891 | 262 | 20 | 17 | 54 | 47 | 226 | 6 | 6 | 6 | 7 | 5,335 | 4 |
| TEXAS | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| State Tuberculosis Sanatorium Sanatorium | 506 | 162 | 718 | 1,597 | 347 | 1,944 | 1,933 | 697 | 373 | 692 | 26 | 8 | 0 | 16 | 45 | 212 | Yes | Yes | Yes | Yes | 3,101 | No |
| County | | | | | | | | | | | | | | | | | | | | | | |
| Jefferson County Tuberculosis Hospital Beaumont | 64 | 18 | 82 | 74 | 10 | 84 | 89 | 82 | 3 | 77 | 11 | 1 | 0 | 4 | 6 | 29 | No | Yes | Yes | Yes | 606 | No |
| Jefferson County Tuberculosis Hospital (col.) Beaumont | 20 | | 20 | 41 | 1 | 42 | 46 | 20 | 2 | 10 | 20 | 1 | 0 | 3 | 0 | 7 | No | No | No | Yes | 85 | No |
| City County | | | | | | | | | | | | | | | | | | | | | | |
| Woodlawn Sanatorium Dallas | 110 | 10 | 120 | 214 | 6 | 220 | 234 | 115 | 10 | 109 | 70 | 1 | 0 | 10 | 6 | 33 | Yes | Yes | Yes | Yes | 492 | No |
| Elmwood Sanatorium Ft. Worth | 50 | | 50 | 41 | | 41 | 34 | 60 | 20 | 49 | 6 | 1 | 0 | 2 | 2 | 0 | No | No | No | No | 16 | No |
| Houston Tuberculosis Hospital Houston | 122 | 50 | 172 | 278 | 100 | 378 | 320 | 164 | | 163 | 54 | 1 | 0 | 7 | 7 | 40 | No | No | No | Yes | 617 | |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Hendricks-Laws Sanatorium El Paso | | | 88 | 83 | 4 | 92 | 61 | 63 | 0 | 32 | 4 | 2 | 0 | 3 | 1 | 14 | Yes | Yes | Yes | Yes | 199 | No |
| Homan Sanatorium El Paso | | | 110 | | | 120 | | 44 | | 80 | 7 | 3 | 0 | 4 | 2 | 23 | Yes | Yes | Yes | Yes | | |
| Long Sanatorium El Paso | 40 | | 40 | 120 | | 120 | 80 | 40 | 0 | 23 | | 1 | 1 | 2 | 1 | 13 | Yes | Yes | Yes | Yes | | |
| Pine Sanatorium El Paso | 20 | | 20 | 33 | | 33 | 13 | 20 | 0 | 20 | | 2 | 1 | 5 | 1 | 7 | No | Yes | Yes | Yes | 490 | Yes |
| St. Joseph's Sanatorium El Paso | | | 75 | 123 | 1 | 129 | 69 | 60 | | 54 | | 0 | 2 | 6 | 0 | 20 | Yes | Yes | Yes | Yes | | |
| Southern Baptist Sanatorium El Paso | | | 80 | | | 94 | 100 | 65 | | 60 | 10 | 2 | 0 | 5 | 1 | 18 | Yes | Yes | Yes | Yes | 490 | Yes |
| Thompson Sanatorium Kerrville | | | 56 | 98 | 6 | 164 | 89 | 50 | 0 | 33 | 8 | 3 | 0 | 6 | 0 | 23 | Yes | Yes | Yes | Yes | 400 | No |
| Dr. Farmer's Sanatorium San Antonio | 20 | | 30 | 40 | | 40 | 23 | 17 | 0 | 10 | 1 | 1 | 0 | 1 | 2 | 10 | No | No | Yes | Yes | 50 | No |

* Does not include physicians
† Partly unclassified

TUBERCULOSIS HOSPITALS AND SANATORIA—Continued

| | Bed Capacity | | | Patients Admitted | | | Patients Discharged (Including Deaths) | Patients Present | Waiting List | Daily Average | Deaths | Physicians | | | | Nurses | Total Employees* | Medical Facilities | | | | Total Pneumo- thorax Treatment Occupant Department |
|---|--------------|----------|-------|-------------------|----------|-------|---|------------------|--------------|---------------|--------|---------------|--------------------------|----------|-------|--------|------------------|--------------------|-------------|------------|--------------|--|
| | Adults | Children | Total | Adults | Children | Total | | | | | | Regular Staff | Attending and Consulting | Graduate | Other | | | X Ray | Fluoroscope | Laboratory | Pneumothorax | |
| TEXAS—Continued | | | | | | | | | | | | | | | | | | | | | | |
| Grace Lutheran Sanatorium for Tuberculosis, San Antonio | | | 50 | | | 51 | 50 | 26 | 30 | | 7 | 1 | 0 | | | | | Yes | Yes | Yes | Yes | 120 |
| Woodmen of the World War Memorial Hospital, San Antonio | 180 | | 180 | 118 | | 118 | 148 | 08 | 101 | | 18 | 3 | 4 | 7 | 0 | 48 | Yes | Yes | Yes | Yes | 20 | No |
| Von Ormy Cottage Sanat Von Ormy | | | 45 | 40 | | 40 | 10 | 41 | 0 | 33 | 5 | 1 | 0 | 1 | 4 | 12 | No | Yes | No | Yes | 6 | No |
| Totals | 1 192 | 240 | 1 071 | 2 010 | 470 | 3 080 | 3,389 | 1 057 | 408 | 1,569 | 2,8 | 33 | 10 | 78 | 78 | 530 | 10 | 13 | 13 | 16 | 7,569 | 1 |
| VERMONT | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| Washington County Sanat Barre | 47 | | 47 | 63 | | 63 | 50 | 47 | 1 | 41 | 26 | 1 | 0 | 2 | 10 | 13 | Yes | Yes | Yes | Yes | 531 | No |
| Vermont Sanatorium Pittsford | 80 | | 80 | 74 | | 74 | 70 | 69 | 12 | 72 | 12 | 2 | 0 | 5 | 2 | 20 | Yes | Yes | Yes | Yes | 1,020 | No |
| Totals | 127 | | 127 | 137 | | 137 | 120 | 116 | 13 | 113 | 38 | 3 | 0 | 7 | 12 | 38 | 2 | 2 | 2 | 2 | 1,551 | 0 |
| VIRGINIA | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| Piedmont Sanatorium (col.) Burkeville | 150 | | 150 | | | 194 | 180 | 143 | 70 | 132 | 61 | 3 | 0 | 6 | 16 | 74 | Yes | Yes | Yes | Yes | | No |
| Catawba Sanatorium Catawba | 340 | | 340 | | | 401 | 357 | 301 | 92 | 290 | 30 | 5 | 0 | 22 | 20 | 130 | Yes | Yes | Yes | Yes | | No |
| Blue Ridge Sanatorium Charlottesville | 230 | 40 | 270 | 209 | 68 | 357 | 338 | 209 | 206 | 206 | 26 | 6 | 0 | 10 | 27 | 107 | Yes | Yes | Yes | Yes | | No |
| City | | | | | | | | | | | | | | | | | | | | | | |
| Pine Camp Hospital Brook Hill | 190 | 24 | 214 | 114 | 16 | 130 | 131 | 147 | 150 | 40 | 6 | 12 | 7 | 15 | 57 | Yes | Yes | Yes | Yes | 2,637 | Yes | |
| Charles R. Grandy Sanat Norfolk | 64 | | 64 | | | 123 | 110 | 83 | 82 | | 1 | 1 | 5 | 2 | 15 | Yes | Yes | Yes | Yes | 600 | No | |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Hilltop Sanatorium Danville | 40 | 20 | 60 | 73 | 50 | 123 | 120 | 58 | 4 | 50 | 4 | 1 | 3 | 5 | 0 | 0 | Yes | Yes | No | Yes | 400 | Yes |
| Mount Regis Sanatorium Salem | | | 25 | 31 | 2 | 33 | 46 | 11 | 0 | 14 | 2 | 1 | 0 | 3 | 1 | 13 | Yes | Yes | Yes | Yes | 330 | Yes |
| Totals | 1 014 | 84 | 1 123 | 517 | 120 | 1,301 | 1 292 | 1,002 | 172 | 680 | 169 | 23 | 16 | 56 | 91 | 400 | 7 | 7 | 6 | 7 | 3,557 | 1 |
| WASHINGTON | | | | | | | | | | | | | | | | | | | | | | |
| Federal—U.S.A. | | | | | | | | | | | | | | | | | | | | | | |
| Yakima Sanitarium Toppenish | 40 | | 40 | 29 | | 29 | 32 | 36 | 10 | 41 | 6 | 1 | 3 | 4 | 0 | 12 | Yes | Yes | Yes | Yes | 174 | Yes |
| County | | | | | | | | | | | | | | | | | | | | | | |
| Oakhurst Sanatorium Elma | 51 | 14 | 65 | 87 | 31 | 118 | 113 | 70 | 5 | 67 | 21 | 1 | 0 | 6 | 2 | 19 | Yes | Yes | Yes | Yes | 580 | Yes |
| Mountain View Sanatorium, Lakeview | 120 | 30 | 150 | 82 | 30 | 118 | 120 | 142 | 2 | 140 | 1 | 0 | 12 | 0 | 40 | Yes | Yes | Yes | Yes | 2,000 | Yes | |
| King County Tuberculosis Hosp., Seattle | | | 170 | 163 | | 163 | 160 | 160 | 30 | 152 | 2 | 2 | 18 | 0 | 40 | No | Yes | Yes | Yes | Yes | 1,020 | Yes |
| Aldercrest Sanatorium, Snohomish | 40 | | 40 | 24 | 1 | 25 | 17 | 39 | 5 | 39 | 1 | 1 | 3 | 5 | 15 | Yes | Yes | Yes | Yes | | No | |
| Edgell Sanatorium Spokane | 117 | 23 | 140 | | | 67 | 99 | 111 | 0 | 111 | 30 | 2 | 2 | 9 | 11 | 50 | Yes | Yes | Yes | Yes | | No |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Laurel Beach Sanatorium, Seattle | | | 60 | 138 | 3 | 141 | 130 | 40 | | 42 | 14 | 3 | 1 | 6 | 7 | 21 | Yes | Yes | Yes | Yes | 624 | Yes |
| Riverton Sanatorium Seattle | | | 60 | 70 | | 70 | 60 | 18 | 0 | 30 | 15 | 1 | 3 | 4 | 0 | 10 | Yes | Yes | Yes | Yes | 163 | No |
| Bellevue Sanatorium, Tacoma | 16 | | 16 | 16 | | 16 | 11 | 11 | 0 | 10 | 4 | 1 | 1 | 2 | 0 | 5 | No | No | No | Yes | 700 | No |
| Totals | 389 | 67 | 751 | 618 | 71 | 760 | 700 | 631 | 57 | 637 | 90 | 13 | 13 | 64 | 20 | 227 | 7 | 8 | 8 | 9 | 5,321 | 1 |
| WEST VIRGINIA | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| Pinecrest Sanitarium Beckley | 143 | | 143 | 143 | | 143 | 166 | 137 | 75 | 120 | 24 | 3 | 3 | 23 | 0 | 40 | Yes | Yes | Yes | Yes | 1,488 | Yes |
| Denmar Sanitarium (col.) Denmar | 60 | 20 | 80 | | | 63 | 57 | 60 | 9 | 62 | 21 | 1 | 0 | 4 | | 22 | No | No | No | No | | Yes |
| Hopemont Sanitarium Hopemont | 360 | 60 | 420 | 406 | 52 | 458 | 443 | 400 | 43 | 401 | 40 | 5 | 3 | 26 | 23 | Yes | Yes | Yes | Yes | | | |
| County | | | | | | | | | | | | | | | | | | | | | | |
| Grandview Sanatorium Moundsville | 27 | 5 | 32 | | | 47 | 30 | 28 | 0 | 24 | 6 | 1 | 0 | 3 | 2 | 9 | No | No | No | Yes | | No |
| Ohio County Tuberculosis Sanatorium | | | | | | | | | | | | | | | | | | | | | | |
| Wheeling | 17 | | 17 | | | 26 | 21 | 17 | 6 | 17 | 4 | 1 | 0 | 1 | 3 | 10 | No | No | No | No | | No |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Hillcrest Sanatorium Charleston | | 42 | 42 | | | 10 | 19 | 40 | 6 | 40 | 2 | 1 | 0 | 0 | 3 | 9 | No | No | No | No | | No |
| Eastmont Tuberculosis Sanatorium, | | | | | | | | | | | | | | | | | | | | | | |
| Morgantown | 24 | 0 | 33 | 23 | 21 | 44 | 20 | 30 | | 28 | 3 | 1 | 6 | 4 | 0 | 9 | No | No | No | No | | No |
| Totals | 636 | 136 | 772 | 572 | 73 | 707 | 766 | 718 | 133 | 692 | 100 | 13 | 12 | 61 | 31 | 104 | 2 | 2 | 2 | 3 | 1,488 | 1 |
| WISCONSIN | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| Lake Tomahawk State Camp Lake | 42 | | 42 | 49 | | 49 | 48 | 41 | 5 | 40 | 3 | 2 | 0 | 0 | | 22 | | | | | | |
| Tomahawk | 240 | | 240 | 147 | | 147 | 103 | 210 | 19 | 217 | 30 | 4 | 2 | 10 | 19 | 113 | Yes | Yes | Yes | Yes | 832 | No |
| Wisconsin State Sanatorium Statesan | | | | | | | | | | | | | | | | | | | | | | |
| County | | | | | | | | | | | | | | | | | | | | | | |
| Mount Washington Sanat., Eau Claire | 58 | | 58 | 44 | 2 | 46 | 40 | 58 | 8 | 58 | 8 | 1 | 1 | 4 | 4 | 23 | No | No | No | Yes | 408 | No |
| Middle River Sanatorium Hawthorne | 135 | | 135 | 71 | | 71 | 57 | 121 | | 128 | 21 | 2 | 1 | 17 | 5 | 53 | Yes | Yes | Yes | Yes | 449 | Yes |
| Pinehurst Sanatorium Janesville | 68 | | 68 | | | 86 | 85 | 60 | 3 | 57 | 12 | 1 | 8 | 8 | 2 | 23 | Yes | Yes | Yes | Yes | 433 | Yes |
| Forest Lawn Sanatorium Jefferson | 54 | | 54 | 30 | | 30 | 21 | 54 | 5 | 62 | 11 | 1 | 0 | 5 | 2 | 22 | Yes | Yes | Yes | Yes | 330 | No |
| Riverview Sanatorium Kaukauna | 65 | | 65 | 50 | | 50 | 54 | 61 | 0 | 62 | 16 | 1 | 1 | 5 | 6 | 23 | Yes | Yes | Yes | Yes | 609 | Yes |
| Willowbrook Sanatorium, Kenosha | 32 | 0 | 32 | 21 | 4 | 25 | 28 | 33 | 8 | 35 | 7 | 1 | 0 | 3 | 2 | 17 | Yes | Yes | Yes | Yes | 56 | No |
| Lake View Sanatorium Madison | 130 | 10 | 140 | 67 | 1 | 68 | 69 | 108 | 9 | 100 | 10 | 3 | 0 | 17 | 7 | 65 | Yes | Yes | Yes | Yes | 605 | Yes |
| Oak Forest Sanatorium, Onalaska | 60 | | 60 | | | 73 | 72 | 61 | 4 | 59 | 12 | 1 | 2 | 8 | 1 | 28 | Yes | Yes | Yes | Yes | 235 | No |
| Oak Sanatorium Pewaukee | 38 | | 38 | 39 | | 39 | 35 | 38 | 0 | 35 | 7 | 1 | 2 | 4 | 0 | 14 | Yes | Yes | Yes | Yes | 1,153 | No |
| Rocky Knoll Sanatorium Plymouth | 74 | 14 | 88 | 68 | 19 | 87 | 80 | 85 | 4 | 86 | 17 | 1 | 11 | 9 | 5 | 48 | Yes | Yes | Yes | Yes | 578 | No |
| Pureair Sanatorium Pureair | 70 | | 70 | 54 | 2 | 56 | 55 | 67 | 7 | 68 | 10 | 1 | 0 | 8 | 6 | 34 | Yes | Yes | Yes | Yes | 574 | No |
| Sunny Rest Sanatorium Racine | 39 | | 39 | 36 | | 36 | 34 | 39 | 2 | 50 | 8 | 1 | 2 | 4 | 2 | 19 | No | No | Yes | Yes | 471 | Yes |
| Mount View Sanatorium, Wausau | 66 | | 66 | 74 | 1 | 75 | 71 | 65 | 2 | 61 | 17 | 1 | 8 | 11 | 3 | 35 | Yes | Yes | Yes | Yes | 3,581 | Yes |
| Mulrdales Sanatorium Wauwatosa | 400 | 53 | 453 | 447 | 10 | 417 | 594 | 451 | 15 | 430 | 101 | 4 | 9 | 20 | 16 | 165 | Yes | Yes | Yes | Yes | | No |
| Hickory Grove Sanat West DePere | 84 | 0 | 84 | | | 153 | 82 | 2 | 82 | 10 | 1 | 0 | 7 | 4 | 28 | Yes | Yes | Yes | Yes | | No | |
| Maple Crest Sanatorium Whitelaw | 50 | | 50 | 33 | | 33 | 32 | 43 | 4 | 43 | 10 | 1 | 0 | 6 | 2 | 19 | Yes | Yes | Yes | Yes | 511 | No |
| Sunny View Sanatorium Winnebago | 62 | 31 | 93 | 91 | 36 | 127 | 119 | 91 | 6 | 88 | 12 | 1 | 2 | 10 | 4 | 39 | Yes | Yes | Yes | Yes | 369 | No |
| Private | | | | | | | | | | | | | | | | | | | | | | |
| Morningside Sanatorium Madison | 20 | 20 | 45 | 17 | 6 | 23 | 20 | 33 | 1 | 39 | 2 | 1 | 0 | 3 | 2 | 15 | No | No | No | Yes | | No |
| River Pines Sanatorium Stevens Point | | | 52 | 58 | | 58 | 50 | 45 | 0 | 44 | 9 | 1 | 0 | 6 | 2 | 24 | Yes | Yes | Yes | Yes | | 1 |
| Totals | 1 797 | 140 | 1 959 | 1,396 | 241 | 1 940 | 1 744 | 1 846 | 100 | 1,843 | 330 | 32 | 87 | 165 | 94 | 829 | 17 | 17 | 17 | 20 | 11,691 | 1 |
| WYOMING | | | | | | | | | | | | | | | | | | | | | | |
| State | | | | | | | | | | | | | | | | | | | | | | |
| Wyoming Tuberculosis Sanat Basin | 33 | | 33 | 31 | | 31 | 31 | 29 | 0 | 28 | 10 | 1 | 1 | 2 | 2 | 17 | Yes | Yes | Yes | Yes | 106 | Yes |
| Totals | 33 | | 33 | 31 | | 31 | 31 | 29 | 0 | 28 | 10 | 1 | 1 | 2 | 2 | 17 | 1 | 1 | 1 | 1 | 106 | 1 |
| Grand total (all states) | 49754 | 9036 | 64997 | 50460 | 10394 | 70001 | 60423 | 56579 | | 56325 | 10923 | 2193 | | 8419 | 26369 | 384 | 368 | 364 | 406 | 450100 | 146 | |

TUBERCULOSIS DEPARTMENTS OF HOSPITALS

INCLUDING GENERAL AND SPECIAL HOSPITALS

| | Type of Service | Total Capacity of Hospital | Tuberculosis Department | | |
|---|-----------------|----------------------------|-------------------------|-------------------|------------------|
| | | | Beds | Patients Admitted | Patients Present |
| ALABAMA | | | | | |
| Federal—U.S.P.H.S. | | | | | |
| U.S. Marine Hospital, Mobile | Gen | 190 | 4 | 16 | 2 |
| U.S.V.B. | | | | | |
| Veterans Admin Facility Tuscaloosa | Gen | 346 | 25 | | 22 |
| Veterans Admin Facility (col) Tuscaloosa | Gen | 1,164 | 24 | 50 | 19 |
| State | | | | | |
| Searcy Hospital (col) Mt Vernon | Ment | 1,000 | 20 | 4 | 12 |
| Dryce Hospital Tuscaloosa | Ment | 3,017 | 00 | | 61 |
| Partlow State School Tuscaloosa | MeDe | 620 | | | 3 |
| State Convict Tuberculosis Hospital Wetumpka | InstTB | 87 | 87 | 94 | 42 |
| Private | | | | | |
| Employees Hospital of the Tennessee Coal, Iron and Railroad Company Fairfield | Gen | 287 | | 64 | 1 |
| Totals | | 7,301 | 220 | 633 | 162 |
| ARIZONA | | | | | |
| Federal—U.S.V.B. | | | | | |
| Veterans Admin Facility Tucson | G&TB | 358 | 275 | 627 | 342 |
| Veterans Admin Facility Whipple | G&TB | 600 | 300 | | |
| U.S.A. | | | | | |
| Kayenta Sanatorium, Kayenta | Gen | 62 | | 53 | 20 |
| Pima Indian Hospital Sacaton | Gen | 60 | | 62 | 3 |
| San Carlos Indian Hosp San Carlos | Gen | 29 | | 11 | 3 |
| Indian Oasis Hospital Sells | Gen | 46 | | 16 | 9 |
| Western Navajo Hosp Tuba City | Gen | 46 | | 16 | 2 |
| Fort Apache Agency Hosp Whiteriver | Gen | 46 | | 17 | 5 |
| Fort Yuma Indian Hospital Yuma | Gen | 32 | | 29 | 1 |
| County | | | | | |
| Cochise County Hospital, Douglas | Gen | 93 | 0 | 5 | 8 |
| Pinal County Hospital Florence | Gen | 23 | 8 | 12 | 5 |
| Yavapai County Hospital Prescott | Inst | 70 | 8 | 14 | 7 |
| Private | | | | | |
| Booker T. Washington Memorial Hospital (col) Phoenix | G&TB | 22 | 13 | 12 | 10 |
| St. Mary's Hosp and Sanat Tucson | G&TB | 100 | 50 | 229 | 3 |
| Southern Methodist Hospital and Sanatorium Tucson | G&TB | 75 | 30 | 65 | 20 |
| Sage Memorial Hospital Ganado | Gen | 6 | 10 | 33 | 3 |
| Totals | | 1,767 | 708 | 1,101 | 473 |
| ARKANSAS | | | | | |
| Federal—U.S.A. and U.S. | | | | | |
| Army and Navy General Hospital Hot Springs National Park | Gen | 412 | | 0 | 1 |
| U.S.V.B. | | | | | |
| Veterans Admin Facility Fayetteville | Gen | 238 | 59 | 23 | 32 |
| Veterans Admin Facility North Little Rock | Ment | 820 | 23 | 5 | 23 |
| State | | | | | |
| State Hospital Little Rock | Ment | 3,593 | 100 | | |
| Arkansas State Penitentiary Hospital Tucker | Inst | 20 | 8 | 4 | 2 |
| County | | | | | |
| Pulaski County Hosp Little Rock | Gen | 200 | 22 | 32 | 14 |
| Sebastian County Hosp Ft Smith | Inst | 78 | 22 | | 12 |
| Totals | | 5,331 | 234 | 80 | 89 |
| CALIFORNIA | | | | | |
| Federal—U.S.A. | | | | | |
| Letterman General Hosp San Francisco | Gen | 600 | 20 | 90 | 3 |
| U.S.N. | | | | | |
| U.S. Naval Hospital Mare Island | Gen | 534 | 92 | 133 | 36 |
| U.S. Naval Hospital San Diego | Gen | 800 | 29 | 57 | 16 |
| U.S. Ship Relief San Pedro | Gen | 367 | 24 | 40 | 1 |
| U.S.P.H.S. | | | | | |
| U.S. Marine Hospital San Francisco | Gen | 493 | 53 | 00 | 53 |
| U.S.V.B. | | | | | |
| Veterans Admin Facility Livermore | G&TB | 318 | 318 | 304 | 236 |
| Veterans Admin Facility West Los Angeles | G&TB | 1,232 | 280 | 423 | 100 |
| Veterans Admin Facility Palo Alto | Ment | 1,060 | 42 | 5 | 34 |
| U.S.A. | | | | | |
| Fort Bidwell Sanatorium Ft Bidwell | G&TB | 23 | 30 | 25 | 23 |
| Hoopa Valley Indian Hospital Hoopa | Gen | 30 | | 11 | 3 |
| Kobobah Indian Hospital San Jacinto | Gen | 30 | | 15 | 5 |
| State | | | | | |
| Agnew State Hospital Agnew | Ment | 3,000 | 30 | | 23 |
| North State Hospital Northwalk | Ment | 2,262 | | | 7 |
| Patton State Hospital Patton | Ment | 3,697 | 140 | 23 | 13 |
| Stockton State Hospital Stockton | Ment | 3,500 | 100 | 12 | 67 |
| Mendocino State Hospital, Talmage | Ment | 2,700 | | | 8 |
| Folsom Prison Hospital Repressa | Inst | 76 | 15 | 4 | 13 |
| Charles L. Neumiller Hospital San Quentin | Inst | 137 | 50 | | 50 |
| Freeman School of Industry Hospital Waterman | Inst | 42 | | 3 | 1 |
| County | | | | | |
| Riverside County Hospital Arlington | G&TB | 32 | 91 | 97 | 84 |
| Santa Cruz County Hosp., Santa Cruz | G&TB | 35 | 16 | 34 | 13 |
| San Joaquin General Hospital French Camp | Gen | 500 | 50 | 138 | 42 |
| Fresno County General Hosp Fresno | Gen | 100 | 92 | 150 | 94 |
| Alameda County Hospital Hanford | Gen | 80 | 6 | 2 | 3 |
| Los Angeles County Hosp Los Angeles | Gen | 3,266 | 201 | 1,216 | 202 |
| Madera County Hospital, Madera | Gen | 47 | | 21 | 2 |
| Merced General Hospital Merced | Gen | 220 | 50 | 67 | 34 |
| Stanislaus County Hospital Modesto | Gen | 200 | 12 | 14 | 11 |
| Nevada County Hospital, Nevada City | Gen | 62 | 4 | 8 | 4 |
| Orange County Hospital Orange | Gen | 275 | 82 | 134 | 92 |
| Shasta County Hospital Redding | Gen | 62 | 20 | 4 | 5 |
| CALIFORNIA—Continued | | | | | |
| Sacramento County Hosp Sacramento | Gen | 400 | 23 | 250 | 16 |
| San Bernardino County Charity Hospital San Bernardino | Gen | 312 | 63 | 84 | 43 |
| San Diego County General Hospital San Diego | Gen | 640 | 180 | 180 | 172 |
| Fairmont Hospital of Alameda County San Leandro | Gen | 900 | 133 | 413 | 150 |
| Community Hospital of San Mateo County San Mateo | Gen | 102 | 44 | 44 | 41 |
| Santa Barbara General Hospital, Santa Barbara | Gen | 215 | 56 | 63 | 53 |
| Sonoma County Hospital Santa Rosa | Gen | 153 | 60 | 30 | 45 |
| Ventura County Hospital Ventura | Gen | 182 | 40 | 44 | 32 |
| Marin County Tuberculosis Hospital San Rafael | Inst | 10 | 10 | 32 | 16 |
| City County | | | | | |
| San Francisco Hosp San Francisco | Gen | 1,306 | 415 | 706 | 330 |
| Private | | | | | |
| Sacred Heart Hospital Hanford | Gen | 20 | | 2 | 1 |
| Loma Linda Sanitarium and Hospital Loma Linda | Gen | 112 | | 15 | 1 |
| Cedars of Lebanon Hosp Los Angeles | Gen | 248 | | 56 | 3 |
| Western Pacific Railway Hosp., Portola | Gen | 30 | | 2 | 2 |
| Ross General Hospital Ross | Gen | 60 | 18 | 51 | 18 |
| French Hospital San Francisco | Gen | 226 | | 33 | 6 |
| San Pedro Hospital San Pedro | Gen | 89 | 4 | 8 | |
| Shriners Hospital for Crippled Children San Francisco | Orth | 60 | | 67 | 2 |
| Santa Fe Coast Lines Hospital, Los Angeles | Indus | 150 | | 19 | 1 |
| Lane Sanitarium San Diego | Conv | 9 | 6 | 2 | 4 |
| Totals | | 32,121 | 2,035 | 5,860 | 2,433 |
| COLORADO | | | | | |
| Federal—U.S.A. | | | | | |
| Fitzsimons General Hospital Denver | G&TB | 1,186 | 536 | 915 | 447 |
| U.S.V.B. | | | | | |
| Veterans Admin Facility Ft Lyon | Ment | 699 | | 4 | 17 |
| U.S.A. | | | | | |
| Edward T. Taylor Hospital, Ignacio | Gen | 35 | | 14 | 0 |
| State | | | | | |
| Colorado State Hospital Pueblo | Ment | 3,120 | 34 | | 60 |
| Colorado State Penitentiary Hospital Canon City | Inst | 25 | 5 | 2 | 3 |
| County | | | | | |
| Boulder County Hospital Boulder | Gen | 40 | 7 | 0 | 3 |
| Island Grove County Hospital Greeley | Inst | 70 | | 5 | 2 |
| City County | | | | | |
| Denver General Hospital Denver | Gen | 550 | 80 | 178 | 64 |
| Private | | | | | |
| Glockner Sanatorium and Hospital Colorado Springs | G&TB | 150 | 62 | 70 | 50 |
| St. Francis Hospital and Sanatorium, Colorado Springs | G&TB | 186 | 75 | 63 | 40 |
| Union Printers Home and Tuberculosis Sanatorium Colorado Springs | G&TB | 176 | 100 | 50 | 50 |
| Menonite Hosp and Sanit La Junta | G&TB | 70 | 18 | 7 | 14 |
| Eben Ezer Hospital Brush | Gen | 20 | 10 | 14 | |
| St. Joseph's Hospital and Sanatorium Del Norte | Gen | 25 | 10 | 6 | 8 |
| St. Anthony's Hospital Denver | Gen | 200 | 6 | 11 | 10 |
| St. Joseph's Hospital Denver | Gen | 200 | 5 | 20 | 6 |
| Mount San Rafael Hospital Trinidad | Gen | 65 | | 5 | 1 |
| Totals | | 6,780 | 945 | 1,370 | 795 |
| CONNECTICUT | | | | | |
| State | | | | | |
| Connecticut State Hosp Middletown | Ment | 3,074 | 46 | | 83 |
| Norwich State Hospital Norwich | Ment | 2,910 | 90 | | |
| City | | | | | |
| Englewood Hospital Bridgeport | TB Iso | 150 | 40 | 62 | 24 |
| Municipal Hospital Greenwich | TB Iso | 61 | 10 | 21 | 0 |
| Municipal Hospitals Hartford | Gen Iso | 300 | | 90 | 20 |
| Private | | | | | |
| St. Mary's Hospital Waterbury | Gen | 220 | 6 | 31 | |
| William W. Winchester Hospital (Dept of New Haven Hosp) West Haven | Gen | 307 | 42 | 110 | 42 |
| Totals | | 7,076 | 240 | 362 | 174 |
| DELAWARE | | | | | |
| State | | | | | |
| Delaware State Hospital Farnhurst | Ment | 978 | | 5 | 13 |
| Totals | | 978 | | 5 | 13 |
| DISTRICT OF COLUMBIA | | | | | |
| Federal—U.S.A. | | | | | |
| Walter Reed General Hospital Washington | Gen | 1,120 | 12 | 115 | 3 |
| U.S.N. | | | | | |
| U.S. Naval Hospital Washington | Gen | 323 | 4 | 13 | 1 |
| U.S.V.B. | | | | | |
| Veterans Admin Facility Washington | Gen | 327 | 34 | 20 | 9 |
| Other | | | | | |
| St. Elizabeth's Hospital (Psych), Washington | Ment | 5,275 | 140 | 50 | 110 |
| City | | | | | |
| Gallinger Municipal Hosp Washington | Gen | 700 | 100 | 321 | 62 |
| Private | | | | | |
| Washington Sanitarium and Hospital, Washington | Gen | 170 | | 12 | 0 |
| Children's Hospital Washington | Child | 162 | | 20 | 5 |
| Totals | | 8,102 | 296 | 775 | 210 |

| FLORIDA | Type of Service | Total Capacity of Hospital | Tuberculosis Department | | |
|--|-----------------|----------------------------|-------------------------|-------------------|------------------|
| | | | Beds | Patients Admitted | Patients Present |
| Federal—U S P H S | | | | | |
| U S Marine Hospital, Key West | Gen | 65 | 10 | 12 | 0 |
| U S V B | | | | | |
| Veterans Admin Facility Lake City | Gen | 307 | 16 | 102 | 22 |
| American Legion Hospital for Crippled Children St Petersburg | Orth | 30 | | | |
| Florida State Hospital Chattahoochee | Ment | 4 125 | 48 | | 40 |
| Florida State Farm Hospital Ralford County | Inst | 44 | 14 | 16 | 12 |
| Duval County Hospital, Jacksonville | Gen | 170 | 37 | 61 | 28 |
| Dade County Hospital Miami | Gen | 82 | | 10 | 5 |
| Pinellas County Home, Largo | InstTB | 18 | 18 | | 10 |
| City | | | | | |
| Morrell Memorial Hospital, Lakeland | Gen | 72 | | 10 | 1 |
| James M Jackson Memorial Hospital Miami | Gen | 320 | | 62 | 33 |
| City Hospital (col), St Petersburg | Gen | 25 | 10 | 6 | 0 |
| Private | | | | | |
| University Hospital Coral Gables | Gen | 35 | 4 | 10 | 2 |
| Centro Asturiano Hospital, Tampa | Gen | 75 | 9 | | 5 |
| Harry Anna Memorial Home for Crippled Children, Umatilla | Orth | 35 | | 14 | 0 |
| Totals | | 5 403 | 108 | 312 | 176 |

| | | | | | |
|--|--------|-------|-----|-----|-----|
| GEORGIA | | | | | |
| Federal—U S A | | | | | |
| Station Hospital Ft Benning | Gen | 239 | | 6 | 2 |
| U S P H S | | | | | |
| U S Marine Hospital Savannah | Gen | 165 | 0 | 17 | 5 |
| U S Penitentiary Hospital Atlanta | Inst | 187 | 0 | 11 | 4 |
| U S V B | | | | | |
| Veterans Admin Facility Atlanta | Gen | 200 | 20 | | 10 |
| Veterans Admin Facility Augusta | Ment | 966 | 46 | 8 | 40 |
| State | | | | | |
| Milledgeville State Hosp, Milledgeville | Ment | 6 150 | 466 | | 466 |
| Georgia State Penitentiary Tubercular Hospital Milledgeville | InstTB | 75 | 75 | 184 | |
| Private | | | | | |
| Charity Hospital (col) Savannah | Gen | 39 | 5 | 25 | 2 |
| Totals | | 8 021 | 627 | 261 | 535 |

| | | | | | |
|--|------|-----|----|----|----|
| IDAHO | | | | | |
| Federal—U S V B | | | | | |
| Veterans Admin Facility Boise | Gen | 303 | 24 | 19 | 12 |
| State | | | | | |
| Idaho State Soldiers Home Hospital Boise | Inst | 27 | 12 | | 1 |
| Private | | | | | |
| St Alphonsus Hospital Boise | Gen | 125 | 20 | 24 | 15 |
| Coeur d Alene Hospital Coeur d Alene | Gen | 50 | 20 | 14 | 11 |
| St Joseph's Hospital Lewiston | Gen | 75 | | 25 | 1 |
| Pago Hospital Sandpoint | Gen | 35 | | 3 | 0 |
| Wallace Hospital Wallace | Gen | 50 | 8 | 4 | 0 |
| Totals | | 605 | 84 | 89 | 40 |

| | | | | | |
|---|------|-------|-----|-------|-----|
| ILLINOIS | | | | | |
| Federal—U S A | | | | | |
| Station Hospital, Ft Sheridan | Gen | 216 | 6 | 18 | 0 |
| Station Hospital Rantoul | Gen | 50 | 0 | 2 | 0 |
| U S P H S | | | | | |
| U S Marine Hospital Chicago | Gen | 180 | 14 | 19 | 12 |
| U S V B | | | | | |
| Veterans Admin Facility Hines | G&TB | 1,750 | 250 | 491 | 250 |
| Veterans Admin Facility, Danville | Gen | 562 | 38 | 57 | 19 |
| Veterans Admin Facility, North Chicago | Ment | 1 135 | 35 | 4 | 24 |
| State | | | | | |
| Infirmary of Clearing House Illinois | | | | | |
| Emergency Relief Chicago | Gen | 350 | 20 | 78 | 14 |
| Research and Educational Hospital Chicago | Gen | 357 | | 34 | 5 |
| Alton State Hospital Alton | Ment | 1,537 | 169 | | 140 |
| Anna State Hospital Anna | Ment | 2 047 | 65 | 77 | 62 |
| Chicago State Hospital, Chicago | Ment | 4 118 | | 5 | 42 |
| Dixon State Hospital Dixon | McDe | 3,323 | 156 | | 134 |
| East Moline State Hosp East Moline | Ment | 1 951 | 68 | | 68 |
| Elgin State Hospital Elgin | Ment | 3 900 | 110 | 15 | 185 |
| Jacksonville State Hosp Jacksonville | Ment | 3,345 | 96 | | 91 |
| Kankakee State Hospital, Kankakee | Ment | 4 000 | 100 | 80 | 130 |
| Lincoln State School and Colony Lincoln | McDe | 3 777 | 97 | 8 | 47 |
| Peoria State Hospital, Peoria | Ment | 2,771 | 48 | 10 | 203 |
| Southern Illinois Penitentiary Hospital Menard | Inst | 36 | 9 | 12 | 4 |
| Illinois State Reformatory Hospital Pontiac | Inst | 38 | 18 | 21 | 10 |
| County | | | | | |
| Cook County Hospital Chicago | Gen | 3 800 | 327 | 1 240 | 335 |
| Lake County General Hosp Waukegan | Gen | 90 | 24 | | |
| City | | | | | |
| House of Correction Hospital Chicago | Inst | 75 | 6 | 51 | 2 |
| Private | | | | | |
| Berwyn Hospital Berwyn | Gen | 75 | | 6 | |
| Oakwood Hospital Charleston | Gen | 23 | 4 | | 1 |
| Ravenswood Hospital Chicago | Gen | 150 | | 20 | 1 |
| St Joseph Hospital Chicago | Gen | 150 | | 8 | 1 |
| University of Chicago Clinics Chicago | Gen | 262 | 17 | | 11 |
| St Elizabeth Hospital, Granite City | Gen | 103 | 4 | 8 | |
| St Francis Hospital Kewanee | Gen | 50 | | 30 | 1 |
| Olney Sanitarium Olney | Gen | 68 | | 17 | 3 |
| St Francis Hospital Peoria | Gen | 300 | | 24 | 2 |
| St Anthony's Hospital Rock Island | Gen | 150 | | 10 | 1 |
| Shriners Hospital for Crippled Children Chicago | Orth | 60 | | 7 | 5 |

| | | | | | |
|--|-------|-----|-----|-----|-----|
| ILLINOIS—Continued | | | | | |
| St John's Sanitarium Springfield | TB Or | 325 | 225 | 208 | 230 |
| Country Home for Convalescent Crippled Children West Chicago | Orth | 120 | | | |

| | | | | | |
|---------------|--|--------|-------|-----|-------|
| Totals | | 40 756 | 1,502 | 950 | 2,022 |
|---------------|--|--------|-------|-----|-------|

| | | | | | |
|--|------|-------|-----|-----|-----|
| INDIANA | | | | | |
| Federal—U S A | | | | | |
| Station Hosp, Ft Benjamin Harrison | Gen | 167 | | 3 | 1 |
| U S P H S | | | | | |
| U S Marine Hospital, Evansville | Gen | 90 | 4 | 11 | 3 |
| U S V B | | | | | |
| Veterans Admin Facility Indianapolis | Gen | 162 | | 42 | 4 |
| Veterans Admin Facility Marion | Ment | 1,500 | 60 | 70 | 4 |
| State | | | | | |
| Fort Wayne State School Ft Wayne | McDe | 1 675 | 20 | 30 | 20 |
| Central State Hospital Indianapolis | Ment | 1 229 | 25 | 6 | 20 |
| Logansport State Hospital Logansport | Ment | 1 632 | 24 | | |
| Madison State Hosp North Madison | Ment | 1,580 | 30 | | |
| Indiana Women's Prison Indianapolis | Inst | 4 | | 2 | 2 |
| Indiana State Prison Hospital, Michigan City | Inst | 100 | 80 | | 14 |
| Indiana State Reformatory Hospital Pendleton | Inst | 100 | 12 | 23 | 10 |
| Private | | | | | |
| St John Hospital (col), Gary | Gen | 15 | 4 | 9 | 2 |
| Totals | | 8 784 | 229 | 158 | 150 |

| | | | | | |
|---|------|--------|-----|-----|-----|
| IOWA | | | | | |
| Federal—U S V B | | | | | |
| Veterans Admin Facility, Des Moines | Gen | 300 | 50 | 20 | 13 |
| Veterans Admin Facility, Knoxville | Ment | 851 | 27 | 5 | 23 |
| State | | | | | |
| University Hospitals Iowa City | Gen | 900 | | 194 | |
| Cherokee State Hospital Cherokee | Ment | 1 670 | 72 | | 55 |
| Clarinda State Hospital Clarinda | Ment | 1 400 | | 4 | 20 |
| Iowa Institution for Feeble-minded Children Glenwood | McDe | 1,500 | 36 | 4 | 32 |
| Independence State Hosp Independence | Ment | 1,735 | | 5 | 61 |
| Mount Pleasant State Hospital Mount Pleasant | Ment | 1 600 | | 3 | 40 |
| Hospital for Epileptics and School for Feeble-minded Woodward | McDe | 1,227 | 10 | 2 | 3 |
| Reformatory Hospital Anamosa | Inst | 35 | 2 | 1 | 0 |
| Iowa State Penitentiary Hospital, Ft Madison | Inst | 38 | 10 | 9 | 6 |
| Private | | | | | |
| Iowa Lutheran Hospital Des Moines | Gen | 135 | | 13 | 1 |
| St Francis Hospital, Grinnell | Gen | 40 | | 3 | 3 |
| Totals | | 11 731 | 207 | 263 | 271 |

| | | | | | |
|--|------|-------|-----|-----|-----|
| KANSAS | | | | | |
| Federal—U S P H S | | | | | |
| U S Penitentiary Hosp, Leavenworth | Inst | 180 | | 4 | 1 |
| U S V B | | | | | |
| Veterans Admin Facility Veterans Administration Home | Gen | 741 | 67 | 158 | 55 |
| Veterans Admin Facility Wichita | Gen | 168 | | 37 | |
| U S I A | | | | | |
| Haskell Institute Hospital, Lawrence | Inst | 40 | | 7 | 2 |
| State | | | | | |
| Larned State Hospital, Larned | Ment | 1 048 | | 1 | 5 |
| Osawatomie State Hosp Osawatomie | Ment | 1,580 | 60 | 15 | 75 |
| Topeka State Hospital Topeka | Ment | 1,827 | 40 | | 23 |
| Kansas State Penitentiary Hosp Lansing | Inst | 50 | 10 | 8 | 2 |
| Private | | | | | |
| St Anthony Hospital Dodge City | Gen | 89 | | 7 | 1 |
| St Catherine's Hospital, Garden City | Gen | 40 | | 5 | 4 |
| St Rose Hospital, Great Bend | Gen | 70 | | 10 | 2 |
| Halstead Hospital Halstead | Gen | 170 | | 6 | 1 |
| St Elizabeth Mercy Hosp Hutchinson | Gen | 250 | | 33 | 2 |
| St Margaret's Hospital Kansas City | Gen | 43 | | 6 | 1 |
| Asbury Protestant Hospital Salina | Gen | 44 | | 3 | |
| St Mary's Hospital Winfield | Gen | 40 | | 7 | 3 |
| Suburban Rest Sanitarium Wichita | Conv | 30 | 6 | | 14 |
| Totals | | 6 410 | 183 | 316 | 194 |

| | | | | | |
|--|--------|-------|-----|-----|-----|
| KENTUCKY | | | | | |
| Federal—U S P H S | | | | | |
| U S Marine Hospital, Louisville | Gen | 100 | | 3 | 2 |
| State | | | | | |
| Western State Hospital Hopkinsville | Ment | 1 925 | 150 | 19 | 37 |
| Central State Hospital Lakeland | Ment | 2,350 | 2 | | 63 |
| County | | | | | |
| McCracken County Tuberculosis Sanatorium Paducah | InstTB | 20 | 90 | | |
| City | | | | | |
| Louisville City Hospital Louisville | Gen | 528 | | 41 | 5 |
| Private | | | | | |
| Red Bird Evangelical Hosp Beverly | Gen | 15 | 3 | 4 | 19 |
| St Elizabeth Hospital Covington | Gen | 263 | | 2 | |
| Highway Medical Hospital Florence | Gen | 20 | | 1 | 7 |
| St Joseph Infirmary Louisville | Gen | 320 | | 7 | |
| Lynch Hospital Lynch | Indus | 60 | | 3 | |
| Totals | | 5,591 | 257 | 304 | 122 |

| | | | | | |
|--|-----|-------|-----|-----|----|
| LOUISIANA | | | | | |
| Federal—U S P H S | | | | | |
| U S Marine Hospital New Orleans | Gen | 572 | 49 | | 25 |
| U S V B | | | | | |
| Veterans Admin Facility Alexandria | Gen | 439 | 157 | 330 | 91 |
| State | | | | | |
| John Dibert Memorial Hospital (Charity Hospital) New Orleans | Gen | 1,514 | 321 | | |

| | | Type of Service | Total Capacity of Hospital | Tuberculosis Department | | |
|---|------------|-----------------|----------------------------|-------------------------|-------------------|------------------|
| | | | | Beds | Patients Admitted | Patients Present |
| LOUISIANA—Continued | | | | | | |
| Shreveport Charity Hosp | Shreveport | Gen | 478 | 50 | 183 | 50 |
| East Louisiana State Hospital | Jackson | Ment | 3 535 | | 4 | 90 |
| Central Louisiana State Hospital, Pineville | | Ment | 1 785 | 150 | 22 | 110 |
| Totals | | | 8 021 | 727 | 539 | 316 |

| | | | | | | |
|-------------------------------|-----------|------|-------|----|-----|----|
| MAINE | | | | | | |
| Federal—U.S.A. | | | | | | |
| Station Hospital Cape Cottage | | Gen | 64 | | 4 | 1 |
| USPHS | | | | | | |
| U S Marine Hospital | Portland | Gen | 72 | 12 | 10 | 8 |
| USVB | | | | | | |
| Veterans Admin Facility | Augusta | Gen | 275 | | 57 | 0 |
| State | | | | | | |
| Augusta State Hospital | Augusta | Ment | 1 350 | 18 | | |
| Bangor State Hospital | Bangor | Ment | 890 | 40 | 12 | 40 |
| Pownall State School | Pownall | MeDe | 820 | | 7 | 6 |
| Private | | | | | | |
| Central Maine General Hosp | Lewiston | Gen | 157 | 16 | 23 | 16 |
| Queen's Hospital | Portland | Gen | 48 | | 2 | 1 |
| Rumford Community Hosp | Rumford | Gen | 75 | 6 | | |
| Kennebec Valley Hospital | Skowhegan | Gen | 37 | 2 | | 2 |
| Totals | | | 3 788 | 94 | 125 | 78 |

| | | | | | | |
|-------------------------------------|-----------------|--------|-------|-----|-----|-----|
| MARYLAND | | | | | | |
| Federal—U.S.P.H.S. | | | | | | |
| U S Marine Hospital | Baltimore | Gen | 278 | 20 | 30 | 10 |
| USVB | | | | | | |
| Veterans Admin Facility | Perry Point | Ment | 1 015 | 48 | | 48 |
| State | | | | | | |
| Spring Grove State Hosp | Catoxville | Ment | 1 700 | 20 | 2 | 18 |
| Crowsville State Hosp (col) | Crowsville | Ment | 1 020 | 10 | | 20 |
| Rosewood State Training School | Owings Mills | MeDe | 1 125 | | 28 | 26 |
| Springfield State Hospital | Sykesville | Ment | 2,000 | 85 | | 82 |
| Maryland Penitentiary Hosp | Baltimore | Inst | 44 | 10 | 11 | 4 |
| Maryland House of Correction | Hopital Jessups | Inst | 48 | 7 | | |
| Private | | | | | | |
| Children's Hospital School | Baltimore | Orth | 120 | | | |
| James L. Kerran Hospital and Indus | | | | | | |
| trial School for Crippled Children, | Baltimore | Orth | 80 | | | |
| Pinehurst sanitarium | Hyattsville | NervTB | 30 | | 28 | 4 |
| Totals | | | 8 001 | 200 | 108 | 221 |

| | | | | | | |
|--------------------------------------|----------------|--------|--------|-------|-------|-------|
| MASSACHUSETTS | | | | | | |
| Federal—U.S.P.H.S. | | | | | | |
| U S Marine Hospital | Chelsea | Gen | 167 | 12 | 16 | 1 |
| U S Marine Hospital | Vineyard Haven | Gen | 24 | 4 | 2 | 2 |
| USVB | | | | | | |
| Veterans Admin Facility | Northampton | Ment | 611 | | | 66 |
| State | | | | | | |
| Captain John Adams Hosp at Soldiers' | | | | | | |
| Home | Chelsea | Gen | 241 | 6 | 37 | 5 |
| State Infirmary | Tenksbury | Gen | 3 110 | 280 | 244 | 190 |
| Bridgewater State Hosp | Bridgewater | Ment | 988 | 21 | 13 | 15 |
| Foxboro State Hospital | Foxboro | Ment | 1 174 | 24 | 15 | 14 |
| Gardner State Colony | Gardner | Ment | 1,342 | 24 | 2 | 35 |
| Danvers State Hospital | Hathorne | Ment | 2,220 | | | 44 |
| Medfield State Hospital | Medfield | Ment | 1,800 | 50 | | 75 |
| Northampton State Hosp., Northamp- | | | | | | |
| ton | | Ment | 1,881 | | 6 | 58 |
| Grafton State Hospital | North Grafton | Ment | 1,600 | 52 | 11 | 50 |
| Taunton State Hospital | Taunton | Ment | 1,545 | 60 | 5 | 40 |
| Westboro State Hospital | Westboro | Ment | 1,594 | 66 | 5 | 14 |
| Worcester State Hospital | Worcester | Ment | 2,260 | 40 | 5 | 28 |
| Hospital of the Norfolk State Prison | Colony Norfolk | Inst | 75 | 27 | 20 | 12 |
| County | | | | | | |
| Harnstable County Sanat | Pocasset | TB Iso | 48 | 28 | 177 | 41 |
| City | | | | | | |
| Fall River General Hosp | Fall River | G&TB | 261 | 110 | 104 | 75 |
| Board of Health Hospital | Brookline | TB Iso | 40 | 30 | 22 | 22 |
| Lowell Tuberculosis Hospital | Lowell | TB Iso | 84 | 54 | 70 | 51 |
| Health Department Hosp | Springfield | TB Iso | 112 | 46 | 70 | 40 |
| Belmont Hospital | Worcester | TB Iso | 275 | 150 | 190 | 104 |
| Malden Contagious Hospital | Malden | Iso | 40 | 16 | 40 | 10 |
| Somerville Contagious Hosp | Somerville | Iso | 60 | 20 | 3 | |
| Long Island Hospital | Boston | Gen | 407 | | 4 | 3 |
| Private | | | | | | |
| New England Deaconess Hosp | Boston | Gen | 285 | 11 | 54 | 8 |
| Whidden Memorial Hospital | Everett | Gen | 95 | | 2 | 1 |
| Burbank Hospital | Fitchburg | Gen | 180 | 30 | 32 | 19 |
| North Adams Hospital | North Adams | Gen | 70 | 3 | 3 | 1 |
| Waltham Hospital | Waltham | Gen | 155 | 12 | 1 | |
| New England Peabody Home for Crip- | | | | | | |
| pled Children | Newton | OrthTB | 100 | 100 | 24 | 84 |
| Shriners Hospital for Crippled Chl- | | | | | | |
| dren | Springfield | Orth | 60 | | 18 | 8 |
| Do ton Lying in Hospital | Boston | Mat | 217 | | 13 | 1 |
| Totals | | | 23 165 | 1 257 | 1,235 | 1 125 |

| | | | | | | |
|--------------------------|-------------|------|-------|----|-----|----|
| MICHIGAN | | | | | | |
| Federal—U.S.P.H.S. | | | | | | |
| U S Marine Hospital | Detroit | Gen | 240 | 16 | 31 | 6 |
| USVB | | | | | | |
| Veterans Admin Facility | Camp Custer | Ment | 835 | 20 | 2 | |
| State | | | | | | |
| University Hospital | Ann Arbor | Gen | 1,251 | 98 | 540 | 98 |
| Ionia State Hospital | Ionia | Ment | 831 | | | |
| Kalamazoo State Hospital | Kalamazoo | Ment | 2,700 | | | 93 |

| | Type of Service | Total Capacity of Hospital | Tuberculosis Department | | |
|---|-----------------|----------------------------|-------------------------|-------------------|------------------|
| | | | Beds | Patients Admitted | Patients Present |
| MICHIGAN—Continued | | | | | |
| Michigan Home and Training School, Lauper | MeDe | 8,825 | | 20 | 32 |
| Newberry State Hospital Newberry | Ment | 1 200 | | 6 | 30 |
| Pontiac State Hospital Pontiac | Ment | 1 706 | 36 | | |
| Traverse City State Hospital Traverse City | Ment | 1 905 | 130 | | 62 |
| Ypsilanti State Hospital Ypsilanti | Ment | 1 485 | | | 14 |
| Michigan State Prison Hosp Jackson | Inst | 232 | 90 | 413 | 26 |
| Michigan Farm Colony for Epileptics Wahjamega | Epil | 1 051 | 8 | | 6 |
| County | | | | | |
| Grand View Hospital Ironwood | G&TB | 112 | 60 | 36 | 44 |
| Fairmount Hospital Kalamazoo | TB Iso | 151 | 75 | 76 | 52 |
| Saginaw County Contagious Hospital, Saginaw | Iso | 75 | 25 | 54 | 24 |
| City | | | | | |
| Herman Klefer Hosp Detroit | GenTB Iso | 1 335 | 761 | 1 357 | 741 |
| Hurley Hospital Flint | Gen | 875 | 28 | 113 | 28 |
| Highland Park General Hospital Highland Park | Gen | 156 | 13 | 5 | 4 |
| Private | | | | | |
| Ohelek Hospital Detroit | G&TB | 52 | 20 | 23 | 17 |
| Grace Hospital Detroit | Gen | 800 | | 119 | 2 |
| Henry Ford Hospital Detroit | Gen | 560 | 68 | 127 | 58 |
| Lincoln Hospital Detroit | Gen | 89 | 80 | 169 | 23 |
| St. Mary's Hospital Detroit | Gen | 237 | | 17 | 3 |
| Blodgett Memorial Hosp Grand Rapids | Gen | 132 | | 13 | 1 |
| Shurly Eye Ear Nose and Throat Hospital Detroit | ENT | 133 | 58 | 58 | 25 |
| Totals | | 21,108 | 1 616 | 3 179 | 1,889 |

| | | | | | | |
|---------------------------------------|--------------|------|--------|-----|-------|-----|
| MINNESOTA | | | | | | |
| Federal—U.S.V.B. | | | | | | |
| Veterans Admin Facility | Ft Snelling | G&TB | 642 | 194 | 250 | 168 |
| Veterans Admin Facility | St Cloud | Ment | 746 | 24 | 1 | 24 |
| U.S.A. | | | | | | |
| Onigum General Hospital | Onigum | Gen | 76 | 53 | | |
| Pipestone Indian School Hospital | Pipestone | Gen | 80 | 15 | 12 | 15 |
| State | | | | | | |
| University Hospitals | Minneapolis | Gen | 490 | 4 | 60 | 6 |
| Gillette State Hospital for Crippled | | | | | | |
| Children | St Paul | Orth | 250 | | 26 | 37 |
| Minnesota Colony for Epileptics, Cam- | bridge | MeDe | 873 | 8 | 6 | 4 |
| Minnesota School for Feeble-minded | Fairbault | MeDe | 2,200 | 23 | 30 | 27 |
| Fergus Falls State Hospital | Fergus Falls | Ment | 1,800 | 70 | 20 | 65 |
| Rochester State Hospital | Rochester | Ment | 1,600 | 38 | 11 | 25 |
| St Peter State Hospital | St Peter | Ment | 2,037 | 94 | 99 | 93 |
| Minnesota State Reformatory Hospi- | tal St Cloud | Inst | 30 | 7 | 6 | 1 |
| Minnesota State Prison Hospital | Stillwater | Inst | 50 | 12 | 0 | 1 |
| City County | | | | | | |
| Ancker Hospital | St Paul | Gen | 1 000 | 215 | 222 | 226 |
| Private | | | | | | |
| Fairview Hospital | Minneapolis | G&TB | 200 | 80 | 101 | 3 |
| St Luke's Hospital | Duluth | Gen | 237 | 25 | 105 | 17 |
| St Mary's Hospital | Duluth | Gen | 260 | 28 | 98 | 16 |
| Swedish Hospital | Minneapolis | Gen | 271 | | 25 | 1 |
| St Cloud Hospital | St Cloud | Gen | 181 | | 47 | 2 |
| Vocational Nursing Home | Minneapolis | Conv | 50 | | 2 | 1 |
| Totals | | | 12,624 | 845 | 1 141 | 742 |

| | | | | | | |
|-----------------------------|--------------|------|-------|-----|---|-----|
| MISSISSIPPI | | | | | | |
| Federal—U.S.A. | | | | | | |
| Choctaw Mississipp Hosp | Philadelphia | Gen | 28 | 4 | 6 | 2 |
| State | | | | | | |
| Mississippi State Hospital | Fondren | Ment | 2,500 | 200 | | 108 |
| East Mississippi State Hosp | Meridian | Ment | 900 | 41 | | 41 |
| Totals | | | 3 428 | 245 | 6 | 241 |

| | | | | | | |
|--------------------------------------|--------------------|--------|-------|----|-----|----|
| MISSOURI | | | | | | |
| Federal—U.S.P.H.S. | | | | | | |
| U S Marine Hospital | St Louis | Gen | 100 | 10 | 10 | 7 |
| USVB | | | | | | |
| Veterans Admin Facility | Excelsior | Gen | 252 | 37 | 64 | 35 |
| State | | | | | | |
| Veterans Admin Facility | Jefferson | Gen | 372 | 40 | 37 | 40 |
| Dept of Justice | | | | | | |
| U S Hospital for Defective Delin- | quents Springfield | Ment | 705 | | 75 | 60 |
| State | | | | | | |
| Missouri State Hospital No 4 Farm | ington | Ment | 1 160 | 40 | | 21 |
| State Hospital No 1 | Fulton | Ment | 1 763 | 98 | | 69 |
| State Hospital No 3 | Wernada | Ment | 1 764 | 60 | | 20 |
| State Hospital No 2 | St Joseph | Ment | 2,430 | 20 | 4 | 21 |
| Missouri State Penitentiary Hospital | Jefferson City | Inst | 70 | | 10 | 40 |
| City | | | | | | |
| Sunnyslope Hospital | St Joseph | TB Iso | 27 | 0 | 12 | |
| City Isolation Hospital | St Louis | TB Iso | 250 | 67 | 131 | 67 |
| Kansas City General Hospital | Kansas City | Gen | 430 | | 230 | 6 |
| Kansas City General Hospital No 2 | (col) Kansas City | Gen | 250 | 18 | 500 | 19 |
| St Louis City Hospital | St Louis | Gen | 750 | 62 | 371 | 48 |
| St Louis City Hospital No 2 (col) | St Louis | Gen | 500 | 40 | 258 | 38 |
| City Sanitarium | St Louis | Ment | 3 460 | 26 | 8 | 38 |

MISSOURI—Continued

| Type of Service | Total Capacity of Hospital | Tuberculosis Department | | |
|--|----------------------------|-------------------------|-------------------|------------------|
| | | Beds | Patients Admitted | Patients Present |
| Private | | | | |
| B B Putnam Memorial Hospital, Marcelline | Gen | 15 | 0 | 1 |
| Barnes Hospital, St Louis | Gen | 270 | 140 | 23 |
| Jewish Hospital, St Louis | Gen | 257 | 42 | 3 |
| Missouri Odd Fellows Home Hospital Liberty | Inst | 80 | 6 | 4 |
| Totals | 1460 | 603 | 1013 | 577 |

MONTANA

| | | | | |
|--|--------|-----|-----|----|
| Federal—U S V B | | | | |
| Veterans Admin Facility Ft Harrison | Gen | 438 | 40 | 26 |
| U S A | | | | |
| Blackfeet Hospital Browning | Gen | 30 | 6 | 41 |
| Crow Indian Hospital Crow Agency | Gen | | 24 | 8 |
| Fort Belknap Indian Hospital and Sanitarium Harlem | Gen | 48 | 15 | 1 |
| Tongue River Agency Hosp | Gen | 47 | 15 | 34 |
| Lame Deer City County | Gen | | | |
| Detention Hospital Great Falls | TB Iso | 35 | 10 | 12 |
| Private | | | | |
| Sidney Deaconess Hospital, Sidney | Gen | 24 | 5 | 1 |
| Totals | 622 | 110 | 126 | 54 |

NEBRASKA

| | | | | |
|--|------|-----|-----|-----|
| Federal—U S V B | | | | |
| Veterans Admin Facility Lincoln | Gen | 107 | 25 | 40 |
| U S A | | | | |
| Winnebago Indian Hosp | Gen | 53 | 15 | 60 |
| Nebraska State Penitentiary Hospital Lincoln | Inst | 22 | 6 | 4 |
| County | | | | |
| Douglas County Hospital Omaha | Gen | 400 | 90 | 93 |
| City | | | | |
| Lincoln General Hospital Lincoln | Gen | 140 | 8 | 6 |
| Private | | | | |
| St Elizabeth's Hospital Lincoln | Gen | 175 | | 15 |
| St Catherine of Siena Hosp McCook | Gen | 60 | | 2 |
| Morrow and Clarke Hospital Seward | Gen | 20 | 3 | |
| Totals | 1077 | 147 | 220 | 121 |

NEVADA

| | | | | |
|-----------------------------------|-----|-----|----|----|
| Federal—U S A | | | | |
| Carson Indian Hospital Stewart | Gen | 32 | | 17 |
| County | | | | |
| Mineral County Hospital Hawthorne | Gen | 15 | | 4 |
| Washoe General Hospital Reno | Gen | 153 | 10 | 7 |
| Lyon County Hospital Yerington | Gen | 18 | 8 | 3 |
| Totals | 251 | 18 | 24 | 15 |

NEW HAMPSHIRE

| | | | | |
|--|-------|------|----|----|
| Federal—U S N | | | | |
| U S Naval Hospital Portsmouth | Gen | 150 | | 8 |
| State | | | | |
| New Hampshire State Hosp Concord | Ment | 1900 | 20 | |
| Private | | | | |
| Mary Hitchcock Memorial Hospital Hanover | Gen | 123 | | 8 |
| Totals | 2,223 | 20 | 10 | 18 |

NEW JERSEY

| | | | | |
|---|--------|-------|-------|-----|
| Federal—U S V B | | | | |
| Veterans Admin Facility Lyons | Ment | 895 | 27 | 7 |
| State | | | | |
| New Jersey State Hospital Greystone Park | Men | 4520 | 131 | 43 |
| New Jersey State Prison Hospital Trenton | Inst | 45 | 12 | 5 |
| State Home for Girls Trenton | Inst | 50 | | 9 |
| New Jersey State Village for Epileptics Skillman | Epil | 1,357 | 18 | |
| County | | | | |
| Essex County Hospital for Contagious Diseases Belvidere | Iso | 550 | 30 | |
| Bergen Pines Bergen County Hospital Ridgewood | TB Iso | 380 | 220 | 292 |
| Essex County Hospital Cedar Grove | Ment | 2,427 | 102 | 8 |
| City | | | | |
| Trenton Municipal Hospital Trenton | Iso | 404 | 108 | 53 |
| Passaic Municipal Hospital Passaic | Iso | 20 | 4 | 3 |
| Paterson City Hospital Paterson | TB Iso | 110 | 30 | 12 |
| Irvington General Hospital Irvington | Gen | 79 | 12 | 1 |
| Jersey City Hospital Jersey City | Gen | 900 | 75 | 390 |
| Private | | | | |
| Bayonne Hospital and Dispensary Bayonne | Gen | 170 | | 55 |
| Alexian Brothers Hospital Elizabeth | Gen | 105 | | 10 |
| St Mary Hospital, Hoboken | Gen | 430 | 8 | 57 |
| Dr E C Hazard Hosp Long Branch | Gen | 80 | 12 | 23 |
| St Peter's General Hosp New Brunswick | Gen | 164 | 33 | 37 |
| St Mary's Hospital Orange | Gen | 125 | | 9 |
| Children's Seashore House Atlantic City | Orth | 875 | | 87 |
| Totals | 13,266 | 680 | 1,133 | 818 |

NEW MEXICO

| | | | | |
|-------------------------------------|------|-----|-----|-----|
| Federal—U S V B | | | | |
| Veterans Admin Facility Albuquerque | G&TB | 259 | 105 | 247 |
| Veterans Admin Facility Ft Bayard | G&TB | 450 | 321 | 144 |
| U S A | | | | |
| U S Indian School Hosp Albuquerque | Gen | 74 | | 23 |
| Zuni Sanatorium Black Rock | Gen | 15 | | |

NEW MEXICO—Continued

| | | | | |
|--|-------|-----|-----|-----|
| Eastern Navajo Agency Hospital, Crownpoint | Gen | 24 | | 33 |
| Jicarilla Agency Hospital Dulce | Gen | 19 | 8 | 13 |
| Mescalero Indian Hospital Mescalero | Gen | 31 | 12 | 8 |
| Northern Navajo Hospital Shiprock | Gen | 44 | | 60 |
| Private | | | | |
| St Joseph Sanatorium and Hospital Albuquerque | G&TB | 196 | 93 | 84 |
| Southwestern Presbyterian Sanatorium Albuquerque | G&TB | 130 | 80 | 120 |
| St Anthony's Sanitarium and Hospital Las Vegas | G&TB | 46 | 20 | 7 |
| St Vincent's Sanatorium and Hospital Santa Fe | G&TB | 80 | 90 | 14 |
| St Joseph Hospital Clayton | Gen | 20 | | 12 |
| Rehoboth Mission Hospital Rehoboth | Gen | 30 | | 10 |
| A T & S F Hospital Albuquerque | Indus | 67 | 16 | 49 |
| A T & S F Hospital Clovis | Indus | 32 | | 5 |
| Totals | 1,677 | 633 | 844 | 361 |

NEW YORK

| | | | | |
|--|---------|-------|-----|-------|
| Federal—U S A | | | | |
| Station Hospital Ft Slocum | Gen | 155 | | 3 |
| U S A | | | | |
| U S Naval Hospital, Brooklyn | Gen | 843 | 27 | 12 |
| U S P H S | | | | |
| U S Marine Hospital Buffalo | Gen | 75 | 4 | 16 |
| U S Marine Hospital New York City | Gen | 540 | 130 | 43 |
| U S V B | | | | |
| Veterans Admin Facility Batavia | Gen | 297 | | 20 |
| Veterans Admin Facility New York City | Gen | 900 | 62 | 133 |
| Veterans Admin Facility Northport | Ment | 1,332 | 40 | 3 |
| State | | | | |
| New York State Reconstruction Home West Haverstraw | Orth | 310 | | 3 |
| Mattawan State Hospital Beacon | Ment | 1,275 | | 8 |
| Binghamton State Hosp Binghamton | Ment | 2,974 | 100 | 8 |
| Buffalo State Hospital Buffalo | Ment | 2,764 | 40 | 7 |
| Central Islip State Hosp Central Islip | Ment | 7,240 | 100 | 27 |
| Dannemora State Hospital Dannemora | Ment | 965 | | |
| Gowanda State Homeopathic Hospital Helmuth | Ment | 1,303 | 60 | 6 |
| Kings Park State Hosp Kings Park | Ment | 4,651 | 106 | 57 |
| Marcy State Hospital Marcy | Ment | 2,633 | 150 | |
| Middletown State Homeopathic Hospital Middletown | Ment | 3,097 | 100 | |
| Institution for Male Defective Delinquents Japanech | McDe | 965 | 4 | 4 |
| Newark State School Newark | McDe | 1,822 | 8 | 4 |
| Manhattan State Hosp New York City | Ment | 3,433 | 134 | 53 |
| St Lawrence State Hosp Ogdensburg | Ment | 2,317 | 104 | |
| Rockland State Hospital Orangeburg | Ment | 3,750 | | 23 |
| Hudson River State Hospital Poughkeepsie | Ment | 4,378 | 168 | 33 |
| Rochester State Hospital Rochester | Ment | 2,168 | 75 | |
| Rome State School Rome | McDe | 2,767 | 120 | 87 |
| Syracuse Psychopathic Hosp., Syracuse | Ment | 60 | | 4 |
| Syracuse State School Syracuse | McDe | 1,083 | | 1 |
| Letchworth Village Thells | McDe | 2,850 | 8 | |
| Utica State Hospital Utica | Ment | 1,640 | | 1 |
| Willard State Hospital Willard | Ment | 2,692 | 31 | |
| Harlem Valley State Hosp Wingdale | Ment | 3,972 | 154 | 100 |
| Auburn State Prison Hosp Auburn | Inst | 50 | 6 | |
| Clinton Prison General and Tuberculosis Hospital Dannemora | Inst | 230 | 167 | 15 |
| Sing Sing Prison Hospital, Ossining | Inst | 100 | | 24 |
| Craig Colony Sonoma | Epil | 2,120 | 100 | |
| County | | | | |
| Oneida County Hospital Rome | Gen | 213 | | 23 |
| Grasslands Hospital Valhalla | Gen | 833 | 333 | 456 |
| Onondaga County Hosp Onondaga | GenAged | 164 | | 7 |
| Rensselaer County Hospital Troy | Chronic | 63 | | 2 |
| City | | | | |
| Buffalo City Hospital Buffalo | Gen | 1,020 | 324 | 434 |
| City | | | | |
| Kingston Avenue Hospital Brooklyn | Iso | 410 | 72 | 165 |
| Riverside Hospital New York City | TB Iso | 332 | 284 | 679 |
| Willard Parker Hosp New York City | TB Iso | 494 | 134 | 665 |
| Binghamton City Hosp Binghamton | Gen | 460 | | 118 |
| Cumberland Hospital Brooklyn | Gen | 254 | 200 | 1,457 |
| Kings County Hospital Brooklyn | Gen | 3,190 | 174 | 3,304 |
| Bellevue Hospital New York City | Gen | 2,313 | | 549 |
| Harlem Hospital New York City | Gen | 273 | 308 | 1,229 |
| Metropolitan Hospital New York City | Gen | 1,562 | | 330 |
| Morrisania City Hosp New York City | Gen | 471 | | 13 |
| Utica General Hospital Utica | Gen | 127 | | |
| New York City Children's Hospital New York City | McDe | 808 | | 116 |
| Harts Island Prison Hospital New York City | Inst | 69 | 31 | 94 |
| Bellevue Settlement House New York City | ConvTB | 22 | 22 | 43 |
| Private | | | | |
| Metropolitan Life Insurance Company Sanatorium Mt McGregor | G&TB | 300 | 204 | 73 |
| Albany Hospital Albany | Gen | 545 | 120 | 147 |
| Auburn City Hospital Auburn | Gen | 133 | | 12 |
| Beth El Hospital Brooklyn | Gen | 190 | | 24 |
| St John's Hospital Brooklyn | Gen | 204 | | 12 |
| Trinity Hospital, Brooklyn | Gen | 110 | | 133 |
| Buffalo General Hospital Buffalo | Gen | 439 | | |

| | Type of Service | Total Capacity of Hospital | Tuberculosis Department | | |
|--|-----------------|----------------------------|-------------------------|-------------------|------------------|
| | | | Beds | Patients Admitted | Patients Present |
| NEW YORK—Continued | | | | | |
| Willard Fillmore Hospital Buffalo | Gen | 220 | | 96 | 1 |
| Charles B. Wilson Memorial Hospital Johnson City | Gen | 184 | | 29 | 2 |
| Lenox Hill Hospital, New York City | Gen | 614 | 44 | 143 | 44 |
| Manhattan General Hospital New York City | Gen | 138 | 17 | 74 | 3 |
| Mount Sinai Hospital New York City | Gen | 780 | 8 | | |
| St. Francis Hospital New York City | Gen | 42 | | 33 | 2 |
| Nyack Hospital Nyack | Gen | 83 | | 4 | 2 |
| Northern Dutchess Health Service Center Rhinebeck | Gen | 30 | 4 | 2 | 0 |
| Genesee Hospital Rochester | Gen | 163 | | 19 | 2 |
| Roma Infirmary Rome | Gen | 50 | 10 | 1 | 0 |
| Ballers Snug Harbor Hospital, Staten Island | Gen | 200 | 12 | 1 | 2 |
| Ataulfo and Louis Heinsheimer Memorial Fat Rockaway | Orth | 60 | 60 | 112 | |
| Blythedale Hospital and Home for Crippled Children, Valhalla | Orth | 73 | | | |
| New York Orthopaedic Dispensary and Hospital White Plains | Orth | 160 | | | |
| Montefiore Hospital for Chronic Diseases New York City | Chronic | 711 | 164 | 264 | 167 |
| Totals | | 89,737 | 4,680 | 11,834 | 4,481 |

| | | | | | |
|--|-------|--------------|------------|-----------|-----------|
| NORTH CAROLINA | | | | | |
| Federal—U.S.A. | | | | | |
| Station Hospital, Ft. Bragg | Gen | 83 | | 5 | 1 |
| State | | | | | |
| North Carolina Orthopedic Hospital, Gastonia | Orth | 160 | 60 | | |
| State Hospital (col.), Goldsboro | Ment | 1,919 | 70 | | 40 |
| State Hospital, Raleigh | Ment | 2,275 | 30 | 3 | 24 |
| County | | | | | |
| Gaston County Colored Hospital, Gastonia | Gen | 11 | 7 | 2 | 1 |
| Wake County Home Hosp., Raleigh | Inst | 115 | 0 | 2 | 2 |
| Private | | | | | |
| Jubilee Hospital (col.), Henderson | Gen | 33 | | 10 | 2 |
| Martin Memorial Hospital, Mt. Airy | Gen | 44 | | | 1 |
| Atlantic Coast Line Hospital, Rocky Mount | Indus | 60 | | 7 | 1 |
| Totals | | 4,680 | 171 | 29 | 72 |

| | | | | | |
|--|------|--------------|-----------|------------|-----------|
| NORTH DAKOTA | | | | | |
| Federal—U.S.A. | | | | | |
| Turtle Mountain Hospital, Belcourt | G&TB | 12 | 14 | 49 | 7 |
| Fort Totten Hospital, Fort Totten | Gen | 31 | 4 | 22 | 2 |
| State | | | | | |
| Grafton State School, Grafton | McDe | 784 | 10 | | 7 |
| North Dakota State Hospital for Insane, Jamestown | Ment | 2,600 | 25 | 3 | 10 |
| North Dakota State Penitentiary Hospital, Bismarck | Inst | 30 | 10 | 3 | 0 |
| Private | | | | | |
| St. Joseph's Hospital, Minot | Gen | 60 | 3 | 10 | 1 |
| Wahpeton Hospital, Wahpeton | Gen | 23 | | 2 | 1 |
| Mercy Hospital, Williston | Gen | 70 | | 6 | 2 |
| Totals | | 3,086 | 70 | 100 | 30 |

| | | | | | |
|--|------|-------|-----|-----|-----|
| OHIO | | | | | |
| Federal—U.S.P.H.S. | | | | | |
| U.S. Marine Hospital, Cleveland | Gen | 241 | 23 | 4 | 12 |
| U.S.V.B. | | | | | |
| Veterans Admin. Facility, Dayton | Gen | 1,104 | 240 | 522 | 176 |
| Veterans Admin. Facility, Chillicothe | Ment | 944 | | 3 | 20 |
| State | | | | | |
| Athens State Hospital, Athens | Ment | 1,641 | 153 | | 78 |
| Longview State Hospital, Cincinnati | Ment | 2,343 | 30 | 5 | 64 |
| Columbus State Hospital, Columbus | Ment | 2,846 | 60 | | 60 |
| Dayton State Hospital, Dayton | Ment | 1,689 | 69 | 0 | 82 |
| Lima State Hospital, Lima | Ment | 1,133 | 41 | | 29 |
| Massillon State Hospital, Massillon | Ment | 2,330 | 88 | 8 | 41 |
| Institution for Feeble-minded, Orient | McDe | 2,600 | | 25 | 25 |
| Toledo State Hospital, Toledo | Ment | 2,532 | 40 | | 32 |
| Ohio Penitentiary Hospital, Columbus | Inst | 182 | 31 | 180 | 31 |
| Girls Industrial School Hosp., Delaware | Inst | 32 | 3 | 11 | 2 |
| Ohio State Reformatory, Mansfield | Inst | 91 | 10 | 31 | 6 |
| Ohio Soldiers and Sailors Home Hospital, State Soldiers Home | Inst | 200 | | 3 | 1 |
| Ohio Hospital for Epileptics, Gallipolis | Epil | 1,917 | 26 | | |
| County | | | | | |
| Butler County Home, Hamilton | Inst | 170 | 20 | 23 | 5 |
| City | | | | | |
| City Hospital, Akron | Gen | 712 | | 63 | 1 |
| Cincinnati General Hospital, Cincinnati | Gen | 450 | | 71 | 20 |
| City Hospital, Cleveland | Gen | 1,640 | 24 | 576 | 24 |
| Private | | | | | |
| Bethesda Hospital, Cincinnati | Gen | 109 | | 21 | 1 |
| Good Samaritan Hospital, Cincinnati | Gen | 463 | 6 | 50 | 5 |
| Charity Hospital, Cleveland | Gen | 221 | 14 | 75 | 14 |
| Frangelical Deaconess Hosp., Cleveland | Gen | 103 | 24 | 4 | 13 |
| Fairview Park Hospital, Cleveland | Gen | 6 | 11 | 15 | 11 |
| Glenville Hospital, Cleveland | Gen | 83 | | 4 | 1 |
| Polysynic Hospital, Cleveland | Gen | 90 | | 23 | 20 |
| St. Alexis Hospital, Cleveland | Gen | 220 | 23 | 20 | 19 |
| St. Anthony's Hospital, Columbus | Gen | 220 | 8 | 14 | 6 |
| White Cross Hospital, Columbus | Gen | 210 | 16 | 23 | 2 |
| St. Elizabeth Hospital, Dayton | Gen | 230 | 20 | 84 | 20 |
| Toledo Hospital, Toledo | Gen | 200 | 24 | 29 | 6 |
| St. Elizabeth's Hospital, Youngstown | Gen | 216 | 7 | 3 | 4 |

| | | | | | |
|--|------|---------------|--------------|--------------|--------------|
| OHIO—Continued | | | | | |
| St. Luke's Convalescent Hospital for Children, Cleveland | Orth | 62 | | | 4 |
| Children's Convalescent Home, Cincinnati | Conv | 100 | | 0 | 6 |
| Totals | | 23,315 | 1,396 | 2,264 | 1,180 |

| | | | | | |
|---|------|--------------|------------|------------|------------|
| OKLAHOMA | | | | | |
| Federal—U.S.V.B. | | | | | |
| Veterans Admin. Facility, Muskogee | Gen | 447 | 61 | 131 | 54 |
| U.S.A. | | | | | |
| Klown Indian Hospital, Lawton | Gen | 101 | 12 | 117 | 7 |
| Pawnee-Ponca Hospital, Pawnee | Gen | 47 | 12 | 30 | 4 |
| State | | | | | |
| Central Oklahoma State Hospital, Norman | Ment | 2,500 | 30 | | |
| Western Oklahoma Hospital Supply | Ment | 1,275 | 20 | | 15 |
| Eastern Oklahoma Hospital, Vinita | Ment | 2,360 | 60 | 30 | 37 |
| Oklahoma State Prison Hospital, McAlester | Inst | 50 | | 21 | 4 |
| City | | | | | |
| Okmulgee City Hospital, Okmulgee | Gen | 75 | | 2 | 2 |
| Private | | | | | |
| Mason Hospital, Cherokee | Gen | 50 | | 2 | 1 |
| Oklahoma Baptist Hospital, Muskogee | Gen | 80 | | 1 | 1 |
| Great Western Hospital (col.), Oklahoma City | Gen | 21 | 3 | 2 | 2 |
| Oklahoma City General Hospital, Oklahoma City | Gen | 100 | | 20 | 2 |
| Ponca City Hospital, Ponca City | Gen | 60 | | 3 | 1 |
| Morningside Hospital, Tulsa | Gen | 220 | | 20 | 1 |
| Totals | | 7,791 | 193 | 439 | 131 |

| | | | | | |
|--|------|--------------|------------|------------|------------|
| OREGON | | | | | |
| Federal—U.S.V.B. | | | | | |
| Veterans Admin. Facility, Portland | Gen | 330 | 32 | 48 | 29 |
| U.S.A. | | | | | |
| Klamath Indian Hosp., Klamath Agency, Coos Bay | Gen | 23 | 2 | 6 | 1 |
| State | | | | | |
| Oregon State Hospital, Salem | Ment | 2,300 | | 6 | 60 |
| Oregon Fairview Home, Salem | McDe | 915 | 15 | 4 | 10 |
| County | | | | | |
| Multnomah Hospital, Portland | Gen | 300 | 40 | 60 | 30 |
| Private | | | | | |
| Columbia Hospital, Astoria | Gen | 91 | | 2 | 1 |
| Holy Rosary Hospital, Ontario | Gen | 30 | | 6 | 1 |
| Morningside Hospital, Portland | Ment | 306 | 20 | | 24 |
| Totals | | 4,705 | 109 | 132 | 109 |

| | | | | | |
|--|---------|-------|-----|-------|-----|
| PENNSYLVANIA | | | | | |
| Federal—U.S.N. | | | | | |
| U.S. Naval Hospital, Philadelphia | Gen | 540 | | 50 | 6 |
| U.S.P.H.S. | | | | | |
| U.S. Public Health Service Hospital, Lewisburg | Gen | 100 | 12 | 12 | 4 |
| U.S. Marine Hospital, Pittsburgh | Gen | 73 | | 8 | 2 |
| U.S.V.B. | | | | | |
| Veterans Admin. Facility, Aspinwall | G&TB | 501 | 181 | 370 | 177 |
| Veterans Admin. Facility, Coatesville | Ment | 1,132 | 42 | 20 | 11 |
| State | | | | | |
| Hospital of the University of Pennsylvania, Philadelphia | Gen | 562 | | 37 | 2 |
| Phillipsburg State Hospital, Phillipsburg | Gen | 100 | | 10 | 1 |
| Hospital for Crippled Children, Elizabethtown | Orth | 120 | | | |
| Allentown State Hospital, Allentown | Ment | 1,510 | 80 | 20 | 90 |
| Danville State Hospital, Danville | Ment | 1,947 | 83 | | 43 |
| Harrisburg State Hospital, Harrisburg | Ment | 1,833 | | | 132 |
| Laurelton State Village, Laurelton | McDe | 600 | 0 | 2 | 8 |
| Norristown State Hospital, Norristown | Ment | 3,490 | 150 | | |
| Pennhurst State School, Pennhurst | McDe | 1,603 | 300 | | 10 |
| Polk State School, Polk | McDe | 3,006 | 16 | 30 | 10 |
| Torrance State Hospital, Torrance | Ment | 1,497 | 22 | | |
| Fairview State Hospital, Waymart | Ment | 708 | 24 | | 20 |
| Wernersville State Hosp., Wernersville | Ment | 1,400 | 80 | 13 | 70 |
| Eastern State Penitentiary Hospital, Philadelphia | Inst | 81 | | 6 | 8 |
| Western Penitentiary Hosp., Pittsburgh | Inst | 20 | 8 | 6 | 4 |
| County | | | | | |
| Retreat Mental Hospital, Retreat | N&M | 1,000 | 40 | | 90 |
| Schuylkill County Hospital for Mental Diseases, Schuylkill Haven | Ment | 400 | | | 0 |
| Allegheny County Home and Hospital for the Insane, Woodville | Ment | 2,636 | 300 | 707 | 200 |
| Erle County Home, Tuberculosis Annex, Girard | Inst&TB | 32 | 32 | 4 | 20 |
| Retreat Home and Hospital for Chronic Diseases, Retreat | Inst | 130 | 25 | | 20 |
| Schuylkill County Almshouse Hospital, Schuylkill Haven | Inst | 165 | 8 | | |
| City | | | | | |
| Philadelphia County Prison Hospital (Holmesburg), Philadelphia | Inst | 50 | 14 | 14 | 6 |
| City | | | | | |
| Municipal Hospital, Johnstown | Iso | 60 | 12 | 4 | 0 |
| Philadelphia General Hosp., Philadelphia | Gen | 2,500 | 465 | 1,620 | 312 |
| Pittsburgh City Home and Hospital, Mayview | G&N&M | 896 | 133 | 139 | 140 |
| Private | | | | | |
| Abington Memorial Hosp., Abington | Gen | 242 | | 45 | 2 |
| Coatesville Hospital, Coatesville | Gen | 97 | 2 | 5 | 0 |
| Elizabethtown Mercy Hospital, Darby | Gen | 200 | 10 | 15 | 1 |
| Easton Hospital, Easton | Gen | 190 | | 22 | 2 |
| Latrobe Hospital, Latrobe | Gen | 65 | | 6 | 1 |

| PENNSYLVANIA—Continued | Type of Service | Total Capacity of Hospital | Tuberculosis Department | | |
|--|-----------------|----------------------------|-------------------------|-------------------|------------------|
| | | | Beds | Patients Admitted | Patients Present |
| Henry Clay Frick Memorial Hospital Mt Pleasant | Gen | 60 | | 2 | 1 |
| Frederick Douglass Memorial Hospital (col) Philadelphia | Gen | 61 | 15 | 40 | 15 |
| Germantown Dispensary and Hospital, Philadelphia | Gen | 310 | | 67 | 15 |
| Hahnemann Hospital Philadelphia | Gen | 515 | | 40 | 1 |
| Hospital of the Protestant Episcopal Church Philadelphia | Gen | 48 | 6 | 17 | 3 |
| Hospital of the Woman's Medical College of Pennsylvania Philadelphia | Gen | 146 | | 40 | 0 |
| Jefferson Medical College Hospital Philadelphia | Gen | 631 | 40 | 153 | 40 |
| Mercy Hospital (col) Philadelphia | Gen | 100 | | 43 | 4 |
| Presbyterian Hospital Philadelphia | Gen | 383 | | 36 | 1 |
| Temple University Hosp., Philadelphia | Gen | 300 | 4 | | 4 |
| Allegheny General Hosp. Pittsburgh | Gen | 370 | | 81 | 7 |
| Mercy Hospital Pittsburgh | Gen | 622 | | 102 | 5 |
| St Francis Hospital Pittsburgh | Gen | 500 | | 38 | 1 |
| Flk County General Hosp. Ridgway | Gen | 60 | | 2 | 1 |
| Robert Packer Hospital Sayre | Gen | 231 | | 18 | 1 |
| Washington Hospital, Washington | Gen | 138 | | 3 | 1 |
| Windber Hospital Windber | Gen | 107 | | 16 | 3 |
| Dixmont Hospital Dixmont | N&M | 1 000 | 72 | | 71 |
| Elwyn Training School Elwyn | McDe | 1 045 | 60 | | |
| St Barnabas Free Home Gibsonia | Inc | 100 | | | 4 |
| Children's Hospital, Philadelphia | Chil | 130 | | 17 | 11 |
| Totals | | 36 077 | 2 004 | 3 686 | 1,507 |

| RHODE ISLAND | | | | | |
|---|--------|-------|----|-----|-----|
| Federal—U S N | | | | | |
| U S Naval Hospital Newport | Gen | 227 | | 3 | 3 |
| State | | | | | |
| State Infirmary Howard | Gen | 1 004 | | 10 | 7 |
| State Hospital for Mental Diseases Howard | Ment | 2,301 | | 8 | |
| Rhode Island State Prison Hospital Howard | Inst | 24 | | 3 | 2 |
| City | | | | | |
| Charles V Chapin Hosp., Providence | TB Iso | 265 | 60 | 160 | 53 |
| Private | | | | | |
| Newport Hospital, Newport | Gen | 150 | | 2 | 4 |
| Totals | | 3 971 | 60 | 191 | 154 |

| SOUTH CAROLINA | | | | | |
|--|------|-------|-----|-----|-----|
| State | | | | | |
| South Carolina State Hosp Columbia | Ment | 3 454 | | | 81 |
| County | | | | | |
| Spartanburg General Hospital Spartanburg | Gen | 240 | 98 | 48 | 31 |
| Private | | | | | |
| Berkeley County Hosp Moncks Corner | G&TB | 51 | 22 | 36 | 13 |
| Roper Hospital Charleston | Gen | 20 | 10 | 103 | 14 |
| St. Francis Xavier Infirmary Charleston | Gen | 50 | | 4 | 2 |
| South Carolina Baptist Hospital Columbia | Gen | 95 | | 11 | 2 |
| Totals | | 4 201 | 130 | 202 | 143 |

| SOUTH DAKOTA | | | | | |
|--|-----|-----|-----|-----|----|
| Federal—U S V B | | | | | |
| Veterans Admin Facility, Hot Springs | Gen | 230 | 90 | 103 | 46 |
| U S A | | | | | |
| Ohayenne River Indian Hospital Ohayenne Agency | Gen | 40 | | 23 | 3 |
| Maroon Indian Hospital Ft Thompson | Gen | 14 | | 30 | 1 |
| Pine Ridge Hospital Pine Ridge | Gen | 58 | 15 | 81 | 11 |
| Totals | | 342 | 105 | 242 | 61 |

| TENNESSEE | | | | | |
|---|------|-------|-----|-----|-----|
| Federal—U S V B | | | | | |
| Veterans Admin Facility Johnson City | Gen | 565 | 27 | | 20 |
| Veterans Admin Facility, Memphis | Gen | 400 | 44 | 111 | 31 |
| State | | | | | |
| Western State Hospital Bolivar | Ment | 1,800 | 40 | 35 | 40 |
| Eastern State Hospital Knoxville | Ment | 1 445 | 13 | | 106 |
| Central State Hospital Nashville | Ment | 1 700 | 54 | | 40 |
| Tennessee State Prison Hosp Nashville | Inst | 128 | 00 | 27 | 25 |
| Private | | | | | |
| Uplands Cumberland Mountain Sanatorium Pleasant Hill | G&TB | 20 | 6 | 16 | 3 |
| Geo W Hubbard Hospital of Meharry Medical College (col) Nashville | Gen | 147 | 2 | | 1 |
| Wiggins Clinic, Paris | Gen | 12 | | 2 | 1 |
| Junior League Home for Crippled Children Nashville | Orth | 36 | | 6 | 5 |
| Totals | | 6,308 | 398 | 197 | 272 |

| TEXAS | | | | | |
|---|------|-------|-----|-----|-----|
| Federal—U S A. | | | | | |
| William Beaumont General Hospital El Paso | Gen | 512 | 46 | 26 | 8 |
| Station Hospital Laredo | Gen | 2 | 4 | 0 | 0 |
| U S P H S | | | | | |
| U S Marine Hospital Galveston | Gen | 102 | 40 | 40 | 22 |
| U S V B | | | | | |
| Veterans Admin Facility Legion | G&TB | 433 | 433 | 397 | 244 |
| Veterans Admin Facility Waco | Ment | 334 | | | 5 |
| State | | | | | |
| Austin State School Austin | McDe | 1 140 | | 9 | 6 |
| Rusk State Hospital, Rusk | Ment | 1 987 | | 10 | 57 |
| San Antonio State Hosp San Antonio | Ment | 2,321 | 137 | | 120 |

| TEXAS—Continued | | | | | |
|--|--------|--------|-----|-----|----|
| Terrell State Hospital Terrell | | | | | |
| Wichita Falls State Hospital, Wichita Falls | Ment | 2,220 | 15 | 1 | 2 |
| Texas State Prison Hosp Huntsville | Inst | 2 050 | 50 | 18 | 4 |
| Arlens State Hospital Abilene | Epil | 42 | 4 | 38 | |
| County | | | | | |
| Northwest Texas Hospital, Amarillo | Gen | 1 082 | 30 | | 2 |
| Kleberg County Hospital Kingsville | Gen | 70 | 9 | 17 | |
| Bexar County Home for the Aged and Bexar County Tuberculosis Colony Southton | InstTB | 50 | 8 | | |
| City County | | | | | |
| El Paso City County Hospital El Paso | Gen | 72 | 72 | 93 | 7 |
| Jefferson Davis Hospital Houston | Gen | 150 | 31 | 110 | 1 |
| City | | | | | |
| John Sealy Hospital, Galveston | Gen | 180 | | 132 | |
| Private | | | | | |
| Baylor University Hospital Dallas | Gen | 350 | 16 | | 1 |
| Denison City Hospital Denison | Gen | 300 | | 26 | |
| Hotel Dieu Sisters Hospital El Paso | Gen | 2 | 4 | 12 | |
| All Saints Episcopal Hosp Ft Worth | Gen | 100 | | 16 | |
| St Mary's Infirmary Galveston | Gen | 8 | | 4 | |
| Santa Rosa Hospital San Antonio | Gen | 160 | | | |
| Wichita Falls Clinic Hospital Wichita Falls | Gen | 342 | | 23 | |
| Totals | | 14,368 | 894 | 994 | 68 |

| UTAH | | | | | |
|---|-----|-----|----|-----|----|
| Federal—U S V B | | | | | |
| Veterans Admin Facility Salt Lake City | Gen | 103 | | 26 | 1 |
| U S A | | | | | |
| Utah and Ouray Agency Indian Hospital Ft Duchesne | Gen | 18 | | 8 | 1 |
| County | | | | | |
| Salt Lake General Hospital Salt Lake City | Gen | 22 | 22 | 44 | 21 |
| Private | | | | | |
| Park City Miners Hosp Park City | Gen | 50 | 6 | 10 | 1 |
| St Mark's Hospital Salt Lake City | Gen | 123 | 16 | 38 | 15 |
| Totals | | 510 | 64 | 126 | 38 |

| VERMONT | | | | | |
|-----------------------------------|-----|-----|--|----|---|
| Private | | | | | |
| Mary Fletcher Hospital Burlington | Gen | 130 | | 97 | 1 |
| Totals | | 130 | | 97 | 1 |

| VIRGINIA | | | | | |
|--|--------|--------|-----|-----|----|
| Federal—U S N | | | | | |
| Norfolk Naval Hospital Portsmouth | Gen | 613 | | 17 | 15 |
| U S P H S | | | | | |
| U S Marine Hospital Norfolk | Gen | 300 | 20 | 36 | 12 |
| U S V B | | | | | |
| Veterans Admin Facility Veterans Administration Home | Gen | 810 | | 16 | 2 |
| State | | | | | |
| State Colony for Epileptics and Feeble-minded Colony | McDe | 1 000 | | | 23 |
| Central State Hosp (col) Petersburg | Ment | 3,081 | 90 | 40 | 75 |
| Western State Hospital Staunton | Ment | 2,600 | 100 | 10 | 60 |
| Eastern State Hospital Williamsburg | Ment | 1,544 | | 28 | 20 |
| State Farm Hospital State Farm | Inst | 100 | 40 | 28 | |
| City | | | | | |
| City Home Richmond | G&Inst | 525 | 52 | 57 | 13 |
| Private | | | | | |
| Alexandria Hospital Alexandria | Gen | 60 | | 3 | 1 |
| Totals | | 10 483 | 302 | 307 | 27 |

| WASHINGTON | | | | | |
|--|--------|-------|-----|-----|-----|
| Federal—U S A | | | | | |
| Station Hospital Ft Lewis | Gen | 160 | | 5 | 1 |
| U S N | | | | | |
| U S Naval Hospital Bremerton | Gen | 311 | | 13 | 4 |
| U S P H S | | | | | |
| U S Marine Hospital Seattle | Gen | 300 | 4 | 64 | 45 |
| U S Penitentiary Hosp Stellacoom | Inst | 72 | 16 | 18 | 5 |
| U S V B | | | | | |
| Veterans Admin Facility Walla Walla | G&TB | 400 | 168 | 133 | 100 |
| Veterans Admin Facility American Lake | Ment | 676 | 6 | | 5 |
| U S A | | | | | |
| Tacoma Hospital Tacoma | G&TB | 268 | 68 | 203 | 27 |
| State | | | | | |
| Eastern State Hospital Medical Lake | Ment | 1,532 | | 1 | 1 |
| Northern State Hosp Sedro Woolley | Ment | 1 600 | 27 | 5 | 27 |
| County | | | | | |
| King County Hospital Unit No 1 (Harborview) Seattle | Gen | 394 | | | 5 |
| City County | | | | | |
| Flrland Sanatorium and Isolation Hospital Richmond Highlands | TB Iso | 240 | 230 | 53 | 23 |
| Private | | | | | |
| Aberdeen General Hospital Aberdeen | Gen | 50 | | 11 | 1 |
| St Francis Hospital Bellingham | Gen | 17 | | 2 | 0 |
| St Luke's General Hospital Bellingham | Gen | 75 | | 10 | 1 |
| Seattle General Hospital Seattle | Gen | 100 | | 5 | |
| Memorial Hospital Sedro Woolley | Gen | 30 | | 17 | 4 |
| Tacoma General Hospital Tacoma | Gen | 220 | | 10 | 2 |
| St. Anthony's Hospital Wenatchee | Gen | 65 | | | |
| Shriners Hospital for Crippled Children Spokane | Orth | 20 | | 5 | 1 |
| Totals | | 6 640 | 480 | 691 | 63 |

PREVENTORIUMS (Sanatorium units for children not included)

INDEX FOR THE TUBERCULOSIS DATA

| PAGE | | | | | PAGE | | | | | PAGE | | | | |
|---|------|------|------|------|------|--|------|------|--|------|------|------|--|--|
| Admissions | 1860 | 1861 | 1865 | 1866 | 1869 | Health service for employes | 1881 | 1869 | Private sanatoriums by states | 1887 | | | | |
| Capacity of tuberculosis institutions by state and by control | 1859 | 1860 | | | | Income sources of | 1882 | 1882 | Purpose of survey | 1855 | | | | |
| Census of patients | 1862 | 1864 | | | | Industrial rehabilitation facilities for | 1858 | 1876 | Records medical | 1877 | 1879 | | | |
| Census of patients on day of reporting | 1863 | 1865 | | | | Isolation facilities for tuberculosis | 1858 | 1868 | Rehabilitation | 1876 | 1891 | | | |
| Children hospitalization of | | 1866 | | | | Laboratory tests and examinations | 1862 | 1873 | Research | | | | | |
| Children sanatoriums for | | 1870 | | | | Length of stay | 1863 | 1864 | Residences in tuberculosis | | | | | |
| City-county sanatoriums | | 1886 | | | | Library facilities | | 1877 | Roentgen examinations | | | | | |
| Control | 1856 | 1860 | 1882 | 1887 | | Medical facilities | 1870 | 1873 | Scope of survey | | | | | |
| Costs annual maintenance of tuberculosis institutions | 1879 | 1880 | | | | Medical service | | 1869 | Size of tuberculosis institutions | 1856 | 1868 | | | |
| Costs daily per capita of tuberculosis in institutions | 1879 | 1881 | | | | Men sanatoriums for | | 1870 | State sanatoriums | 1863 | 1884 | | | |
| Costs of tuberculosis hospitalization | 1879 | | | | | Method of survey | | 1855 | Summary by states | 1892 | 1899 | | | |
| County sanatoriums | 1882 | 1891 | | | | Municipal sanatoriums | 1885 | 1886 | Surgical facilities | | | | | |
| Dental service | 1884 | 1845 | | | | Necropses | | 1873 | Therapeutic procedures | | | | | |
| Discharge condition of patients on | 1866 | 1867 | | | | Negroes sanatoriums for | | 1870 | Tuberculosis departments of hospitals according to type of service | | | | | |
| Discharged patients | 1861 | 1863 | | | | Nurses training of in tuberculosis | | 1875 | Tuberculosis departments of hospitals list of | | | | | |
| Distribution number and size of tuberculosis institutions | 1856 | 1857 | 1858 | | | Patients training of | | 1876 | Tuberculosis isolation hospitals | | 1887 | 1888 | | |
| Educational activities | 1873 | 1877 | | | | Patients treated during twelve months period | | 1861 | Tuberculosis hospitals and sanatoriums list of | | | | | |
| Educational facilities for patients | | 1876 | | | | Paying status of patients | | 1882 | Valuation of sanatoriums according to size and control | | | | | |
| Federal tuberculosis departments and sanatoriums | | 1882 | 1883 | | | Personnel nonmedical | | 1868 | Valuation replacement of tuberculosis in institutions | | 1878 | 1879 | | |
| General hospitals tuberculosis departments of | | 1887 | 1889 | 1891 | | Personnel of civilian sanatoriums | | 1869 | Women sanatoriums for X ray facilities | | | | | |
| | | | | | | Physicians number of in tuberculosis sanatoriums | | 1868 | | | | | | |
| | | | | | | Pneumothorax | | 1870 | | | | | | |
| | | | | | | Population patient | | 1860 | | | | | | |
| | | | | | | Preventorium list of | | 1815 | | | | | | |
| | | | | | | Preventorium service | | 1891 | | | | | | |

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO, ILL

Cable Address

' Medic, Chicago

Subscription price

Seven dollars per annum in advance

Please send in promptly notice of change of address giving both old and new always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, DECEMBER 7, 1935

THE TUBERCULOSIS SURVEY

In this issue, THE JOURNAL presents a unique report of a survey of tuberculosis hospitals, sanatoriums, tuberculosis departments and preventoriums, which provides the most complete data yet obtained on the hospitalization of tuberculous patients in the United States. The report is a compilation of facts which lend themselves to comparative studies.

The purpose of the survey made by the Council on Medical Education and Hospitals was to give the medical profession a comprehensive picture of tuberculosis hospitalization in this country. The report will also assist in the registration of hospitals and sanatoriums and in their recognition for purposes of training physicians and nurses. It covers 471 tuberculosis hospitals and sanatoriums, 740 tuberculosis departments of hospitals and twenty-nine institutions classified as preventoriums, a total of 1,240 institutions.

The great number of classified facts presented in these pages was made possible by the cooperation of many persons and agencies, including the officers of the American Sanatorium Association and the National Tuberculosis Association, who assisted in the preparation of questionnaires and the direction of the survey and the officers of the institutions, 98.9 per cent of whom filled out and returned the questionnaire and who responded cordially to each of the 656 visits of inspection by the hospital examiners on the staff of the Council on Medical Education and Hospitals. Nearly all state departments of health and state tuberculosis associations contributed data from their offices not available elsewhere.

The survey shows that 95,198 beds are available for tuberculous patients throughout the states and there is an average of 69,024 patients. Construction planned or in progress will add another 6,661 beds.

The figures given were obtained within the calendar year 1934 and are for the twelve months preceding the date of the questionnaire. During that time 97,381 patients were discharged, including those who died. Reports of state departments of health and estimates based on the United States Census indicate that the

total deaths, institutional and otherwise, from all forms of tuberculosis in the year 1933 were 74,564. Among those treated for tuberculosis in institutions, 67,021 were adults. Of these cases 75 per cent were reported as "arrested," 9.8 per cent as "apparently arrested," 11.6 per cent as "quiescent," 30 per cent "improved," 17.2 per cent "unimproved," and 23.9 per cent of the patients died.

The ratio of physicians to patients is 1:28 in the Veterans tuberculosis hospitals, 1:52 in the Indian sanatoriums and 1:36 in the tuberculosis hospital operated by the U. S. Public Health Service, 1:62 in the state institutions, 1:51 in the county, 1:70 in the municipal, 1:60 in the city and county, and 1:32 in the private sanatoriums.

The total cost of all the facilities provided for tuberculosis in all institutions including the value of land, buildings and equipment and figured on the basis of replacement is around \$330,000,000. The average cost of these facilities in veterans' hospitals was \$4,000 per bed.

In most of the other institutions, both private and public, the cost per bed was less, but there are extremes in variation. In several instances, because of elaborate plans and expensive equipment, the cost of existing institutions has been as high as \$10,000 per bed, and one sanatorium built with public money cost \$13,043 per bed.

In hospitals maintaining tuberculosis departments, 225 provided separate buildings, 304 had segregated units and 211 failed to show what provision was made for segregation from nontuberculous patients. In tuberculosis sanatoriums the need for isolation facilities is attested by the admission of 12,629 children, 1,191 of whom had adult type tuberculosis, 6,659 the childhood type, 824 had extrapulmonary lesions, 3,236 were non-tuberculous and 701 were unclassified.

Four tuberculosis departments and 120 sanatoriums have separate buildings for children. In a few sanatoriums it was found that adults and children are allowed to associate in various ways. In a few cases children with pulmonary cases were hospitalized with children in the preventorium unit. Such conditions call for prompt corrective action.

The use of tuberculosis departments in general hospitals has been endorsed by the American Medical Association, the American Hospital Association and the National Tuberculosis Association. The endorsement, however, embodies a requirement of adequate segregation for the protection of other patients and personnel. In the crusade against tuberculosis, all institutions should keep pace with the advancing standards. There is need for increasing vigilance on the part of both specialists and general practitioners.

An attempt was not made at a relative rating of the individual institutions, but comment that would characterize the tuberculosis institutions of the United States in general would in most cases be commendatory.

GROWTH OF LONG BONES

The first observations on the growth of long bones were made by Stephen Hales,¹ whose extraordinary versatility in the field of science has generally been overshadowed by the emphasis placed on his discourses on the circulation. Among the numerous contributions of this clergyman and scientist is recorded an experiment performed in 1747 in which Hales drilled two holes in the shaft of the tibia of a chicken. Two months later the bone was examined and, although the shaft had increased an inch in length, the distance between the holes had remained the same. Hales observed that most of the lengthening of the bone had occurred at the proximal end and concluded that growth in the length of long bones results entirely from deposition of new bone at the extremities, the amount of the growth from the two ends was unequal. A little more than a century later, Ollier² reported the first clinical evidence of unequal growth from the two ends of long bones. He reported that when the knee joint had been resected the leg was considerably shorter than normal on reaching maturity, removal of the elbow joint under similar conditions produced little shortening of the arm.

Since these two early observations there have been many experimental and clinical reports describing the growth of long bones. However, the problem of measuring accurately the quantity of growth that takes place from each end of the principal long bones is a more difficult one. Methods and measurements have been devised and recorded, but well controlled actual measurements have been lacking. The recent detailed study by the Bisgards,³ however, leaves little to be desired in detail and accuracy of direct measurements of the longitudinal growth of long bones. These authors worked with new-born goats and thus obtained records of the entire postnatal period of growth. When the animals were from 2 to 5 days old, the bones were marked with steel shots placed in drill holes in the shafts. Roentgenograms were taken of the bones at the beginning and the end of the experiments and at intervals during the course of investigations extending over a twelve to eighteen months period, the span of major growth. Final measurements from which growth calculations were obtained by actual measurement of postmortem examinations. It was possible to determine the proportion of growth that takes place at each end of each principal long bone by placing the shots at a measured distance from the epiphyseal cartilages at the ends of the shaft. The periodic roentgenograms gave the serial representation of growth in the postmortem specimens the shots were exposed and exact measurements made of the distance between the shot and the end of each diaphysis. The differences between these measurements and those recorded at the

beginning of the experiment represented the distance that the epiphyseal lines had moved during growth away from the shots, which remained as fixed points to mark the original locations of the epiphyseal lines. It was observed that the lengthening of long bones, which occurs at the ends, takes place by the deposition of layers of new bone between the end of the diaphysis and the epiphyseal cartilage and between the articular cartilage and the epiphysis. The proportion of longitudinal growth from the two ends of a long bone was found to be unequal. The rate of growth remains constant during the first two months and then progresses at half its former rate. The epiphyseal cartilage, giving the lesser increment of growth, is the first to ossify and close.

These investigations of the postnatal growth of long bones are supplemented by similar studies of prenatal growth. In order to conduct the latter experiments, the Bisgards devised a method for marking the embryonic bones as soon after the beginning of ossification as possible. This was accomplished by producing phosphorus arrest lines in the bones of the fetus by feeding phosphorus to the mothers. The results of these experiments demonstrated that prenatal as well as postnatal longitudinal growth of the long bones takes place at the ends but that growth from the two ends is proportionately more equal before than after birth, particularly during the first portion of prenatal life.

THE IRON REQUIREMENT OF MAN

The necessity of iron for the formation of hemoglobin attaches considerable importance to the question of the amount of this element needed to satisfy the daily human requirement. Attempts to ascertain this value accurately were made more than thirty years ago by the use of the balance method, which involves the simultaneous daily determination of the amount of iron ingested in the food and the amount excreted in the feces and urine. When the quantity of iron ingested just equals the quantity excreted, the subject is said to be in "iron equilibrium", obviously, in the adult, such a state is a satisfactory one from a nutritional point of view and indicates that the diet employed contains a sufficient amount of the element in question. Moreover, the amount of iron that just suffices to maintain the subject in equilibrium represents the daily "iron requirement". If, however, the amount excreted exceeds the amount ingested, it is obvious that the diet does not contain sufficient iron to satisfy the requirement, and if the regimen should be continued a severe anemia may result. Such a situation is not uncommon in persons consuming a restricted type of diet.

Several early iron balance studies on man¹ demonstrated that equilibrium can be maintained in normal adult male subjects by diets providing as little as 10 mg of iron daily. In order to allow a margin of safety

1 Clark Kennedy A. E. Stephen Hales. An Eighteenth Century Biographer. Clark Kennedy. Cambridge University Press. 1929. p. 87 ff.

2 Ollier L. Y. E. L. Traité expérimentale et clinique de la régénération des os et de la production artificielle du tissu osseux. Paris G. Masson 1867. vol. 1.

3 Bisgard J. D. and Bisgard M. E. Longitudinal Growth of Long Bones. Arch. Surg. 31: 568 (Oct.) 1935.

1 Sherman H. C. Chemistry of Food and Nutrition. ed. 4. New York. Macmillan Company, 1932. p. 318.

for possible poor absorption or impaired utilization, the value of 15 mg a day was suggested as a satisfactory standard. Recently the problem has been reinvestigated in a somewhat more satisfactory manner, longer experimental periods being employed.² Two normal men were maintained on a diet of low iron content for 316 and 260 days respectively. During the latter part of the period the iron content of the daily food and excreta was determined quantitatively. The daily iron intake for one subject averaged 5.2 mg, the average daily excretion was about the same, 5.2 mg appearing in the feces and 0.02 mg in the urine. The other subject remained in equilibrium on a diet containing 7.8 mg of iron daily. The iron and hemoglobin content of the blood and the erythrocyte counts of these subjects remained within normal limits during the entire period of observation. Thus it appears that the actual daily iron requirement of the normal adult male is no greater than 5 mg. A similar recent study³ on two persons indicates that the requirement of the normal, nonpregnant adult female does not differ greatly from that of the male. However, it is possible that the amount may be slightly greater, for at least 12 mg of iron in the form of hemoglobin is lost during each menstrual period.²

Because of the added nutritional stress imposed by such factors as growth, pregnancy and lactation, it is reasonable to expect that a relatively larger amount of iron would be necessary to maintain a state of equilibrium in these conditions than in the normal adult. Indeed, studies on growing and pregnant subjects support this view. It has been demonstrated repeatedly⁴ that satisfactory equilibrium can be maintained in young children by diets providing 0.6 mg of iron per kilogram of body weight. During pregnancy, a daily iron intake of from 15 to 20 mg insures a satisfactory iron balance.⁵ Of this amount, from 2 to 6 mg daily is used to supply the demand of the growing fetus.

One point of considerable importance that has not been taken into consideration in iron balance studies is the proportion of the total iron ingested that is available for the formation of hemoglobin. If the food iron were in a form that could not be absorbed from the intestine, it obviously would appear in the feces and an apparent iron equilibrium would be maintained while in reality the subject would be experiencing iron "starvation" just as though this element were lacking in the diet. Both chemical and biologic studies⁶ have demon-

strated that the availability of iron for physiologic purposes varies widely in different foods. Less than one fourth of the iron present in oysters, spinach, alfalfa and blood is available for hemoglobin formation, whereas more than half of that present in beef muscle, liver, wheat, yeast, soy beans and oats is utilizable. The fact that the entire amount of iron in some foods is not available to the organism warrants the suggestion that the iron content of a satisfactory diet should exceed by a liberal margin the minimal amount actually found to satisfy the human iron requirement when the element is supplied in a readily available form.

Current Comment

CLIMATE IN RELATION TO PULMONARY TUBERCULOSIS

The role assumed by climate in the treatment of this case has been both interesting and puzzling.¹ The effect of individual variation on the course of a disease allows only one means of study of a factor such as climate, viz, the statistical. The problem with regard to tuberculosis has been recently studied from this angle by Cowles and Chapman.² The data used and the method of attack were carefully considered with regard both to the underlying figures and to statistical reliability. The final study was based on the records of more than 150,000 deaths from pulmonary tuberculosis among the white populations of forty-two states. In the analysis, nineteen elements were considered which, on the basis of a priori reasoning, might be expected to influence the tuberculosis death rate. These included both climatic and nonclimatic factors. By a series of highly technical statistical analyses, six primary variants were included in the final multiple correlation. There was thus conclusive evidence of the independent significance of the factors of (1) percentage of Negroes in the population, (2) percentage of the illiterate, (3) hours of sunshine, and there was strong evidence of the significance of (4) school expense, (5) altitude and (6) occupational index. There was no contention, however, that the probabilities involved afford conclusive evidence as to specific causes, since there is always the possibility that the elements identified as apparently significant may simply be correlated highly with the true etiologic factors. The results indicate that climatic factors are of independent significance, although less so than the nonclimatic. The percentage of Negro population appears to have a considerable direct relationship to the tuberculosis death rate for the white population in the case of thirty-three states with less than 19 per cent of Negroes. In the case of nine Southern states with more than 25 per cent of Negroes, a different relationship is indicated, which might be due to the stricter segregations in these regions. Educational factors, chiefly percentage of white population illiterate and, to a lesser extent, per capita expenditures

² Farrar, G. E. and Goldhamer, S. M. The Iron Requirement of the Normal Human Adult, *J. Nutrition* **10**: 241 (Sept.) 1935.

³ Vahlteich, E. M., Funnell, E. H., MacLeod, G. and Rose, Mary S. Egg Yolk and Bran as Sources of Iron in the Human Diet, *J. Am. Dietet. A* **11**: 331 (Nov.) 1935.

⁴ Rose, Mary S., Vahlteich, Ella M., Robb, Elda and Bloomfield, Emily M. Iron Requirement in Early Childhood, *J. Nutrition* **3**: 229 (Nov.) 1930. Ascham, L. A Study of Iron Metabolism with Preschool Children, *J. Nutrition* **10**: 337 (Sept.) 1935.

⁵ Coons, C. M. and Coons, R. R. Continuous Balances in Pregnancy, *J. Nutrition* **10**: 289 (Sept.) 1935.

⁶ Elvehjem, C. A., Hart, E. B. and Sherman, W. C. The Availability of Iron from Different Sources for Hemoglobin Formation, *J. Biol. Chem.* **103**: 61 (Nov.) 1933. Sherman, W. C., Elvehjem, C. A. and Hart, E. B. Further Studies on the Availability of Iron in Biological Materials, *J. Biol. Chem.* **107**: 383 (Nov.) 1934.

¹ Climate and Health, editorial, *J. A. M. A.* **103**: 683 (Sept.) 1934.

² Cowles, A. and Chapman, E. N. A Statistical Study of Climate in Relation to Pulmonary Tuberculosis, *J. Am. Statist. A* **30**: 517 (Sept.) 1935.

in elementary and secondary schools, represent in total importance a large part of the elements disclosed as significant. One climatic factor that seems to be definitely significant is hours of sunshine. Of additional possible significance are precipitation, daily temperature range, and altitude. The general conclusion is that, as far as the United States is concerned, higher standards of education and decreased risk of infection from Negroes, combined with life in a sunny, dry and high altitude climate seem to be more important than other climatic and environmental elements in reducing the white death rate from pulmonary tuberculosis.

Association News

ANNUAL CONGRESS ON MEDICAL EDUCATION, MEDICAL LICENSURE AND HOSPITALS

The Annual Congress of the Council on Medical Education and Hospitals of the American Medical Association will be held at the Palmer House, Chicago, Feb 17 and 18, 1936. The Federation of State Medical Boards of the United States will participate in the congress. The program follows:

MONDAY, FEBRUARY 17, 10 A M

Report of the Council on Medical Education and Hospitals

Ray Lyman Wilbur M.D. LL.D. Chairman Stanford University Calif.

The Accrediting of Higher Institutions

George F. Zook Ph.D., President American Council on Education Washington D.C.

Consistency Versus Chaos in Medical Education and Licensure

Walter L. Biering M.D. Secretary The Federation of State Medical Boards of the United States Des Moines Iowa

The State University and Professional Education

Arthur C. Willard S.B. LL.D. President University of Illinois Urbana

MONDAY, FEBRUARY 17, 2 P M

Swans Sing Before They Die

Elias P. Lyon M.D. LL.D. Dean University of Minnesota Medical School Minneapolis

Scope and Objectives of the Undergraduate Teaching of Obstetrics

George W. Hosmak M.D. New York

Charles B. Reed M.D. Associate Professor of Obstetrics Northwestern University Medical School Chicago

Robert H. Riley M.D. Director State of Maryland Department of Health Baltimore

TUESDAY, FEBRUARY 18 9 A M

The Personality of the Teacher

James S. McLester M.D. President American Medical Association Birmingham Ala.

Some Observations on the Social Background of Medical Practice in Great Britain

Richard E. Scammon Ph.D. LL.D. Distinguished Service Professor of the Graduate Faculty of the University of Minnesota Minneapolis

Instruction of Students and Interns in the Legal Social and Economic Influences Affecting Medical Practice

Stanhope Bayne-Jones M.D. Dean Yale University School of Medicine New Haven Conn.

Can the Present Medical Curriculum Achieve the Proper Aims of Medical Education?

Langley Porter M.D. Dean University of California Medical School San Francisco

TUESDAY, FEBRUARY 18 2 P M

Function of the Hospital in the Training of Interns and Residents

J. A. Curran M.D. Executive Secretary New York Committee on the Study of Hospital Internships and Residencies New York.

The Laboratory of Pathology in the Small Hospital

Howard T. Karsner M.D., Professor of Pathology, Director of the Institute of Pathology Western Reserve University and the University Hospitals Cleveland

Accur Points of View Concerning the Use of the Outpatient Department in Medical Education

W. McKim Marriott M.D. Dean, Washington University School of Medicine St. Louis

THE FEDERATION OF STATE MEDICAL BOARDS OF THE UNITED STATES

MONDAY, FEBRUARY 17, 2 P M

The Federation and the Survey of Medical Schools

William D. Cutter M.D. Secretary Council on Medical Education and Hospitals American Medical Association Chicago

The Two-Year Medical School

George M. Williamson M.D. Secretary North Dakota State Board of Medical Examiners Grand Forks

Benjamin J. Lawrence M.D. Secretary North Carolina Board of Medical Examiners, Raleigh

Comments on National Board Examinations

J. Stewart Rodman M.D. Medical Secretary, National Board of Medical Examiners Philadelphia

Everett S. Elwood Executive Secretary National Board of Medical Examiners Philadelphia

Final Objective

Harold Rypins M.D. Secretary Board of Medical Examiners of the State of New York, Albany

MONDAY, FEBRUARY 17, 6 30 P M

FEDERATION DINNER

Address The Responsibility of a University in Medical Training

Eugene A. Gilmore LL.B. LL.D. President State University of Iowa Iowa City

Address The Art of Medicine

Irvin D. Metzger M.D. President The Federation of State Medical Boards of the United States Pittsburgh

Round Table Discussion—State Board Problems

TUESDAY, FEBRUARY 18, 1 30 P M

Enforcement Procedure

Thomas J. Crowe, M.D. Secretary Texas Board of Medical Examiners Dallas.

Herbert M. Platter, M.D. Secretary, Ohio State Medical Board Columbus.

Aggressive Versus Passive Attitudes of State Board Members

Arthur C. Morgan M.D. Member Pennsylvania State Board of Medical Education and Licensure Philadelphia

Foreign Medical Credentials

Charles B. Pinkham M.D. Secretary California Board of Medical Examiners, San Francisco

Experience with Basic Science Law in Nebraska

Henry J. Lehnhoff M.D. Secretary Nebraska Board of Examiners in Medicine Lincoln.

Narcotic Legislation

William C. Woodward M.D. LL.D. Director Bureau of Legal Medicine American Medical Association Chicago

Executive Session

RADIO BROADCASTS

The American Medical Association broadcasts over the Blue network and certain additional stations of the National Broadcasting Company at 5 p.m. eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time) each Tuesday presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers a toast "Ladies and gentlemen, your health!" The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

The next three programs are as follows:

December 10 Hunting Accidents Morris Fishbein M.D.

December 17 Animal Diseases in Man W. W. Bauer M.D.

December 24 No broadcast

This program is broadcast also on the short waves through KDKA, Pittsburgh, over station W8XX, 11,870 and 12,210 kilocycles.

THE KANSAS CITY SESSION

Special Exhibit on Fractures in the Scientific Exhibit

The Committee on Scientific Exhibit of the Board of Trustees has announced that the special exhibit on fractures will be resumed at the Kansas City session under the direction of a committee composed of Kellogg Speed chairman Chicago, Frank D. Dickson Kansas City, and Walter Estell Lee, Philadelphia. For five years from 1927 to 1931 the fracture exhibit was carried on as a regular feature of the annual session but for the last four years it has been omitted.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Chamber of Commerce Honors Physician—A resolution was adopted by the Mobile Chamber of Commerce, October 3, in appreciation of the services of the late Dr. Herbert P. Cole, Mobile, and expressing regret over his recent death. Dr. Cole was a former president of the chamber of commerce.

Hookworm Survey—A survey of all the school children in Baldwin County was begun, October 1, under the direction of Dr. Stephen A. Durick, Bay Minette, county health officer, to determine the presence of hookworm. Specimens will be analyzed in the laboratory of the state health department and reports of the examinations will be submitted to the parents. Children showing a positive report will be given treatment for hookworm free of charge. Examinations of parents and pre-school children will also be made on request.

CALIFORNIA

Popular Medical Lectures—The fifty-fourth course of popular medical lectures for 1936 at Stanford University School of Medicine will be held on alternate Friday evenings, beginning January 3, with Dr. Edward C. Sewall as the first speaker, on "Sinusitis, Allergy and the Common Cold." Other lecturers in the series are:

Dr. Thomas Henshaw Kelly, January 17, Public Patient Physician and Health Insurance.
Dr. C. Frederick Fluhmann, January 31, Superstitions, Facts and Theories of Menstruation.
Dr. George H. Becker, February 14, Success of Control of Communicable Diseases in San Francisco.
Dr. Albert D. Davis, February 28, Value and Limitations of Plastic Operative Procedures.
Dr. Thomas G. Inman, March 13, Present Conceptions of the Nature of Mind.

CONNECTICUT

Changes in Health Officers—Dr. Thomas F. O'Brien has been appointed acting health officer for the city and town of Hartford, succeeding Dr. Charles P. Botsford, who retired after twenty-seven years' service. Dr. John A. Bucciarelli has succeeded Dr. Myron J. Brooks, retired, as health officer of New Canaan. Dr. Michael D. Riordan has been appointed health officer of the town of Windham for a term of four years.

Dr. Nicholas Named Professor of Comparative Anatomy—John S. Nicholas, Ph.D., associate professor of comparative anatomy, Yale University, New Haven, has been appointed Bronson professor of comparative anatomy. The appointment is the first to this chair since 1927, when Dr. Ross G. Harrison, the incumbent at that time, was named Sterling professor of biology in the medical school. Dr. Nicholas received the degree of doctor of philosophy from Yale in 1921. He was associated with his alma mater as assistant in biology from 1917 to 1919 and was instructor in anatomy at the University of Pittsburgh School of Medicine from 1921 to 1922, when he became assistant professor. In 1926 he returned to Yale, becoming associate professor of comparative anatomy in 1932.

DISTRICT OF COLUMBIA

Dr. Coulter Named Tuberculosis Coordinator—Dr. Archibald Barklie Coulter has been appointed tuberculosis coordinator of the District of Columbia. His first task will be to coordinate efforts being made by public and private agencies to locate persons unaware that they have tuberculosis and see that provision is made for their treatment. A campaign against tuberculosis was begun in the district, November 25, with funds made available by the Works Progress Administration.

Radio Advisory Board—An advisory board has been appointed for the radio broadcasts of the Medical Society of the District of Columbia with Drs. Roy Lyman Sexton, chairman, Harry Arnold McNitt, vice chairman, and Herbert P. Ramsey, member ex officio. Representatives on the board for the society at large are Drs. James A. Cahill Jr., Roger S. Cohen, Tomas Cajigas and Robert A. Bier, for the health department; Dr. Daniel L. Seckinger, deputy health officer, for the U. S. Public Health Service; Dr. Ralph C. Williams, assistant surgeon general and for the National Broadcasting Company, Mr. Stanley Bell, technical adviser.

FLORIDA

Personal—Dr. Ralph E. Stevens, assistant surgeon, Veterans' Administration Facility, Bay Pines, has been appointed city physician and superintendent of the municipal public health service.—Dr. Leon H. O'Quinn has been elected mayor of Hialeah.—Dr. Huston J. Banton, captain, U. S. Army Medical Corps, has been appointed a deputy district health officer of the state board of health of Florida.—Dr. Harry C. Galey Jr. was recently elected mayor of Key West.

Public Health Meeting—The Florida Public Health Association held its seventh annual meeting in Orlando, December 2-4, at the Colonial Orange Court Hotel. Speakers included:

Dr. Herbert L. Bryans, president, Florida Medical Association, Attitude of the Florida Medical Association Toward Public Health.
Dr. Halbert L. Dunn, chief statistician for vital statistics, U. S. Bureau of the Census, Washington, D. C., Importance of Vital Statistics to the Citizen.
Dr. Reginald M. Atwater, executive secretary, American Public Health Association, New York, Team Work in Public Health.
Dr. William W. Bauer, director, bureau of health and public instruction, American Medical Association, Coordination of Private Practice and Preventive Medicine.
Dr. Kendall Emerson, managing director, National Tuberculosis Association, New York, Tuberculosis in a State Health Department Program.

A public meeting was held Monday evening, December 2, with the following speakers: Dr. Edward S. Godfrey Jr., assistant commissioner of health of the state of New York, What the Public Should Know About the Control of Diphtheria; Conrad Van Hynning, commissioner of social welfare, Jacksonville, "Public Health Aspects in Social Work," and Dr. James P. Leake of the U. S. Public Health Service, Present Knowledge of Prevention and Control of Poliomyelitis.

GEORGIA

Officers of State Medical Board—Dr. Frank M. Rudley Jr., LaGrange, has been appointed for a term of four years to the state board of medical examiners to succeed Dr. Burr T. Wise, Americus. Drs. James M. Baird, Columbus, and Jesse L. Howell, Atlanta, were reappointed for four year terms. Dr. Baird is president of the board and Dr. Howell, vice president.

Society News—Dr. Alton V. Hallum read a paper before the Fulton County Medical Society, Atlanta, November 7, entitled "Eye Changes in Hypertensive Toxemia of Pregnancy (A Study of 300 Cases)," and Dr. James N. Brawner Jr. gave a clinical talk on "Hormone Treatment of Gonococcal Vaginitis in Children."—At a meeting of the Spalding County Medical Society in Griffin recently, speakers included Drs. Earl H. Floyd and James L. Pittman, Atlanta, on "Operation on the Single Kidney for the Removal of Calculi."

ILLINOIS

State Health Conference—The annual state health conference will be held in Springfield, December 10-11. The control of communicable diseases will be the theme of the two day session and the functions of diagnostic laboratories, essentials of sanitary supervision over milk supplies, practices in public health administration and methods of health education will also be considered. Speakers will include Drs. Logan Clendening, clinical professor of medicine, University of Kansas School of Medicine, Lloyd D. Felton, Baltimore, John P. Koehler, commissioner of health of Milwaukee, and Maud E. Watson, Ph.D., director, child guidance division, Children's Fund of Michigan, Detroit.

Chicago

Drive to Reduce Noise—A campaign against inadequately muffled exhausts of automobile, motorcycle and truck engines will be in force by the traffic division of the city police department during December, it is announced. A summons will be issued to all violators to enforce the city ordinance and state statute that require all motor vehicles to be equipped with adequate mufflers.

Premedical Requirements Raised to Three Year Minimum—Students entering Loyola University School of Medicine in October 1939 must present a minimum of three years of college (premedical) work, according to an announcement from the dean. Accordingly, all students enrolling in the premedical curriculum beginning in the fall of 1936 will be subject to the three year premedical requirement. The premedical requirement was raised from one to two years, to become effective in the fall of 1937.

Dr. Sevringhaus to Lecture at Psychoanalytic Institute—Dr. Elmer L. Sevringhaus, associate professor of medicine, University of Wisconsin Medical School, Madison, will lecture on "Clinical Pathology of Endocrine Disturbances" at

the Institute for Psychoanalysis, December 10 According to previous announcement Dr Solomon Strouse was to have been the speaker but illness has compelled him to leave Chicago for the winter Dr Sevringhaus will also lecture, January 10, when he will review the results of the clinical research of his group during the last few years on the mental and peripheral nervous disturbances associated with various irregularities in the menstrual cycle and during the menopause Those who wish to attend these lectures are asked to notify the institute in advance A luncheon will be held at the Tavern Club, December 10, in honor of Dr Sevringhaus

INDIANA

Outbreak of Food Poisoning in Prison—Seventy-two prisoners in the county jail in Indianapolis became ill immediately after the noon meal November 20, and five of them were taken to the city hospital suffering from food poisoning newspapers reported.

Society News—Dr Emil G Vrtak, Chicago, discussed arthritis before the Montgomery County Medical Society in Crawfordsville, November 21—At a meeting of the Fort Wayne County Medical Society in Fort Wayne, November 19, Dr Carroll S Wright, Philadelphia, spoke on the treatment of syphilis—The Kosciusko County Medical Society was addressed in Warsaw, November 19, by Dr Fred O Clark Syracuse, on sciatic pain A resolution was adopted at this meeting in memory of Dr C. Norman Howard, who died November 11—At a meeting of the Thirteenth District Medical Society, November 6, in Rochester speakers included Drs Aaron Arkin and George H Gardner, Chicago on "Differential Diagnosis of Organic Heart Lesions" and the unhealthy cervix, respectively, and Dr Orus R Yoder, Ypsilanti, The Psychological Management of the Patient—Dr Arthur E. Hertzler Kansas City, Mo., gave the banquet address on "Office Management of Stomach Complaints" Dr Arkin also conducted a heart clinic—The meeting of the Indianapolis Medical Society, November 19 was devoted to a discussion of diseases of the gastro-intestinal tract, the speakers were Drs Homer H Wheeler, Julius H P Gauss and Walker Stoeffler

LOUISIANA

Society News—A symposium on cancer was presented before the New Orleans Parish Medical Society, November 25 by Drs James T Nix, Curtis H Tyrone and Gilbert C Anderson—Dr Emil Novak, Baltimore, delivered a paper before the New Orleans Gynecological and Obstetrical Society, November 29, entitled "Ovarian Tumors"

A Record in Cancer Education—Louisiana has made a striking record in cancer education, according to the *Bulletin* of the American Society for the Control of Cancer Under the chairmanship of Dr John A. Lanford, New Orleans, of the committee on cancer of the state medical society, ninety-two radio talks have been given, 501 newspaper articles have been distributed and thirty-three public meetings with a total attendance of more than 7,400 have been held Seventeen study courses for nurses have also been held

MASSACHUSETTS

Dr Freeman Wins the Warren Prize—The Warren Triennial Prize of \$500 has been awarded by the general executive committee of the Massachusetts General Hospital, Boston to Dr Norman E. Freeman, a member of the staff, for an essay on The Physiology of Gangrene The prize was founded by the late J. Mason Warren in memory of his father and is awarded every three years Previous to 1934 there have been sixteen awards of this prize, thirteen going to men in this country and three to foreigners

Sanatorium Honors Memory of Founder—Sharon Sanatorium Sharon a tuberculosis hospital, has recently published a special edition of its 1929 annual report as a memorial to Dr Vincent Y Bowditch, founder of the institution who died in that year The report entitled "His Last Year" is the thirty-ninth issued by the sanatorium Dr Bowditch was a past president of the National Association for the Study and Prevention of Tuberculosis now the National Tuberculosis Association and at one time was medical director of the institution he founded Sharon Sanatorium was opened in 1891 and now has a capacity of fifty-one beds

Personal—Dr Charles Moline, Sunderland, was recently chosen president of the Franklin County Public Health Association—Dr Alice Hamilton, Boston, recently appointed technical adviser on industrial poisons U S Department of Labor was guest of honor at a luncheon meeting November 21 given by the Consumers League of Massachusetts—The recent retirement of Dr George Burgess Magrath Boston,

as medical examiner of Suffolk County on account of ill health will not interfere with his position as professor of legal medicine in the Harvard Medical School or with his functioning as a consulting medicolegal pathologist.—Dr Riley H. Guthrie, assistant to the commissioner in the department of mental diseases, has been named chief executive officer of the Boston Psychopathic Hospital

MICHIGAN

Dr Lavan Named Health Officer of Grand Rapids—Dr John L. Lavan, for four years director of the department of public health and welfare of Kalamazoo, has resigned to become commissioner of public health of Grand Rapids, effective December 1 Grand Rapids, which is Dr Lavan's home city, has a population of more than 168,000 The new commissioner is a graduate of the University of Michigan Medical School, Ann Arbor He was formerly epidemiologist with the Kansas City, Mo., health department and at one time was health commissioner of Toledo

Society News—At a meeting of the Eaton County Medical Society in Charlotte, recently, Dr Don V Hargrave, Eaton Rapids, discussed gastric hemorrhage.—Dr Frederick A. Collier, Ann Arbor, discussed gallbladder disease before the Oakland County Medical Society, October 20, in Pontiac—Dr Garner M. Byington, Battle Creek, medical director of the Kellogg Foundation was elected president of the Michigan Public Health Association at its annual meeting, November 7, in conjunction with the annual Michigan Health Conference—A symposium on anesthesia was presented before the Wayne County Medical Society, November 4 in Detroit, by Drs James E. Watson, Myra E. Babcock and Francis J. Murphy, all of Detroit

Dinner to Dr Warnshuis—Dr Frederick C. Warnshuis, formerly secretary of the Michigan State Medical Society and now holding a similar position with the California Medical Association, San Francisco was guest of honor at a dinner at the Wayne County Medical Society in Detroit, November 11 Among those present were seven former presidents of the state medical society Drs Andrew P. Biddle, 1917, 1918, Angus McLean, 1920, Guy L. Connor, 1923, Herbert E. Randall, Flint, 1927, Louis J. Hirschman, 1928, Carl F. Moll, Flint, 1932 and James Milton Robb, 1933 In addition, the present president Dr Grover C. Penberthy, attended Dr Warnshuis discussed "Medical Practice in California" before the medical section of the society, November 11, and Dr Hugh L. Stalker, Grosse Pointe, showed moving pictures of the mechanism of the heart beat and electrocardiography

MISSOURI

Pilgrimage to Beaumont's Grave—Members of the St. Louis Medical Society arranged a pilgrimage to the grave of William Beaumont in Bellefontaine Cemetery, November 21, the one hundred and fiftieth anniversary of Beaumont's birth Dr Beaumont was born in Lebanon, Conn., Nov. 21, 1785, and died in St. Louis, April 25, 1853 Wreaths were placed on Dr Beaumont's grave by representatives of the Southern Medical Association, Southern Association of Anesthetists, Missouri State Medical Association, International Anesthesia Research Society and the Midwest Association of Anesthetists and the St. Louis Medical Society

NEW YORK

New Medical School for Syracuse—Federal funds have recently been made available for the erection of a new building for the University of Syracuse School of Medicine, construction to begin December 15 The new building will be a new unit in a medical center that now contains the City Hospital, Syracuse Memorial Hospital and the Syracuse Psychopathic Hospital It will be three stories high and will cost \$1,250,000, according to the *Syracuse Herald* It is expected that the building will be completed within a year

Society News—Drs Leon E. Sutton and Frederick S. Wetherell, Syracuse, addressed the Oswego County Medical Society, Oswego October 15 on "Local Anesthesia in Minor Surgery" and "Present-Day Problems in Medical Economics," respectively—Dr Raeburn J. Wharton, Johnson City recently addressed the Schoharie County Medical Society, Cobleskill, on "Anorexia in Childhood"—Dr Emanuel D. Friedman, Cortland Cortland December 6, on "Encephalitis and Cerebral Vascular Accidents" Dr Peter G. Denker, New York, spoke, November 15, on "Diseases of the Spinal Cord and Peripheral Nerves"—Dr Hugh H. Young, Baltimore, addressed the Glens Falls Academy of Medicine, October 25, on cancer of

the prostate.—Drs Wardner D Ayer, Syracuse, and Joseph S Lawrence, Albany, addressed the Franklin County Medical Society, Malone, October 23, on intracranial hemorrhages and the work of county medical societies, respectively.—Dr Eldridge H Campbell Jr, Albany, gave a lecture on "Early Diagnosis of Brain Tumors" before the Fulton County Medical Society, Johnstown, in October

New York City

Eight Made Ill by Cream Puffs—Eight persons from the lower east side suffered from food poisoning within a few hours after having eaten cream puffs, November 11. All were taken to Bellevue Hospital.

Third Harvey Lecture—Dr Francis Peyton Rous of the Rockefeller Institute for Medical Research delivered the third Harvey Lecture of the winter, December 5, at the New York Academy of Medicine. His subject was "The Virus Tumors and the Tumor Problem."

The Welch Lectures—Dr George Hoyt Whipple, dean and professor of pathology, University of Rochester School of Medicine, Rochester, will deliver the William Henry Welch Lectures at Mount Sinai Hospital, December 12-13. Dr Whipple's subjects will be "Ways and Means of Hemoglobin Construction Within the Body" and "Plasma Protein Regeneration as Influenced by Various Factors."

Resolution Concerning New Hospitals—The Hospital Council of the City of New York at a meeting November 6 adopted a resolution taking the position that it is inadvisable for public or private hospital authorities to commit themselves to any major program of hospital construction without conferring with the council. In the opinion of the council no such project should be launched unless it can be shown to be necessary, timely, reasonably assured of support, and wisely located.

Personal—Dr Nathan Ratnoff, medical director of the Beth Israel and Jewish Maternity hospitals, was guest of honor at a dinner at the Waldorf Astoria, November 12, in celebration of his sixtieth birthday.—Dr Charles Walter Clarke, medical director of the American Social Hygiene Association, has been appointed temporary director of the bureau of venereal disease in the city department of health, a half time position.—Mr Henry C Wright, hospital consultant and for many years president of the Queensboro Tuberculosis and Health Association, died October 24.

Society News—Dr Michael Canick delivered an afternoon lecture before the Medical Society of the County of Queens, November 15, on "Common Rectal Diseases—Office Treatment." Dr Benjamin M Bernstein gave a lecture in October on ulcerative colitis.—Dr Charles F Geschickter, Baltimore, addressed the International Association of Industrial Surgeons, October 31, on "Bone Tumors in Their Relation to Trauma."—Dr Hermann Holthusen, professor of radiology, University of Hamburg, Germany, gave the Middleton Goldsmith Lecture of the New York Pathological Society, December 10, at the New York Academy of Medicine. His subject was "Biological Effects of Radiation on the Cells."—Dr William P Healy gave the fourth afternoon lecture of the New York Academy of Medicine, December 6, on "Significance of Uterine Bleeding in Later Life." Dr George Draper will give the fifth, December 13, on "Significance of the Human Constitution in Clinical Medicine."—Drs Harold J Stewart and Archibald G MacLeod were speakers at a scientific meeting of the New York Heart Association, the heart committee of the New York Tuberculosis and Health Association, December 3, on "Cardiac Output" and "The T Deflection of the Electrocardiogram," respectively.—Dr George F Chandler, Kingston, addressed the Society of Medical Jurisprudence, November 11, on "Causes and Treatment of Crime."—Dr Josephine B Neal addressed the Women's Medical Association of New York City, November 13, on "Newer Developments in Poliomyelitis."

PENNSYLVANIA

Society News—Dr John T Farrell Jr, Philadelphia, addressed the Northampton County Medical Society, Easton, November 14, on "Causes of Bronchial Occlusion and Their Importance in the Production of Respiratory Symptoms."—The Chester County Medical Society sponsored a public health meeting in Chester as its observance of state health day, November 19, speakers were Drs Martha Edith MacBride-Dexter, state secretary of health, on tuberculosis, and Arthur C Morgan, Philadelphia, on progress of medicine in the past fifty years.—Dr Jesse O Arnold, Philadelphia, addressed Washington County physicians at Hillsview Farms Sanatorium, Washington, November 13 on "More Rational Methods in Prevention and Control of Eclampsia," with discussion by Drs Paul Titus, Pittsburgh, and James R Bloss, Huntington, W Va.

Philadelphia

Seminars on Tuberculosis—The second series of graduate seminars sponsored by the Philadelphia County Medical Society, dealing with clinical application of laboratory methods in tuberculosis, began November 29, with the following lecturers: Drs William P Belk, on "Variations in the Blood Count and Their Significance", Jacob W Cutler, "The Sedimentation Rate", Abraham Cantarow, "Blood Sugar and Blood Cholesterol Significance of Variation", Frederick William Sunderman, "Minerals in the Blood and Their Significance." Speakers, December 6, were Henry L Bockus, "Interpretation of Gastric Analysis", Louis H Clerf, "The Gastroscope," and B B Vincent Lyon, "Biliary Drainage." Coming lectures are

December 13 Drs Charles C Wolferth Laboratory Examination of the Heart—Electrocardiographic Interpretation, Isaac Starr Jr, Circulation Time and Minute Volume Studies, Alexander Margolies, Heart Sounds—The Stethograph, Charles L Brown Blood Pressure and Its Variation.

December 20 Drs Joseph B VanderVeer, The Basal Metabolic Rate—A Discussion of Its Determination, Edward L Bortz, Variations in the Metabolic Rate and Their Practical Significance and Francis F Borzell, X Ray and Its Clinical Application.

Research Laboratories Transferred.—The Cancer Research Laboratories of the Graduate School of Medicine of the University of Pennsylvania have been transferred to the Franklin Institute and will be continued under the name of Biochemical Research Foundation. Dr Ellice McDonald will continue as director, with forty-two research workers on the staff. Thomas S Gates, president of the university, explained in his annual report that the change was made because Mr Irene du Pont, who provided funds for the research, could not agree with the university's policy on the question of rewards for scientific research. Last year the university formally adopted the policy that all discoveries should be made available to the public without any profits accruing to the individuals or the institution responsible. Mr du Pont is said to have expressed the opinion that greater progress would be made if some definite form of financial reward was held forth. He also felt it would be well for the foundation to patent discoveries with the intent of using profits or income to pay for further research. Mr du Pont established the cancer research department anonymously in 1927.

Pittsburgh

Research Chemist Honored—Edward R. Weidlem, director of Mellon Institute for Industrial Research, received the Chemical Industry Medal for 1935 at a joint meeting of the New York section of the American Chemical Society and the American section of the Society of Chemical Industry in New York, November 8, at the Chemists Club. Dr Weidlem is a graduate of the University of Kansas, from which he received the master of arts degree in 1910. He received the honorary degree of doctor of science from Tufts College in 1924 and doctor of laws from the University of Pittsburgh in 1930. He joined the staff of Mellon Institute in 1912 and became director in 1921. His investigations in the field of medicine include epinephrine and recently, in cooperation with Western Pennsylvania Hospital, treatment of pneumonia and allied pulmonary diseases.

TENNESSEE

Physicians in Attendance at Births—Eighty six per cent of births reported to the state health department in 1934 were attended by physicians, according to a recent report. In cities the percentage was 98, while it was 82 in rural districts. There were ten counties in which less than half the births were attended by physicians. In 1934 physicians signed 93.3 per cent of the death certificates. Including certificates signed by health officers and coroners, the percentage of certificates correctly signed was 95.6, compared with 93.3 the previous year.

Society News—The Chattanooga Surgeons Club was recently organized with Dr William J Sheridan as president.—Drs John H Musser, New Orleans, and James B McElroy, Memphis, were guest speakers at a meeting of the third color district medical society in Chattanooga in October, on disease of the gallbladder and heart disease, respectively.—Drs Russell A Hennessey and Conley H Sanford, Memphis, addressed the Gibson County Medical Society, Trenton, October 28 on "Treatment of Gonorrhea in the Male" and "Further Experience with Mechanical Drainage of the Lung in Pneumonia," respectively.—Dr John Roberts, Kingston, addressed the Roane County Medical Society, Harriman, October 15, on induced pneumothorax.—Dr James Leslie Bryan and J H Phillips, D D S, Nashville, addressed the Robertson County Medical Society, Springfield, October 15, on "Acute Suppurative Mastoiditis" and "The Middle Ground Between Medicine and Dentistry," respectively.—Dr Robert L Sanders, Memphis was guest speaker at the annual meeting of the East

Tennessee Medical Association in Elizabethton in October Dr Estill L. Caudill, Elizabethton, was elected president.—Drs Charles A. Bender and Frank D. Linn, Memphis, addressed the Memphis and Shelby County Medical Society, Memphis, October 15, on "Ileus" and "Fractures Through the Ethmoid Sinuses," respectively.—Drs Stanton S. Marchbanks and Buchanan S. Wert addressed the Chattanooga and Hamilton County Medical Society, Chattanooga, October 24, on hyperparathyroidism and peptic ulcer.

TEXAS

Changes at University of Texas—At the beginning of the fall term at the University of Texas School of Medicine, Galveston, Dr Jarrett E. Williams, formerly of Durham, N. C., succeeded Dr Jesse Morris Horn as adjunct professor of pathology, Dr William B. Sealy, instructor in anatomy, succeeded Dr Francis J. L. Blasingame as adjunct professor of anatomy. Dr Horn moved to Fort Worth and Dr Blasingame to Detroit. In the department of biologic chemistry, Felix Paquin, Galveston, succeeded Marion Fay, Ph.D., associate professor, Dr Fay resigned to become professor of physiologic chemistry at the Woman's Medical College of Pennsylvania. Dr William S. Carter, who returned to the school as dean to succeed the late Dr George E. Bethel, was guest of honor at a banquet arranged by alumni and former students. Dr Carter was dean seventeen years ago.

New Home for State Medical Association—The Texas State Medical Association has bought a two-story brick residence in Fort Worth as a home for the association and



New home of Texas society

its library. It is near the Medical Arts Building and five hospitals, as well as the business district, the railway stations and the postoffice. The house is said to be in such good condition and so arranged that no alterations will be necessary for immediate occupancy. It has a spacious lawn with trees, flowers and shrubs and has also a garage building which will provide a large storage space. For some time the association has recognized the necessity for larger quarters, especially for the development of its library. It is hoped that with permanent quarters the library will receive endowments not only from members of the profession but from laymen as well. The new address is 1404 El Paso Street, Fort Worth.

WASHINGTON

Personal—Dr Arthur E. Wade, Seattle, has been appointed school physician of the city to succeed Dr Ira C. Brown who occupied the position for twenty-two years.—Dr Roger Anderson, Seattle, was chosen president-elect of the Western Orthopedic Association at the annual meeting in San Francisco in October.

Society News—Drs Delmar F. Bice, Yakima and Frank J. Clancy, Seattle, addressed the Walla Walla Valley Medical Society, Walla Walla, November 14 and the Pierce County Medical Society, Tacoma, November 12, on social medicine.—The Washington State Radiological Society was organized in October with Dr Harold E. Nichols, Seattle, as president and Dr Terence T. Dawson, Seattle, as secretary.—Drs Roger Anderson and Robert D. Forbes, Seattle, addressed the King County Medical Society, December 2, on "Ambulatory Method of Treating Fractures of the Shaft of the Femur" and "Appendicitis," respectively.

WISCONSIN

Memorial Lecture—The University of Wisconsin Medical Society and the Phi Chi medical fraternity sponsored a memorial lecture, November 26 for the late Dr Charles R. Bardeen, dean of the medical school for many years. Dr Anton J. Carlson, professor of physiology, University of Chicago, gave the address on "Science, Medicine and the Common Life."

Society News—Dr Edward F. Barta, Milwaukee, gave an illustrated talk on "Malignancies of the Skin" before the Brown-Kewaunee-Door Counties Medical Society at Alaska, October 25.—Drs Charles K. Maytum and Edwin J. Kepler, Rochester, Minn., addressed the Chippewa County Medical Society, October 23, Chippewa Falls, on "Allergy" and "Syndromes Associated with Diseases of the Pituitary Body and the Suprarenal Glands," respectively.—Drs Frank A. Boeckman, Marshfield and Waldo W. Stiles, Arpin, among others, addressed the Wood County Medical Society, Wisconsin Rapids, October 15 on "Prevention of Scarlet Fever" and "Multiple Myeloma," respectively.

GENERAL

Alpha Omega Alpha Lecture—Dr Anton J. Carlson, professor of physiology, University of Chicago, will deliver the annual Alpha Omega Alpha lecture at the Kansas City session of the American Medical Association, May 14.

Grants Available—The committee on grants-in-aid of the National Research Council announces that it will meet next in March 1936. Applications for grants to be considered at this meeting must be on file with the secretary, Clarence J. West, before February 15. The address is 2101 Constitution Avenue, Washington, D. C. Additional information and application blanks will be furnished on request.

Society News—The Eastern Interstate Medical Economics Conference held a meeting in New York, October 13. Thirty-six representatives attended from seven state medical societies: Indiana, Maryland, Michigan, New Jersey, Pennsylvania and the District of Columbia. Dr Frederic E. Elliott, Brooklyn, is president of the conference and Dr Francis F. Borzell, Philadelphia, secretary.—Dr Walter H. McNeill Jr., New York, was elected president of the New York Central Surgeons' Association at the annual meeting in Columbus, Ohio, October 28.

Medical Supplies for Ethiopia—Medical supplies and equipment, including a truck and half a ton of bandages and other necessities, were recently presented to the Ethiopian government through John M. Shaw, Ethiopian consul general, in New York. The gift was made possible through the work of American Aid for Ethiopia, a national organization of which William Jay Scheffelin, Ph.D., New York, is chairman. Haile Selassie recently appealed for volunteer American physicians, nurses and hospital supplies. In a letter transmitted through the New York Times the emperor advised volunteers to communicate with Dr Thomas A. Lambie, American physician who is secretary general of the Ethiopian Red Cross at Addis Ababa.

Prevalence of Poliomyelitis—One hundred and fifty-three cases of poliomyelitis were reported throughout the United States for the week ended November 2, as compared with 109 for the similar period of 1934. During this weekly period the largest number of cases (twenty-eight) was reported in Massachusetts, while the next highest number (twenty-three) occurred in New York. Pennsylvania came third, with a total of nineteen. For the corresponding period of 1934, Washington had the highest number (fourteen). California and Texas were second with eleven cases each. There were 9,992 cases of the disease tabulated in the first forty-four weeks of 1935, compared with 6,759 for the corresponding period of 1934.

'Fight Cancer with Knowledge'—The American Society for the Control of Cancer, in its November bulletin, announces a nation-wide campaign to educate the public on the subject of cancer. The bulletin points out that the society has spent most of its time surveying and recording basic facts concerning cancer diagnosis and therapy because it wished to make certain that the profession was prepared to care for the increase in work which a campaign of lay education would bring about. The directors of the society have now unanimously agreed that existing facilities are entirely adequate for more patients than are now availing themselves of the opportunity of early diagnosis and treatment. The society's slogan, 'Fight Cancer with Knowledge,' will be the theme of the campaign.

Examinations in Obstetrics and Gynecology—Written examinations and review of case histories of group B applicants for certification by the American Board of Obstetrics and Gynecology will be held in various cities, March 28. Applications for group B must be filed not later than February 28.

The oral clinical and pathologic examination of all candidates for certification will be held in Kansas City, May 11-12, 1936, immediately prior to the scientific session of the American Medical Association. Applications for group A candidates must be received not later than April 1. The annual informal dinner and general conference of diplomates of the board will be held Wednesday evening, May 13, at the Hotel Kansas Citian. For further information apply to the secretary, Dr. Paul Titus, 1015 Highland Building, Pittsburgh.

Southern Surgical Association—The forty-eighth annual session of the Southern Surgical Association will be held in Hot Springs, Va., December 10-12, with headquarters at the Homestead. Among speakers announced on the program are

Dr. Parke G. Smith Cincinnati Anatomical and Mechanical Factors Involved in Nephroptosis
Dr. Waltman Walters Rochester Minn. Successful Plastic Operations for Hypospadias
Dr. Burr N. Carter Cincinnati Technic of Thoracoplasty for Pulmonary Tuberculosis
Dr. Joseph E. J. King New York Brain Abscess
Dr. Bradley L. Coley New York Surgical Treatment of Giant Cell Tumor

At the annual dinner, Wednesday evening Dr. Harvey B. Stone, Baltimore, will be toastmaster, and speakers will be Drs. James Tate Mason, Seattle, President Elect of the American Medical Association, and Robert L. Payne Norfolk, Va., president of the surgical association.

Government Services

Stoner Violates Food and Drugs Act

A fine of \$2000, the maximum penalty, was imposed on 'Dr.' George DeWitt Stoner, Lakeland, Fla., in federal court at Tampa in November for violating the federal Food and Drugs Act. Stoner was placed on probation for two years. In November 1934, Stoner was sentenced for a similar violation and was placed on probation. The recent investigation disclosed that Stoner's wife was continuing the sale of 'Dr. Pene's Uterine Tablets' and 'Regulator Pills' (Compound Pills-Tansy Pennyroyal) to former customers under labels from which the false claims had been removed. The court considered this to be a violation of his probation. Stoner claims graduation from the Curtis Physio Medical Institute of Marion, Ind., in 1896. The institution was said to be a poor excuse for a medical school and the American Medical Association has had no opportunity of checking up the record, since it has been unable to find that there were any records. Stoner also claims to have attended Wichita Medical College and the Hahnemann Medical College. The former had no graduates. The Hahnemann school was closed by its board of trustees. In 1904 this college absorbed the Chicago Homeopathic Medical College. There is no record that Stoner was licensed in Indiana in 1897, as claimed.

Positions for Interns and Residents at St. Elizabeth's Hospital

The U. S. Civil Service Commission announces competitive examinations for positions as junior medical officer at St. Elizabeth's Hospital, Washington, D. C. It is expected that there will be two vacancies July 1, 1936, and two Oct. 1, 1936 for internships and about five vacancies for psychiatric residents July 1. The internship consists of a two year rotating service of four months of surgery, four months of acute medical service, four months of chronic medical service, six weeks each of obstetrics and pediatrics (affiliation), three months of laboratory work and six months of psychiatry. Candidates will not be required to report for examination at any place but will be graded on their education and experience. Applicants for the internship must be senior students in a grade A medical school and applicants for the residencies must have been graduated from a grade A medical school not prior to Jan. 1, 1934 and must have completed an accredited internship. Applicants must not have reached their fortieth birthday on the date of the close of receipt of applications. They must be in sound physical health. Application forms may be obtained from the secretary of the Board of Civil Service Examiners at any first class post office from the commission at Washington, D. C., or at any district office of the commission in the following cities: Atlanta, Boston, Chicago, Cincinnati, Denver, New Orleans, New York, Philadelphia, Seattle, St. Louis, St. Paul, San Francisco, Honolulu, Balboa Heights, C. Z., and San Juan, Puerto Rico. Applications must be filed not later than December 16.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 9, 1935

The Right to Die

The formation of a society to promote legislation to render legal the termination of life in painful and incurable disease, at the request of the patient, has been reported in a previous letter. The story of a kindly, elderly family doctor who said he has broken the law and taken life and would do it again if need be is given in the *Daily Mail* by "a special correspondent." Details are not given of the cases, but they were evidently instances of incurable patients dying from cancer, to whom an overdose of morphine was administered. The physician had the patient write a request for release from suffering, which was signed not only by himself but by his wife and family. The act was certainly illegal.

These revelations have given rise to correspondence in the *Daily Mail*. A London consultant writes that no matter how regrettable many aspects of the disclosures may be, the fact remains that in all countries physicians, actuated by the highest humanitarian motives, do at times take what amounts to a sacred judgment into their power. Such actions are jealously guarded, even within the ranks of the profession. Even the nursing staff would generally not be aware of them. Dr. C. Killick Millard, secretary of the newly formed Voluntary Euthanasia Legalization Society, writes that other physicians have told him stories similar to that related. Lord Listowel, one of the founders of the society, states that, while it is impossible to encourage action contrary to the law, the new society has been formed to get the law altered, so that it will be possible to shorten the agony of incurable disease. The society does not think it right that one physician should have the responsibility of such a decision. There should be at least two to decide whether it is impossible for medicine to alleviate suffering.

Some contrary views are expressed. Dr. Estelle Cole, medical psychologist, writes: "When in general practice, I had several cases in which I thought it would have been only humane to end the patient's sufferings. Of course I did not do so and never have heard of any other physician doing so." The *Daily Mail* publishes a cablegram received from Oklahoma City stating that following its disclosures by a physician who had killed five persons suffering from incurable disease a meeting of specialists of international repute was held and ended in condemning "mercy killings." The meeting held that no physician had the right to take a patient's life, since there is no way of being certain that a case is incurable.

In a further instalment of the correspondence, a physician writes: "The vast majority of doctors would be opposed to taking life in any circumstances, ignoring the fact that in their secret hearts they know that on rare occasions cases arise when decisions have to be taken on this supreme matter. What they will strongly oppose is any effort to legalize such a course of action, and for this reason. There is only a comparatively small fraction of cases which one can say with certainty are incurable. The employment of passive euthanasia by the use of pain-relieving drugs is a very different thing from active euthanasia—the deliberate taking of life. The vicar and rural dean of Tonbridge, vice president of the Guild of Health writes: "I feel that doctors cannot be allowed to take the decision on themselves. It would lead to all sorts of complications in the social order."

So far euthanasia has provoked little discussion in the medical press. In the *British Medical Journal* a London practitioner, Mr. Redmond Roche, says that the profession is all out for

"easy dying," but "easy death" is a different matter. It is a claim never made before, and one that he hopes will never be made legal, for physicians to act as executioners. "The claim of this society is against the moral principles of the sanctity of human life. It cuts right across the principles of every school of ethics and the whole hippocratic tradition. It is no part of a physician's duty to decide what is the value of life for his patient, even a life of suffering and apparently hopeless outlook. What is aimed at by this society would eventuate in giving a helping hand to the would-be suicide and allowing sentimentality to overrule our moral and ethical standards." The Roman Catholic press condemns voluntary euthanasia as contrary to religious teaching. Thus it is evident that the movement will have to run the gauntlet of strong opposition from various quarters.

Tragic Fire in a Surgeon's House

London was shocked by the news of the loss of five lives in a fire at a house in Wimpole Street, the second street in importance of the area in the west end, occupied by the medical consultants. The house belonged to Mr. Philip Franklin, an American who has been practicing laryngology in London for some years. The fire broke out at 6.30 a.m. on Sunday while he was away in the country for the week end. All the inmates—his wife, her niece and three servants—perished. They were trapped in their bedrooms on the upper floors when the fire broke out on the ground floor. It was traced to the fusing of an electric cable. It was extinguished by the fire department in forty minutes.

Ambulance Service for Ethiopia

The British Ambulance Service in Ethiopia has organized an expedition which is about to start from London under the direction of a London surgeon, Mr. A. J. M. Melly, who has had considerable experience in Ethiopia. There are five other medical men, of whom one is a Dane. Besides these the unit will consist of three transport officers, six British noncommissioned officers and twenty-four native dressers, who have been recruited from the medical missions in Kenya and Uganda. The project originated some time ago in the formation of a committee that had a personal knowledge of Ethiopia and was appalled at the prospect the Ethiopian troops would have to face when exposed to the destructive effects of the latest engines of war. The expedition is financed by funds raised in England with the cooperation of the British and Scottish Red Cross societies. The estimated cost of maintaining an expedition in the field for three months is \$175,000. Of this only \$95,000 has been raised as yet. It was decided rather than to wait until all the money was collected to send out as soon as possible a smaller unit. Should the funds be available, the unit now sent out will be duplicated. In order to reduce expenses the members of the unit will travel second class. The Swedish Red Cross Ambulance Service has already sent out two detachments to Ethiopia, including six doctors of whom two are bacteriologists. A Swedish aviator has placed his own airplane at the service of the mission.

Health Study Tour of the United States

Dr. R. M. F. Picken, professor of preventive medicine in the Welsh National School of Medicine, has been appointed by the Health Organization of the League of Nations as representative of Great Britain on an American study tour. Six countries are represented. Each member represents various interests in the field of preventive medicine. The tour was to begin at Washington November 4 and end in New York December 7. The health services generally of the United States will be discussed. The places visited will include Baltimore, Knoxville, Nashville, St. Louis, Chicago, Cincinnati, Columbus, Detroit, Philadelphia, Boston, Cattaraugus County and New Haven.

Street Accidents to Pedestrians

The total number of persons killed in the streets of London in the forty-three weeks ended October 26 was 893 and the number injured was 48,377. In the past week fourteen pedestrians were killed. Of these eight were over the ages of 55 and five over 69. In the forty-three weeks ended October 19, 262 pedestrians over the age of 55 were killed, 143 between 10 and 55 and 114 under 10. It is evident that the proportion of persons of advanced years and of children killed is much greater than for the intermediate period of life.

PARIS

(From Our Regular Correspondent)

Oct 25, 1935

Negative Skin Reactions in the French Army

A large number of individuals develop a primary tuberculosis in adolescence or even later in life, as Troisier, Barety and Nico showed in papers published in 1934 in the *Annales de médecine*. At the July 9 meeting of the Académie de médecine they reported a statistical study of the skin reactions of 132 soldiers in apparent good health, the majority from 20 to 21 years of age. Thirty-three of the 132 (25 per cent) had markedly negative, four had doubtful and fifteen had delayed reactions. Only 60.6 per cent had a positive reaction. Of the 132 soldiers fifty-seven came from villages of 2,000 or less inhabitants. Twenty-three of the fifty-seven, or 40.4 per cent, had negative, eleven, or 19.2 per cent, had doubtful or delayed, and only twenty-three had positive reactions. For the seventy-five soldiers born in cities, the percentages are nearer those considered typical, viz., fifty-seven (76 per cent) had positive, eight doubtful or delayed and ten negative reactions. In the discussion Debre emphasized the necessity of a widespread use of the tuberculin skin reaction. Too many physicians take it for granted that it is always positive in older children and adults. Lereboullet stated that, in the children's hospital of Paris, only after the age of 12 years does the positive reaction reach a percentage of 50, and then it rises to 75 at the age of 13 years. Sergeant has observed from 18 to 20 per cent of negative reactions in medical students working in his tuberculosis service. The majority of these students came from rural districts and should be carefully watched.

Prevention of Tuberculosis in Medical Students with BCG Vaccine

Scheel of Oslo (Norway) reported his observations from 1926 to June 1935 with the Pirquet and Mantoux tuberculin skin tests on 1,225 students who worked in the tuberculosis wards. The report was read at the July 25 meeting of the Academy of Medicine by Professor Guérin of the Pasteur Institute. The students may be grouped as follows: Group 1 includes 361 students having a positive skin test before and two months after entering the ward service. In this group the positive reaction antedates any possible hospital contamination. Group 2 includes 207 students with negative tests prior to entering the wards. Group 3 includes 295 with negative tests before beginning their service and who had been given the BCG vaccine. Group 4 includes 262 students whose tests were positive two months at least after and also during their entire service in the wards. It is impossible to ascertain whether the positive tests existed before their ward work began. Group 5 includes 100 who had evidences of tuberculous infection before entering the wards. All had positive tests with one exception. For the first four groups not having presented evidences of tuberculosis before their ward work, the occurrence of positive tests shows a gradual rise from the age of 16 (34 per cent) to that of 22 years (54 per cent) and a sudden rise between 22 and 25 years to 72 per cent. The ward work was usually begun at 25.

In the case of the nurses in the tuberculosis wards, the percentage of positive skin tests rises from 50 to 100 during the first three years of their service

The average annual morbidity (tuberculous) in the different groups was noted in the case of 1,024 students. Group 1 (262 students), students with positive skin test before entering the wards 135 per cent. Group 2 (144 students), negative test before ward work 46 per cent. Group 3 (295 students), negative test before service but given BCG vaccine 195 per cent. Group 4 (237 students), test found positive during ward service without any knowledge as to result of tests before 238 per cent. Group 5 (eighty-six students), with signs of tuberculosis before beginning service 280 per cent. These figures show that the morbidity is higher among students doing work in tuberculosis wards than among the population of Norway in general, hence students working under these conditions must be protected against contracting tuberculosis. Those having negative skin tests show a morbidity three times as high as that shown by those with positive tests. The benefits of BCG vaccination are evident in group 3 the 295 students had negative skin tests on entering the service and were then given the BCG vaccine with a resultant morbidity of only 195 per cent.

Of the 355 vaccinations given to those in the third group and to others not in the group, 321 were given subcutaneously thirty-four by mouth. The initial dose of the latter was 50 mg

BERLIN

(From Our Regular Correspondent)

Oct 7, 1935

Recent Developments at German Universities

Some time ago reference was made to the marked reduction in the number of students studying at German universities. The reduction was much greater than the authorities had anticipated and led soon to the abolition, or at least the toning down, of restrictions. It seems now, from an examination of statistics of German universities, that the reduction has been considerable. For the summer semester of 1932 the total attendance at the German universities was 129,606 for the winter semester of 1934-1935 it was only 86,865, a decrease of about one third. The number of new entrants for the study of medicine dropped from 4,900 for the school year 1931-1932 to about 1,500 for the school year 1933-1934. (Some subjects, however, showed an increase. Catholic theology, training course for teachers in the public schools, agriculture, forestry and mining engineering.) The shifting in the social strata finds expression in the fact that, of the new entrants for the summer semester 1934 a higher percentage of students belong to the classes represented by minor officials, small land owners, peasants and workmen than has ever previously been the case. On the other hand, the percentage of children of middle-rank officials has declined. By reason of the lowered birth rate during the war, it is thought that the next few years will bring a further reduction in the number of students. Not until 1940 is it anticipated that there will be any considerable increase.

By reason of this great reduction in the number of students, the maximal number of students allocated to the various universities has in some instances been increased. The University of Berlin has been allowed 6,900 students in place of 5,600, a number of other universities located in large cities have had their allocation increased. Requests for admission will be considered in the following order: (a) "veterans" of the national-socialist party, (b) members of the defense forces, provided they are pursuing studies at the command of their military service centers, for later use in the army service, and (c) students who have studied at the two eastern universities Königsberg and Breslau (these two universities, as being frontier centers of German thought, are shown some preference). These provisions do not apply to foreigners.

The general aspect of the student body has changed greatly. Characteristic is the official declaration "Hitler youth and the student body of the universities are the natural supporters of the political struggle of our youth." Especially sharp was the struggle for the preservation of the student "corporations," or corps, which have been for many years a characteristic feature of German universities. A few months ago, this struggle, to which reference has been made in previous letters, was brought to a near close when the League of Corps Students, the so-called Kösener Senioren-Konvent, declared publicly its adherence to national socialism and took the oath of fidelity and loyalty. This occurred in June of this year. On September 25 an order was issued forbidding *fuehrer* and members of the Security League to belong to a chapter of the Kösener SC "because the Kösener SC has publicly refused to carry out the principle of Aryanism." In other words, no one would be allowed to belong to an SC corps or to a league of alumni composed of former members of a given corps, on pain of dismissal from the *Sicherheits-Abteilung*.

Soon after publication of this order, developments were rapid. October 1 the Kösener SC was dissolved of its own free will. No doubt this step was taken in anticipation of compulsory orders to be issued by the central government or the ruling party. The upper strata of German society, the nobility, the bureaucracy, big industry and the bench are permeated with former corps students. It is evident that this opposition, which has continued now over two years, was directed primarily against the "upper classes." The bone of contention, however, was the Jewish problem, for several student corps had steadily refused to eject their non-Aryan members. Pure-blood Jews were seldom involved but rather offspring of mixed marriages. Now that the Kösener SC has been overthrown, the individual student corps at the universities will have rough sledding. In fact, some universities have suspended the student corps. From the standpoint of the present government one can understand that the student corps were a thorn in the flesh. It might be recognized that they brought out many good qualities in their members, yet their esprit gave rise to many things that were not so desirable, for example, their exaggerated exclusiveness, by reason of which an old corps student would often assist a corps brother along the path of life irrespective of whether or not he was deserving of aid. The result of this overemphasis on "connections" has sometimes been that good positions have not gone to the "worthiest and best" but rather to corps brothers. The more serious members of the SC league have often observed and regretted this fact. On the whole, it must be admitted that the class pride displayed by some of the corps students was exaggerated and objectionable. With this league there has disappeared an eighty-year-old tradition, which had accomplished much in the way of character building and had contributed a great deal toward the development of a spirit of camaraderie.

A few days after the dissolution of the Kösener SC, the other large student league, the "Deutsche Burschenschaft," followed suit. In contrast with the student corps, however, whose views formed a sharper contrast with those of the national socialists, the burschenschaften have acquiesced submissively and have thereby turned their backs on their liberal past. Their 110 chapters have been united with the *Nationalsozialistischer Studentenbund*. The bright cap and other insignia of the burschenschaften, which have helped to give a colorful aspect to the German universities, will disappear. Ever since the World War the burschenschaften have shown a tendency to sacrifice their traditions of a hundred years ago, when they were leaders in their support of liberal democratic ideas, and to embrace the newer ideas of the national socialists. It is evident that the leveling process is making rapid headway in the fraternity life of German university students.

The federal minister of public instruction has issued new regulations concerning the admission of students to the "Reichs-schaft der Studierenden an den deutschen Hoch- und Fach-schulen." Without exception, only such students may be admitted to local student bodies as "can prove, in accordance with the regulations of the national-socialist party, that they are of Aryan origin and of true German stock. In case of doubt, documentary evidence back to the year 1800 may be demanded." An official announcement has been published to the effect that "the decree constitutes another forward step in the application of the principle of Aryanism."

Of the 91,480 German students (exclusive of foreigners) attending German universities during the summer semester of 1934 (the last semester for which complete statistics are available) 656, or about 0.71 per cent, were of the Jewish faith. In addition there was a group of non-Aryans who cannot be identified on the basis of statements as to their religious faith but who are known from the fact that they are not admitted to the German student body. The total number of non-Aryans (exclusive of foreigners but including the pure-blood Jews) is 1,316, or 1.44 per cent of the total number of students of German citizenship. Hence it may be concluded that there are twice as many students of Jewish race as there are open adherents of the Jewish faith. In the summer semester of 1934 there were only twenty-four Jews among the first-semester entrants out of a total of 6,189 (excluding foreigners). Of the 4,350 foreign students, 364 were found to be of the Jewish faith, of this number, 208 were studying medicine or dentistry.

New regulations pertaining to examinations given non-Aryan medical students have likewise been announced. If these began their studies before the summer semester of 1933, they will be admitted to examinations in the scheduled manner. But passing of their examinations does not entitle them to a license to practice. If, however, they began their study of medicine or dentistry in the summer semester of 1933, they can be admitted to examinations "only in exceptional cases and that only with the special consent of the minister of the interior. Foreigners will be admitted to the examinations without being obliged to furnish evidence of Aryan origin. The following citation from the regulations is revealing: "The licensure (the right to practice medicine or dentistry) will not be granted to non-Aryan physicians or dentists until further notice. Only in a few exceptional cases, which must be presented to the minister for his decision, will a license to practice be granted. An exception will usually be made if the candidate fought at the front in the World War, or if only one of his four grandparents was Jewish (thus having only a quarter Jewish blood), or if his bearing and appearance are unobjectionable."

ITALY

(From Our Regular Correspondent)

Sept 30, 1935

Society of Anesthesia and Analgesia

The Società di anestesia e analgesia held recently its first meeting at Turin, jointly with the Società Piemontese di chirurgia, in which many foreign physicians participated. Papers were presented that dealt with the use of carbon dioxide in surgery. According to Bogetti, the administration of carbon dioxide during anesthesia suppresses the initial state of excitement and in addition increases the depth of inspiration and prevents respiratory syncope. It combats also hypotension and inhibits nausea and vomiting.

Peracino reported the results secured in the Ospedale Mauriziano in Turin over a period of three years from the administration of carbon dioxide during and after anesthesia. It has always aided the respiration during anesthesia. The reawakening is more rapid and is without nausea or vomiting.

Coronedi pointed out that, following acute poisoning due to barbituric compounds grave symptoms involving the broncho-

pulmonary apparatus are observed. This is due to the fact that, because of the intoxication, the respiratory movements are extremely limited. The inhalation of carbon dioxide-oxygen mixture is an excellent prophylactic means and an auxiliary remedy in combating intoxications of this nature.

Another series of papers dealt with the treatment of pain. Foa pointed out that ultraviolet irradiation with long waves has an immediate but not an enduring action, whereas ultraviolet irradiation with short waves gives more permanent results. In some cases the application of roentgen rays, he has observed, effects a cure of neuralgic disorders, which is permanent in about 60 per cent of the cases.

Segre spoke on posttraumatic spinal algias, emphasizing the importance of a thorough radiologic examination. In cases that he treated he brought about a permanent cure of peripheral algias by means of subarachnoid alcoholization of the posterior roots, thereby blocking the central nerve paths that transmitted the pain sensation.

Trueta of Barcelona discussed splanchnic anesthesia, which he used in interventions on the stomach, combined with local anesthesia applied to the stomach wall. In 771 cases he obtained excellent results, securing absolute anesthesia in 96 per cent. The number of complications in the form of bronchial pneumonia was reduced two thirds, as compared with the number recorded for ether anesthesia.

Giordanengo reported that in the surgical clinic at Bern, during the previous twenty years, in goiter operations local anesthesia was applied to the subcutaneous tissues and to the superficial cervical plexus by means of very dilute anesthetic solutions. With this method one avoids the blocking of the vagus and the recurrent nerves, together with the consequent complications.

Giorelli discussed the problem of anesthesia as applied to dentin and pointed out that all the preparations that produce insensibility in dentin exert a destructive action on the tooth pulp, as was demonstrated in a number of photomicrographs that he presented, which revealed changes in the tooth pulp due to the application of anesthetic substances to the surrounding dentin.

Roccia spoke on infection as a complication of local anesthesia in stomatology. He holds that in the majority of such cases the local infective process is due to the introduction of bacteria with the needle, during the injection. Local anesthesia has no drawbacks if its use is confined to inflammatory processes without suppuration but it should not be used in the treatment of purulent foci. It exerts a harmful action on the defense mechanism of the tissues.

According to Ruspa, local anesthesia and nerve blocking supply the deficiencies of all the systems of dentin and pulp anesthesia and give excellent results also in devitalization of the teeth.

Pejrone explained the technic of anesthetic injections in dental medicine and emphasized the importance of the degree of pressure applied in injecting the fluid, and the temperature of the fluid injected.

Kirschner of Heidelberg illustrated, in a film, his method of spinal girdle anesthesia induced by means of air. He injects into the dural sac a certain quantity of air, a total of about 22 cc, and an anesthetic solution that has the properties of being lighter than the spinal fluid and of not becoming readily diffused. Several different strata are formed, in the lowest strata is the spinal fluid, in a second strata above is the anesthetic, and above that is a strata of air. By regulating suitably the position of the zone with the anesthetic, the zone of insensibility can be shifted at will. Three thousand cases have demonstrated the value and the advantages of the method.

Figueras of Barcelona uses epidural anesthesia, employing procaine with epinephrine. He secures complete anesthesia in about 85 per cent of the cases, without grave incidents. He

recommends the method especially for interventions on the kidney and on the biliary tracts

Pescarmona secured good results with nupercaine in 500 cases of spinal anesthesia, with rare and transitory untoward incidents. It is necessary, however, to establish the exact indications, to prepare the patient carefully for the anesthetic, and to apply the exact technic of spinal anesthesia.

Ceremonies in Memory of Francesco Folli

Physicians from nineteen countries met recently at Poppi (Arezzo province) to honor the memory of Dr. Francesco Folli, who was the first to employ blood transfusion. Born at Poppi in 1624, this learned physician, in his publications "Recreatio physica" (1665) and "Dialogo sulla cultura delle vite" (1670) explained his idea of transfusing the blood of young and healthy persons to old or sick persons and described the instruments needed for the intervention.

The commemorative address was delivered by Professor Pazzini of the University of Rome.

Professor Cerletti Called to the University of Rome

The faculty of medicine of the University of Rome has asked Prof. Ugo Cerletti, formerly director of the university clinic in Genoa, to accept the chair of nervous and mental diseases at the University of Rome. After finishing his course of training in Rome, Cerletti continued his studies in German and French clinics. His works on the diseases of the cerebral blood vessels and of the meninges, and on the lesions of the cells and of the nerve fibers, are original in thought and classic in mode of expression. His new conception of the structure of the neuroglia, which has been accepted by many leading authorities, changes radically the old conception of Weigert.

BUDAPEST

(From Our Regular Correspondent)

Oct. 18, 1935

The Ninth International Dermatologic Congress

Prof. Louis Nékám of Budapest University, president of the ninth International Dermatologic Congress, opened the congress in the parliament building in Budapest. The Hungarian parliament reaches back to the beginning of the eleventh century. The foundation of the capital city took place, under the name of Aquincum, almost 2,000 years ago. Our scientific academy as at present organized dates back 110 years and our university 300 years. He said that the task of our congress is to further dermatology. Development in dermatology proceeds in the form of waves every fifty to sixty years. In the last 150 years three such waves have passed and the fourth is now under way. The approximate date of the first one was 1780, of the second 1835, and of the third 1880. In the first wave, two thoughts awakened the stagnating dermatologists. One of them carried the names of Plenck of Budapest, Lorry of Paris and Willian of London, who first emphasized the importance of pathologic symptoms and demanded the thorough examination of the patient. The second thought was presented in the method of Hunter, who said that in case of doubt one should appeal to experiments.

The second wave began 100 years ago. In 1834 Renucci demonstrated the mite of scabies, it was then discovered by Bassi and Balsamo that fungi are capable of killing the silk-worm. In 1835 appeared Alibert's great monograph and Rayner's manual on the diseases of the skin. Dermatologic knowledge advanced to such an extent that Cazenave thought of editing a dermatologic magazine. During this time the question was not "what?" but "why?" Dermatologists saw the changes and wanted to know their causes. One after the other entered the arena: the Frenchman Bichat, the Austrian Rokitan-sky, the German Virchow and the Italian Morgagni. Gradually

scientific morphology evolved. Every day new discoveries were made. People saw with amazement what immense importance attaches to the most minute living things. Conditions a hundred years ago must have been very primitive. When Hebra took over his hospital section in 1844, 2,173 of his 2,723 cases were diagnosed scabies. But could it be otherwise? Nothing was yet known about the function of the spleen, bone marrow, lymph glands, internal glands, sympathetic nerves or the reticulo endothelial system. The present laboratory tests had not been discovered. Today every assistant is making analyses with much more exact results than did Laënnec and Shoda.

In the year 1880 came the third wave—bacteriology. Pasteur and Koch founded many new conceptions, such as virulence, vaccination and immunity. Hand in hand with this went in the next fifteen or twenty years recognition of the fact that, besides the etiologic agent, the attacked organism itself is an important determining factor of the pathologic process, and that its reaction or counter attack was also of great influence.

With this a new age was reached in which it appeared that there are still much tiner things than bacteria, than the ultra microscopic beings, these are emanations and rays, which may attack the organism. In this age protection against diseases will be reached not by isolation or quarantine but by training, panimmunity and insusceptibility. Of course this requires a higher realization of the ideals of medical sciences. These perspectives have been a guide in preparing the program of the congress. The most important questions were considered: the correlation of functions, the filtrable viruses, the disturbances of metabolism, heredity, tuberculosis, venereal diseases, lepra, lymphogranulomatosis, industrial diseases and cancer. These were chosen to be dealt with from the scientific point of view and discussed also at separate conferences from the social and hygienic points of view. Besides special committees were organized which should endeavor to make terminology systematic and to frame definitions and basal conceptions. In 1896 Hutchinson said that it would be the greatest blessing if terminology and classification might be improved and that the start had to be made by dermatology. "Names are good servants but bad masters," he said.

Committees were named to deal with the training of dermatologists and with the discussion of the ethical, technical and economical conditions of dermatologic practice. The reports of these committees will appear in a separate volume. Many instructive preparations, historical exhibits, the results of research and technical instruments were shown.

JAPAN

(From Our Regular Correspondent)

Oct. 10, 1935

The Average Size of Japanese Students

About thirty years ago the height of schoolboys at the age of 7 was 107 cm and of schoolgirls 105.8 cm, at present the corresponding measurements are 108.5 and 107 cm. At the age of 13 when they finish the six years course of the primary school the height of the boys was 133.6 cm thirty years ago and of the girls 133.6 cm, the corresponding measurements now are 137.1 and 138.5 cm. This shows that girls grow taller than boys during these years by 1.5 cm on an average. At the age of 21, when they usually enter the university, boys were 160.7 cm in height but now are 163 cm, that is, they become about 55 cm taller than they were at the age of 7. When the girls are about 19 years old they were 147.5 cm in height but at present are 151.2 cm. They are shorter than boys by 12.5 cm but they become 44 cm taller than they were at the age of 7. According to their respective ages, the boys grew 3.9 cm every year on an average, and they have their best yearly growth of 3.6 cm to 8.5 cm at the age of 14 or 15. With the girls the average increase of height is 3.67 cm and the

best growth is seen when they are 13 or 14 years old, the average increase being 53 cm to 58 cm. As for their weight and the circumference of the chest almost the same tendency is observed. The average increase of the weight of boys during their school life is between 36.2 and 37.3 Kg. of the girls between 27.9 and 28.8 Kg. The girth of boys increases by 27.9 to 28.8 cm., of the girls between 24.4 and 25.6 cm. Boys in the first year class in modern primary schools are heavier than the former boys by 0.5 Kg and the girls by 0.4 Kg. As for the girth of the chest, the boys have an increase of 0.5 cm but a decrease is found in the girls.

The Board of Medical Inspectors

The Board of Medical Inspectors met September 19 at the bureau of education, to discuss the problem of how to support private medical educational institutions. The inspectors required that the bureau of education grant these institutions financial assistance. The regular examination made by the inspectors is reported as having brought good results. Another subject discussed was a medical course to be opened for foreign students to this country. There are many Chinese, Filipinos and Siamese who want to finish their medical training in Japan within a comparatively short time. The board agreed that the new course should be satisfactorily adapted to the needs of students who come from foreign countries. There should be two years' preparatory study, chiefly for training in the language, and after that four years of medical training. The six year course is expected to be established by some private medical colleges as the government medical colleges are not authorized to receive foreign students as regular students. At the same time, Manchukuo is in urgent need of more practitioners in the interior of the country. Unfortunately Manchukuo does not have a medical school but must send students to Japan to be educated. Those two needs are to be met by private schools. Another subject discussed was the amalgamation of some medical schools that are in financial difficulties. This is of course desirable, but most of the medical men concerned do not desire amalgamation.

The Health of High School Students

After a year's investigation a report on the health of the pupils of the middle grade schools was issued by the sanitary section of the educational department. These schools are attended by boys and girls from 14 to 18 years of age. In 1934, of a total of 736,500 pupils 2,092 died 3,766 were obliged to leave school on account of sickness 9,734 were compelled to stay away from school a long time through sickness and 47,884 were absent from school for more than a week on account of sickness. The sickness for the most part was tuberculosis. One of the main causes of so much tuberculosis must be competitive examinations. Even the children in the primary schools are forced to prepare themselves in order to enter any good schools. The lack of proper sanitation in the schools must also be a cause and is due to the poverty of the local government. Private bodies of various kinds such as the parents association in the primary schools, are organized to provide needed equipment.

Personals

Prof. Dr. N. Hayashi, famous for his lifelong devotion to research on tsutsugamushi disease, has closed his research laboratory in the prefecture of Nagata where he has rendered such great services in prevention of the disease. The mayor of Nagaoka held a farewell meeting in his honor and decided to give a subsidy of 1,500 yen a year to have his research continued at Nagoya.

Dr. Yutaka Tateki has been appointed chief professor of the Nagasaki medical college, to succeed the late Prof. Dr. Komuro. In the general election of members of the prefectural assemblies, held in the latter part of September throughout the coun-

try, 126 medical men were candidates and sixty-six were elected. This fact shows that medical men are much interested in the politics of the local government and are leaders in their own districts.

Marriages

JOHN E. HARTSAW, Cristobal, C. Z., to Miss Hannah Washington of Guayaquil, Ecuador, at Balboa, October 16.

IRMA CARLENS HENDERSON to Mr. William E. Smathers, both of Asheville, N. C. at Hendersonville, November 3.

JOHN M. BRAND, Spencer, W. Va., to Miss Mary Colebank of Morgantown, in Huntington, November 2.

SAMUEL BUTLER GRIMES, Baltimore, to Miss Elizabeth Brawner of Washington, D. C., October 19.

DONALD C. WILKINSON, Oconomowoc, Wis., to Miss Ruth Halloran of Des Moines, Iowa, October 12.

ADOLPH E. DREVEL, Palatka, Fla., to Miss Charlotte Leah Shapps of Wilkes-Barre, Pa., November 6.

PAUL D. MCCARTY, Ely, Minn., to Mme. Delphine Sames-Schacht of Virginia, in Chicago, recently.

HERMAN HARRISON BRAYTON, Chase City, Va., to Miss Ann Norfolk Grimm of Baltimore, recently.

MARTIN CARL LINDMAN, Rockford, Ill., to Miss Alice Dorothy Port of Youngstown, Ohio, March 31.

SAMUEL LINN GROSSMAN, Harrisburg, Pa., to Miss Mary Quinn of Bayonne, N. J., October 19.

WILLIAM B. BURLISON to Miss Amanda Elizabeth Godfrey, both of Plumtree, N. C., August 29.

FRANK KELLS BOLAND JR. to Miss Octavia Norfleet Riley, both of Atlanta, Ga., November 14.

JAMES J. GWIN, Hartsville, Tenn., to Miss Elsie Evins of Culleoka, at Carthage, October 18.

JACOB JOSEPH SILVERMAN, Staten Island, N. Y., to Miss Myn Reich of Orange, N. J., October 3.

FRANK KARSTENS DEAN, Madison, Wis., to Miss Gladys Paust of Columbus, September 30.

EDGAR MARVIN LANCASTER, Shady Dale, Ga., to Miss Jewel Moats of Fairburn, September 14.

FRANK E. DREW, Milwaukee, to Miss Irene Wollaege, at Pine Lake, Wis., September 7.

WILLIAM D. BURKHALTER to Miss Alice Novella Graves, both of Nashville, Tenn., October 3.

CLIFFORD O. MCCREEDY, Alledo, Ill., to Miss Permella Donaldson of Monmouth, October 24.

BENJAMIN HALPORN, Oberlin, Pa., to Dr. MIRIAM REWALT Polk of Harrisburg, July 11.

HENRY KIRVIN SPEED JR., Sayre, Okla., to Miss Ruth Armstrong of Norman, recently.

ARTHUR J. ROSER, Arcola, Ind., to Miss Lillian Kluger of Indianapolis, September 8.

NORRIS EDWARD LENAHEAN to Miss Ernestine Little, both of Columbus, Ohio, recently.

ARMER H. STOLPESTAD, St. Paul, to Miss Evelyn K. Gordon of Minneapolis, recently.

WILLIAM H. ROE Patchogue, N. Y., to Miss Alice Ongaro of Astoria, September 7.

GLENN R. STAUFF, Green Bay, Wis., to Miss Mildred Witters of Hilbert, October 11.

DAVID E. MARKSON to Miss Esther N. Anderson, both of Chicago, October 12.

MARTIN G. ERICSSON to Miss Martha E. Anderson, both of Chicago, October 26.

THOMAS C. GUTHRIE, Smithville, Ark., to Mrs. Ora Ashburn of Imboden, recently.

CHARLES A. LEBERTHART, Atlanta, to Miss Avis Barr of Bowdon, Ga., August 31.

JAMES H. CARSON, Martins Ferry, Ohio, to Miss Esther Horswell, recently.

GEORGE W. JOHN to Miss Pauline F. Poudrier, both of Beloit, Wis., October 15.

DAVID H. SMELTZER, Youngstown, Ohio, to Miss Florence Buehrle, recently.

PAUL J. LEAHY, Tiffin, Ohio, to Miss Mary Quinn of Erie, Pa., recently.

DEATHS

Deaths

Edward Starr Judd of Rochester, Minn., President of the American Medical Association in 1931-1932, died of pneumonia, after a few days' illness, in the Presbyterian Hospital, Chicago, November 29. Dr Judd was on his way to address a meeting in Philadelphia when he was taken ill. Born in Rochester, Minn., July 11, 1878, he graduated from the University of Minnesota School of Medicine, Minneapolis, in 1902 and then became an intern in St. Mary's Hospital in Rochester. In 1903 Dr Judd became first assistant to Dr Charles H. Mayo, and in 1904 he was appointed head of a section in the division of surgery at the Mayo Clinic, later he was appointed surgeon at St. Mary's Hospital in Rochester and professor of surgery in the graduate school of the University of Minnesota, positions which he has filled with distinction for many years. Dr Judd served during the World War as director of the school of instruction for officers and enlisted men of the medical corps in Rochester. Since the war at times he had given of his talent and experience in the training of medical reserve officers. He contributed much to the advance of surgery, having long been recognized as a foremost leader and teacher, especially in surgery of the abdomen. Attesting his great work and ability are his numerous scientific articles in the periodical medical literature and textbooks, numbering more than 200. One of the latest papers published in THE JOURNAL, November 23. Dr Judd was a favorite lecturer and traveled thousands of miles during his career to address medical groups and societies. He was from the beginning of his career an indefatigable worker in organized medicine in county, state and national medical societies. He served as president of the Minnesota State Medical Association, was secretary of the section on surgery, 1913-1916, and chairman, 1917-1918, and in 1918 was elected second vice president of the American Medical Association. He was also a member of the Council on Scientific Assembly of the American Medical Association from the time it was created in 1915 until the conclusion of the annual meeting in Washington, D. C., in 1927. While President-Elect he was chosen to give the first address of the Mayo Lecture-ship in Surgery at Northwestern University Medical School in Chicago in April 1931, a lectureship that was endowed by Dr Charles H. Mayo for the advancement of learning in surgery. Dr Judd was a member of the Minnesota Academy of Medicine, the Minnesota Pathological Society, the American College of Surgeons, the Surgical Association, the Southern Minnesota Medical Association, the Association of Resident and Ex-Resident Physicians of the Mayo Clinic, Sigma Xi, and an honorary member of several scientific societies of foreign countries. Dr Judd was married to Miss Helen Berkman of Rochester in 1908. Among his five children is a son who is a senior at Rush Medical College. Surgeons everywhere have spoken of the surgical mastery of E. Starr Judd, calling him a surgeon's surgeon and the greatest of the great. Men came from the four corners of the world to witness him at his routine work. He was modest, sincere and earnest—a man with beauty of character and greatness of spirit. His death fell on those who knew him like an overwhelming blow.

George Elgie Brown of Rochester, Minn., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1909 associate professor of medicine, Mayo Foundation, University of Minnesota Graduate School of Medicine, in 1921 came to the Mayo Clinic as first assistant in one of the sections in the division of medicine and was appointed associate in 1922,

served with the Rockefeller Foundation in France in 1918 and 1919, member of the Central Society of Clinical Research and the American Society for Clinical Investigation, fellow and formerly regent of the American College of Physicians, consulting physician and head of a section on medicine of the Mayo Clinic, author of numerous articles, aged 50, died, November 28, of pneumonia.

Henry Joseph Fitzsimmons, Boston, Harvard University Medical School, Boston, 1908, member of the Massachusetts Medical Society, fellow of the American College of Surgeons, instructor in orthopedic surgery at his alma mater, assistant surgeon to the Children's Hospital, orthopedic surgeon to the Newton (Mass.) Hospital, orthopedic surgeon to the St. Mary's Infant Asylum and Hospital, consulting orthopedic surgeon to the Quincy (Mass.) Hospital, the Providence Hospital, Holyoke, and the Choate Memorial Hospital, Woburn, aged 55, died, October 5, of arteriosclerosis.

Charles Thaddeus Souther, Cincinnati, Medical College of Ohio, Cincinnati, 1902, member of the Ohio State Medical Association and the Western Surgical Association, fellow of the American College of Surgeons, past president of the Cincinnati Academy of Medicine, served during the World War, aged 59, president of the staff of St. Mary's Hospital, on the staffs of the Bethesda Hospital and the Deaconess Hospital, where he died, October 11.

Ralph Gates Cressman of Stockton, Calif., Bennett College of Eclectic Medicine and Surgery, Chicago, 1905, served during the World War, at one time medical examiner for the United States Veterans' Bureau, aged 55, died suddenly, October 18, in St. Joseph's Hospital, of ulcer of the stomach with perforation and carcinoma of the pancreas.

Waller Hunn Nardin of Anderson, S. C., New York University Medical College, 1897, fellow of the American College of Surgeons, past president of the Anderson County Medical Society, formerly member of the school board and city council, on the staff of the Anderson County Hospital, aged 59, died, October 7, of coronary thrombosis.

William A. Ferguson, Moncton, N. B., Canada, McGill University Faculty of Medicine, Montreal, Que., 1884, past president of the Council of Physicians and Surgeons of the New Brunswick, fellow of the American College of Surgeons, American College of Hospital

EDWARD STARR JUDD, M.D., 1878-1935



for many years on the staff of the Moncton General Hospital, aged 74, died, October 2, of pneumonia.

Herbert Arthur Breyfogle, Kansas City, Mo., Rush Medical College, Chicago, 1905, member of the Missouri State Medical Association, served during the World War, at one time member of the state board of health, on the staff of St. Luke's Hospital, aged 57, died, October 11, of coronary sclerosis.

Charles Jefferson Simmons of Lawrence, Kan., Bellevue Hospital Medical College, New York, 1885, formerly lecturer on principles of surgery and adjunct professor of general surgery, University of Kansas School of Medicine, aged 77, died, October 20, of peritonitis following a ruptured appendix.

George Marven Cady of Owego, N. Y., University of the City of New York Medical Department 1887, since 1891 trustee and since 1920 on the staff of the Robert Packer Hospital, Sayre, Pa., since 1921 member of the board of visitors of the Elmira Reformatory, aged 70, died, October 10.

Thaddeus Louis Szlapka, Shorewood, Wis., University of Pennsylvania Department of Medicine, Philadelphia 1914, served during the World War, formerly assistant clinical professor of medicine, Marquette University School of Medicine, aged 44, died, September 29, of pneumonia.

Jethra Hancock, Louisville, Ky., Hospital College of Medicine, Louisville, 1905, member of the Kentucky State Medical Association, served during the World War, director of the bureau of venereal diseases, state board of health, aged 60, died, October 4

Charles George Koehler, Brooklyn College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1882, member of the Medical Society of the State of New York, aged 77, died, October 30, of chronic myocarditis and bronchitis

Frank Albert Phillips, Pasadena, Calif., Bennett College of Eclectic Medicine and Surgery, Chicago, 1886 College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1891, aged 69, died, September 10, of tuberculosis

Nathan M. Friedman, Boston Medizinische Fakultät der Albertus-Universität, Königsberg, Prussia, 1906, Tufts College Medical School, Boston 1909, member of the Massachusetts Medical Society, aged 51, died, October 3, of carcinoma of the right lung

Albert Durham, Tuxedo N. C., University of the City of New York Medical Department, 1891, served during the World War, for many years on the staff of the Bloomingdale Hospital, White Plains, N. Y., aged 71 died October 27, of heart disease.

Philip Reginald Fox * Madison, Wis., Rush Medical College, Chicago, 1890, fellow of the American College of Surgeons, on the staffs of St. Mary's and Madison General hospitals, aged 68, died, October 2, of carcinoma of the rectum

Frank Llewellyn Durgin, Winnebago Minn., Western Reserve University Medical Department, Cleveland, 1882, member of the Minnesota State Medical Association aged 83, died, September 23, of chronic myocarditis and arteriosclerosis

Julius Morris Abelio, Los Angeles, College of Physicians and Surgeons of Chicago, 1892 formerly on the staff of the Mount Sinai Hospital, Chicago, aged 72, died, November 8 in the Cedars of Lebanon Hospital, of bronchopneumonia

Francis John Higgins * East Providence, R. I., Tufts College Medical School Boston, 1921, on the staffs of St. Joseph's Hospital and the Homeopathic Hospital, Providence, aged 41, died, October 3, of cerebral hemorrhage

John F. Hargan, Mound City, Ill., University of Louisville (Ky.) Medical Department, 1891, member of the Illinois State Medical Society, aged 71, died, September 29, in St. Mary's Infirmary, Cairo, of cerebral hemorrhage.

William J. Gundelach * St. Louis, Washington University School of Medicine, 1890, University of Pennsylvania Department of Medicine, Philadelphia, 1891 aged 67, died, September 29, of chronic interstitial nephritis

Harry Kepler Gorsuch, Baltimore, College of Physicians and Surgeons, Baltimore, 1889, member of the Medical Surgical Faculty of Maryland, for many years city coroner, aged 66, died, October 9, of angina pectoris

William Hampton Matchett, Greenville, Ohio, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1899, aged 58 died, October 3, in the Greenville Hospital, of chronic nephritis and hypertension

Hazleton H. Stallard, Pikeville, Ky., Columbus Medical College, 1890, member of the Kentucky State Medical Association aged 70, died, September 24, in the Methodist Hospital, of diabetic gangrene.

Frank Gale Renshaw, Pensacola Fla., University of Louisiana Medical Department, New Orleans 1879 member of the Florida Medical Association, aged 79 died September 11, of acute leukemia

Adolph Herman Nahman * San Francisco Northwestern University Medical School, Chicago 1909 fellow of the American College of Physicians, aged 58 died, September 21, of spongioblastoma.

Jacob B. Spangler, Mechanicsburg, Pa., Jefferson Medical College of Philadelphia, 1886 member of the Medical Society of the State of Pennsylvania, aged 72 died October 7 of arteriosclerosis

Leonida Olivieri, Stockton, Calif. Regia Università di Genova degli studi Facoltà di Medicina e Chirurgia Italy, 1884 aged 73, died, September 10, in St. Joseph's Hospital of arteriosclerosis

Charles J. Fazenbaker, Western Port, Md. National Normal University College of Medicine Lebanon, Ohio, 1896, aged 68 died September 22 near Laurel, Md., of chronic myocarditis and epilepsy

George White Griswold, Alma Center, Wis., Milwaukee Medical College, 1910, served during the World War, aged 49 died, September 17, of angina pectoris, arteriosclerosis and pyelitis

Ward Irving Huber, East Cleveland, Ohio, Western Reserve University Medical Department, Cleveland, 1912 aged 51, died, October 3, of chronic nephritis, myocarditis and pneumonia.

Fred Xenophon Lilly, Jumping Branch, W. Va., University of Louisville (Ky.) Medical Department, 1910 aged 49, was killed, September 21, when he was struck by an automobile

Willard Daniel Arnold, Spokane, Wash., Rush Medical College, Chicago, 1895, member of the Illinois State Medical Society aged 63, died September 17, of cerebral hemorrhage.

Morton Harley Lee, Bearden, Tenn., Southern Medical College, Atlanta, 1889 past president of the Knox County Medical Society, aged 79, died, October 3, of angina pectoris

James Henry Barry, Boston Tufts College Medical School, Boston, 1896, member of the Massachusetts Medical Society, aged 65 died, September 23, of arteriosclerotic heart disease.

Susan Sharpe Waddell, Tsinan, Shantung, China, University of Pittsburgh School of Medicine, 1919, medical missionary, aged 40, was killed, October 15, presumably by bandits

Arthur Humphrey Wood, Providence, R. I., New York Homeopathic Medical College and Hospital, 1889, aged 74, died, September 28, of angina pectoris, and arteriosclerosis

John Lavell Reeve, Lake Nebagamon, Wis., Queen's University Faculty of Medicine, Kingston, Ont., Canada 1882, aged 74, died, August 15, of myocarditis and coronary sclerosis

William Wallace Carleton, Waterloo, N. Y., University of Buffalo School of Medicine 1901, served during the World War, aged 56, died, October 15, of coronary thrombosis

Samuel Floersheim * Los Angeles, Bellevue Hospital Medical College, New York, 1898, aged 58 died, October 4, in the California Hospital, of ruptured ulcer of the sigmoid

Joseph Edward Clagett, Hamilton, Va., Maryland Medical College, Baltimore, 1910, member of the Medical Society of Virginia, aged 55, died, October 26, of angina pectoris

Duncan Aeneas MacGregor, Barry's Bay, Ont., Canada University of Bishop College Faculty of Medicine, Montreal, Que., 1904, aged 58, died, October 15, of septicemia

Howard Roeder Swayne, Pittsburgh, Jefferson Medical College of Philadelphia, 1889, aged 72, died, September 29, in the Mercy Hospital of chronic cardiovascular disease

Robert Scott Dinsmore, Walla Walla, Wash., College of Physicians and Surgeons, Keokuk, Iowa, 1878, aged 81, died, August 28, of coronary sclerosis and angina pectoris

Bransen Kemper De Voe, Albany, N. Y., Albany Medical College 1904, member of the Medical Society of the State of New York, aged 63, died, October 3, of myocarditis

Tillman Wesley Gee, Philadelphia, University of Pennsylvania School of Medicine, Philadelphia, 1932, aged 30, died, October 9 of hypertensive cardiovascular disease.

Albert Edward Patterson, Plymouth, Mich., Detroit College of Medicine 1901, served during the World War, aged 65 died, September 13, of cerebral hemorrhage.

Howard Messenger Shaw, Ashland Ore., McGill University Faculty of Medicine, Montreal Que. 1895, aged 64, died, September 12, of carcinoma of the lung

Thomas Frederick Madden * Fresno, Calif., Cooper Medical College, San Francisco, 1904, aged 55, died, September 8, of streptococcal cellulitis of the face

James Robert Lockhart, Sherard, Miss., University of Nashville (Tenn.) Medical Department, 1899, aged 63, died, October 5, of carcinoma of the stomach

Ella Welch Ashley, Ohio, Toledo Medical College, 1894, for many years member of the county board of health, aged 72, died, September 23, of arteriosclerosis

Charles William Stolz, New Albany, Ind., Central College of Physicians and Surgeons, Indianapolis, 1904, aged 73, died, October 14 of arteriosclerosis

Paul F. Deford, Pasadena, Calif., University of Maryland School of Medicine, Baltimore, 1889, aged 67, died, September 21 of coronary sclerosis

John Lemuel Thornton * Warrenton, Va., Jefferson Medical College of Philadelphia, 1924, aged 40, died, October 7, of pulmonary tuberculosis

M. Hugo Rosenheimer, Milwaukee Milwaukee Medical College, 1908, aged 50, died, September 29, in Rochester, Minn., of hypertension and uremia.

Correspondence

THE COMMITTEE AGAINST INFANTILE PARALYSIS AND THE GEORGIA WARM SPRINGS FOUNDATION

To the Editor—In its simplest definition, the Georgia Warm Springs Foundation, Inc., is an organization engaged in "fighting infantile paralysis" in the United States.

Any comprehensive campaign directed to the problems created by this disease is naturally divided into three main subdivisions, namely, (1) research toward successful methods of prevention of and immunization against infantile paralysis, (2) after-treatment, to do everything possible to raise the general standard of methods and facilities used in the after-treatment of infantile paralysis for those who have been left with muscle impairment or deformities, following the acute stage, and (3) rehabilitation and employment. Supplementing and following the work of the orthopedic surgeons and hospitals in bringing about whatever physical restoration is possible, there comes the vital problem of giving to those with a residual handicap such specialized education and training as will enable them to hold a useful place in life and to become economically independent.

Of equal importance is the problem of educating those who employ large numbers of persons to the philosophy of giving an equal opportunity, in appropriate occupations and without prejudice or favoritism, to those who have visible handicaps (orthopedic cripples). It has been proved repeatedly that a physical disability is a minor matter whenever there is real ability, and yet there is all too often an almost automatic ruling out of consideration of persons who use crutches or braces. It has not been sufficiently brought home just what modern transportation does to open the door of opportunity to the crippled workman or executive in the present age, as contrasted to what the disability might have meant 100 years ago. A self-respecting person with the crippling handicap asks or wants no pity. A crippled person is in exactly the same position as a golfer who has to accept a handicap to play in a foursome. It may even make the game of life more interesting, as indeed it does for many of the golfers. The truth is that every member of the golf foursome has some kind of a handicap, if not the one on his score. The same is true of the relationship of people to life, but the crippled person often has to face an unreasonable prejudice, solely because his handicap is visible, whereas the next person who applies for the job may have a much more serious handicap, which is not visible and therefore goes, for the time being, unnoticed.

It is the purpose of the Georgia Warm Springs Foundation to cooperate with those existing agencies—medical and lay—which as a part of their programs contribute directly to the fight against infantile paralysis. It is the purpose of the foundation to approach this in a broad educational manner, without any attempt at centralized control or bureaucratic methods. The name "Georgia Warm Springs Foundation, Inc.," has its origin in the fact that the beginning of the work of this organization was the creation of an institution or hospital at Warm Springs, Ga., devoting its energies to the after-treatment phase of infantile paralysis for a limited number of patients. Out of this small beginning and through public interest and support, as well as through private donations, it has been possible to create a broad program intended to be helpful to the whole cause. Perhaps today the work of the foundation would be better defined under the title "Infantile Paralysis Foundation." It is possible that some day the name of the organization will be changed. In the meantime it is simply a heritage from the manner in which the present program obtained its origin.

A brief outline of the two birthday balls for the President may be in order. The National Committee for the Birthday Ball for the President, under the chairmanship of Mr. Henry L. Doherty, organized parties in a great number of communities in all parts of the United States on the President's birthday, Jan. 30, 1934, with the purpose of presenting the resulting funds to the Georgia Warm Springs Foundation for the furtherance of its program of fighting infantile paralysis. The committee, under the same chairman, conducted a second ball, Jan. 30, 1935, with a program calling for 30 per cent of the funds to be allocated to preventive research and 70 per cent to remain in the local communities for the furtherance of their own programs of after-treatment of infantile paralysis.

On May 9, 1934, there was received from the National Committee for the Birthday Ball for the President the sum of \$1,003 030 08.

It is to be noted that, out of this fund, half of the beds at Warm Springs (which total 100) are being supported in full or in part in order that a substantial proportion of the registration may be made up of charity and semicharity patients.

It is not part of the present purpose of the trustees to enlarge the capacity of the institution at Warm Springs, it is felt that the funds which have been entrusted to us through the generosity of the public and private donors can better be utilized in emphasis on a coordinative educational program. The objective is to have the 100 patients at Warm Springs represent a geographic distribution of the whole country and be a cross section of the problem presented by poliomyelitis as to age, sex, economic condition and degree of physical impairment. The Orthopedic Advisory Committee is assisting in the selection and admission of these 100 patients for treatment and furtherance of the educational and coordinative work of the institution at Warm Springs.

The 1935 birthday ball enabled the national committee to turn over, through the President, the sum of \$242,286.82 for medical research work in prevention and immunization. The disbursement of this sum is the responsibility of a special body created for that purpose, namely, the President's Birthday Ball Commission for Infantile Paralysis Research. This lay commission is assisted in its decisions as to the research projects to be supported by a medical advisory board of three doctors, none of whom are themselves engaged in research work in anterior poliomyelitis.

There are a total of six subdivisions of the foundation's work, which are creations or outgrowths of the work of the Georgia Warm Springs Foundation. They are the President's Birthday Ball Commission for Infantile Paralysis Research, the National Committee for the Birthday Ball for the President, the Employment and Rehabilitation Advisory Committee, the Committee for Public Information, the Orthopedic Advisory Committee and the foundation's institution at Warm Springs, Ga. Two of these, the Employment and Rehabilitation Advisory Committee and the Committee for Public Information, are new and in the process of formation. Four medical groups, between which and these subdivisions there exists a coordinative relationship, are playing a most important part in fighting infantile paralysis. These are (1) the American Medical Association, (2) the American Orthopedic Association and the American Academy of Orthopedic Surgeons, (3) the American Pediatric Society and the American Academy of Pediatrics and (4) the United States Public Health Service and the National Institute of Health.

ARTHUR CARPENTER, New York.

Executive Director, The Committee Against Infantile Paralysis, sponsored by the Georgia Warm Springs Foundation, Inc.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address but these will be omitted on request.

MORTALITY RATE IN TUBERCULOSIS

To the Editor—What is the present mortality rate of tuberculosis in the United States compared with twenty years ago? How does it rank as to the cause of death compared with heart disease and cancer? Please omit name
M D Ohio

ANSWER.—The latest available 'Mortality Statistics' of the United States Bureau of the Census are those for the year 1932 which give the mortality rate per hundred thousand of estimated population in the registration area of continental United States for tuberculosis of the respiratory system as 56.4, and for other forms of tuberculosis as 6.4. For the year 1910 the mortality rate of tuberculosis of the respiratory system is given as 136, and for other forms of tuberculosis as 24.3. The mortality rate per hundred thousand of estimated population in the registration area in continental United States for the year 1932 for diseases of the heart is given in this volume as 209.2 and for cancer and other malignant tumors as 102.2.

USE OF PERIODIC TUBERCULIN TESTS

To the Editor—The pediatrician who cares for my children always gives them a tuberculin test twice yearly. They object strenuously to this and I wonder whether it is necessary. Please omit name
M D Oregon

ANSWER.—The pediatrician who administers the tuberculin test twice yearly for the children under his care has the modern point of view of tuberculosis control. He has two objects in mind: the first is to learn whether the child has become associated with any open case of tuberculosis during the previous six months. He is aware of the fact that there are still many persons who have tuberculosis in a communicable form who are unsuspected of having the disease and that any child may come in contact with such a case and take tubercle bacilli into the body. He also knows that the positive tuberculin test is the first evidence of a tuberculous lesion which any phase of the examination will reveal and that in most cases this is the only evidence available over a considerable period of time and that it may remain the only evidence of the presence of tuberculosis in the body during the lifetime of the individual. Since it is true that a single contact with an open case of tuberculosis may result in a positive tuberculin reaction, one must keep in mind that the association with the open case may have continued. The first and the most important step in the treatment of tuberculosis of the child, even though it is manifested only by the positive tuberculin reaction, is to stop further exposure, that is, to prevent at the earliest possible moment any more tubercle bacilli from entering the body. Convincing evidence has accrued to support the view that the longer exposure to tubercle bacilli is allowed to continue the greater the chances of the child's falling ill from a clinical form of tuberculosis at some later time in life. The pediatrician is desirous of protecting the children under his care from such occurrence, and therefore he administers the tuberculin test periodically to make sure that such exposure is not occurring.

The second object which the pediatrician has in mind is to detect tuberculosis as soon as possible after it develops. There is a small percentage of infants and children who develop primary tuberculosis, tuberculous pneumonia or meningitis soon after the first infection is established. Wallgren (*J Pediat* 5:291 [Sept.] 1934) has shown that these very destructive forms of tuberculosis occur most frequently within three months from the time the first infection type of disease results in sensitization of the tissues. While they are reinfection forms of tuberculosis of endogenous origin there is no way to prevent them after the first infection type of disease is established and they usually do not respond well to treatment. Even though they occur in only a small percentage of all infected infants and children, the pediatrician must constantly keep these conditions in mind in all children who have recently become infected and who react positively to the tuberculin test. The knowledge that the tuberculin test has been positive may aid him greatly in establishing an early diagnosis if such a child falls acutely ill since as primary disease, tuberculous pneumonia and meningitis progress the tissues may become so desensitized that they no longer react positively to the tuberculin test.

Moreover the pediatrician is aware of the remote dangers from the tuberculous infection that results in the positive tuber-

culin test. He knows that the sensitization of the tissues to tuberculo-protein is a liability; he also knows that, while the first infection foci of tuberculosis usually do not cause any significant illness, they usually harbor living and virulent tubercle bacilli over long periods of time and that if such bacilli are set free into the adjacent tissues or into the blood stream they are likely to produce reinfection, clinical forms of tuberculosis in the bones and joints, kidneys, lungs and other parts of the body. Moreover he knows that exposure to exogenous sources is dangerous, and therefore he is in a position to instruct the parents to keep such children, so far as it is possible, from contact with open cases of tuberculosis.

The pediatrician who administers the tuberculin test periodically among the children of his clientele and constantly instructs the parents concerning the prevention of the first infection type of tuberculosis and recommends the proper procedures for those who have already become contaminated with tubercle bacilli is practicing the best method of tuberculosis control. In fact, Sir Robert Philip (*Brit M J* 1:43 [Jan 10] 1931) of Edinburgh has used this procedure for more than three decades with excellent results. Tuberculin administered in the proper dosage every six months to children reacting negatively to the test results in no harm, nor does it sensitize the tissues. Therefore it is an excellent procedure and the physician who administers it is practicing the most modern phase of diagnosis in tuberculosis. Since the children in this particular case object strenuously to the test, it might be well to substitute the percutaneous method of administration as described by Beatrice R. Lovett (*The Percutaneous Tuberculin Reaction Am J Dis Child* 37:918 [May] 1929) or the tape test described by Ernst Wolff (*Am Rev Tuberc* 27:308 [March] 1933). These tests do not require the use of a needle or any instrument and are about as accurate as the epidermal test of Pirquet or the intradermal test of Mantoux. In any event, the pediatrician should be permitted to continue the periodic testing of the children.

INTERPRETATION OF TUBERCULIN TEST

To the Editor—The other day I attempted a tuberculin test on a patient whom I suspected of having tuberculosis. As there was some of the solution left and being curious I tried the test on myself. I used the tablets Tuberculin P P D put out by Sharpe & Dohme. Much to my surprise the next day I showed a four plus skin reaction together with a marked systemic reaction. I am 40 years of age and have always been perfectly healthy and have never suspected that I might have tuberculosis. I should like to know your opinion of this positive reaction of the tuberculin test on myself. I should also like to know your opinion as to its value in making a diagnosis in suspected cases of tuberculosis. Please omit name
M D, Nebraska

ANSWER.—From the description of the reaction, one wonders whether it was due to tuberculin or pyogenic micro-organisms that entered the skin through the needle puncture. The tuberculin reaction is not interpreted as four plus unless there is evidence of necrosis, which is usually followed by sloughing of the tissues. Such evidence usually is not available in such a short period of time. If the directions for administering Purified Protein Derivative were carefully followed when the first dose was administered there should have been no systemic reaction and no necrosis and sloughing at the site of injection. If the first dose has caused no reaction, the second dose almost never results in necrosis and sloughing or a systemic reaction. Therefore if the reaction described was due to tuberculin, it would seem that a larger amount was administered than is usually prescribed.

A positive tuberculin reaction at any age provides one with two facts: first that the reactor has been exposed either directly or indirectly to a person or an animal suffering from tuberculosis or acting as a carrier or disseminator of tubercle bacilli, second that tubercle bacilli have gained entrance to the body and have set up at least one primary focus. Among persons who have reached the age of 40 years, one must expect to find a rather high percentage reacting positively to the tuberculin test. When such persons were infants and children little was done in any community to protect them against tubercle bacilli of both the bovine and the human type. Tuberculin testing of cattle had not reached significant proportions, nor was pasteurization of dairy products extensively practiced. Tuberculous patients for the most part remained in their homes and communities with little or no attempt at isolation and almost no successful treatment; thus they transmitted tubercle bacilli to infants and children. Therefore, the wonder is that any infant or child escaped contamination.

The tubercle bacilli that resulted in the first infection of tuberculosis may have entered the body and set up this disease forty years ago. Again they may have entered as recently as

as from three to seven weeks before the test was administered or at any intervening time. Regardless of the age in life that tubercle bacilli enter the body, the defense mechanism, consisting of neutrophils, monocytes, lymphocytes, connective tissue cells and so on, quickly focalize and surround them. A fibrous capsule usually is thrown up around these foci of bacilli, and lime may be deposited in the small caseous center of the tubercle. This may later extend into the capsule, and thus a true limestone wall surrounds the bacilli. In fact, in about 25 per cent of the cases a wall of true bone develops around the foci of tubercle bacilli. All this transpires in the bodies of human beings who become infected without causing significant illness, and therefore the individual whose body possesses such lesions usually is not aware of their presence until some special examination is made that detects them. Within about three to seven weeks after tubercle formation begins, the tissues of the body have become sensitive to tuberculinoprotein, and this sensitization probably persists as long as the tubercle bacilli remain alive in the body.

Thus the positive reaction indicates the presence of foci of the first infection type of tuberculosis somewhere in the body. Unfortunately, it does not determine whether the reinfection destructive type of disease has developed but since this type usually occurs only in the bodies of persons who react positively to the tuberculin test, every person with such a reaction should have adequate examination to determine whether the disease exists in a destructive form.

One usually looks first to the chest for the tuberculous lesions, whether they are of the first infection or the reinfection type. The x-ray film is far superior to any other phase of examination in detecting the location of such foci, but in the first infection type tuberculosis the lesions are often so small that they do not cast shadows that can be visualized on the film. Therefore, when the film shows no evidence of the location of the lesion it does not in any way invalidate the tuberculin test since this test detects microscopic lesions as well as gross ones, whereas the x-ray film detects the location of only macroscopic lesions. However, when the chronic reinfection type of tuberculosis develops in the lungs to such an extent that it jeopardizes the health of the individual, it is usually sufficiently large to cast a shadow that can be seen on the x-ray film. Such shadows can usually be detected two or three years before the lesions cause any significant symptoms or abnormal physical signs.

The fact that a person who reacts positively to the tuberculin test appears well and has experienced no symptoms is insignificant. Such an individual may have definitely progressive reinfection type tuberculosis. Indeed all persons who suffer from moderately or far advanced pulmonary tuberculosis passed through such a stage when their health was good and their disease could have been detected by tuberculin and roentgen examination.

The great success of the veterinarian in controlling tuberculosis among the cattle of this country is due to the fact that he recognized the specificity of the tuberculin test and that he sought tuberculosis among animals that appeared healthy. It is not until tuberculosis is sought among human beings who appear healthy and treated before it causes illness that significant further strides will be made in the control of tuberculosis in human beings.

The fact that the age of 40 years has been attained does not offer any assurance that clinical tuberculosis may not develop in the body. Although there is a popular belief that after middle life tuberculosis is a rare disease, the truth is that for the number of persons living beyond the age of 50 years the incidence of tuberculosis in a communicable form is higher than during any other age period in life.

In suspected cases of tuberculosis the tuberculin test is of great value. The degree of reaction probably is of no significance, but the test informs one with a high degree of certainty as to the presence or absence of foci of tuberculosis in the body. Whether these foci have anything to do with the symptoms or conditions causing one to suspect clinical tuberculosis must be determined by further examination, including x-ray films of the chest.

SCHOOL CHILDREN AND TUBERCULOSIS

To the Editor—When should children diagnosed as having pulmonary tuberculosis be excluded from school? Please omit name and address
M D Ohio

ANSWER.—In several states, laws exist that provide for the exclusion from school of children with tuberculosis. Formerly, tuberculosis was known to exist only when symptoms were present and abnormal physical signs could be elicited, for example, tuberculosis of the spine was not detected until knock-

ling or some other abnormal physical sign was evident and considerable pain was present. Likewise, pulmonary tuberculosis was not detected until symptoms, such as hemorrhage, cough, expectoration and weight loss, were present and abnormal physical signs, such as rales, could be heard over the area of disease. Such patients with pulmonary tuberculosis were nearly always spreaders of tubercle bacilli, and the individual was in need of drastic treatment when the disease was detected.

Modern methods of diagnosis now make it possible to detect pulmonary tuberculosis long before any symptom or any abnormal physical sign is present and long before the disease is communicable. Obviously, laws designed to exclude communicable cases of tuberculosis from the schools should not be applied in such cases.

While a good many school children, particularly in large cities, have the first infection type of tuberculosis, as indicated by a positive tuberculin test, and occasionally have deposits of calcium, which cast shadows on the x-ray film, it is particularly fortunate that school children who have not reached the high school age rarely have the reinfection form of tuberculosis. The first infection type of tuberculosis usually is not communicable in school children younger than the high school age. While it is true that, when the first infection type of disease is seen in the pneumonic stage, one may recover tubercle bacilli from the gastric contents in a fair percentage of the cases (Poulsen, Valdemar, Jensen, K. A., and Husted, E. The Demonstration of Tubercle Bacilli in Small Children with Pulmonary Tuberculosis, *Am J Dis Child* 37 900 [April] 1929; Willis, H. S. *Tr Nat Tuberc A*, 1933, p 135; Nalbant, J. P. *Am Rev Tuberc* 29 481 [April] 1934; Gourley, Ina, *ibid* 29 461 [April] 1934). It is also true that such children rarely cough or raise sputum. Therefore bacilli are usually eliminated from their bodies through the intestinal tract, and where the sanitary conditions are good there is little or no danger of disseminating bacilli to others. Moreover, the first infection type of tuberculosis is seen in the pneumonic stage much more frequently in infants than in school children. Searches made for tubercle bacilli even in the gastric contents from children with calcifications in their lesions are rarely successful, therefore between the ages of 5 and 12 years the human body is unusually free from pulmonary tuberculosis of a destructive form and rarely do children of this age disseminate tubercle bacilli to others. Children with the first infection type of tuberculosis in this age period require no treatment other than to protect them against open cases of tuberculosis in their homes and elsewhere. Therefore there is no need to enforce the law that provides for the exclusion of tuberculous children with the first infection type.

If the term "tuberculous" were carried to the logical conclusion and the law were rigidly enforced, every child reacting positively to the tuberculin test would be excluded from the schools. While in some rural sections of the nation not more than 5 or 6 per cent of the school children react positively to the tuberculin test, at the same time in our cities, for example Chicago, approximately 30 per cent of the high school children have the first infection type of tuberculosis. Overenthusiasm in the exclusion of children from school because they react positively to the tuberculin test and have evidence of calcium deposits in the lungs or ribs is capable of great injustice to the children and serious harm to the cause of tuberculosis control in general.

In one small city where the tuberculin test was administered and the positive reactors had x-ray films made of the chest, approximately seventy children were excluded from school, of whom not more than one had the reinfection type of disease requiring treatment and was a menace to the other children. The remainder of the children excluded had the noncommunicable first infection type of disease with no treatment indicated. With such action taken against these children, it will become increasingly difficult to secure consent of parents to examine children at any age. Although the reinfection type of disease in a communicable form is extremely rare between the ages of 5 and 12 years, it does occasionally occur, and therefore examination of all school children with tuberculin, x-ray films and so on should be carried out, in order to detect this occasional case, as well as the first infection type.

As adolescence approaches, and thereafter, some of the children who have previously been known to have the first infection type of tuberculosis begin to show evidence of the reinfection type of disease. While this may develop in any part of the lung, it most often makes its appearance just beneath the shadow of the clavicle in one or both lungs. Usually such lesions do not cause cough, expectoration or any other symptom for a year or more after they can be detected by the x-ray film, so that their disease is not communicable. However, if by serial x-ray films or by other laboratory procedures, such

as the differential leukocyte count and the red cell sedimentation test, the disease is found to be progressive treatment should be instituted at once.

Exclusion from school should depend on the communicability of the disease and the necessity of treatment for the individual. This measure is rarely indicated before the high school age is reached but during this period the reinfection type of disease is more frequently seen. Therefore great care should be exercised to find children who have this type of disease in a progressive form, to isolate them before they spread bacilli to others, and to treat them while treatment is of some avail.

HAY FEVER POLLENS IN PENNSYLVANIA

To the Editor—In reading literature of various concerns manufacturing pollen extracts for use in hay fever I am not able to find two lists that agree as to which are the possible causes of August to frost hay fever in Pennsylvania. A composite of all the lists is as follows: short ragweed long ragweed redroot (pigweed) Russian thistle corn goosefoot (lamb's quarters) cocklebur mugwort, sunflower goldenrod burweed marsh elder sheep sorrel careless weed dock hemp plantains spiny amaranth and wormwood. Is it necessary to test a patient for all these pollens in a persistent case of hay fever? Please omit name.

M D Pennsylvania

ANSWER.—It is true that the literature regarding the various pollens that may cause August to frost hay fever in Pennsylvania seems somewhat confusing. However, careful reading of the literature of the various firms that manufacture pollen extracts for use in treating hay fever will bring out the unanimous fact that the main cause of August to frost hay fever in Pennsylvania is the ragweed family consisting chiefly of short or dwarf ragweed (*Ambrosia artemisiifolia*) and the giant or high ragweed (*Ambrosia trifida*). These two constitute the main cause of fall hay fever not only in Pennsylvania but throughout most of the section of the country east of the Rockies and including a large part of Canada. These ragweeds do not grow in Europe.

All the other weeds mentioned in the query are of distinctly minor importance or of no importance at all. However in cases in which relief does not follow the proper injections of ragweed pollen extract or the symptoms do not coincide definitely with the time of pollination of the ragweeds, it is well to search for some local weed other than the ragweeds as a possible or even probable cause of these unusual cases.

Next to the two ragweeds in Pennsylvania come cocklebur (*Xanthium commune*) and burweed marsh elder (*Iva xanthiifolia*). These two give off some pollen but not nearly as much as do the ragweeds. Marsh elder (*Iva ciliata*) blooms from July to September and is not important.

Pigweed belongs to the Amaranth family, which is very important in the Southern and Western states but of minor importance in Pennsylvania. The members of this group are rough pigweed (*Amaranthus retroflexus*) spiny amaranth (*Amaranthus spinosus*), tumbleweed (*Amaranthus graecizans*) and careless weed (*Amaranthus Palmeri*). These pollinate chiefly from July to September.

The wormwoods pollinate from the end of July to October and constitute the main cause of hay fever west of the Rockies, where they are as important in causing hay fever as are the ragweeds east of the Rockies. They are of practically no importance in Pennsylvania although they are found scattered in most parts of the United States.

The goosefoot family (*Chenopodiaceae*) is a very important cause of hay fever in the Middle West especially in the Dakotas and Colorado. This family includes *Chenopodium Kochia Atriplex* and *Salsola* whose most important member is Russian thistle (*Salsola pestifer*). Of these the lamb's quarter (*Chenopodium album*) may be of some importance in Pennsylvania.

The Plantain family is a minor cause of hay fever all over the United States and most of Canada. Its chief member is English plantain (*Plantago lanceolata*).

The Rumex genus of the buckwheat family is also of some importance in hay fever work. Sheep sorrel (*Rumex acetosella*) and yellow or curl dock (*Rumex crispus*) throw out a moderate amount of pollen. They are probably insect pollinated to some extent.

The hemp family is also of minor importance. It consists of hemp (*Cannabis sativa*) and hop (*Humulus lupulus*). These pollinate from July to August. Sunflower and goldenrod are insect pollinated at least for the most part and are unimportant. The pollen of corn is heavy and carried by the wind for only short distances for that reason. It therefore is important only to those who are in close contact with such pollen.

It will be seen from the foregoing that one will get the best results in the average case by injecting an extract of equal parts of giant and short ragweed. When this extract fails, search for some other pollen should be instituted.

THE VON RUCK VACCINE

To the Editor—A young woman patient of mine with tuberculosis has been recommended to the von Ruck Memorial Sanatorium at Asheville, N. C. What is their treatment? Is it approved by the A. M. A.?

M D, Kansas

To the Editor—I have had an inquiry concerning the use of von Ruck's serum in the treatment of tuberculosis. I have been unable to find any reference either in my quackery files or in the literature on this subject. Please give me any information that you have on the subject.

M D Texas

ANSWER.—From these and other inquiries that have come to THE JOURNAL, it would appear that the von Ruck vaccine is in for another period of exploitation. The treatment was first given publicity in 1912 by Dr. Karl von Ruck of Asheville, N. C., who was born in 1849 and was graduated in medicine in 1879. Dr. von Ruck died in 1922. In the period 1912-1915 Dr. von Ruck received wide publicity for his alleged discovery of a "tuberculin" which he asserted would produce immunity from tuberculosis in both man and animals. A preliminary announcement by Dr. von Ruck entitled "A Practical Method of Prophylactic Immunization Against Tuberculosis" was published in THE JOURNAL, May 18, 1912. Through political influence the United States Public Health Service was called on to investigate the von Ruck vaccine, and the newspapers published columns of laudatory matter on the subject. The results of the investigation were published in THE JOURNAL, June 21, 1913, in an article entitled "Animal Experiments With von Ruck's New Tuberculoproteins" by R. S. Cummings, M.D. The sum and substance of the investigations made under government supervision were that immunity was not produced by the vaccine but rather that the vaccine increased the susceptibility to tuberculosis. The newspapers gave practically no publicity to these unfavorable findings. The government studies were begun in Asheville at Dr. von Ruck's laboratory but were later transferred to the Hygienic Laboratory in Washington because Dr. von Ruck would not concede the right of the government's physicians to conduct an independent and controlled investigation and summarily interrupted their investigation in Asheville. It seemed apparent that Dr. von Ruck did not have sufficient confidence in his method to be willing to be investigated unless he supervised and controlled the investigation. These facts were discussed editorially in THE JOURNAL, Jan. 23, 1915. Further political attempts were made to boost the vaccine by printing at government expense as a Senate document a mildly favorable article by two physicians. Time has obviously sustained the findings of the Public Health Service physicians for, if the von Ruck vaccine possessed the virtues that were claimed for it, the scientific world would long since have adopted it.

SEDIMENTATION TEST IN TUBERCULOSIS

To the Editor—A colored woman aged 19 entered a hospital September 12 with unilateral tuberculosis apical with caseation and cavitation. As part of the routine examination a determination of the sedimentation time was attempted. Immediately after having been mixed with fresh 2.5 per cent sodium citrate solution the blood clotted. The attempt was repeated with the same results. Three control tubes were run on other patients with the same solution and these did not clot. The bleeding time of the patient is two minutes and the clotting time seven and one-half minutes. Her blood pressure is 105 systolic and 75 diastolic. Please inform me how this difficulty can be overcome and what effect it will have, if any, on the prognosis. The patient's hemoglobin is 60 per cent and red blood cell count 4,900,000. There is marked and rapid retraction of the clot. Aside from this and the tuberculosis the patient seems to be normal. Please omit name.

M D Tennessee

ANSWER.—The conditions reported seem to indicate an unusually high fibrin content in the blood plasma. Perhaps there is also a high globulin content and a proportionate decrease in albumin. Such a shift in the protein quotient with a high fibrin content is usually indicative of a poor prognosis. The fibrin content at any one time represents approximately the tissue destruction going on at that moment. In this case it is the acute caseation and is both acute and extensive. A subacute or a fibroid lesion although extensive in size, will not show a proportionate rise in fibrin.

The only way to perform this sedimentation is to try a more concentrated solution of citrate or use a smaller quantity of blood for the amount of citrate until a point is reached at which clotting will not result. A correction will have to be

made for the dilution by comparing it to the speed of cells falling in pure citrate. There is no other way to handle it. No doubt the results will be high, irrespective of the method used.

BRONCHITIS WITH BRONCHIECTASIS

To the Editor—I am reporting a case of probably a fetid chronic bronchitis with perhaps a mild degree of bronchiectasis. A man aged 57, had measles at the age of 18 and as a result of early exposure developed a heavy cold followed by prolonged coughing and with every symptom of an active tuberculosis for a few years following. Since that time the patient has enjoyed the average health and has lost no weight or time from work but has had a chronic cough with more or less of a gray brownish expectoration which varies according to the season of the year. The tonsils were removed years ago but more or less chronic throat and laryngeal trouble persists in association with the bronchitis. The teeth have been kept in good condition. The general condition is otherwise negative except for a chronic myocarditis which has developed in the last ten years and in my opinion is a result of the chronic infection of the chest. Beginning about five years ago a very fetid disagreeable odor of the breath developed and no remedy that I have tried has been of any avail. It is a very disagreeable condition with which I have to contend and evidently is quite repulsive to those about me (the patient being myself). I feel reasonably certain of the correctness of the diagnosis and my principal reason for writing you is to ask for any information concerning the treatment or at least some method by which I may be able to control or mask this condition. I have exhausted all information that I have with no avail. Since my breath is sufficient advertising I will ask that you withhold my name.

M D Nebraska

ANSWER—The information available does not permit of a complete diagnosis, without which suggestions as to treatment are apt to be of little value. Chronic bronchitis with a mild degree of bronchiectasis seems likely from the history. Clinically, this condition is often associated with a secondary to chronic sinusitis. It is assumed that pyorrhea is absent. Additional information required includes a special nose and throat examination to rule out ozena, and sinus roentgenograms to rule out chronic sinus infection. If these conditions are present, appropriate treatment should be of benefit. Special examinations directed to the lungs are important, particularly if ozena and chronic sinusitis are absent, these should include chest roentgenograms and aerobic and anaerobic cultures of fresh sputum apparently coughed up from the lungs.

DIET SENSITIVITIES

To the Editor—I have had two patients tell me that a doctor in this district has forbidden them drinking highballs made with ginger ale, advising them to substitute a club soda. Both patients are in excellent health. Is there any scientific medical opinion published on this subject?

ELLA A COUGHLAN M D, Orange N J

ANSWER—The physician who gave this advice is probably sensitive to ginger ale or else knows of some one who is. More and more physicians are now learning to fit the diet to the patient and not to hand it out ex cathedra. There is nothing truer than that one man's food is another man's poison, but a corollary of this is that because of food or a drink is poison to some unfortunate individual it is not necessary to tell ninety-nine other persons that they must not partake of it. The physician may ask a patient to watch and see whether some substances are toxic for him, but if they do not prove to be toxic why should the man go on depriving himself? If any diet fails to bring results in a few days or weeks, it should be discontinued.

TUBERCULIN TESTS

To the Editor—With reference to a tuberculin test in which the purified protein derivative was used intradermally what is the significance of elevation and central necrosis at the site of injection occurring after the prescribed limit of forty-eight hours? This condition appeared on the seventh or eighth day. The dose was 0.00002 mg.

ROBERT E. LEE M D Chicago

ANSWER—The correspondent does not state whether there occurred the usual reaction to tuberculin at the end of forty-eight hours, followed by the elevation and central necrosis at the site of injection on the seventh or eighth day. If the usual reaction occurred first, the later development probably represents a four plus reaction. In persons whose tissues are extremely sensitive to tuberculinoprotein, necrosis may result and evidence of it persist for many days or weeks. The necrotic tissue may slough out the reaction being comparable to the formation of a cavity in the lungs when a new focus of tuberculosis develops in the sensitized tissue.

However if there was no reaction at the end of forty-eight hours and the elevation and central necrosis were the first evidence on the seventh or eighth day there are two possibilities. One is the delayed reaction, which Pirquet described as a

"torpid" reaction (Frequency of Tuberculosis in Childhood, THE JOURNAL, Feb 27, 1909, p 675). While Pirquet's torpid reactions resulted from the epidermal test, they have been observed also when the intradermal test has been employed. However, the particular type of reaction described by the correspondent has not been reported by any one who has used purified protein derivative. The other possibility is that infection with pyogenic micro-organisms may have occurred through the needle tract.

LATENT SYPHILIS

To the Editor—A white man aged 29 contracted syphilis nine years ago. One month after the appearance of the chancre treatment was begun consisting of daily mercury inunctions for eighteen months and neosarsphenamine once weekly for eight weeks at a time over a period of two years with alternating rest periods varying between two weeks and a month. I am unable to ascertain the dosage of neosarsphenamine. The patient became Wassermann negative after several months, and about eight subsequent tests taken for the following two years remained negative. The first Wassermann reaction since then taken recently was 3 plus. What therapy would you advise? Please omit name.

M D New York

ANSWER—If a repetition of the Wassermann test still proves positive, the case should be treated as one of latent syphilis. Iodides and bismuth or mercury compounds should be administered first, followed by one of the arsphenamines. Treatment will depend on the results of subsequent serologic tests and a spinal fluid examination.

FRACTURE OF THE TIBIA

To the Editor—Kindly tell me the best way to treat a fracture of the tibia which extends into the knee joint. There is no displacement. When should passive movements be started? When active movements? When weight bearing?

M D Minnesota

ANSWER—If there is no displacement, fracture of the tibia extending into the knee joint should be treated by balanced traction and overhead suspension, with early active motion. There should be no hurry for passive motion. Adequate immobilization should be continued until union has occurred and it is probable that movement will take care of itself. Protective weight bearing with the use of a caliper brace and crutches may be started usually at the end of from eight to ten weeks. Böhler's clamp and the Forrester clamp and open operation are evidently not required in the case described.

ARTIFICIAL PNEUMOTHORAX IN TUBERCULOSIS

To the Editor—In an answer to a query on the treatment of tuberculosis (THE JOURNAL, September 7 p 818) the following statement is made: "In every case of minimal progressive pulmonary tuberculosis which is unilateral artificial pneumothorax should be instituted, since it is the only method of bringing about adequate rest of the diseased part. Lying in bed gives the lung but little rest. Lying in bed for a long enough time however will give the lung enough rest and increase the bodily resistance sufficiently to heal the disease in most incipient cases. This is no argument against the proper use of artificial pneumothorax which I have found most valuable in many cases but I do not believe that any one is justified in making the dogmatic statement that pneumothorax should be used in every case of minimal, progressive unilateral pulmonary tuberculosis."

Although artificial pneumothorax is a comparatively safe procedure, many complications occur even in the best equipped tuberculosis hospitals, and if this treatment should be attempted everywhere, often without x-ray control it is very likely that more harm than good would be done.

The patient under discussion was given only three months of rest treatment an entirely inadequate length of time for the healing of any active progressive tuberculous lesion though it is granted that if the patient must get up in three months the danger of relapse is less with a good pneumothorax than without it. It is probable that roentgen examination would have shown that the disease was in a more advanced stage than was suspected from the physical signs and that pneumothorax was indicated. Nevertheless the fact remains that some of the best cures of tuberculosis are made with the old fashioned rest treatment continued for a sufficient length of time. To determine what constitutes a sufficient length of time in the individual case is one of the most difficult tasks of the physician and the roentgen observations, physical examination, symptoms and laboratory tests are all to be taken into consideration. After the activity of the disease has apparently subsided a few extra months of at least partial rest should be allowed for good measure.

It is true that general rest without pneumothorax or other effective collapse therapy is futile in many cases but the point to be emphasized is that it takes years to heal any definite tuberculous disease completely either with or without pneumothorax and the man who counts on pneumothorax to heal his tuberculous patients in a hurry is going to be disappointed. In the last analysis the recovery of a patient from tuberculosis, as from any other infectious disease depends on his forces of resistance. Rest together with proper food, good climate and so on is the best method available of increasing the patient's resistance to his disease and no doubt the good results obtained from rest treatment are due more to the raising of resistance than to the lessened movement of the lungs.

LEROY ELRICK, M D Denver

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country March 14. Oral examination for Group A and B applicants will be held in Kansas City Mo May 11-12. Applications for written examination should be filed with the secretary before Jan 15. Sec. Dr C. Guy Lane 416 Marlboro St Boston

AMERICAN BOARD OF OPHTHALMOLOGY Kansas City Mo May 1

Asst. Sec Dr Thomas D Allen 122 S Michigan Ave Chicago

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St Louis Jan 11

Sec. Dr Fremont A Chandler 180 N Michigan Ave Chicago

AMERICAN BOARD OF OTOLARINGOLOGY Kansas City Mo May 9

Sec. Dr W P Wherry 1500 Medical Arts Bldg Omaha

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY New York Dec 30

Sec. Dr Walter Freeman 1726 Eye St N W Washington D C

ARIZONA Basic Science Tucson Dec 17 Sec. Dr Robert L Nugent Science Hall University of Arizona Tucson

COLORADO Denver Jan 7 Sec. Dr Harvey W Snyder 422 State Office Bldg Denver

DISTRICT OF COLUMBIA Washington Jan 13-14 Sec. Commission on Licensure Dr George C Ruhland 203 District Bldg Washington

HAWAII Honolulu Jan 13-16 Sec. Dr James A Morgan 48 Young Bldg Honolulu

ILLINOIS Chicago Jan 28-30 Superintendent of Registration Department of Registration and Education Mr Homer J Byrd Springfield

KANSAS Topeka Dec 10-11 Sec. Board of Medical Registration and Examination Dr C H Ewing 609 Broadway Larned

MARYLAND Medical (Regular) Baltimore Dec 10-13 Sec. Dr John T O'Mara 1211 Cathedral St Baltimore Medical (Homeopathic) Baltimore Dec 10-11 Sec. Dr John A Evans 612 W 40th St Baltimore

MINNESOTA Basic Science Minneapolis Jan 7-8 Sec. Dr J C McKinley 126 Millard Hall University of Minnesota, Minneapolis Medical Minneapolis Jan 21-23 Sec. Dr Julian F Du Bois 350 St Peter St St Paul

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Feb 12 14 May 6-8 June 22-24 and Sept 14-16. Part III tentatively scheduled as follows Chicago Jan 7-9 and New York Jan 13-15 Ex Sec Mr Everett S Elwood 225 S 15th St Philadelphia

NEBRASKA Basic Science Omaha Jan 7-8 Dir Bureau of Examining Boards Mrs Clark Perkins State House Lincoln

NEW YORK Albany Buffalo New York and Syracuse Jan 27-30 Chief Professional Examinations Bureau Mr Herbert J Hamilton 315 Education Bldg Albany

NORTH CAROLINA Endorsement Raleigh Dec 9 Sec. Dr Ben J Lawrence 503 Professional Bldg Raleigh

NORTH DAKOTA Grand Forks Jan 7-10 Sec. Dr G M William son 4½ S 3d St Grand Forks

OKLAHOMA Oklahoma City Dec 11 Sec. Dr James D Osborn Jr Frederick

RHODE ISLAND Providence Jan 23 Dir Department of Public Health Dr Edward A McLaughlin 319 State Office Bldg Providence

SOUTH DAKOTA Pierre Jan 21-22 Dir Division of Medical Licensure Dr Park B Jenkins Pierre

TENNESSEE Memphis Dec 18-19 Sec. Dr H W Qualis 130 Madison Ave Memphis

UTAH Salt Lake City Dec 10-12 Dir Department of Registration Mr S W Golding 326 State Capitol Bldg Salt Lake City

VIRGINIA Richmond Dec 11-13 Sec. Dr J W Preston 28½ Franklin Rd Roanoke

WASHINGTON Basic Science Seattle Jan 9-10 Medical Seattle, Jan 13-15 Dir Department of Licensures, Mr Harry C Huse Olympia

WISCONSIN Basic Science Milwaukee Dec 21 Sec. Prof Robert N Bauer 3414 W Wisconsin Ave Milwaukee Medical Madison Jan 7-10 Sec. Dr Robert E. Flynn 410 Main St LaCrosse

Delaware June Report

Dr Joseph S McDaniel, secretary, Medical Council of Delaware, reports the written examination held in Wilmington, June 11-12, 1935. The examination covered 10 subjects and included 100 questions. A grade of 75 per cent in each subject was required to pass. Eighteen candidates were examined 13 of whom passed and 5 failed. One physician was licensed by reciprocity and 2 physicians were licensed by endorsement. The following schools were represented

| School | PASSED | Year Grad | Per Cent |
|--|-------------------------|-----------|------------------|
| George Washington University School of Medicine | (1933) | | 81.5 |
| Rush Medical College | (1934) | | 81.9 |
| University of Maryland School of Medicine and College of Physicians and Surgeons | (1934) | | 81.6 |
| Columbia University College of Physicians and Surgeons | (1933) | | 81.4 |
| Hahnemann Medical College and Hospital of Philadelphia | (1933) | | 84.8 |
| 85.8 (1934) 84.1 86.2 87 87.7 | | | |
| Jefferson Medical College of Philadelphia | (1934) | | 83.7 |
| University of Pennsylvania School of Medicine | (1933) | | 79.3 |
| Medical College of Virginia | (1934) | | 78.6 |
| School | FAILED | Year Grad | Per Cent |
| University of Georgia School of Medicine | (1932) | | |
| University of Maryland School of Medicine and College of Physicians and Surgeons | (1934) | | |
| Hahnemann Medical College and Hospital of Philadelphia | (1934) | | |
| Temple University School of Medicine | (1934) | | |
| School | LICENSED BY RECIPROCITY | Year Grad | Reciprocity with |
| University of Maryland School of Medicine and College of Physicians and Surgeons | (1920) | | Maryland |

| School | LICENSED BY ENDORSEMENT | Year Endorsement Grad of |
|---|-------------------------|--------------------------|
| Yale University School of Medicine | (1930) | N B M Ex |
| Woman's Medical College of Pennsylvania | (1932) | N B M Ex |

Michigan June Examination at Detroit

Dr J Earl McIntyre, secretary, Michigan State Board of Registration in Medicine, reports the written examination held at Detroit, June 5-7 1935. The examination covered 14 subjects and included 100 questions. An average of 75 per cent was required to pass. Ninety-six candidates were examined, all of whom passed. The following schools were represented

| School | PASSED | Year Grad | Per Cent |
|---|--------------|--------------|----------|
| George Washington University School of Medicine | (1934) | | 78.2* |
| Northwestern University Medical School | (1935) | | 81.3* |
| Rush Medical College | (1934) 84.1 | (1935) 78.9 | 82.3* |
| School of Medicine of the Division of the Biological Sciences | (1934) 85.1† | (1935) 80.7* | 85.2 |
| University of Illinois College of Medicine | (1935) | | 80.8 |
| Wayne University College of Medicine | (1935) | | 75.5† |
| 76.7† 77.4† 78.4† 78.9† 79.1† 79.2† 79.3† 79.3† | | | |
| 79.4 79.8† 79.9† 80 80.1† 80.2† 80.3† 80.8† | | | |
| 80.9* 81.1† 81.2† 81.2† 81.3† 81.5† 81.5† 81.6† | | | |
| 81.7† 81.7† 81.8† 81.8* 81.9* 82† 82† 82.2† | | | |
| 82.3† 82.5† 82.6† 82.6† 82.7† 82.7† 82.7† 82.7† | | | |
| 82.8† 82.8† 83† 83.1† 83.2† 83.2† 83.2† 83.2† | | | |
| 83.3† 83.4† 83.4† 83.4† 83.4* 83.5† 83.5† 83.6† | | | |
| 83.7† 83.8† 83.9† 83.9† 84† 84† 84.1† 84.2† | | | |
| 84.4† 84.4† 84.4 84.6† 84.6† 84.7† 84.8† 85† | | | |
| 86.4† | | | |
| University of Minnesota Medical School | (1921) | | 85.2 |
| (1929) 76.6* (1935) 85* 85.1 | | | |
| University of Buffalo School of Medicine | (1932) | | 84.7 |
| University of Pennsylvania School of Medicine | (1933) | | 83.6 |
| 84.6* 87.7 | | | |
| University of Texas School of Medicine | (1932) | | 82.6 |
| Marquette University School of Medicine | (1935) 81.3* | | 83.2 |

* License has not been issued

† This applicant has completed the medical course and will receive his M D degree on completion of internship. License has not been issued

Book Notices

Policies and Procedures in Public Health Proceedings of the Annual Conference of the Advisory Council of the Milbank Memorial Fund Held on March 27 and 28 1935 at the New York Academy of Medicine Paper Pp 115 New York Milbank Memorial Fund 1935

This brief report of the proceedings of the annual conference of the advisory council of the Milbank Memorial Fund consists of summaries setting forth the principal points in discussions of round-table groups dealing with public health problems with health education, with tuberculosis, with population studies and with venereal disease. In addition, it contains a speech by Albert B Milbank one by Surg Gen Hugh S Cumming one by Dr Simon Flexner, and one by Hon Josephine Roche, assistant secretary of the treasury. Dr Cumming's address on public health and the medical profession will be of particular interest to physicians and so will the remarks of Miss Roche on economic security and health. Dr Flexner's remarks on scientific discovery and the public health constitute a dissertation on the theme taken from Dr William H Welch 'While public health is the foundation of the happiness and prosperity of the people and its promotion is recognized as an important function of government, how wide is the gap between what is achieved and what might be realized.' Miss Roche's remarks are largely in support of the social security program, which at the time this discussion took place was pending but which has since been enacted in the Social Security Act.

In view of the impression which has prevailed among physicians that the Milbank Fund has been committed to socialization of medicine, an impression that gained currency perhaps largely through the activities of Mr John Kingsbury, certain statements in this report are of particular interest. In the report of the round-table discussion on public health problems under the chairmanship of C E A Winslow, DPH, the following statement occurs as a part of the discussion of rural service for the promotion of maternity and infancy health in Cattaraugus County 'The operation of medical services under lay direction is never satisfactory. It was the belief, therefore of the members of the round table that the provision of medical care for maternity and infancy at public expense should be placed under the direction of a county health department.' Physicians will readily agree with the first sentence in the

excerpt just quoted but are much less likely to agree that it leads necessarily to the conclusion which immediately follows. Wise health officers who have learned that the public cannot be educated to distinguish between prevention and treatment will be exceedingly reluctant to have their departments thrust into the practice of medicine.

Perhaps the greatest interest of all attaches to the remarks of Mr. Albert Milbank, who has given evidence, since certain representations were made to him by the medical profession, that closer relationship between himself and the activities of the Milbank Fund may be reflected in a changed attitude on the part of the fund, as shown in the following excerpts from his remarks:

"You are doubtless aware, in a general way, of the experiments that are being conducted in various parts of the country under the auspices of professional groups and of medical societies to bridge the economic gap between those in need of medical care and those equipped to supply that care without however, resorting to compulsory contributory health insurance. Some of these activities are reaching a stage where their effectiveness may be profitably studied and evaluated."

"It is my hope that, after the new Medical Advisory Committee which your Chairman has been authorized to form has been organized, some way may be found for our Fund to cooperate with one or more of these professionally conducted experiments."

"There are other subjects, not related to medical economics, which can also be explored in collaboration with physicians whose primary interest is in the private practice of medicine but who have as well a very real interest in preventive measures. This common interest will form a natural point of contact between the Fund and the profession in the future as it has in the past and will serve to dissipate the erroneous impression that our Fund is chiefly, if not exclusively, concerned with the subject of the cost of medical care."

"Our Board of Directors has not endorsed compulsory contributory health insurance or any other plan to distribute the costs of medical care."

We have not sponsored any form of legislation, Federal or State, bearing upon this subject nor have we given, directly or indirectly, any financial support in furtherance of such legislation.

"The studies made by the members of our staff on this or any other subject in the field of public health, as broadly defined, will be made available to the various groups interested in that field but the Fund will not assume the role of advocate either in favor of or against specific solutions of the problems which are the subject matter of such studies."

"We will cooperate with the groups operating in the broad field of health—whether they be doctors, dentists, hospital managements, nurses, welfare organizations, or governmental agencies—to the extent that our cooperation is desired and to the extent that a basis of mutual helpfulness can be established within the resources at our disposal."

The large influence which voluntary foundations heavily endowed have acquired in the field of health makes them a real factor which must be reckoned with. The evidence that the point of view of the medical profession is gaining increased consideration at the hands of the Milbank Fund might be observed with profit by the directors and the executives of certain other foundations.

Apparatus and Technique for Roentgenography of the Chest. By Charles Weyl and S. Reid Warren Jr. Moore School of Electrical Engineering University of Pennsylvania. Cloth. Price \$5. Pp. 186 with 39 illustrations. Springfield Illinois & Baltimore Charles C. Thomas 1935.

The authors, feeling that the roentgenologist, being busy with the practice of his profession and keeping abreast of medical developments, has little time for a thorough study of physical principles, discuss the physical problems of chest roentgenography. The book is divided into four chapters and an appendix. The first chapter consists of a review of the physical phenomena underlying the production of chest roentgenograms. Available roentgenographic apparatus is discussed in chapter II with a presentation of the advantages and disadvantages of the various types. The quality and interpretability of the finished

film depends on the roentgenographic densities, contrast and sharpness. The effect of varying the controllable roentgenographic factors is discussed in chapter III. The experienced roentgenologist in most instances passes judgment on the quality of roentgenograms. The authors feel that a more accurate method of judgment can be carried out by the use of a densitometer. Chapter IV consists of a discussion of the scientific analysis of roentgenograms by means of various physical tests. For such analysis every roentgenogram should have impressed on it a roentgenographic record of a standard aluminum ladder and timing disk. A comparative densitometer and a standard density table are used in measuring the roentgenographic densities. An appendix on basic and elementary electrical principles has been added to the volume. Much of the material covered is common knowledge to experienced roentgenologists, who will probably find it cumbersome and time consuming to employ the rather complicated method of judging the quality of a roentgenogram recommended by the authors.

Traitement des fractures et luxations des membres. Par Jacques Leveuf, professeur agrégé à la Faculté de médecine de Paris, Charles Glrode et Raoul Charles Monod, chirurgiens des hôpitaux de Paris. Préface du Professeur Pierre Delbet. Second édition. Paper. Price, 30 francs. Pp. 447 with 314 illustrations. Paris: Masson & Cie 1935.

This treatise on fractures and dislocations is of an eclectic nature, as the authors confine themselves to a description of methods used by them, hence a bibliography and references to other methods have been omitted.

The first part of the book deals with fractures. The first chapter offers a discussion of general principles of treatment, including first aid, temporary immobilization of fractured limbs, final conservative or surgical therapy, and after-care. The advice to use sheets as hammocks in which patients with broken hips are suspended during transportation will probably not meet with approval in this country, where a board is preferred for efficient immobilization. Local anesthesia is advocated for reduction of fractures, but its technic is not described. In children, tribrom-ethanol anesthesia is being used. Spinal anesthesia is recommended for reduction of hip fractures. The technic of open reductions is described briefly, avenues of approach are discussed in general terms. Accompanying pictures are numerous but inadequate and without details. Many methods and splints popular in the United States are not mentioned such as Russell traction, Hodgen's leg splint, the Jones humerus splint and the well leg countertraction splint. Skeletal traction appliances are recommended but the technic has not been described. The ensuing thirteen chapters describe the treatment of fractures of various bones. The therapy of skull fractures has been entirely omitted. The treatment of dislocation has been allotted only sixty pages, forming the second part of the book. The scope of this book is the technical side of the treatment of fractures and dislocations. It may serve as a valuable manual for French students, better books are available in the English language.

Anesthesia in Dental Surgery. By Sterling V. Mead, D.D.S., M.S.-B.S. Cloth. Price \$6.50. Pp. 482 with 144 illustrations. St. Louis: C. V. Mosby Company 1935.

This is a good book and should prove valuable, particularly to undergraduate students and practitioners of dentistry. There are thirty-two chapters. The chapters on the history of general and local anesthesia are well written and will be useful for purposes of reference.

Anesthesia is essentially a clinical subject, and, while a foundation of general medical training is of prime value, one learns the art of anesthesia by practical experience. The author properly emphasizes the necessity of ample knowledge and experience before assuming the responsibility of administering either local or general anesthetic agents. Under the heading "Legal Responsibility" he says: "The right to administer an anesthetic, whether by a physician or a dentist, depends entirely upon the possession of the requisite knowledge, skill and experience. A dentist undoubtedly has the right to administer anesthetics in his practice if he is competent to do so. But a dentist has not the right to administer anesthetics unless he is familiar with their effects and can show his proficiency in this respect." In line with this declaration one may properly ask

two questions Should any one not competent to make an intelligent physical examination administer anesthetics? Or, again, Should any one administer a general anesthetic in his office, with only a nonmedical assistant, except perhaps, in cases of emergency? The rather widespread practice of dentists administering nitrous oxide in the office without a full knowledge of the patient's general condition and without the knowledge or means of meeting accidents incident to anesthesia, may be questioned In these times of good hospitals and expert anesthetists, the dentist may relieve himself of moral and legal responsibility by employing them It is no more a hardship on the patient to pay the ordinary fee for this service than the fee for other minor surgical operations

In skilful hands local anesthesia should reduce the use of nitrous oxide in dental practice to an irreducible minimum Except in cases of certain acute infections, young children and highly nervous individuals, who prefer a general to a local anesthetic, local anesthesia in oral surgery is simpler, safer and much more satisfactory, viewed from any angle In short the use of local anesthesia is advised only in the office, and general anesthesia only in the hospital

The use of sedatives preceding a general anesthetic is merely a part of the problem of responsibility The author meets these facts in a fair and honest manner One is compelled to disagree with the author in advising the use of nitrous oxide for children, especially young children surgeons and anesthetists will largely agree that ether is the anesthetic of choice for children On page 62, 93 per cent nitrous oxide and 7 per cent oxygen is recommended for children during the period of induction this is high even for an adult Attention is called to 'bridging' This is due to a lack of oxygen and should be regarded as a sign of danger

Chapters 18 to 32 cover the subject of local anesthesia in a comprehensive and satisfactory manner The entire text has been prepared with a good sense of fidelity to principles and details and should meet with a wide circulation

Archiv und Atlas der normalen und pathologischen Anatomie in typischen Röntgenbildern Die theoretischen Grundlagen und Möglichkeiten der röntgendiagnostischen Weichteiluntersuchung Von Dr. Adolf Zuppinger Assistent am Röntgeninstitut der Universität Zürich Fortschritte auf dem Gebiete der Röntgenstrahlen Ergänzungsband XLVIII. Herausgegeben von Prof. Dr. Grashey Paper Price 16 marks Pp. 99 with 46 illustrations Leipzig Georg Thieme 1935

The authors have made an elaborate study of the photographic and other physical bases underlying the possibility of demonstrating soft tissue detail in the roentgenogram The discussions on photographic emulsions the spectrum of diagnostic rays and the quantitative factors in the choice of diagnostic radiation are carefully elaborated The various other factors such as the choice of tubes, use of compression focus skin distance, use of filters for eliminating secondary radiation and the back fire radiation from the film mounting receive adequate attention Examples are given of roentgenograms of esophageal varices the soft tissues of the pharynx, the hypopharynx and the epipharynx A few pages are devoted to roentgenography of the mammary gland. Probably at this time the most important field for soft tissue radiography is the larynx and hypopharynx. The book is essentially technical and the explanations employ free use of higher mathematics Most radiologists have a practical experience in soft tissue demonstration and succeed to a degree. No doubt a thorough understanding of the principles put forth in this book will considerably amplify the field of soft tissue roentgenography

Disorders of the Blood Diagnosis, Pathology Treatment and Technique By Lionel E. H. Whitby C.V.O. M.C. M.D. Assistant Pathologist the Bland Sutton Institute of Pathology London and C. J. C. Britton M.D. Assistant Pathologist the Christchurch Hospital New Zealand Cloth Price \$7 Pp. 543 with 65 illustrations Philadelphia P. Blakiston's Son & Co. Inc. 1935

This book is a thoroughly up to-date presentation of hematology in both its scientific and its practical aspects It is lucid and simple in its manner of presentation and yet comprehensive enough in its scope to meet demands of almost any physician who should be interested in the blood and blood-forming organs It is adequately illustrated both in black and white and in colored plates It is well organized and exceedingly well

balanced Each subject is concisely but adequately treated and the important phases of the subject are well outlined The recent medical literature has been digested and assimilated and the reader will find a representative bibliography after each chapter The chapter on anemias in infancy and childhood is particularly well done Although it is a short chapter it is one of the most rational discussions of the subject that can be found in any textbook of hematology It is highly recommended as well balanced and authoritative and it should meet the needs of most physicians and students

Medicolegal

Silicosis Liability of Employer for Silicosis and Tuberculosis Contracted by Employee—Curtis operated a rock crushing machine for the Allen Gravel Company from April 1 to November 1930 During the dry times when the machine was being operated, large quantities of dust were created by the crushing of the rock, and employees who worked around this machine had their eyes, mouths, and noses affected thereby After Curtis had been working there a few months he developed a cough and experienced pains in the chest He finally procured medical attention and abandoned the particular employment However, he gradually grew worse, and the physician diagnosed his condition as tuberculosis brought on by silicosis Curtis sued his employer and obtained judgment, from which the employer appealed to the Supreme Court of Mississippi, division B

The rule is, said the court, that the employer must use reasonable care to provide a safe place for his employees to work. He is not an absolute insurer of the safety of the place, nor is he required to use the highest degree of care, but he should take reasonable precautions to make the place of work reasonably safe. The medical testimony, continued the court, was ample to show the dangers incident to the inhalation of silica dust and the general recognition of such dangers by the medical profession The public is interested in the preservation of health, and when others engage in business for profit which is dangerous to the health of employees, reasonable care should be taken to minimize the dangers The employer in this case, apparently, did not furnish his employees with respirators or other appliances to reduce the hazards incident to the employment. Where simple devices may be obtained, the court said, at a reasonable cost, the employer should procure them for the protection of his employees While the employer does not have to use all the latest devices that may be obtainable, he should exercise care to make the place safe, using reasonable care as a standard The jury was warranted, in the opinion of the court, in finding that there was negligence on the part of the employer The judgment for the employee was therefore affirmed—*Allen Gravel Co. v. Curtis (Miss.)*, 161 So. 670

Occupational Diseases Combined Sclerosis Attributed to Zinc Poisoning Not an Occupational Disease—The plaintiff in the course of his employment in the defendant's chemical plant was exposed to dust incident to the manufacture of zinc stearate dusting powder Attributing a combined sclerosis from which he subsequently suffered to the inhalations of zinc stearate dust, he sued his employer The trial court overruled the defendant's demurrer to the evidence and entered judgment for the plaintiff

On appeal, the Supreme Court of Missouri said that the question to be determined was whether there was evidence tending to prove that combined sclerosis—a degenerative process of the spinal cord—from which the experts testified that the plaintiff was suffering was an occupational disease under the Missouri occupational disease act An occupational disease, said the court, within the meaning of the act, as well as at common law, is one that is "peculiar" or "incident" to the work or process carried on. "Such a disease is defined to be a disease contracted in the usual and ordinary course of events, which, from the common experience of humanity, is known to

be incidental to a particular employment. It ordinarily results from long-continued work in the particular employment." *Lovell v Williams Bros* (Mo App) 50 S W (2d) 710. In the case here abstracted, the plaintiff testified that he was in good health when he went to work for the defendant. During the last six months of his employment he was engaged in making zinc stearate dusting powder. He coughed a great deal, 'emitting white stuff 'like talcum powder'." His throat and lungs were sore, his arms hurt, and his hands "were without feeling." His stomach became swollen and he could eat very little. He walked with difficulty and, after he left the defendant's employment, he could not move for a time. He was in a hospital twice for treatment and, according to the medical testimony, while there he was treated for locomotor ataxia. A physician specializing in mental and nervous diseases, called by the plaintiff, testified that the plaintiff was suffering from a nervous disorder consisting of a degeneration of the posterior columns of the spinal cord and known as combined sclerosis, which "could be due to absorption of zinc." He further testified, however, that he had never had a patient who had contracted combined sclerosis from zinc poisoning and did not know what amount of exposure or absorption would be necessary to produce the condition. He further testified that certain abnormalities which he found in the plaintiff and on which he rested his opinion that the plaintiff had combined sclerosis were cardinal symptoms of locomotor ataxia, such as an absence of the knee jerks, slight reaction of the pupils to light, and an ataxic gait. Another specialist in mental and nervous diseases testified that the plaintiff was suffering from combined sclerosis but did not definitely attribute the condition to any particular cause. Medical witnesses testifying for the defendant denied that the plaintiff had combined sclerosis and attributed his condition to locomotor ataxia.

In reviewing the evidence, the Supreme Court could find no testimony to the effect that combined sclerosis is an illness or disease peculiar or incident to the work or process carried on. In substantiation of this conclusion drawn from the evidence the court pointed out that in the report of the Committee on Standard Practices in the Problem of Compensation of Occupational Diseases of the Industrial Hygiene Section of the American Public Health Association (1931), containing a history of the extension of the workmen's compensation laws to include occupational diseases, there are many schedules of occupational diseases, but combined sclerosis is not listed in any schedule of any state or country. In the opinion of the Supreme Court, therefore, the trial court should have sustained the demurrer to the evidence because there was no testimony that the disease which the plaintiff contracted was peculiar or incident to his work. The judgment of the trial court was therefore reversed and the cause remanded for a new trial.—*IVolf v Mallinckrodt Chemical Works* (Mo) 81 S W (2d) 323

Workmen's Compensation Acts Strangulation of Pre-existing Hernia Attributed to Strain—The employee had suffered from an irreducible hernia for several years but had worked regularly and had experienced little trouble from his condition. He was employed as a craneman and during the process of repairing a broken crane he strained or twisted himself, a strangulated hernia developed and he died eleven days later. His widow instituted proceedings under the workmen's compensation act of Maryland. The state industrial accident commission denied compensation and from a judgment of the circuit court reversing the order of the commission the employer and its insurance carrier appealed to the Court of Appeals of Maryland.

The main controversy involved whether the injury was accidental within the meaning of the workmen's compensation act. A twist of a part of the human body, said the court, while engaged in the performance of some physical labor implies a sudden, unforeseen and unnatural bodily position or movement or muscular distortion that generally occurs without anticipation. The twist that was inflicted on the employee in the course of his work was not a natural result that could fairly be assumed to have been intended or expected. It was produced by a sudden, unintended movement of a heavy chain he was holding which caused the affected parts of his body to be forced or thrown from a normal state into a hurried unexpected and

unnatural or distorted position. If the lifting and holding of a heavy chain under difficult, insecure and unusual conditions should cause a rupture, the injury would, in ordinary acceptance, be described as an accident. The conclusions that the strangulated hernia, the court said, was the result of an accidental injury is supported by a number of decisions. *Schneider's Workmen's Compensation* (2 Ed) Sections 200, 335. The old hernia with which the employee was suffering for some years before the accident was not the hernia for which compensation was claimed. The compensable injury was a strangulated hernia which did not exist before the accident but which was directly caused by the accident. This strangulated hernia caused the employee's death and, where death ensues, there is no basis for the determination of the proportionate disability attributable to an old hernia and to the later strangulated hernia.

The court, therefore, affirmed the judgment of the circuit court for the claimant.—*Ross v Smith* (Md), 179 A 173

Dental Practice Acts Revocation of License Without Personal Service on Nonresident Licentiate—The board of dental examiners of West Virginia revoked the license of a dentist, presently residing in Ohio. The circuit court, on the ground that no notice of the revocation hearing was personally served on the dentist, set aside the revocation order on the condition that the dentist appear before the board on a certain day to defend the charges against him. Both the dentist and the board appealed to the Supreme Court of Appeals of West Virginia.

A revocation proceeding, said the Supreme Court of Appeals is in effect an in rem proceeding, and personal service on a nonresident is not requisite to jurisdiction, service of notice by publication is sufficient. The circuit court, therefore, erred in its ruling to the contrary. But, continued the court, the record in this case certified by the clerk of the circuit court contained no copy of any sort of notice to the defendant. The record did contain a recital that the hearing before the board was had "at the time and place appointed in the notice." The recital does not show to whom, or the manner in which, that notice was given. While the presumption arises that the members of the board, being public officers, performed their duty and that the notice referred to in the record was the notice required by the dental practice act, the Supreme Court of Appeals thought that the ends of justice would be better met by returning the case to the circuit court to afford the board an opportunity to supply for the record a copy of the notice referred to in the recital. The judgment of the circuit court was therefore reversed and the cause remanded.—*Board of Dental Examiners v Hedrick* (IV Va) 179 S E 809

Society Proceedings

COMING MEETINGS

- American Association for the Study of Neoplastic Diseases Baltimore, Dec. 19-21. Dr. Eugene R. Whitmore, 2139 Wyoming Avenue N.W., Washington D. C. Secretary
- American Student Health Association New York Dec. 27-28. Dr. Harold S. Diehl, University of Minnesota Medical School, Minneapolis, Secretary
- Eastern Section American Laryngological Rhinological and Otolological Society Newark N. J. Jan. 3. Dr. Henry B. Orton, 24 Commerce St., Newark N. J. Chairman
- Middle Section American Laryngological, Rhinological and Otolological Society Milwaukee Jan. 11. Dr. William E. Grove, 324 East Wisconsin Avenue, Milwaukee Chairman
- Mid Western Section American Laryngological Rhinological and Otolological Society St. Louis Jan. 15. Dr. Harry W. Lyman, Carleton Building, St. Louis Chairman
- Puerto Rico Medical Association of Santurce Dec. 13-15. Dr. Euripides Silva Ave. Fernandez Juncos Parada 19 Santurce Secretary
- Society of American Bacteriologists New York Dec. 26-28. Dr. J. L. Baldwin, College of Agriculture University of Wisconsin Madison, Wis. Secretary
- Society of Surgeons of New Jersey Jersey City Jan. 15. Dr. Walter B. Mount, 21 Plymouth St., Montclair Secretary
- Southern Section American Laryngological Rhinological and Otolological Society Jackson, Miss Jan. 18. Dr. Robin Harris Lamar Building, Jackson, Miss Chairman
- Southern Surgical Association Hot Springs Va. Dec. 10-12. Dr. E. W. Alton Ochsner, 1430 Tulane Ave. New Orleans Secretary
- Western Section American Laryngological Rhinological and Otolological Society Del Monte Calif. Feb. 1-2. Dr. Carroll Smith, Paulsen Building, Spokane Wash. Chairman
- Western Surgical Association, Rochester Minn. Dec. 6-8. Dr. Albert H. Montgomery, 122 South Michigan Boulevard Chicago Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to *THE JOURNAL* in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Archives of Internal Medicine, Chicago

56: 627-832 (Oct.) 1935

- Etiology and Treatment of Sprue** Observations on Patients in Puerto Rico and Subsequent Experiments on Animals W B Castle Boston C P Rhoads New York H A Lawson Providence R I and G C Payne San Juan Puerto Rico—p 627
- ***Clinical Experience with Derivative of Squill** J G Carr and J D Mayer Chicago—p 700
- Effect of Digitalis on Cardiac Output of Persons with Congestive Heart Failure** B Friedman New York G Clark H Resnik Jr and T R Harrison Nashville Tenn—p 710
- Pathology of Vessels of Pulmonary Circulation** Part III O Brenner, Birmingham England—p 724
- ***Pulmonary Abscess and Pulmonary Gangrene** Analysis of Ninety Cases Observed in Ten Years B S Kline and S S Berger Cleveland—p 753
- Treatment of Cardiovascular Syphilis** Study of Duration of Life in Eighty Treated and Untreated Patients with Aortic Aneurysm and Aortic Regurgitation E K Stratton San Francisco—p 773
- Relation of Asthma to Sinusitis with Especial Reference to Results from Surgical Treatment** R A Cooke and R C Grove New York—p 779
- ***Pyothorax Due to Fusospirochetal Infection** R A Flack, Lafayette Ind—p 790
- Progress in Internal Medicine** Gastro Enterology in 1934 G Cheney San Francisco—p 797

Clinical Experience with Derivative of Squill—Carr and Mayer studied the effect that a derivative of squill (scillonin) had on 104 patients having cardiac decompensation. They observed that the drug will produce the usual therapeutic and toxic effects of digitalis in the treatment of cardiac decompensation. In their experience, cardiac irregularities are likely to be the first signs of dangerous intoxication. Nausea does occur and may precede the appearance of cardiac irregularities. The nausea of scillonin intoxication is significant in that it appears to signify a more advanced grade of intoxication than that associated with the nausea of digitalis. When nausea and cardiac irregularities occur in the course of treatment with scillonin, the drug should be discontinued. Slowing of the cardiac rate to 60 or below is frequent with the successful use of scillonin. The onset of a rate as low as 60 is significant of the full therapeutic dose and calls for temporary discontinuance. A dose of from 8 to 12 mg of scillonin of standard potency as now provided, depending on the weight of the patient, may be given within four days to patients who are known to have taken no drug of the digitalis group within two weeks. If a prior course of scillonin or of some other drug of the digitalis group has been used with full therapeutic effect, the maximal dosage of scillonin should not be repeated within a month, but small doses may be given daily until the effect appears. The maintenance dose of scillonin is approximately 0.5 mg daily, but it must be adapted to the needs and response of the individual patient. A few patients have been kept on a small daily ration for three years or more. For small patients the daily maintenance dose is as low as 0.33 mg. Scillonin therapy is of advantage to certain persons who take digitalis with difficulty because of gastric distress early in the course of medication. It is not a substitute for digitalis in the presence of frank digitalis intoxication. Scillonin retains its potency over a long period. A supply in the authors' possession for about seventeen months proved as effective at the end of that time as the lots assayed recently.

Pulmonary Abscess and Pulmonary Gangrene—During the last ten years at Mount Sinai Hospital, Kline and Berger observed fifty-five cases of pulmonary spirochetosis (Miller-Vincent's infection of the lung) including thirty-nine cases of pulmonary gangrene, as well as twelve cases of bronchogenic pulmonary abscess and twenty-three cases of embolic pulmonary

abscesses. The embolic pulmonary abscesses were associated with areas of suppuration elsewhere in the body and were manifestations of generalized pyemia or bacteremia. Of the local bronchogenic pulmonary lesions, gangrene was observed more than three times as frequently as abscess. Although all the cases presented the clinical picture of so-called typical abscess of the lung, usually they were readily recognized by distinguishing characteristics as cases of gangrene and abscess, respectively. Of the thirty-nine cases of gangrene, thirty-two were in adults and seven in children. Of the twelve cases of bronchogenic abscess eight were in children and four in adults. Twenty-two cases of pulmonary gangrene followed an operation, usually performed under general anesthesia. Half the operations were on the oral cavity. This incidence emphasizes the danger of aspiration of infective material from the oral cavity. Of the patients with embolic pulmonary abscess, 96 per cent died. The mortality in cases of bronchogenic abscess was 58 per cent. In twenty-five cases of pulmonary gangrene with cavitation, the mortality was only 32 per cent. Mortality was 49 per cent in the whole group of cases including fourteen in which there was no treatment with arsenic or only one treatment when the patient was practically moribund (within four days of death).

Pyothorax Due to Fusospirochetal Infection—Flack reports three cases in which pyothorax accompanied severe pulmonary infection and in which fusospirochetal organisms appeared to constitute the important etiologic factor. The clinical course indicated that pyothorax associated with large numbers of fusospirochetal organisms causes certain clinical signs not encountered in the more common types of pyothorax. Diagnosis of this type of pyothorax should receive particular attention as the treatment should be directed along lines different from the medical and surgical treatment of the more common types of pyothorax. The establishment of a diagnosis of pyothorax resulting from fusospirochetal infection may precede the proper identification of the underlying infection involving the parenchyma of the lungs and may be of great value in the true estimation of the prognosis of the case. The diagnosis in the three cases was established only after the presence of fusospirochetal organisms in the empyema fluid was observed. Attention is called to the severity of the pleural pain and to the fact that the pain persists after the development of pleural effusion. The fetid odor of the pus obtained from the pyothorax in this type of infection is considered of diagnostic importance. The author believes that this type of acute pulmonary infection is much more common than a survey of the medical literature would indicate. In the differential diagnosis of cases of acute pulmonary disease, more consideration should be given to this type of infection.

Journal of Pediatrics, St Louis

7: 435-584 (Oct.) 1935

- ***Microcytic, Hypochromic (Iron Deficiency) Anemia in Infancy and Childhood** Its Relation to Gastric Acidity and to Simple Achlorhydric Anemia of Adults H A Faber Camille Mermod A L Gleason and R P Watkins, San Francisco—p 435
- Child Guidance in Outpatient Pediatrics** Study of Five Hundred Consultative Patients Mary I Preston, San Francisco—p 452
- Tetany in the New Born** C E Snelling Toronto—p 465
- ***Use of Lactic Acid Milk in Prevention of Summer Diarrhea** L A Scheuer New York—p 468
- Evaluation of Splenectomy in Treatment of Sickle Cell Anemia** Late Results of Two Cases so Treated with Summary of Present Condition of All Reported Splenectomized Patients J F Landon and H A Patterson New York—p 472
- Encephalitis in Children** Some Etiologic and Therapeutic Considerations K E Appel Philadelphia—p 478
- Amateur Idiocy (Infantile Type of Tay Sachs Disease)** Report of Another Case in an Infant of Non Jewish Ancestry A. Roos Chicago—p 488
- Cachexia Hypophyseopriva (Simmonds Disease)** Report of Case in an Adolescent Girl C A Aldrich Winnetka Ill, and J A Walsh, Peoria Ill—p 491
- Further Observations on Use of Acetarsone in Treatment of Congenital Syphilis** A S Traisman Chicago—p 495
- Encephalography Chair for Children** C Bradley, East Providence R. I.—p 512
- Institutional Mortality of the New Born** Report of Ten Thousand Consecutive Births W W Swanson A R Turner and F L Adair Chicago—p 516

Microcytic, Hypochromic Anemia in Childhood—Faber and his associates observed ten patients between the ages of 7 months and 2 years with anemia of the "nutritional" or "iron-deficiency" type, in whom gastric analysis after histamine

demonstrated a marked secretory defect free acid was absent in six and low in the other four, total acidity and volume were low in all cases. The blood showed marked hypochromia and microcytosis before treatment was begun. When soluble iron was administered in adequate amounts, there was a striking immediate response with reticulocytosis and increased size of red cells (transient macrocytosis) accompanying an increase in hemoglobin. This was followed by a decline of reticulocytes, by a return to an approximate distribution of cell sizes and by a continued rise in hemoglobin. A certain number of microcytes tended to persist. Twins who at the age of about 8 months had anacidity and anemia were reexamined seven years later. One still had nearly complete anacidity and a mild degree of anemia. The other was able to produce a moderate amount of acid (though probably less than the normal minimum) and still had microcytosis, but without hypochromia. On the basis of a comparison with the normal values for later childhood and adult life, the average presumptively healthy child in the latter half of the first year and for a few years thereafter has a mild hypochromic anemia. Available figures show that at least during the first and second years children secrete small amounts of gastric juice containing a relatively small amount of acid. It is probable that in this period of life the absorption of iron from ordinary diet is difficult and might be improved by administering soluble iron as a routine measure and by taking into account the acid-absorbing (buffer) effect of milk in regulating diet. The close resemblance between "iron deficiency" anemia of infancy and childhood and the hypochromic, microcytic anemia of adults is noted.

Lactic Acid Milk in Prevention of Summer Diarrhea—Scheuer reviews the incidence and mortality rate of summer diarrhea at the New York Foundling Hospital during the past twenty-five years (1910-1934). He observed that there was a persistence in the number of cases of summer diarrhea despite an adequate supply of clean milk with a low bacterial count. Because of the large number of marasmic cases resulting from summer diarrhea, powdered whole lactic acid milk mixtures containing only a total carbohydrate content of 7 per cent, 0.3 per cent lactic acid and a caloric value of less than 50 calories, per pound of body weight were fed to 403 infants during the summer months of 1931 to 1934. These infants were malnourished and were less than 6 months of age. Summer diarrhea did not occur among the 403 infants who were fed this type of lactic acid milk mixture.

Medicine, Baltimore

14: 323-376 (Sept.) 1935

Heat Cramps J. H. Talbott, Boston—p. 323

Michigan State M. Society Journal, Grand Rapids

34: 575-644 (Oct.) 1935

President's Annual Address Michigan and Our Profession Yesterday and Today R. R. Smith Grand Rapids—p. 575

Acute Hepatic Insufficiency Clinical Occurrence Liver Function Tests and Therapy W. A. Thomas Chicago—p. 581

Abdominal Pregnancies Occurring in Detroit During 1933 C. N. Swanson Detroit—p. 585

Diagnosis of Early Tuberculosis H. S. Willis Detroit—p. 589

Chronic Sinusitis in Children F. Smith Grand Rapids—p. 593

Congenital Hypertrophic Pyloric Stenosis H. J. Vanden Berg Grand Rapids—p. 596

*Treatment of Trichomonas Vaginalis Vaginitis J. C. Smith Detroit—p. 598

Factors Affecting Immunity Balance in Dermatophytosis L. W. Shaffer Detroit—p. 601

Infantile Eczema G. Van Rhee Detroit—p. 604

Skin Diseases in Industry A. E. Schiller Detroit—p. 608

Value of the Potter Type of Internal Podalic Version in Management of Persistent Posterior Occiput Cases M. M. Jones Pontiac—p. 614

Treatment of Trichomonas Vaginalis Vaginitis—The form of treatment that Smith has been using for several months and seems to give the most satisfactory results, with no failures to date, is the following. The vagina is wiped dry of all discharge and is painted with a 1 per cent aqueous solution of gentian violet. After this has dried for a few moments, an amebicide powder mixture, suggested by Gellhorn, is blown into the vagina by means of a powder blower. The powder mixture consists of acetarsone and equal parts of kaolin and sodium

bicarbonate. The average dose is 1 teaspoonful of the mixture, containing $7\frac{1}{2}$ grains (0.5 Gm.) of acetarsone, and this dosage is usually doubled when treatment is given during the menstrual period or a pregnancy. The powder blower is so designed that it causes a ballooning out of the vagina, and thus the powder is deposited in all the crevices and folds of the vaginal mucosa. The treatments are given every second day and the number has varied from four or five to a dozen or more. Douches, baths and coitus are not permitted. Several stubborn cases treated by other agents have responded readily to this more recently tried method. For patients who for some reason cannot take the treatment, lactic acid is usually prescribed for douching, but vinegar is just as effective, and the author has one poor patient who completely eliminated the infection by the use of vinegar douches.

Minnesota Medicine, St. Paul

18: 631-694 (Oct.) 1935

Criteria of Operability for Golter E. Goetsch Brooklyn—p. 631
Pulmonary Fat Embolism Pathologic Consideration K. Ikeda, St. Paul—p. 636

Megacolon Report of Traumatic Case Treated by Left Lumbar Sympathectomy L. H. Fowler and W. A. Hanson, Minneapolis—p. 646

Anal Abscess and Anal Fistula H. W. Christianson, Minneapolis—p. 655

Pathologic Conditions in the New Born T. Myers St. Paul—p. 658
Hyperparathyroidism R. C. Webb Minneapolis—p. 664

New England Journal of Medicine, Boston

213: 639-698 (Oct. 3) 1935

Development of Physical Diagnosis J. H. Pratt, Boston—p. 639

Etiology of Chronic Arthritis C. S. Keefer Boston—p. 644

Some Factors in Etiology of Bright's Disease J. P. Peters New Haven, Conn.—p. 653

*Etiology of Degenerative Vascular Disease H. B. Sprague, Boston—p. 659

*Drug or Protein Allergy as Cause of Agranulocytosis and Certain Types of Purpura F. T. Hunter Boston—p. 663

Electrosurgical Cholecystectomy II Clinical Application L. R. Whitaker Boston—p. 674

Etiology of Degenerative Vascular Disease—Sprague states that it is impossible to differentiate clearly intimal and medial processes, or to subdivide hyaline, fatty, fibrous and calcific changes from one another. Vascular disease has been attributed to the following factors: material voluntarily ingested, material involuntarily ingested, inhaled or acquired parenterally, toxic products endogenously elaborated in the body, such as occur in metabolic disorders, general strain on the vascular tree from hypertension or excessive bodily activity or local strain on special vessels from their anatomic situation or structural peculiarities, as in the pulmonary or coronary circulation, acceleration or exaggeration of the changes normally occurring in old age, chiefly dehydration, loss of muscle cells, elastic tissue and power of regeneration, deposit of lipoids and calcium salts in the cells and changes in the colloid state of the tissues, endocrine influences through hypo-activity, hyperactivity or dysfunction, influence of psychic factors and speed of modern life on vascular irritability, and climatic factors. The cause of degenerative vascular disease is unknown, but the boundaries of the problem are being progressively narrowed by the study of experimental arteriosclerosis of chemical analysis of vessels, of the properties of colloidal gels and of human biology. No theory of etiology is wholly satisfactory to explain premature death from disease of the blood vessels. Acceleration of the normal changes of age seems to be inherent in certain familial or racial groups and can be abolished only by a wide, and probably impossible, application of human genetics. Enough evidence exists to make it probable that there are controllable factors of environment, which in some cases can be altered in such ways as to delay the process of aging or change its manifestations.

Allergy as Cause of Agranulocytosis and Purpura—Hunter cites the arguments that the agranulocytic and purpuric syndrome is a manifestation of allergy, and those which have been advanced to show that it is a result of primary injury to the liver. Agranulocytosis occurs in susceptible individuals following the ingestion of aminopyrine, but in less than 10 per cent of the reported cases this drug has been proved, by further ingestion tests, to be the causative factor. Typical clinical

agranulocytosis may result from injections of arsphenamine, gold salts or foreign protein or from the ingestion of dinitrophenol. Agranulocytic purpura has been attributed to arsphenamine and to quinine, thrombopenic purpura and aplastic anemia, to arsphenamine and to gold salts, but many of these cases have been incorrectly referred to as pure agranulocytosis. In view of the difficulty of drawing definite dividing lines between various blood dyscrasias, and since arsphenamine can produce any of them, they may be manifestations of a physiologic mechanism similar to allergy, which, in turn, may be dependent on injury to the liver. There is not enough evidence in the literature or in the author's twenty-seven cases to justify the statement that injury to the blood-forming organs from the use of drugs or foreign protein occurs more frequently in allergic patients than in normal individuals, or more often in patients presenting evidence of past liver injury than in those without it. The author concludes that agranulocytosis is a syndrome rather than a clear cut clinical entity of established etiology and may be occasioned by a number of substances, such as aminopyrine, arsphenamine, gold salt, dinitrophenol and foreign protein. It, together with some allied blood disorders, probably belongs in the category of allergic phenomena and may even be conditioned by functional damage to the liver.

New York State Journal of Medicine, New York

35 1001 1062 (Oct. 15) 1935

- Pneumothorax in Pneumonia. An Appraisal. J. G. M. Bullowa, New York.—p. 1001
Treatment of Ocular Affections with Gold Sodium Thiosulfate. I. J. Koenig. Buffalo.—p. 1019
Trauma and Tuberculosis. E. Mayer. New York.—p. 1024
Community Health Education. G. D. Forbes. Kendall.—p. 1031
Vitamins and the Child. C. G. Kerley, New York.—p. 1035
Bacillary Dysentery. Acute Fulminating Type with Marked Toxic Neuropenia. J. Felsen. New York.—p. 1037

Philippine Journal of Science, Manila

57: 149 294 (June) 1935 Partial Index

- Notes on Philippine Mosquitoes. III. Genus *Culex*. Groups *Lophocera* and *Mochthogenes* and *Neoculex*. F. E. Baisas, Manila.—p. 167
Heterophyid Trematodes of Man and Dog in the Philippines with Descriptions of Three New Species. C. M. Africa and E. Y. Garcia. Manila.—p. 253
Results of Bacteriologic Examination of Ice Drops Manufactured in Manila. Teresa V. Rosario-Ramirez and O. Garcia. Manila.—p. 269
Treatment of Human Beriberi with Crystalline Antineuritic Vitamin. A. J. Hermano and F. Eubanas. Manila.—p. 277
Nitrogen Distribution and Carbohydrate Partition in Philippine Rice Bran. J. Marañon and L. Cosme, Manila.—p. 289

57: 295-408 (July) 1935 Partial Index

- Methylene Blue Reduction Test. Its Efficiency and Interpretation Under Philippine Conditions. J. B. Uichanco, Manila.—p. 295
Mineral Constituents in Fresh and Canned Milk. A. J. Hermano and S. Claravall. Manila.—p. 323
Breeding Habits of *Anopheles Litoralis* and *Anopheles Indefinitus* in Salt Water Ponds. W. V. King. Washington, D. C. and F. Del Rosario. Manila.—p. 329

Mineral Constituents in Fresh and Canned Milk.—Hermano and Claravall analyzed forty-five samples of milk for their calcium, iron, phosphorus, fat and ash contents. The results for evaporated whole milk, powdered whole milk and sweetened condensed milk agree, in general, with the data given by the associates of Rogers for these products. Fresh cow's milk gave a higher percentage of ash and calcium than the natural sterilized milk. Milk from carabaos had the lowest ash content (0.64 per cent), but the ash had the highest amount of calcium (27.99 per cent). Carabao milk also had more fat and protein than the other natural fresh milks. The Toggenberg breed of goats gave milk with a higher calcium content than any other breed of goats. Whole powdered milks gave the highest percentage of fat.

South Carolina Medical Assn. Journal, Greenville

31 167 186 (Sept.) 1935

- Ischioanal Abscess and Rectal Fistula. W. H. Prioleau. Charleston.—p. 167
Clinical Aspects of Primary Pulmonary Carcinoma. W. A. Smith. Charleston.—p. 169
Management of Therapeutic Malaria for Syphilitic Meningo-Encephalitis (General Paresis). J. E. Boone. Columbia.—p. 173

Southern Medical Journal, Birmingham, Ala.

28: 867 958 (Oct.) 1935

- Synovectomy of Knee Joint in Chronic Arthritis. Report of Cases. S. D. David. Houston, Texas.—p. 867
Treatment of Arthritis with Colloidal Sulfur. Report of Two Hundred and Fifty Cases. S. C. Woldenberg. Dayton, Ohio.—p. 875
Congenital Solitary Kidney. R. A. Hennessey and A. D. Mason. Memphis, Tenn.—p. 881
Hypoplastic Kidney. Report of Case Having Stone in Opposite Kidney. P. G. Gamble. Greenville, Miss.—p. 887
Cardiospasm. R. McKinney, Memphis, Tenn.—p. 891
Xanthoma Diabeticorum. E. Thompson, Little Rock, Ark. E. Stevenson and F. Krock. Fort Smith, Ark.—p. 895
Amebic Abscess of the Liver. Report of Fatal Case in Which Etiology Was First Demonstrated in Tissue Sections of Diaphragm, Following Autopsy. No Previous Manifestations of Amebiasis. Pauline Williams. Richmond, Va.—p. 902
Unusual Tumor of Neck. W. F. Dutton and N. C. Prince, Amarillo, Texas.—p. 905
Sacral (Caudal Block) Analgesia in Gynecology. H. V. Sims. New Orleans.—p. 908
Agranulocytosis. Etiology, Diagnosis and Treatment. R. R. Kracke and F. P. Parker, Emory University. Ga.—p. 911
Management of the Heart in Hypertensive Disease. O. P. J. Falk. St. Louis.—p. 915
Treatment of Circulatory Failure. J. Kopecky. San Antonio, Texas.—p. 918
Motor and Secretory Dysfunction of Gastro-Intestinal Tract and the Vitamin B₁ Factor. Clinical Study. J. B. Fitts, Atlanta, Ga.—p. 920
The Problem of Rabies. W. B. Grayson and G. Hastings, Little Rock, Ark.—p. 924
Infant Hygiene Program and Relationship of Infant Mortality to Maternal Hygiene Program. Analysis of Seven Years Work in Williamson County, Tennessee. 1927-1933. W. C. Williams, Nashville, Tenn. and E. L. Bishop, Knoxville, Tenn.—p. 928
Inflammation of Uterine Cervix. H. W. Kostmayer, New Orleans.—p. 931
The Prognosis of Syphilis. C. P. Bondurant. Oklahoma City.—p. 933
Importance of Psychiatric Examination in Evaluation of Head Injury Sequels. T. H. Harris and A. Hauser. Galveston, Texas.—p. 937
Routine Tuberculin Tests in Children. C. V. Rice, Muskogee, Okla.—p. 942
Food Problems in the One Child Family. M. R. Woodward. Sherman, Texas.—p. 946
Tracheobronchial Diphtheria. H. Dupuy, New Orleans.—p. 948
Simple Technique for Establishing Spinal Fluid Drainages. G. B. Lawson, Roanoke, Va., and O. D. Boyce. Nashville, Tenn.—p. 949

Treatment of Arthritis with Colloidal Sulfur.—Woldenberg employed colloidal sulfur in the treatment of 231 cases of atrophic and five of hypertrophic arthritis and in fourteen cases of muscular rheumatism. Every case showed excellent clinical improvement, and the results were obtained in a much shorter period of hospitalization than previously known. All these patients except six were discharged from hospitalization with a complete arrest of the active symptoms of the disease. Great care was exercised in each case in establishing the diagnosis of arthritis. The familiar symptoms were confirmed by a thorough examination of the nature of the inflammation and the tenderness complained of in the affected joints. In addition, the diagnosis was confirmed by roentgen studies of each joint in which any change had occurred, and in every case of arthritis in this series abnormal shadows showed extraordinary joint alterations. Coexisting diseases were found in many of these patients. All foci of infection when present were cleared up as far as possible. The routine eradication of teeth and tonsils was not done unless it was apparent that they were factors in the causation of the arthritic process. Protective and corrective treatment was carried out whenever indicated. Chronic constipation, an extremely common condition among these patients, was corrected. While anemia, as shown by low hemoglobin and a slight reduction of the red cells, was mostly mild, the best nutritional state possible was secured for each patient. Generally they were placed on a high vitamin, low carbohydrate, low caloric diet, with 50 or 60 Gm of protein and the necessary amount of fats according to the patient's caloric requirements. Exercises gradually increasing in vigor were given daily throughout the treatment. The colloidal sulfur used was supplied in 2 cc. ampules said to contain 10 mg of colloidal sulfur disbursed in a protein-free aqueous medium for intravenous medication and in 2 cc. ampules containing 20 mg of colloidal sulfur suspended in an acid-free olive oil for intramuscular medication. In the severe type and long standing cases, showing a low cystine content of fingernail clippings and a high sedimentation rate, 30 mg of sulfur was

given every day until a course of ten injections had been completed. The more satisfactory results were obtained from the intravenous medication. The majority of the patients were free from pain after the fifth or sixth injection and the spasticity of muscles began to disappear. The effusion in the joints gradually became less, and after about three or four weeks of treatment it was practically gone. Great care was taken when giving colloidal sulfur intravenously to inject it slowly, to prevent any leakage into the soft tissue, as the latter causes excruciating pain and sometimes sloughing of the soft part at the vicinity of the point of injection. In the most recent cases, the cystine and sedimentation tests, supported by the clinical observations, have enabled the author to treat very acute cases with doses as high as 30 mg of colloidal sulfur intravenously daily for a full course, and as a result completely ridding the patients of the intense pain they were suffering within thirty-six hours of the first injection. It is his opinion that the larger doses administered at more frequent intervals are the most important factor in the beneficial results obtained with sulfur therapy in arthritis.

Surgery, Gynecology and Obstetrics, Chicago

61 433 584 (Oct.) 1935

- *Chronic Atrophic Dermatitis of Vulva F L Adair and M E Davis Chicago—p 433
- Phlebitis Thrombosis and Thrombophlebitis of Lower Extremities L M Zimmerman Chicago—p 443
- Conservative and Radical Measures in Treatment of Ulcer of Leg Study of Technique Indications and Results B Douglas Nashville Tenn—p 458
- Study of Relationship of Pregnancy to Disease of Gallbladder R R Huggins B Harden and G W Grier Pittsburgh—p 471
- *Peptic Ulcer Experimental Study E E. Blanck Chicago—p 480
- Tissue Diagnosis During Operation Reliability of Terry's Supravital Technique in One Thousand and Thirty Biopsies C A. Hellwig Wichita Kan—p 494
- Method of Closure of Temporary External Fecal Fistula H W Cave New York—p 499
- *Surgical Treatment of Joint Tuberculosis M Cleveland New York—p 503
- Medical Treatment of Amebic Infections of Liver W H Holmes Chicago—p 521
- Pineal Teratomas Report of Case of Operative Removal A J McLean Portland Ore—p 523
- Loss of Urinary Control Associated with Relaxation of Vesical Neck. Modified Technic for Its Treatment. M Douglass Cleveland—p 534
- Significance of Bleeding or Discharge from the Nipple J E Stowers Kansas City Mo—p 537
- Obstetric Analgesia with Pentobarbital Sodium Leukocyte Response During the Puerperium H M Teel and D E. Reid Boston—p 545

Chronic Atrophic Dermatitis of Vulva—Adair and Davis state that the present terminology—kraurosis, leukoplakic, vulvitis, leukokraurosis—is unsatisfactory, as it describes only certain phases of this condition. It leads to failure in making a diagnosis of the early stages of the disease prior to the development of the shrinkage of kraurosis or the white areas of leukoplakia. Chronic atrophic dermatitis of the vulva is a simple and descriptive term for the entire process in its various manifestations. In a period of five years the authors have encountered twenty-three patients with typical chronic atrophic dermatitis of the vulva, an incidence of 0.24 per cent. Vulvectomy was done in nine cases with uniformly good results. Various types of treatment were given, including irradiation in the majority of the cases with only temporary relief. The disease is progressive and does not tend to regress spontaneously, although there may be periods of quiescence. Surgical removal of the involved tissue is the only safe, logical and effective treatment in alleviating the symptoms and arresting the progress of the disease. The condition is to be regarded as a precancerous lesion with an incidence of carcinoma in more than 50 per cent of the cases. Vulvectomy is further justified as a prophylactic measure against carcinoma of the vulva.

Experimental Peptic Ulcer—Blanck shows that gastrointestinal ulceration can be prevented in dogs with biliary exclusion by the adequate feeding of fresh bile obtained from dogs. Gastric changes were observed in the pyloric region in three dogs. Another characteristic of the associated gastritis as observed in man and in the animals was the patchy distribution of the pathologic areas. The destruction of the epithelium of

the surface and necks of the pyloric glands constituted the earliest type of alteration in these glandular structures. Cystic dilatation of some of the glandular structures was noted in the necks of pyloric glands of one dog and in Brunner's glands of the duodenum in another dog. In the fundus mucosa of one dog an increase in the amount of interstitial tissue resulting in a forcible separation of the closely packed gland tubules was observed. There was also a destruction or atrophy of the glandular cells manifested first in the necks of the glands and then in the fundus portions. In the regions in which the process had progressed sufficiently to destroy entire tubules, there often could be seen one or more nests of from one to six parietal cells lying as vestiges in the path of the destructive process. These cells presented intact cell outlines and perfectly normal appearing nuclei. In the changes observed in the duodenums of the animals there was chiefly a loss of epithelium covering the villi. In some areas there was in addition a beginning erosion of the tips of the intestinal villi. The sections stained in muchematein solution, as long as any portion of the cell cytoplasm remained, continued to give the characteristic staining reaction, confirming the work of Whitlow that mucus laden and mucus covered cells are more resistant to acid pepsin digestion than other cells. Although these cells possess a natural power of protection they finally succumb to the influences of the destructive process. Of the changes occurring on both sides of the pyloric ring, those on the stomach side are progressive and constitute chiefly a loss or atrophy of the gland structures, and on the intestinal side of the pyloric ring the changes are manifested by a continual loss of tissue. The author believes that this fact explains why there is a preponderance of the duodenal lesion over the gastric lesion in peptic ulcer disease.

Surgical Treatment of Joint Tuberculosis—Cleveland believes that tuberculosis of the joint as a distinct entity does not exist. Manifestations of tuberculosis in the joints must be considered as tuberculosis with a primary focus in the lungs, lymph glands or tonsils, in which the joint has been secondarily invaded. The condition of the lungs, upper respiratory tract, gastro-intestinal tract and genito-urinary tract is of paramount importance in these cases, which must be studied as a whole in relation to the tuberculous infection. Until each series of cases reported with joint tuberculosis is so studied, exact knowledge of the problem of treatment or prognosis cannot be arrived at. In the author's 210 patients the average age of onset was 22 years. The mortality was 28.5 per cent and will undoubtedly be higher as time goes on and the number of deaths is augmented from the list of cases that he considers uncertain. In the first decade of life the mortality in this group was only 14.8 per cent, but in the third decade the mortality mounted to 46 per cent. Patients with positive sputum and caseous pneumonic lesions, and those with pulmonary disease and negative sputum, but with metastatic spread to other organs, have shown a mortality of 52 per cent. On the other hand, patients with inactive pulmonary disease and no metastatic spread to other organs and those with no evidence of pulmonary disease have shown a mortality of only 9 per cent. A factor that adversely influences the end result is prolonged suppuration from sinuses with resulting amyloid disease. The only joints that tend to fuse spontaneously are those of the spine. This occurs in only 22 per cent of the cases and then only after many years and the development of tremendous deformity. A study of the end results of the 224 joints treated shows that the joints of the upper extremities and the tarsal and ankle joints had the highest percentage of excellent results, 70 per cent or better. The knee joint cases showed 61 and the spine cases 54 per cent of excellent results. The percentage of excellent results fell to 44 in the hip joint cases and to 37.5 in the sacro-iliac joint cases. As the excellent results declined, the mortality rose. The sacro-iliac joint with a mortality of 43.5 per cent is, in the author's experience, the gravest form of joint tuberculosis, while the knee joint and joints of the upper extremities offer the best prognosis. The operative treatment aimed at eliminating the surgical focus by putting the joint or joints involved at complete rest, by operative fusion. If a joint of an extremity was overwhelmingly involved and any attempt to save it endangered the patient's life, amputation was resorted to.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

58: 333 426 (Sept.) 1935

- The Origin of the Berger Rhythm E D Adrian and K Yamagiwa —p 323
Observations on Terminations of Cutaneous Nerves H H Woollard —p 352
Chronic Progressive (Endotoxic) Polyneuritis W Harris —p 368
Visual Disorientation in Homonymous Half Fields G Riddoch —p 376
Certain Anatomic and Physiologic Aspects of Meninges and Cerebrospinal Fluid L H Weed —p 383
Traumatic Lesions of Optic Chiasma H M Traquair N M Dott and W R Russell —p 398
*Reactions of Dog After Removal of Cerebral Hemispheres S I Lebedinskaja and J S Rosenthal —p 412

Experimental Removal of Cerebral Hemispheres—

Lebedinskaja and Rosenthal removed the cerebral hemispheres of a young male dog by two successive operations carried out without great loss of blood and without damaging the subcortical matter. They found that a small portion of cerebral cortex is sufficient for the establishing of simple conditioned reflexes. Motor disturbances pass away almost completely in the course of time. The sleep is deeper and sounder than that of normal dogs, owing to the absence of the cerebral cortex, which is a more sensitive mechanism to internal and external stimuli than the subcortical matter. The internal functions of the organism (metabolism, temperature regulation) depending on the subcortex remain satisfactory. The dog lost sight and smell. Taste remains more or less normal. Cutaneous sensibility to mechanical and thermal stimuli is lowered. The unconditioned orientation reflex to sounds and noises is preserved. Explorations (investigatory movements of the head) are preserved and can be easily mistaken for olfactory reactions, which in reality are absent. The mating (sex) instinct may be preserved but incompletely. The dog was unable to find his food without assistance. Fits or convulsions of the tonic type were not observed. The dog lived without cerebral hemispheres for one year and two days after a third fit of convulsions. At necropsy, the dura mater was found adhering closely everywhere to the remnants of the brain tissue. It was very much thicker than normal, especially at the posterior part near the tentorium cerebelli, as well as along the middle line above the fissura cerebri magna, where the thickness of the scar exceeded 1 cm. On its internal surface the dura mater adhered closely to the surface exposed by the removal of the cerebral hemispheres. Scars were found in front, in the region of the olfactory lobes, which were destroyed by the operations. All the nerves of the base of the brain were intact and were not adherent to scar tissue. Transversal sections made from the medulla oblongata to the front end of the tractus olfactorius at a distance of from 2 to 3 mm. from one another have shown that: 1 The lower posterior horn of the left lateral ventricle was absent to the middle of the thalamus. 2 In that part the dura mater modified by the scar adhered directly to the subcortical matter. 3 Owing to the secondary scar formations the cornu ammonis on the left was hardly discernible. 4 In front of their middle parts both lateral ventricles were intact and descended together with the fornix toward the front part of the base of the brain. 5 The right gyrus pyriformis was intact the left was damaged. 6 Near the right gyrus pyriformis a well preserved portion of the auditory area of the cortex-gyrus compositus posterior was found.

British Medical Journal, London

2: 609-650 (Oct 5) 1935

- General Ideas in Medicine W Trotter —p 609
Some Aspects of Infant Feeding H B Graham —p 614
Gas Anesthesia Under Positive Pressure G Kaye —p 618
Advances in Our Knowledge of Hydatid Disease During Twentieth Century H R Dew —p 620
Agranulocytosis with Purpura Haemorrhagica Following Gold Therapy. Note on Prevention of Complications P Ellman and J S Lawrence. —p 622

Agranulocytosis Following Gold Therapy—Ellman and Lawrence present a fatal case of hemorrhagic purpura with agranulocytosis following gold therapy. They divide the complications of gold therapy into effects on the skin, the mucous

membrane the liver and kidneys and the hematopoietic system. They emphasize that, apart from a few cases of degenerative hepatitis, accidents due to gold therapy have proved fatal only when the hematopoietic system has been involved. Émile Weil and Bousser consider the causation of toxic manifestations due to a sensitivity to gold. The most effective treatment of agranulocytosis is blood transfusions repeated as often as is found necessary. Subcutaneous injections of blood have also been used and epinephrine and liver by mouth. Dextrose intravenously, sodium thiosulfate or magnesium and sodium nucleinate are also recommended. Before starting gold therapy the patient should always be questioned with regard to a personal or family history of purpura or bleeding. Gold salts should not be given to patients with such a history. They should likewise not be given following substances that affect the bone marrow such as thorium. Blood counts should be carried out frequently during the treatment in order to detect an incipient agranulocytosis, aplastic anemia or thrombocytopenia. The necessity for this in the gold treatment of rheumatoid arthritis cannot be overemphasized. If the eosinophil count rises above 5 per cent the injections should be discontinued temporarily. As erythema is a sign of intolerance to gold, the authors discontinue the injections when it occurs. On recommencing half the previous dose is employed.

Edinburgh Medical Journal

42: 505 568 (Oct.) 1935

- The Teaching of the Neuroses to Medical Students T A Ross —p 505
Acrodysplasia Type Syndactylic Oxycephaly D M Greig —p 537

Irish Journal of Medical Science, Dublin

No 117 537 572 (Sept.) 1935

- Evaluation of Intrapleural Pneumolysis G Maurer —p 537
Tay Sachs Disease (Amaurotic Family Idiocy) Review of the Disease with Description of Case R E Steen —p 547
Hay Fever Immunization (Personal Experience) E O Shaughnessy —p 554

Medical Journal of Australia, Sydney

2: 367 396 (Sept 21) 1935

- Treatment of Acute Anterior Poliomyelitis in Early Stages R Southby —p 367
Early Treatment of Poliomyelitis Jean Macnamara —p 374
Early Treatment of Anterior Poliomyelitis J W Grieve —p 378
Radiologic and Clinical Findings in Eight Hundred Adult Chests E L Cooper and Barbara G Wood —p 379
Abdominal Adhesions H S Stacy —p 380
Notes on Ectopic Ureter in Female Case Report K Kirkland —p 381

South African Medical Journal, Cape Town

9: 585 624 (Sept 14) 1935

- Anemia Hematologic Aspect G Buchanan —p 597
Prevention of Deformity and Disability from Fractures of Long Bones J M Edelstein —p 603
Medicine and Dentistry Inaugural Floyd Lecture E B Fuller —p 609

Japanese Journal of Obstetrics and Gynecology, Kyoto

18: 301 354 (Aug.) 1935

- Biologic Study of Effect of Toxins of Malignant Tumor to Suprarenals Lymphatic System and Other Organs Parts I II and III S Okamoto —p 302
Kapeller Adler's Reaction of Pregnancy S Okamoto and Y Yamamoto —p 323
*Electrocardiogram of New Born First Report Electrocardiogram of the Normal New Born H Hori M Imai and M Sato —p 325
Id Second Report Electrocardiogram of the Asphyxiated New Born H Hori M Imai and M Sato —p 333
Surface Tension of Tissue of Uterine Tumor T Aikuchi and G Kawanishi —p 340
Application of Grelan for Roentgen Sickness H Kawakami and K Kominami —p 345
Statistical Observation of Cephalohematoma Neonatorum M Oshima —p 347
Labor Complicated by Deformity of Promontory A Yamabe —p 350

Electrocardiogram of the Normal New-Born—Hori and his associates examined the electrocardiograms of 126 mature new born infants and thirty-four premature infants. Irrespective of the maturity or prematurity of the new-born, the preponderance of the right ventricle was proved in all the cases and every wave was lower than that in the suckling, infant or adult. The abnormal electrocardiogram was observed more frequently in the premature new-born infants, especially in those electrocardiographed on the first to the third day after birth than in the mature infant.

Annales de Médecine, Paris

38 213 308 (Oct.) 1935

- Dispersion of Tubercle Bacillus in Course of Human Pulmonary Tuberculosis R Debré and M Perrault.—p 213
- Expectorants and Expectoration J Gordonoff.—p 248
- *Place of Carotid Sinus in Mechanism of Acute Pulmonary Edema A. Salmon.—p 270
- Disorders of Myocardial Function Fractionated Systoles R Lutembacher.—p 280
- Familial Hemangiomatosis of Rendu Osler and Hepatic Cirrhosis L Van Bogaert and J H Scherer.—p 290

Carotid Sinus in Pulmonary Edema—The carotid sinus is situated in the enlargement of the internal carotid after the bifurcation of the common carotid and consists of a plexus rich in nerve fibers which connect with the bulbar nuclei and the vagus centers. According to Salmon, the functional relations of this sinus with the bulbar respiratory nucleus is also interesting. It has been shown that mechanical excitation of the sinus modifies constantly the amplitude and rhythm of respiratory movements. Thermal stimulation of this organ produces an acceleration of the same movements. Depression of the sinus results in apnea, which ceases after the removal of the depressive agent. These and other factors have value in explaining the pathogenesis of acute pulmonary edema. The connection between the sinus and the bulbar nuclei does much to explain the fact that these crises of pulmonary edema having all the characters of bulbar vagotonic phenomena are usually produced by agents affecting the sympathetic, by injections of epinephrine and by emotions, hypertensive crises, strongly painful sensations, experimental excitation of sympathetic ganglions, brain lesions resulting in irritation of the nuclei of the third and fourth ventricle and similar stimuli.

Schweizerische medizinische Wochenschrift, Basel

65 997 1020 (Oct. 19) 1935 Partial Index

- *Treatment of Fracture of External Malleolus O Winterstein.—p 999
- *Pathogenesis of Thromboses H Wantoch.—p 1000
- Therapy of Sympathetic Dystonias O Lampl.—p 1003
- Treatment of Cardiac Neuroses and of Insomnia in Tuberculous Patients F Grandjean.—p 1004
- Studies on Action of Histidine in Gastric and Duodenal Ulcer and in Related Disturbances J W König.—p 1006

Treatment of Fracture of External Malleolus—According to Winterstein fractures of the external malleolus are especially frequent in ski runners. He shows how a fracture can be differentiated from a distortion and thinks that roentgenoscopy is usually unnecessary. In discussing the treatment, he says that some recommend small bandages and early mobilization and that others advise a plaster-of-paris cast, which remains in position for from two to six weeks and is then followed by mobilization. He concedes that the plaster-of-paris cast gives satisfactory results in most fractures but shows that prolonged functional impairment and weakened muscles are frequently the result of this treatment. With other surgeons he is of the opinion that the plaster-of-paris cast goes beyond the aim. Since 1919 his clinic has followed Clairmont's suggestion in that it employs the so called Gradl bandage for the fractures of the external malleolus in which there is no dislocation. As soon as a definite diagnosis has been reached, a strong linen bandage, 5 cm. in width and 5 meters in length, is put on in the form of an ascending spica of the foot, beginning at the toes and going up to three fingerbreadths above the malleolus. The linen bandage is covered with a gauze bandage. The foot is placed on a small hard cushion with lateral sand bags and an ice bag. At intervals of several hours the bandage may be moistened with cold water or with aluminum acetate. As the bandage dries, the pressure becomes more intense. According to requirement, the bandage may be removed for a time every day. Massage, which should be painless and should not touch the malleolus itself, is not begun until after at least three days. Active exercises may be begun a few days later, resistance exercises being especially helpful. Daily warm baths, the temperature of which is gradually increased, are beneficial. After about a week it is no longer necessary to keep the bandage constantly moistened. Rest in bed is necessary for a short time but when the patient sits up it is advisable to elevate the leg. Standing and walking should at first

be done without putting a strain on the leg with the fracture. In young persons this is possible after about a week, in middle aged persons after from two to five weeks.

Pathogenesis of Thromboses—Wantoch points out that since Virchow's time most authors have accepted the theory that three factors are involved in the development of thrombosis, namely, retardation of the speed of the blood current, impairment of the vascular epithelium and changes in the composition of the blood. The author shows that opinions differ about the relative importance of these three factors, some stressing the one and some the other as the most important one. However, recently the opinion has gained ground that changes in the composition of the blood are the most important factor in the pathogenesis of thrombosis. In discussing this factor, the author evaluates the resorption of the decomposition products of protein, the condition that is produced by protein and serum therapy and the importance of injections and of diuretics. He describes the observations made in the course of postmortem examinations. At his clinic, 367 cases of fresh thrombosis and embolism were found in the course of 4,739 necropsies. After mentioning the various pathologic conditions found in these 367 cases, he asserts that there were only twenty cases in which there was no disorder that is accompanied by changes in the blood, pointing out that the composition of the blood is altered not only in the conditions in which a predisposition to thrombosis exists but also in case of transudates and of stasis. He thinks that it may be concluded with some reservations that the accumulation of fluids in the cavities and tissues of the body is connected with a tendency to thrombosis. It was found also that, the more conditions concur which have a tendency to thrombosis, the more likely is the development of a thrombosis. The author was unable to corroborate that obesity or endocrine factors play a determining part in the pathogenesis of thrombosis, and, in reviewing the opinions on the connection between thrombosis and meteorological conditions, he says that as yet nothing definite is known about this relationship.

Clinica Pediatrica, Modena

17 661 724 (Sept.) 1935

- *Skin Reaction to Histamine and to Epinephrine in Scarlet Fever A. Colarizi.—p 661
- Acute Hypo-Adrenalism in the New Born A. Martinetti.—p 706

Skin Reaction to Histamine and Epinephrine in Scarlet Fever—Colarizi observed a marked refractoriness of the skin capillaries to histamine and to epinephrine in forty-two cases of scarlet fever. This lack of reactivity became less pronounced in a few days. Hypo-excitability and sometimes total loss of excitability were observed in the advanced stage of the disease in two patients presenting postscarlatinal nephritis. This study, comprising 270 cutaneous tests threw light on the nature of the lesions of the cutaneous vessels in scarlet fever and contributed to the understanding of the Schultz-Charlton phenomenon of rash extinction. The author investigated the various phases of the reaction as manifested by the behavior of the capillaries, veins and arteries toward the pharmacodynamic substances, comparing the skin of healthy persons, of scarlatinal exanthems and of the areas of fading rash. He found that the capillaries exhibit diminished permeability (urticaria reaction to histamine) and diminished contractility (ischemic reaction to epinephrine) as much in the exanthematous area as in the area of fading rash. He states that a lack of arterial contractility (erythematic reaction) is more evident in the zone of fading rash than in the exanthematous portion. The changes in the cutaneous blood vessels to which the rash extinction is due are first observed in the arterial and venous circulation and after that in the capillary loops. The changes are due to the persistence of the lesions in the exanthematic skin. This is explained by the fact that the capillary loops are more affected by the toxic action of scarlet fever and that a certain time elapses before the walls of the capillaries recover from their lesions. The changes in the veins and in the arteries of the area of fading rash, resulting in the cessation of hyperemia, may be explained as an increase of the tonus. Although this hypertonia does not compare with the ischemia induced by epinephrine it inhibits and limits the response to the vasodilatory stimuli. The extinction phenomenon

enon always occurs as a regular round spot. The author concludes that the Schultz-Charlton phenomenon is one of the best tests of regulation of the tonus of the small cutaneous vessels.

Policlinico, Rome

42: 2031 2090 (Oct. 21) 1935. Practical Section

- *Allergy to Extract of Cancer Tissue. Importance of Desensitization in Prevention of Cancer. S. Citelli.—p. 2031
Treatment of Pulsating Exophthalmos. A. Chiasserini and A. Tommasini Mattiucci.—p. 2034

Allergy to Extract of Cancer Tissue—Citelli states that the subcutaneous injection of 1 cc of the whole extract of cancer tissue given persons while fasting produces a hemoclastic reaction in about 85 per cent of the patients suffering from cancer and in about 15 per cent of noncancerous persons (generally over 40 years old and belonging to cancerous families). The allergic condition in the last group may be spontaneous or produced by injecting intravenously, also while fasting, 8 or 10 cc of blood serum, previously centrifuged, of either noncancerous persons with a positive test or of cancerous patients. It disappears after three subcutaneous injections given at weekly intervals. The desensitization persisted after three years in the only two patients out of a group of eleven in whom the results were verified. The test is specific for cancer. The author advises desensitization of noncancerous persons who have a positive reaction by administering three subcutaneous injections of whole extract of cancer tissue given in doses of 8 or 10 cc of the extract per injection at weekly intervals, as a new preventive treatment of cancer.

Prensa Médica Argentina, Buenos Aires

22: 1849 1906 (Sept. 25) 1935

- Transmission of Tumors Developed by Action of Ultraviolet Radiation. A. H. Roffo.—p. 1849
*Absence of Pericardial Murmur in Myocardial Infarct. G. Bosco.—p. 1856
Surgical Treatment of Detachment of Retina. Safar's Technic. R. F. Pereira.—p. 1859
Anatomoclinical Forms of Pulmonary Syphilis in Adults. D. Vivoli.—p. 1875

Absence of Pericardial Murmur in Myocardial Infarct—Bosco states that there are certain cases of myocardial infarct in which the pericardial murmur cannot be heard on auscultation of the heart. The audibility of the murmur depends on the topographic situation of the occluded coronary arterial branch, the intensity of myocardial necrosis, the site of development of the fibrous pericarditis that follows myocardial necrosis, and the development of the disease. The actual murmur is due to the anatomopathologic alteration of the pericardium and is audible only during the first stage of the disease, which is rather brief, and then only when there is intense necrosis of the anterior wall of the myocardium and the seat of fibrous pericarditis that follows is accessible to auscultation on the anterior wall of the thorax. These conditions are produced only by occlusion of the anterior descending branch of the left coronary artery. When the occlusion takes place at the posterior descending branch of the right coronary artery or at any of the two circumflex branches of the right and left coronary arteries the murmur is inaudible at auscultation.

Münchener medizinische Wochenschrift, Munich

82: 1669 1708 (Oct. 18) 1935. Partial Index

- Asphyxia by Carbon Monoxide and Resuscitation with Oxygen and Carbon Dioxide. S. Y. Henderson.—p. 1672
Endocrine Therapy of Female Sterility. H. Buschbeck.—p. 1677
Influence of Testis Hormone Preparations and Estrogenic Substance on Coagulability of Blood. C. Bablik.—p. 1679
*Changes in Carotene-Vitamin A Economy in Myxedema and in Cretinism. H. Wendt.—p. 1679
Elimination of Acetone by Diabetic Patients During Work. H. Rothkopf and K. H. Seborn.—p. 1681
Method of Prolapse Operations. F. Orthner.—p. 1682

Hormone Preparations and Coagulability of Blood—Bablik cites investigators who observed that estrogenic substance promotes the coagulation of the blood and describes experiments that he made with testis hormone. He found that the testis hormone considerably retards the coagulation. Since the testis hormone retards the coagulation and estrogenic substance accelerates it, it may be assumed that in case of an oversupply of the one or the other, the coagulability is influenced

in a corresponding manner. The author thinks that this conclusion is justified also by observations on thrombosis and embolism on the one hand and on hemophilia on the other.

Carotene-Vitamin A Metabolism and Thyroid—Wendt cites animal experiments in which it was demonstrated that the thyroid influences the vitamin A metabolism and describes his own studies on human subjects. He found that in human hyperthyroidism, in exophthalmic goiter, the examination of the serum disclosed a considerable reduction of the carotene and particularly of the vitamin A values. He says that vitamin A may be entirely absent from the serum in severe cases of hyperthyroidism. After successful treatment with iodine or by surgery, the values increase. If patients with hyperthyroidism are given large quantities of vitamin A, their weight increases and their metabolic rate recedes to almost normal values. The author investigated also the carotene and vitamin A metabolisms in patients with hypofunction of the thyroid, in myxedema and cretinism. In myxedema patients he found that the transformation of carotene into vitamin A is disturbed. In patients with cretinism the vitamin A values of the serum are considerably reduced, and it appears that this reduction is essentially a result of the transformation disturbance of carotene into vitamin A, but the lack of capacity to store vitamin A also seems to play a part in cretinism.

Zeitschrift für Kinderheilkunde, Berlin

57: 383 504 (Sept. 19) 1935. Partial Index

- *Changes in Blood Chemistry in Parathyroparvetic Tetany and in Administration of Parathyroid Extract. S. Siwe.—p. 383
Acid Base Equilibrium of Cerebrospinal Fluid in Tuberculous Meningitis. B. Wollek and Margarete Kulcsár.—p. 409
*Hepatic Function and Significance of Takata Reaction in Disorders of Nourlings and of Small Children. S. Recht.—p. 419
Biologic Significance of Phosphate Ester of Erythrocytes. E. Freudenberg.—p. 427
Does Young Nursing Take a Special Position in Vitamin C Metabolism? U. Hahn.—p. 442

Blood Chemistry in Parathyroparvetic Tetany—Siwe aimed at determining what action the hypofunction of the parathyroids exerts on the calcium and phosphorus contents of the blood and on the ultrafiltrable fractions of these substances. He also wished to see whether an increased amount of parathyroid extract in the organism would produce chemical changes that would be the exact opposite of those found in acute or chronic insufficiency of the parathyroids. He summarizes his observations as follows: 1 In acute insufficiency of the parathyroids (parathyroidectomized dogs) the total calcium content of the blood may decrease before the inorganic phosphorus has commenced to increase. 2 This indicates that the insufficiency exerts its effect first on the total calcium and later on the phosphorus content of the blood. 3 When the phosphorus increases the total calcium does not necessarily have to show the lowest values, although the tetany may be fully developed. 4 The ultrafiltrable calcium fraction may become reduced, but it does not do so always and it never goes below the values corresponding to the amount ionized at the pH of the blood. 5 In case of chronic insufficiency of the parathyroids in human subjects and after it, the ultrafiltrable calcium may be normal, even if the total calcium content is reduced. The organic phosphorus content is, independent of the calcium level, either normal or slightly increased and its ultrafiltrable portion is present in normal values. 6 Administration of parathyroid extract produces in rabbits an increase in the total calcium content of the blood and a considerable increase in its ultrafiltrable portion in the arterial blood. 7 The intake of parathyroid extract results also in a considerable increase of the inorganic phosphorus in the blood and of its ultrafiltrable portion in the arterial blood. 8. Here and in other experiments it is shown that the total calcium content as well as the organic phosphorus may differ in the arterial and in the venous blood. At any rate, the difference does not become greater in the case of parathyroid insufficiency and there are indications that it has a tendency to decrease following the administration of parathyroid extract. 9 For this reason the behavior of the ultrafiltrable fractions is the more surprising. Whereas under normal conditions and in parathyroid insufficiency the ultrafiltrable portion of phosphorus is not constantly different in the arterial and venous blood, since under normal conditions the ultrafiltrable calcium is slightly

higher in the arterial than in the venous blood, and although the ultrafiltrable calcium is slightly increased in parathyroid insufficiency, the differences are great in case of administration of parathyroid extract. In the latter case the ultrafiltrable calcium in the arterial blood may be twice as high as in the venous blood. The corresponding phosphorus fraction varies by 50 per cent or more in the same direction. This happens in spite of the fact that in case of the administration of parathyroid extract the variations in the total calcium and in the inorganic phosphorus are unusually small in both types of blood. The addition of parathyroid extract to the serum in vitro corroborates the results of the animal experiments.

Hepatic Function and Takata Reaction in Children's Disorders—Recht calls attention to the fact that Jegler's adaptations for the serum of Takata's original cerebrospinal fluid reaction indicate changes in the colloid chemistry of the serum. In the development of these changes the liver plays an important part, and it is generally accepted that a positive Takata reaction indicates severe hepatic lesions. To be sure, in nurslings and small children the disorders for the detection of which the Takata reaction is used in adults are rare. If the finer changes in the hepatic function that occur in nurslings and children are to be detected with the Takata reaction, mere positivity or negativity of the reaction is not sufficient. The author gained the impression that not the quantity of the precipitate is important for the diagnosis but rather the appearance of the precipitate in lower or higher dilutions. Studies on sixty nurslings and twenty-six children revealed that under normal conditions the precipitate begins at a dilution of 1:8. If flocculation appears at higher or lower concentrations, it may be assumed that a disorder exists. The author maintains that in disturbances of nurslings and children the colloid chemical changes can in many cases be determined by means of the Takata reaction.

Klinicheskaya Meditsina, Moscow

13 763 922 (June) 1935 Partial Index

- Mountain and Desert Climate Factor in Diseases Prevalent in Central Asia I A Kassirskiy—p 772
Rare Forms of Hemorrhagic Diathesis I I Mnatsalampy—p 791
Phagocytic Properties of Toxic Leukocytes R I Feldman—p 815
*Morphologic and Biologic Characteristics of Heinz Bodies S P Vinogradskaya and A M Kirichenko—p 820
Tonus of Cardiac Muscle A M Sigal—p 825
Effect of High Atmospheric Pressure on Cardiovascular System A M Dikovskiy—p 831

Characteristics of Heinz Bodies—In order to determine whether the inclusion of Heinz bodies within the erythrocytes is a degenerative or a regenerative process, as well as to determine the physical and chemical characteristics of these bodies, Vinogradskaya and Kirichenko studied the blood of a rabbit in which they produced aniline poisoning by subcutaneous injection of a solution of aniline in oil. They found that the number of Heinz bodies increased in the course of the acute experiment and reached its maximum within from twenty-four to forty eight hours. The diminution in the number of Heinz bodies was accompanied by a rise in the number of the reticulocytes. The Heinz bodies are not soluble in substances that dissolve lipoids and probably do not represent a purely lipid structure. The resistance of an erythrocyte containing Heinz bodies is lowered but that of the bodies themselves is increased. Oxygen absorption capacity by erythrocytes containing Heinz bodies is considerably less than that of reticulocytes, which fact may serve as an index to the age of the erythrocytes. The presence of Heinz bodies within mature erythrocytes speaks for their degenerative character.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

79 5111 5214 (Nov. 2) 1935

- Subphrenic Abscess J G Remijnse—p 5114
*Hydroxyestrin Benzoate in Large Doses for Treatment of Primary Chronic Rheumatoid Arthritis F C Kuipers—p 5122
Observations on Physiologic and Anatomic Basis of Hysteria H C Rumke—p 5136
Treatment of Favus in Dermatologic Clinic at Leyden H W Siemens—p 5140

Hydroxyestrin Benzoate in Treatment of Rheumatoid Arthritis—Kuipers treated three women suffering from chronic rheumatoid arthritis with intramuscular injections of

hydroxyestrin benzoate (Progynon B). The weekly dosage for one patient, aged 53, was from 25,000 to 50,000 mouse units for a period of twelve months. Two patients, aged 54 and 23 received 50,000 mouse units weekly for a period of six months. These two patients, who had suffered from the disease for twenty and for sixteen years, responded well to treatment. The patients showed better posture, diminution of the periarticular swelling and return of normal skin temperature. The younger patient, in addition, showed a decrease in the osteoporosis. In all patients the pain increased occasionally during treatment and was accompanied by more articular crepitation. The women suffered from irregular bloody discharges and other minor menstrual disturbances. The third patient, presenting clinical symptoms of secondary chronic rheumatoid arthritis of the feet, gave a roentgenogram of osteo arthritis. During treatment she showed functional improvement, but no changes occurred in the roentgenogram.

Ugeskrift for Læger, Copenhagen

97 1003 1032 (Oct. 3) 1935

- *Some Comparisons Between Epidemic and Endemic Poliomyelitis Endemic in Copenhagen in 1934 N I Nissen—p 1003
*Blood Picture in Poliomyelitis P Plum—p 1012
Treatment of Tuberculosis of Larynx in State Sanatorium S F Nielsen and J N Lorenzen—p 1018
Treatment of Opium Eaters with Strychnine and Sodium Thiosulfate P Wedel—p 1022

Epidemic and Endemic Poliomyelitis—Nissen states that 192 patients were treated in the Copenhagen poliomyelitis endemic. Morbidity was relatively high among older school children and adults, and was higher among men than among women. Dementia paralytica occurred most frequently in girls. A study of ninety-seven preparalytic cases showed that the symptoms of drowsiness, unrest, fibrillation, tremor, perspiration, muscular tenderness and a dysphasic picture appeared oftener in the patients in whom dementia paralytica set in after one or more days. In contrast to epidemic poliomyelitis, the absolute cell count is apparently not of especial prognostic value in endemic poliomyelitis. The dementia paralytica generally occurred on the second or third day, the frequency was highest in infants and children at home, decreasing toward school age and increasing again later. The mortality was lowest in infants rising with the age. The degree of dementia paralytica and the prognosis were considerably more favorable in children at home and school children than in the older age group. As in epidemic poliomyelitis, the degree of the endemic disease depended on the season of the year.

Blood Picture in Poliomyelitis—Plum says that in poliomyelitis the white blood picture usually shows a slight neutrophil leukocytosis, more marked in grave than in mild cases, with slight shifting to the left. The leukocytosis subsides slowly. In respiratory paralysis a relatively great increase in the number of granulated cells appears immediately before the paralysis, with slight shifting to the left and moderate increase in the absolute number of leukocytes. Similar changes were noted in three cases of poliomyelitis with bulbar paralysis. The blood picture in nonparalytic poliomyelitis does not differ from that in cases with slight paralysis. The author considers the white blood picture a valuable aid in doubtful cases of poliomyelitis, especially in the differential diagnosis between pneumonia complicated with serous meningitis (meningism) and nonparalytic poliomyelitis.

97: 1033 1062 (Oct. 10) 1935

- *Weil's Disease in Denmark B Kristensen—p 1033
Immunization Against Measles by Aid of Total Blood from Adults H Hargrath—p 1036

Weil's Disease—Kristensen says that, although Weil's disease has been regarded as rare in Denmark, rats from the various parts of the country are found to eliminate virulent Weil spirochetes. In the course of a year nineteen grave cases of the disease have been diagnosed, and probably a larger number of unrecognized milder cases have occurred during that time. Infection during bathing is believed to play a minor part in Denmark in comparison to direct pollution of articles of food and drinking water by rats.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 105, No 24

CHICAGO, ILLINOIS

DECEMBER 14, 1935

THE CAUSES OF BLINDNESS IN CHILDREN

THEIR RELATION TO PREVENTIVE
OPHTHALMOLOGY

CONRAD BERENS, M D
C. EDITH KERBY, B A
AND
EVELYN C. McKAY, B.A.
NEW YORK

A study of 2,702 children in schools for the blind in the school year 1933-1934 disclosed certain facts concerning the causes of blindness and the possibilities for preventive work that made it seem desirable to direct the attention of ophthalmologists to the eye conditions incident in the younger age groups. This paper is presented in the hope that the dissemination of the information secured may make it possible to obtain more reliable data which will stimulate medical research and programs for the prevention of blindness.

Reliable information on causes of blindness has been lacking. Even when detailed studies have been made they have been limited to a comparatively small number of patients or to a restricted geographic area, so that they could not be considered representative, and because the methods and classifications used lacked uniformity, the results of these studies could neither be compared nor totaled scientifically.

Recognizing this difficulty, the Committee on Statistics of the Blind¹ set up a standard classification of causes of blindness² which could be applied to any group and which would make possible uniform statistics for the entire country. This classification was prepared with the advice and cooperation of a number of ophthalmologists, and in 1934 the Section on Ophthalmology of the American Medical Association desig-

Read before the Section on Ophthalmology at the Eighty Sixth Annual Session of the American Medical Association Atlantic City N J June 13 1935

The members of the Committee on Statistics of the Blind acknowledge with grateful appreciation the valuable assistance they have received from ophthalmologists throughout the country both in constructive criticism during the development of these classifications and in cooperation during the studies made in the schools for the blind.

1 The Committee on Statistics of the Blind sponsored jointly by the American Foundation for the Blind and the National Society for the Prevention of Blindness was appointed in 1930 to act as a coordinating body whose chief functions are to develop standard methods for recording and summarizing information adaptable to statistical treatment and to act as a central agency for the collection, analysis and distribution of these data. The members of the committee are Conrad Berens M D ophthalmic surgeon New York Eye and Ear Infirmary Lewis H Carris managing director National Society for the Prevention of Blindness Ralph C. Hurlin Ph D chairman director Department of Statistics, Russell Sage Foundation Robert B Irwin executive director, American Foundation for the Blind C Edith Kerby statistician, National Society for the Prevention of Blindness Evelyn C. McKay research agent, American Foundation for the Blind Bennet Mead statistician United States Department of Justice B Franklin Royer M D Stetson K. Ryan executive secretary Connecticut Board of Education of the Blind.

2 The standard blanks and classifications mentioned in this paper may be obtained without charge from the secretary of the Committee on Statistics of the Blind 15 West Sixteenth Street, New York.

nated a committee (under the chairmanship of Dr T B Holloway) to serve in an advisory capacity to the Committee on Statistics of the Blind.

METHOD OF STUDY

In the academic year 1933-1934, at the invitation of a group of schools for the blind,³ the Committee on Statistics of the Blind made a study of causes of blindness among pupils in these schools. Eighteen residential schools and the public school braille classes of two cities were included, a total of 2,702 children. Since this number represents nearly half the children registered in schools for the blind, and since the institutions studied were widely scattered geographically, this group may be considered representative of the country as a whole.

The examining ophthalmologist was asked to record his observations on a special report form (fig 1). This form does not require a detailed record of a complete ophthalmologic examination but only the minimum of medical data, in summary form, that is considered essential for the intelligent solution of problems relating to the child's education, vocational guidance and medical care, as well as for statistical purposes. Especial attention is called to the heading "diagnosis," with its three subdivisions (1) eye condition primarily responsible for blindness, (2) secondary conditions, if any, and (3) etiologic factor responsible for the primary eye condition.

THE IMPORTANCE OF ETIOLOGY

Etiology is stressed as a separate question because experience has shown that the ophthalmologist tends to record his diagnosis in terms of the nature and location

3 List of schools and classes for the blind included in study on causes of blindness for the school year 1933-1934

| Name of School | Examining Ophthalmologist |
|---|-------------------------------|
| Alabama School for the Blind | Dr Joseph Brown (OALR) |
| Alabama School for the Negro Deaf and Blind | Dr Joseph Brown (OALR) |
| Illinois School for the Blind | Dr A L Adams (Oph) |
| Louisiana State School for the Blind | Dr Rufus Jackson (OALR) |
| Maryland School for the Blind | Dr L J Goldbach (Oph) |
| Maryland School for the Blind (Department Colored Blind and Deaf) | Dr L J Goldbach (Oph) |
| Perkins Institution and Massachusetts School for the Blind | Dr Harold B Chandler (Oph) |
| Minnesota School for the Blind | Dr Trygve Gundersen (Oph) |
| Mississippi School for the Blind | Dr Douglas Wood (OALR) |
| Missouri School for the Blind | Dr J H Gammell (OALR) |
| New York State School for the Blind | Dr M L Batson (Oph) |
| New York Institute for the Education of the Blind | Dr Harvey D Lamb (Oph) |
| North Carolina State School for the Blind and Deaf | Dr H H Glosser (Oph) |
| North Carolina State School for the Blind and Deaf Colored Dept | Dr Bernard Samuels (Oph) |
| Ohio State School for the Blind | Dr V M Hicks (Oph) |
| Pennsylvania Institution for the Instruction of the Blind | Dr V M Hicks (Oph) |
| Tennessee School for the Blind | Dr Albert D Frost (Oph) |
| Wisconsin School for the Blind | Dr Thomas B Holloway (Oph) |
| Chicago Day School Classes for the Blind | Dr Bruce P Pool (OALR) |
| Cleveland Day School Classes for the Blind | Dr Benjamin I Brindley (OALR) |
| | Dr S H Monson (OALR) |

cated by the mental condition of many of these children Holloway⁴ reports that 437 per cent of the pupils at the Overbrook School for the Blind fall into the group of the dull, backward or feeble-minded

CLASSIFICATION BY CAUSE⁵

Data on the causes of blindness are presented according to an etiologic and a topographic classification. The plan is similar to that of the Standard Classified Nomenclature of Disease,⁶ but the lists of the Committee on Statistics of the Blind include only conditions that may lead to blindness.

Etiologic Classification—In this classification (table 3) the causes are grouped under six main headings: (1) infectious diseases, (2) traumatic and chemical injuries, (3) toxic poisoning, (4) neoplasms, (5) non-infectious systemic diseases, and (6) congenital and hereditary. Under each heading the individual items represent the causes that occur most frequently, but there are two general items to cover other specified cases of the same nature and those cases belonging in the group but not specified. The inclusion of the latter type of item under each heading makes it possible to reduce the miscellaneous "unknown" group ("etiology not specified") to a minimum.

The congenital and hereditary group accounts for more than half the cases of blindness among children (51.1 per cent). This group is subdivided into two parts. In one part are the hereditary and familial cases (11.6 per cent) in which have been included all those specified as hereditary by the examiner and also those specified as "congenital" but suspected of being hereditary because of the presence in the same school of sisters or brothers with the same eye condition. It seems quite probable that, if family histories of all cases in the congenital group could have been studied,

TABLE 1—Age Distribution

| Present Age (as of 6/1/34) | Total Pupils | Per Cent of Total |
|----------------------------|--------------|-------------------|
| All ages | 2,702 | 100.0 |
| Under 6 years | 3 | 0.1 |
| 6 to 9 years | 856 | 31.7 |
| 10 to 14 years | 954 | 35.3 |
| 15 to 19 years | 934 | 34.6 |
| 20 years and over | 594 | 22.0 |
| Age not reported | 61 | 2.2 |

TABLE 2—Distribution by Amount of Vision Remaining

| | Number | Per Cent |
|--|--------|----------|
| Total 40 schools and classes reporting | 2,702 | 100.0 |
| Group 1 (total blindness or light perception only, less than 2/2000) | 1,003 | 37.1 |
| Group 2 (2/200 but not 5/200) | 430 | 15.9 |
| Group 3 (5/200 but not 10/200) | 366 | 13.6 |
| Group 4 (10/200 but not 20/200) | 258 | 9.6 |
| Group 5 (20/200) borderline cases | 223 | 8.3 |
| Better than 20/200 through 20/70 | 240 | 8.9 |
| Better than 20/70 | 100 | 3.7 |
| Not reporting vision remaining | 79 | 2.9 |

the percentage transferred to "hereditary" would be markedly increased. The "prenatal" cases should also be investigated for evidences of underlying etiologic factors. Routine Wassermann tests, which are not now required in many schools for the blind, would aid the

ophthalmologist in making diagnoses of prenatal syphilis and would undoubtedly result in classifying many more cases under the "infectious disease" heading.

The number classified as "congenital and hereditary" indicates that these are the cases most in need of attention from the standpoint of prevention. A more

TABLE 3—Causes of Blindness Classification by Etiologic Cause

| Cause of Blindness | Number | Per Cent |
|---|--------------|--------------|
| Infectious diseases | 772 | 28.6 |
| Diphtheria | 3 | 0.1 |
| Gonorrhea (excluding ophthalmia neonatorum) | 6 | 0.2 |
| Measles | 24 | 0.3 |
| Meningitis | 55 | 2.0 |
| Ophthalmia neonatorum | | |
| Gonorrheal | 82 | 3.0 |
| Other types specified | — | — |
| Not specified | 208 | 7.7 |
| Scarlet fever | 6 | 0.2 |
| Septicemia | 16 | 0.6 |
| Smallpox | 3 | 0.1 |
| Syphilis | | |
| Prenatal | 120 | 4.7 |
| Acquired | — | — |
| Origin not specified | 16 | 0.6 |
| Trachoma | 18 | 0.5 |
| Tuberculosis | 13 | 0.5 |
| Typhoid | 1 | 0.1 |
| Other infections specified | 30 | 1.1 |
| Infections not specified | 171 | 6.3 |
| Traumatic and chemical injuries | 211 | 7.8 |
| Nonindustrial injuries | | |
| War | — | — |
| Explosives | | |
| Fireworks | 4 | 0.2 |
| Firearms | 10 | 0.7 |
| Other explosives specified | 28 | 1.0 |
| Explosives not specified | — | — |
| Play or sport | 68 | 2.5 |
| Household activities | 4 | 0.2 |
| Street and traffic accidents | 10 | 0.3 |
| Injuries incidental to surgery | 1 | 0.0 |
| Birth injuries | 4 | 0.2 |
| Other nonindustrial injuries specified | 30 | 1.1 |
| Nonindustrial injuries not specified | 22 | 0.8 |
| Industrial injuries and diseases | | |
| Trauma (including burns) specified | 1 | 0.05 |
| Industrial disease (including poison) | — | — |
| Industrial injury not specified | — | — |
| Injuries, not specified | 20 | 0.7 |
| Toxic poisoning (excluding industrial) | 2 | 0.1 |
| Tobacco | — | — |
| Alcohol (ethyl grain) | — | — |
| Alcohol (methyl wood denatured) | 1 | 0.05 |
| Other toxic poison not specified | 1 | 0.05 |
| Neoplasms | 58 | 2.2 |
| Noninfectious systemic diseases | 33 | 1.2 |
| Anemia and other blood diseases | — | — |
| Diabetes | — | — |
| Nephritis and other kidney diseases | 1 | 0.1 |
| Vascular diseases | — | — |
| Noninfectious diseases central nervous system | 14 | 0.5 |
| Diseases of pregnancy and childbirth | — | — |
| Other systemic diseases specified | 13 | 0.4 |
| Systemic diseases, not specified | 6 | 0.2 |
| Congenital and hereditary | 1,382 | 51.1 |
| Prenatal | 1,067 | 39.6 |
| Hereditary and familial | 315 | 11.6 |
| Etiology not specified | 244 | 9.0 |
| Unknown to science | 4 | 0.1 |
| Undetermined by physician | 186 | 6.9 |
| Not specified | 54 | 2.0 |
| Total—All causes | 2,702 | 100.0 |

intensive study of this group, in order to obtain a maximum of information on the etiologic factors involved, seems to be a necessity.

"Infectious diseases" constitute the next largest group (28.6 per cent of the total cases), with ophthalmia neonatorum (10.7 per cent) and syphilis (5.3 per cent) heading the list of specified diseases. We believe that the syphilis figure is greatly understated. Probably some cases of syphilis are concealed in "congenital and hereditary" and "infectious diseases, not specified." More complete data may be obtained on this important point if ophthalmologists will cooperate by giving accurate and detailed information for every case examined.

⁴ Holloway T. B. The New Statistics on Causes of Blindness Among Children. Sight-Saving Rev. 5:13 (March) 1935.
⁵ The relative proportions of the various causes here discussed are typical only of the younger age groups.
⁶ A Standard Classified Nomenclature of Disease Compiled by the National Conference on Nomenclature of Disease. New York, the Commonwealth Fund 1933.

The relation of syphilis to blindness is a subject of which all too little is known. Keyes⁷ stated that a "weighted average of prevalence in the United States based on a compilation of existing material, with due emphasis given to race, social and economic status, and geographical location, would strike a figure somewhere

TABLE 4—*Causes of Blindness Classification by Topographic Cause*

| Cause of Blindness | Number | Per Cent |
|--|--------------|--------------|
| Eyeball | 838 | 31.0 |
| Hypertension (glaucoma) | 4 | 0.2 |
| Refractive errors | | |
| Myopia | 93 | 3.4 |
| Other refractive errors specified | 51 | 1.9 |
| Refractive errors not specified | 1 | 0.1 |
| Motor anomalies | | |
| Amblyopia ex anopsia (squint) | 9 | 0.3 |
| Other motor anomalies specified | — | — |
| Motor anomalies not specified | — | — |
| Developmental anomalies and degenerative changes | | |
| Albinism | 63 | 2.3 |
| Anophthalmos (excluding surgical) | 9 | 0.3 |
| Megalophthalmos | 175 | 6.5 |
| Microphthalmos | 77 | 2.3 |
| Aniridia | 25 | 0.9 |
| Disorganized eyeball | 224 | 8.7 |
| Other developmental and degenerative changes specified | 73 | 2.7 |
| Developmental and degenerative changes, not specified | 3 | 0.1 |
| Panophthalmitis and endophthalmitis | 21 | 0.8 |
| Other disorders of eyeball specified | — | — |
| Disorders of eyeball, not specified | — | — |
| Conjunctiva | 0 | 0.0 |
| Conjunctivitis | — | — |
| Other disorders of conjunctiva specified | — | — |
| Disorders of conjunctiva not specified | — | — |
| Cornea | 389 | 14.4 |
| Interstitial keratitis | 65 | 2.4 |
| Keratoconjunctivitis, phlyctenular | 12 | 0.4 |
| Keratitis not specified | 14 | 0.5 |
| Ulcerative keratitis | 277 | 10.3 |
| Other disorders of cornea specified | 21 | 0.8 |
| Disorders of cornea not specified | — | — |
| Iris and ciliary body | 60 | 2.2 |
| Iridocyclitis | 53 | 1.9 |
| Iritis | 7 | 0.3 |
| Other disorders of iris and ciliary specified | — | — |
| Disorders of iris and ciliary not specified | — | — |
| Crystalline lens | 451 | 17.1 |
| Lens opacity (cataract) | 423 | 15.7 |
| Dislocated lens | 37 | 1.4 |
| Other disorders of lens specified | — | — |
| Disorders of lens not specified | — | — |
| Choroid and retina | 390 | 14.4 |
| Chorioiditis | 50 | 1.3 |
| Uveitis | 90 | 3.3 |
| Retinitis | 10 | 0.4 |
| Disseminated chorioretinitis | 188 | 5.1 |
| Detached retina | 9 | 0.3 |
| Retinal hemorrhage | 1 | 0.1 |
| Retinal degeneration | 51 | 3.0 |
| Obstruction of central artery or vein | — | — |
| Other disorders of choroid and retina specified | 11 | 0.4 |
| Disorders of choroid and retina not specified | — | — |
| Optic nerve | 453 | 16.7 |
| Optic atrophy | 381 | 14.0 |
| Optic neuritis | 25 | 0.9 |
| Neuroretinitis | 41 | 1.5 |
| Other disorders of optic nerve specified | 4 | 0.2 |
| Disorders of optic nerve, not specified | 2 | 0.1 |
| Vitreous humor | 6 | 0.3 |
| Intra ocular hemorrhage | 2 | 0.1 |
| Opacities | 3 | 0.1 |
| Other disorders of vitreous humor specified | 1 | 0.1 |
| Miscellaneous and ill defined | 105 | 3.9 |
| Amblyopia undefined | 41 | 1.5 |
| Other ill defined lesions specified | 64 | 2.4 |
| Lesions not specified | — | — |
| Total—All causes | 2 702 | 100.0 |

around 5 per cent as the average prevalence of syphilis in the United States at the present time." Jeans and Cooke⁸ state that the incidence of congenital syphilis among children (under 14 years) is 2 per cent. From studies of the incidence of syphilis in the general population and of syphilis in children it is our belief that, if the Wassermann test were used more as a routine and

adequate treatment were given to syphilitic persons, much unnecessary blindness could be prevented.

That blindness still results from ophthalmia neonatorum is deplorable. Although silver nitrate is apparently an excellent preventive, the problem of prevention should go further back than this. The proper preparation of the birth canal should receive greater consideration and the treatment of gonorrhea⁹ in clinics must be improved. Education in regard to prevention of gonorrhea and the universal use of prophylactic stations are other factors of great importance.

Special mention should be made of the subdivisions appearing under ophthalmia neonatorum (table 3). Our committee wished to obtain statistics for the gonorrheal cases as differentiated from the nongonorrheal cases, but this proved to be impracticable. In the first place, the examiners reported "not specified" in seven of every ten cases, and, from the fact that some examiners reported all their cases as gonorrheal, it is possible that their figures represent their opinion that only the gonorrheal type leads to blindness. Definite information on some of the cases might be obtained by referring to hospital and board of health records.

"Traumatic and chemical injuries" rank third on the list of etiologic causes (7.8 per cent of the total cases). Perhaps the percentage was so small because of the fact that, when the ophthalmologist could not determine the etiology in cases of enucleation and the like, he preferred to classify them as "unspecified" rather than to accept the parent's claim of accident.

"Neoplasms" (2.2 per cent), "noninfectious systemic diseases" (1.2 per cent) and "toxic poisoning" (0.1 per cent) are together responsible for only a small proportion of the total cases. This small percentage is due to the fact that only the younger age groups were included in the results. It should be mentioned also that in 9 per cent of the total cases etiology was "not specified." More intensive investigation into available records would reduce the number of these cases, but this group should be eliminated finally by more adequate primary recording.

Topographic Classification.—For the topographic classification (table 4) the parts of the eye have been used as the eight main headings: (1) eyeball, (2) conjunctiva, (3) cornea, (4) iris and ciliary body, (5) crystalline lens, (6) choroid and retina, (7) optic nerve and (8) vitreous humor. Separate headings are available for types of disorders of the eye occurring frequently enough to warrant them, and at the end of each group have been inserted the items "other affections specified" and "affections not specified."

Disorders involving the entire eyeball constitute the largest group of topographic causes (31 per cent). These are largely the developmental anomalies, e. g., megalophthalmos, microphthalmos, albinism, and the refractive errors. An analysis of this group by etiologic factor indicates that seven of ten of the disorders of the eyeball are "congenital and hereditary" cases, the remainder were due chiefly to "infectious diseases" and to "traumatic and chemical injuries."

Disorders of the lens (cataract 15.7 per cent and dislocated lens 1.4 per cent) comprise the next largest group. These also are almost entirely included in the "congenital and hereditary" group. Only primary cataracts were considered congenital. However, it is possible that some of the cataracts diagnosed as primary are really secondary to uveitis and other inflammatory

7 Keyes E. L. The Present Status of Venereal Disease Prophylaxis—Social and Medical J Soc Hyg 19 1 (Jan.) 1933.
8 Jeans P. C. and Cooke J. V. Prepubescent Syphilis. New York: D. Appleton & Co. 1930 p. 94.

9 Goldberg J. A. Personal communication to the authors. March 26 1935.

conditions but could not be so diagnosed because of the lapse of time between the onset of the condition and the examination. This study of the ophthalmologist's recommendations and prognosis indicates that operations for cataract as well as for other conditions have not been carried out in many cases. Even when the visual acuity obtained is disappointing (as it sometimes is in spite of apparently good surgical results), it must be remembered that the smallest improvement in vision is of great value to these blind children. Many of the schools, however, have neither the facilities for surgery and treatments nor adequate procedure to bring the physician's recommendations to the attention of welfare agencies that can arrange for the necessary service. In some cases ophthalmologists are undertaking the corrective work voluntarily, although they are handicapped by lack of funds for providing necessary lenses and also by the lack of proper personnel to do follow-up work in the homes. This is another function which the nurse or social worker could perform.

The "optic nerve" group is next in order of frequency (16.7 per cent). The etiology in these cases is divided as follows: 42 per cent "congenital and hereditary," 27 per cent "infectious diseases," principally syphilis and meningitis, 9 per cent "neoplasms," 5 per cent "traumatic and chemical injuries," 2 per cent "noninfectious systemic diseases," and the remainder not specified. It is probable that some of the cases reported as "optic atrophy" represent the terminal stage of some other eye diseases and should be classified under other headings.

Among the causes affecting the cornea, which include 14.4 per cent of the total cases, ulcerative keratitis appears most often. About two thirds of these cases are due to ophthalmia neonatorum. Interstitial keratitis, amounting to 2.4 per cent of the total cases, is described in most cases as syphilitic in origin.

Diseases of the choroid and retina account for 14.4 per cent of the cases, one third of these were only indefinitely classified as to etiology. They were ascribed to "infectious diseases, not specified" or to "undetermined by physician." The Wassermann reaction is a fairly accurate guide in syphilis, but available tests for the diagnosis of other infections have much less diagnostic importance. This is the reason why focal infection is ignored in one country and tuberculosis is considered the commonest cause of chronic infections, whereas in other countries the emphasis is reversed. Neither opinion has much scientific, bacteriologic or pathologic foundation. Therefore each is essentially a clinical conception. Certain serobacteriologic tests¹⁰ and inoculation of animals may finally furnish more conclusive information.¹¹

Another third were classified as "congenital and hereditary" and the remainder were due principally to specified infectious diseases and trauma. The other groups are not large enough to call for special analysis.

From this analysis it is evident that the assembling of sound and consistent statistical information on the causes of blindness in children may have considerable significance in shaping a program of preventive ophthalmology, in illustrating the effectiveness of preventive methods used, and for teaching purposes.

CONCLUSIONS

1 More ophthalmologic service is required for children in schools for the blind if much blindness is to be prevented and many children are to be removed from the blind group and placed in the seeing and partially seeing classifications. This service should include provision for corrective operations and treatment as well as for examinations. It is important to remember that a large proportion of this group are wards of the state and that, once removed from their home communities, they are usually out of reach of medical service other than the facilities which the institution provides. If improved eye service were available, more accurate etiologic information could be obtained for classifying the cases, on which effective work for the prevention of blindness must be based.

2 If blindness is to be prevented, it seems desirable to make available to the schools the services of a public health nurse or medical social worker with a good knowledge of eye conditions, to supplement the work of the physician. Such a worker could make contacts with parents to obtain their cooperation in necessary treatments, for example, operations and antisyphilitic treatments. She would be in a position also to do preventive work in the homes in which syphilis or hereditary factors are problems.

3 Although ophthalmia neonatorum accounts for only 10.7 per cent of the blindness in the group studied, continued effort should be made to reduce the number of cases of blindness and visual defects arising from this disease. Until a drug has been proved more effective than silver nitrate, its use as a prophylactic should be required. If blindness from this preventable disease is to be decreased, education must be continued in regard to the proper care of the birth canal, the need for improvement in the treatment of gonorrhea in clinics, and the use of prophylactic stations. More careful bacteriologic technic and complete records are needed before the role of the gonococcus, as compared with other bacteria in the cause of ophthalmia neonatorum, can be properly evaluated and adequate preventive measures instituted.

4 Since the hereditary and congenital group apparently accounts for more than 50 per cent of the blindness in these schools for the blind, and since some of this is undoubtedly due to syphilis, it is imperative that the methods of preventing syphilis be improved. More accurate knowledge of the etiologic factors underlying these ocular defects need to be secured before adequate preventive measures can be successfully applied. It seems evident that syphilis plays a larger part in the etiology of these conditions than these statistics indicate.

5 Because syphilis heads the list of specified diseases and accounts for 5.3 per cent of blindness in these schools for the blind and is probably also responsible for a large proportion of blindness now classified as "congenital" or "hereditary," better methods of preventing and treating syphilis must be insisted on. The antepartum care of syphilitic mothers, better treatment of syphilitic diseases in syphilis clinics, eye clinics and hospitals, and better organized social service and follow-up work will aid greatly in reducing the number of children who may become blind from this cause. In addition to searching for eye diseases attributable to syphilis and preventing blindness as a result of this disease, every ophthalmologist should work for a comprehensive plan in each state for the prevention and treatment of syphilis and the education of the public regarding this disease.

10 Berens, Conrad, Connolly, P. T. and Chapman, G. H. Focal Infection in Diseases of the Eye. I. Report of Certain Laboratory Examinations. *Tr. Internat. Cong. Ophth.* Madrid 1: 247, 1933.

11 Rosenow, E. C., and Nickell, A. C. Elective Localization in Determining the Etiology of Chronic Uveitis. *Am. J. Ophth.* 15:1 (Jan) 1932. Brown, A. L. Chronic Uveitis. Bacteriologic and Immunologic Considerations. *Tr. Sect. Ophth. A. M. A.* 1934 p. 111.

6 Diseases of the choroid and retina are responsible for the visual impairment of 14.4 per cent of the children in these schools for the blind. This group includes disseminated chorioretinitis, choroiditis, uveitis and several other conditions that could be classified only indefinitely as to etiology. Excluding the traumatic cases and those due to known infections, it is evident that this group will require much fundamental research before the etiology can be stated specifically and blindness prevented by direct attack on the underlying cause. The Wassermann reaction is a fairly accurate guide in syphilis, but no equally valuable tests are available in the study of tuberculosis and focal infections.

7 Although the percentage of blindness (7.8) attributable to traumatic and chemical injuries is comparatively small among the children studied, the presence of this cause indicates that educational efforts and the improvement of safety devices should be continued.

8 Because the visual acuity in this group was better than 20/200 in 12.6 per cent of the pupils and was above 20/70 in nearly 4 per cent, ophthalmologists should insist that more attention be paid to educational opportunities. Sight-saving classes should be available for children whose visual defects are not serious enough to justify education by tactual methods but who cannot be safely or profitably educated in the regular public school classes.

These statistics on the causes of blindness in schools for the blind in the United States are probably better than those obtained previously. However, this study clearly indicates the need for the cooperation of ophthalmologists and all concerned with eye diseases and blindness in obtaining more reliable statistical information, especially in regard to exact etiology. We believe that members of the Section on Ophthalmology of the American Medical Association will continue to cooperate as they have in the past.

35 East Seventieth Street.

ABSTRACT OF DISCUSSION

DR. ALBERT D. FROST, Columbus, Ohio. The work done by the committee has accomplished a great purpose, for it has brought to the attention of the profession fairly accurate statistics and will do much to stimulate prevention work. The etiologic classification is of the greatest importance and has shown clearly where the prevention program should be concentrated. However, the accurate etiologic factors are the most difficult to obtain with the present methods, as little or no history is obtainable when the child enters the school for the blind. If it were possible to require that all cases of blindness at the onset be reportable to the state boards of health a great step forward would be made. It is during the preschool period that much valuable time is lost from the standpoint both of treatment and of prevention. Ophthalmia neonatorum is fairly well under control, but as a consequence of time consuming red tape necessary to obtain treatment, many eyes are lost. In Ohio there is an emergency fund to provide necessary treatment to avoid lost time while responsibility is being established. Congenital and hereditary diseases could all be decreased in numbers materially by a concerted personal campaign of education in afflicted families. It is through ignorance that many of these families continue to bring blind children into the world, often against their will. One of the greatest obstacles in prevention is the unscrupulous optometrist who deliberately discourages his patient from consulting an ophthalmologist. It seems that nothing can legally be done about it, but in Ohio we have had some cooperation with the state board of optometry in at least bringing censorship on their own offenders. Unfortunately, the state medical boards have no authority to prosecute this form of malpractice. Snellen measurements should not be the sole method of classification, as many children with corrected vision

of less than 20/200 are able to read ordinary print, and, if made to read braille, do so with their eyes. These cases should be placed according to the judgment of the school ophthalmologist. I have never observed any harm done to vision by allowing them to attend sight-saving classes. Uniform case records must be made before accurate statistics can be compiled. The standard form recommended by the committee seems adequate in that it emphasizes the etiologic diagnosis, which is of much greater importance in any prevention program. This form should be universally adopted so that the next census will be as accurate as possible.

DR. S. W. NEWMAYER, Philadelphia. As an ophthalmologist in charge of sight-saving classes of Philadelphia, I thought that there would be a few facts which may be of interest along this line. We have a school population of 275,000 children, and we have 190 children in sight-saving classes. Of these 190 children fifty-eight have a vision of 15/200 or less, and thirty-one of the fifty-eight have a vision of 5/200 or less, and, as can readily be seen, these are potential cases of blindness or many of them are institutional cases. In Philadelphia, we etiologically group their cases into three groups: (1) congenital and hereditary similar to Dr. Berens, but we exclude from this those with myopia, (2) acquired systemic diseases, and (3) ametropia with degenerative changes. Among these 190 cases, fifty-six are due to congenital diseases, twenty-four of which were diagnosed congenital amaurosis. Twelve of these twenty-four patients have a vision of 15/200 or less. There were fifty-seven cases of acquired systemic diseases and seventy-six cases of ametropia with degenerative changes. There were in class 1 and 2, out of a total of 113 patients, fifty-three with a vision of 15/200 or less, and of the fifty-three, the majority of them, to my mind are institutional cases, as we have thirty-one of them with 5/200 vision or less. Valuable statistics and measures for prevention of blindness may be obtained through studies of large groups of school children, especially in large cities. With reference to the eye examinations in schools and corrective operations and treatments, allow me to call attention to the fact that in the state of Pennsylvania there are legal obstacles that forbid the use of any educational appropriations for any such use. The most effective preventive work is within the power of practicing physicians. School doctors and nurses can only recommend consultation with physicians, and they dare not in their work forbid a parent from taking a child for an eye examination or consulting with opticians, optometrists and others. More than 50 per cent of our patients who are recommended for treatment refuse such recommendations. We cannot force it on them. More than 50 per cent of those who do seek consultations go to other than recognized physicians.

DR. T. B. HOLLOWAY, Philadelphia. While one of the chief purposes of this paper is to stimulate effort to secure honest and reliable statistics concerning the etiologic factors that have to do with blindness, it also serves the purpose of illustrating the fact that much relative relief can be given to many who are included within the group regarded as blind, as this pertains to schools for the blind. How splendid it would be if those who seem so vitally interested in preventing the deaths and economic ills that result from war would devote some of their interest to preventing the same disasters that result from the shot and shell of civilization, namely, syphilis and gonorrhea and this pertains to our various types of government, lay organizations, and individuals. Seventy per cent of the 2,700 students under consideration were from 10 to 20 years of age, and it is surprising to note that 12.6 per cent of the whole student body had better vision than 6/60 or 20/200. When possible, this is the group that should be given the advantage of sight-saving methods. Children with better vision than 20/200 do not belong in schools for the blind. In certain localities and certain states there are readily understood reasons why these schools might be appropriate, for example, Arizona, Idaho, New Mexico, Utah and Wyoming have a population about equal to that of Philadelphia. But there are still other states that are proud of their school systems but they fail to realize the importance of providing the best means for these physically handicapped children to 'carry on' in the great industry of youth. As to the advantages of a social worker affiliated with a school for the blind to me there is no question about the

advisability of such a step I believe that in the more densely populated states there are enough mentally handicapped blind children to be brought together in one state school I believe that the average person would be surprised to see the incidence of 511 per cent for the congenital and hereditary conditions While our statistics are not yet assembled, I feel quite certain that the incidence for this group has increased at Overbrook during the last twenty-five years We do not have sufficient knowledge to judge just how many of these cases are preventable We do know that certain disorders occur repeatedly and frequently in certain families and that the children ultimately become wards of the state or of some philanthropic institution to say nothing of receiving a pension for life later on At Overbrook it costs about \$950 a year to educate a blind child Compare that to the cost to the state or a municipality for educating a normal child

Dr. HARRY S GRADLE, Chicago According to the latest United States census there are 64 500 known blind persons That figure is undoubtedly too low, it probably is somewhere between 80,000 and 90 000 The classification of the census is far from complete, more than 20 per cent of cases being of unknown cause A short time ago I estimated that in the light of present knowledge practically 70 per cent of the blindness in the United States today is unnecessary and could be prevented and eliminated in the course of the next generation It is rather up to this section to take the lead in that type of work Dr Berens spoke of the schools Some two years ago four of us made a survey of the Illinois State School for the Blind We found that, of the 246 pupils, 24 per cent were there unnecessarily, their vision being of such a quality that they could continue their education in the seeing world, and that another 25 per cent could be restored to the seeing world by surgical remedial measures In the last two years we have tried to carry out these remedial measures As a result, we have decreased the population of the Illinois School for the Blind by about 40 per cent To take up the space that was left there, the state government gave us authority to introduce two sight-saving classes, available only to children who live in communities that have no sight-saving classes of their own These are brought in, and, although the expense of conducting these classes is greater than the expense of similar classes in the city, still it puts within the range of those who are not so situated the advantages of this education The difference in cost is great It costs in Illinois, I think, about \$960 a year to educate a blind child, whereas the cost of education of a normal child is around \$45 a year Consequently, in going over the schools for the blind in the various states one should keep in mind the possibilities of reducing the population But the prevention of blindness in the children is only a small phase of the work of prevention of blindness throughout the country by far the majority of cases are in adult life and greater attention must be devoted not only to the prevention but to the remedying of blindness before we can really hold up our heads as a forward-looking nation

Dr. E V L BROWN, Chicago I wish to speak from an educational and ophthalmologic point of view regarding the possible use of smaller print for sight-saving class work than the large 24 point now in use, and to urge a trial of a smaller size of type, namely, 18 point The 24 point type measures about three sixteenths inch in height and the 18 point is definitely smaller In my opinion pupils with stationary conditions such as scarred corneas, aphakia and optic nerve atrophy cannot possibly be harmed by the most strenuous use of their eyes, any more than can one hurt a scarred hand by using it Meissner has reported on the use by twenty two pupils of ordinary print through five school years Many of these pupils had less than 01 vision I have translated and published this report and would be glad to send it to any one interested

Mr. LESLIE PATON, London, D 1, England I wish to stress the necessity for cooperation between all the national societies of the blind We had a meeting a few weeks ago in London, attended by Mr Carris Dr Park Lewis and representatives from different national societies all over the world I happen to be a member of the National Society for the Prevention of Blindness in London, financed by the Cloth Workers Company and by the National Institute for the Blind All together, I have had a good deal to do in recent years with this question

of the prevention of blindness I think that it was Dr Gradle who said that the number of blind that had to be dealt with in this country was 65,000 We have a very much smaller population in Great Britain, but we already have registered papers from 66,000 These haven't all been investigated, myself and my colleagues have gone through about 5,000 of them and we have the prospect of the remaining 60,000 to investigate I am afraid we shall have to issue a preliminary report before we finish I think that the reason of the difference in the numbers may be due to the fact that we have a blind pension scheme in Great Britain, and every registered blind person gets, I think, ten shillings a week I don't think you have a similar scheme Have you? Possibly that is a very natural explanation for the difference between the two numbers Priestley Smith and I were the originators of the definition which secures admission to that blind pension scheme, and it was an extraordinarily difficult thing to devise a practical definition It wasn't any good saying that a person has one eye 6/60 and the other 6/30, because some of these might get on very well, and others with much better central vision but a limited field would be much worse off than these people with good fields and 6/36 So many different factors enter into the determination of the visual efficiency of the individual that any numerical definition becomes unfair Consequently, the definition that we ultimately adopted was too blind to be able to perform work for which eyesight is usually essential" It leaves us a fairly wide scope Of course it does sometimes come to putting down the eyesight in terms of visual acuity, but it allows a freedom of choice which is not given by any other method of definition, and it has worked fairly well on the whole

Mr. LEWIS H CARRIS, New York I merely want to express the appreciation of the National Society for the Prevention of Blindness to the members of this section for the fine cooperation which you have given to the Committee on Statistics of the Blind in assembling these data We do not feel that the eyes of children with congenital anomalies can be harmed by the reading of small print but we always say that, if limitations are to be put on the use of the eyes, this should be decided in individual cases by the attending ophthalmologist In connection with Dr Gradle's discussion, it is my understanding that the Census Bureau will omit all statistics on causes of blindness from any future census, leaving this field of activity to the Committee on Statistics of the Blind The committee is a joint effort of the American Foundation for the Blind and the National Society for the Prevention of Blindness, but it is independent of both organizations If any of you have not had the publications of this committee, we shall be glad to send them to you on request It has been my opportunity in the last few years to visit many parts of the United States and to cooperate with ophthalmologists and state health boards May I express on behalf of the national society our appreciation for the uniform courtesy which you have always extended to the members of our staff on our visits to you in your offices

Dr. TRYGVE GUNDERSEN, Boston As a field worker in one of the large schools for the blind in this country I should like to point out a few of the points that come up in the course of the year's work I began at Perkins Institution one year ago The first thing that confronted me was that I was completely unable to get an ocular history from the patient This difficulty has been largely overcome with the help of a well trained medical social worker and furthermore by incorporating in each application blank questions that will furnish better ocular histories in the future One large group of patients that I immediately encountered consisted of those who had entered this institution with a diagnosis of congenital amblyopia I found that a small number of these patients had completely normal fundi, but on examining their histories I made the interesting observation that birth injuries and convulsions were associated with a great many I believe that this immediately takes these cases out of the classification of hereditary blindness and puts them into the classification of birth injuries The remainder of this large group were found to have retinitis pigmentosa, when the fundi were more carefully examined after mydriasis At the onset of this work I expected that one large branch of the service would be devoted to restoration of vision and the other to conservation of vision I found that the work

consisted practically of the latter only. By more careful examination of the patients I believe that the number of operations performed for glaucoma has been increased at least 100 per cent.

DR. V. M. HICKS, Raleigh, N. C. For fourteen years I have been ophthalmologist for the North Carolina schools for the blind. We all recognize that, from a financial standpoint, our states are responsible in this problem. However, active interest in the problem from a scientific standpoint has been definitely lacking. A few connected with the schools have shown interest, but the profession as a whole has shown the interest of the lay person. It is our duty as ophthalmologists to sponsor in an active way the problem that confronts these children. Schools for the blind sponsored and maintained by the states should be the active workhouse for this problem. More than education of blind children is needed. In North Carolina, in addition to the school, we have developed our hospital and have a medical and surgical staff connected with the institution. Also, we have a gymnasium and swimming pool and other facilities that have been practical in developing these children. I think that it is imperative that this work be centralized, that it be compulsory and that it be actively supported by us in our interests and by the states with their money. Our school is a part of the public school system in North Carolina. Work in an institutional way should frequently be begun before the age of 6 if blindness is to be prevented. Congenital blindness can be solved when enough information is at hand to give positive advice as to the best way out. In our schools in North Carolina more than one third of the population are children whose parents, either one or both, attended a similar institution. These parents do not want to give birth to blind children, but they have not had any advice, and it is natural to find from three to ten children coming into our institution from a mother who was educated there and married for her rightful companionship. Therefore, I believe that it is the duty of this section, and the duty of the specialty of ophthalmology, to give to the states positive information as to what should be done, and I am satisfied that they will act accordingly.

DR. CONRAD BERENS, New York. It is possible that more cases are studied in England than here. However, we have decided to begin with a smaller select group before investigating the larger field. Mr. Paton speaks of having found 65,000 blind persons in Great Britain. Dr. Gradle quoted the census figures showing approximately the same number in the United States. I believe census counts are generally incomplete and that there are actually about 120,000 since the ratio is approximately one blind person in a thousand of the population. Mr. Paton also spoke of the question of pensions for the blind. We have a similar pension system in a few of our states. Dr. Holloway mentioned the importance of sight-saving classes. In the schools for the blind included in our study, there are only two of these classes. Certainly more of them are needed in the schools, or, preferably, the partially seeing children in the schools should be referred to outside classes. In a study of the subject last winter, Hathaway and I concluded that the need for many more of these sight-saving classes was imperative. Dr. Hicks was too modest to say anything of the splendid work he has done. I know that he has been able to help a great many children in his school. Some of these should not have been admitted, some should have been operated on before, and some have been given proper lenses or other appropriate treatment. Dr. Frost spoke of the need for an emergency fund to provide treatment for ophthalmia neonatorum cases while the responsibility for their care is being determined. Such a fund has been established in the state of New York. Dr. Newmayer mentioned the sight-saving classes in the schools and the fact that more than 50 per cent of the children for whom treatment was recommended received no medical care or care administered by nonmedical persons. It is unfortunate that we cannot prevent treatment by nonmedical persons of certain pupils who require scientific care. I do believe, as Dr. Brown does that possibly in some cases children could be permitted to read smaller print. However, we need the active cooperation of ophthalmologists in every case in which special exceptions are made, and this is sometimes difficult to obtain. This is due to lack of interest at times. As Dr. Hicks has said, ophthalmologists should consider these schools as workhouses not just as places to observe interesting blind people.

SUSCEPTIBILITY AND IMMUNITY

IN RELATION TO VACCINATION IN ACUTE ANTERIOR
POLIOMYELITIS

JOHN A. KOLMER, M.D., Sc.D.

Professor of Medicine Temple University School of Medicine
Director, Research Institute of Cutaneous Medicine

PHILADELPHIA

Is it worth while to attempt vaccination against acute anterior poliomyelitis in view of the low attack rate of the disease? If so, what are the prospects of success attending such efforts since the disease is evidently caused by a virus probably multiplying on or in the susceptible anterior horn cells of the spinal cord and causing the pronounced signs of disease only when coming in contact with such cells? Is it likely that antibody produced in human beings by vaccine of spinal cords of monkeys infected with remote passage virus will protect against the disease? If this appears possible, how should the vaccine be prepared? And if it is found possible to vaccinate human beings safely and effectively against poliomyelitis with such vaccine, how should the method be applied as a practical procedure? These and additional problems of related interest are briefly discussed herewith as the basis of my efforts to evolve a safe and effective method of active immunization against the disease.

IMMUNITY IN VIRUS DISEASES IN RELATION TO VACCINATION AGAINST POLIOMYELITIS

In the first place, the fact that an attack of acute anterior poliomyelitis almost invariably results in a lasting immunity against the disease constitutes the main reason for believing and hoping that it may be possible to vaccinate against it safely and effectively. Quigley¹ has recently collected but fourteen cases of second attacks from the literature, of which he believes that eleven appear reasonably definite and he added one case of his own. This indicates that the virus is capable of engendering an active and lasting immunity in human beings, which has been substantiated by the finding of specific neutralizing antibody in the blood of the majority of recovered individuals as well as by the demonstration of acquired immunity in monkeys recovering from the disease produced by intranasal or intracerebral inoculations of virus.

Indeed, it would appear that the majority of diseases caused by viruses are followed by lasting immunity as, for example, in smallpox, chickenpox, rabies, measles, mumps and yellow fever among human beings, and cattle plague, swine fever and dog distemper among the lower animals. Furthermore, it would appear that the majority of viruses are peculiarly capable of immunizing agents not only during an attack of disease but likewise when administered as vaccines, as indicated by the success attending vaccination against smallpox and rabies as well as against dog distemper, cattle plague, African horse sickness, fowlpox, yellow fever and psittacosis. Since acute anterior poliomyelitis is regarded as a virus disease, all this lends great encouragement to efforts for evolving a safe and efficient method for vaccination against it.

From the Research Institute of Cutaneous Medicine and the Department of Medicine of Temple University.

Read before the Section on Pathology and Physiology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1955.

Owing to lack of space this article has been abbreviated as it appears here. The complete article will appear in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

¹ Quigley, T. B. Second Attack of Poliomyelitis. J. A. M. A. 102: 752 (March 10) 1934.

INCIDENCE AND SUSCEPTIBILITY IN RELATION TO
VACCINATION AGAINST POLIOMYELITIS

Further impetus to such efforts is given not only because the disease is known to be world wide in distribution but likewise because the mortality has varied from 73 to as much as 43 per cent in different epidemics, with as high as from 25 to 45 per cent of residual or permanent paralysis among those fortunate enough to survive. Indeed, there are but few diseases capable of creating as much fear among physicians and the public alike as an epidemic of acute anterior poliomyelitis not only because of the death rate but likewise because of the crippling that may follow an attack of the disease.

Unfortunately, our information on how the virus is spread and epidemics produced is still inadequate, but it would appear, as stated by Flexner,² that it is largely distributed by carriers and that the portal of entry is the upper respiratory tract. Toomey³ has recently renewed interest in the possibility of the gastro-intestinal tract being a portal of entry and in Sicard's thought that the virus may be absorbed by the gray fibers of the intestine and conducted by way of the sympathetic nerves to the spinal cord. For my own part, however, I have not yet succeeded in producing the disease in *Macacus rhesus* monkeys by feeding the virus, nor have Miss Rule and I been able to vaccinate monkeys by this route of administration.⁴

The majority of new-born infants appear to possess a natural and temporary immunity to the virus, as indicated not only by the low attack rate in infants under 1 year of age (35 per cent in the 1916 New York City epidemic) but likewise because Aycock and Kramer⁵ found that the serums of 83 per cent of umbilical cord specimens of blood contained neutralizing antibody for the virus presumably passively transferred from the mothers. However, as shown in table 1, this passive immunity appears to be of short duration as the results of neutralization tests with the serums of twenty-nine children under 4 years of age have shown that from 58.3 to 100 per cent (average, 79.2 per cent) did not contain appreciable amounts of antibody in the blood and on the basis of these serum neutralization tests were to be regarded as susceptible to infection. In our own tests with the serums of nine children under 4 years of age 77.7 per cent failed to neutralize passage virus and thereby proved susceptible.

Among 159 children from 5 to 14 years of age the percentage of serums failing to neutralize virus has varied according to different investigators from 17 per cent to 100 per cent (average, 45.5 per cent). As Aycock and Kramer have shown, the percentage is always higher among children reared in urban than in rural districts. In our own series of twenty children included in this age group, all being reared in Philadelphia, the serums of 40 per cent gave negative monkey neutralization tests and were presumably susceptible.

Among 128 individuals over 15 years of age the percentage of serums failing to neutralize virus and thereby presumably indicating susceptibility has varied from 11.1 to 60, according to different investigators, with a general average of 24.7 per cent. As in the case of

children, Aycock and Kramer have found the highest percentage of susceptibles in the rural districts, but in general terms it would appear that from 60 to 70 per cent of adults have neutralizing antibody in the blood presumably sufficient for conferring some resistance to infection.

Under the circumstances it must be admitted that, except for new-born infants, a large percentage of children are susceptible to poliomyelitis, especially those under 10 years of age, and that the low attack rate among them under "normal" conditions is not due so much to the presence of immunity as to factors influencing the virulence and dissemination of the virus over which we have at present little control and concerning which our information is even less satisfactory. Certainly no community, in the United States at least, can feel secure against the disease, and since the percentage of susceptible children is always high, the attack rate, mortality and residual paralysis can always be expected to increase sharply in the presence of factors increasing the virulence of virus or whatever it is that produces epidemics of the disease. Under these circumstances and because our information on the epidemiology of the disease is still incomplete, coupled with the knowledge that it is known to strike the lowly and well-to-do alike under most unusual conditions despite even rigid precautions against infection, I believe that there is a place of real value for the vaccination of children if a safe and practical method is available for producing sufficient immunity to tide them over to maturity, even though we omit adults on the basis that from 60 to 70 per cent may have lived long enough to acquire resistance to the disease.

THE NATURE OF IMMUNITY IN POLIOMYELITIS
IN RELATION TO VACCINATION

As first shown by Netter and Levaditi⁶ in 1910, the serums of individuals recovering from poliomyelitis contain the antibody capable of neutralizing *in vitro* monkey passage virus and since that time have become the best known antibody identified with the disease.

But it is a mistake to assume that this humoral antibody occurs in all persons who have recovered, so far at least as the neutralization of monkey passage virus is concerned. I have summarized the results reported by various investigators in table 2, in which it will be noted that from 12.1 to as high as 63.6 per cent (average, 34.9 per cent) of the serums of 126 individuals recovering from poliomyelitis failed to neutralize the virus *in vitro*, presumably because the antibody was absent or present in insufficient amounts. It is for this reason that several investigators have cautioned against the assumption that the serums of all convalescents and patients who have recovered are fit for the serum prophylaxis or treatment of the disease.

And yet, as previously stated, the immunity following an attack is quite solid, since second attacks are so rare. It is therefore suggested that there is probably an important cellular or tissue immunity in many individuals who have recovered who do not show demonstrable amounts of antibody in their serum.

Therefore, since it is possible for the serums of patients who have recovered to give negative monkey neutralization tests, despite the evidence for the existence of immunity, I was well prepared to observe that the serums of some children vaccinated by my method failed to develop this type of antibody and indeed this

2. Flexner, Simon. Libman Anniversary Volume 1: 425. 1932.
3. Toomey, J. A. The Intestinal and Urinary Bladder in Poliomyelitis. *Am J Dis Child* 45: 1211 (June) 1933. An Enteroprevalent Factor in the Stools and Spinal Cords of Monkeys Infected with Poliomyelitis. *ibid* 48: 30 (July) 1934.
4. Kolmer, F. A., and Rule, Anna M. *J Immunology* 26: 505 (June) 1934.
5. Aycock, W. L. and Kramer, S. D. *J Exper Med* 52: 457 (Oct.) 1930.

6. Netter, A., and Levaditi, C. *Compt. rend. Soc. de biol* 58: 617, 853, 1910. Romer, P. Die epidemische Kinderlähmung. Berlin: Julius Springer, 1911.

happened in four children of the original group.⁷ Whether these children have a tissue immunity or are susceptible still remains to be seen. On the other hand, the presence of the antibody is widely accepted as indicative of immunity and I do not know of any individual carrying antibody in the blood who has contracted poliomyelitis. The nature of this assumed tissue immunity is unknown but it has occurred to me that the body cells may be "tuned up" for the rapid production of antibody when virus gains access to them and that in this manner they may escape infection. But since the attack rate is so sharply increased during epidemics, presumably because of greatly enhanced virulence of the virus, it seems to me highly desirable to vaccinate children under 12 years of age.

Suggestive of the existence of tissue immunity is the observation made during the past year by Miss Rule and myself that the serums of normal guinea-pigs and rabbits do not contain neutralizing antibody for our monkey passage virus, though as is well known these animals possess an absolute immunity to the virus. At least we have never been able to infect these animals by intracerebral inoculation,⁸ and Harmon, Shaughnessy and Gordon⁹ have had a similar experience with them as well as with young dogs, cats, mice, young hogs, lambs and calves. In this connection mention may also be made that in certain other virus diseases (dog distemper, fowl plague, fowlpox, African horse sickness, foot and mouth disease and horse encephalitis) various investigators have found neutralizing antibodies either absent or but irregularly present in the blood of natural hosts that have been recovered, even though these infections generally engender a high state of immunity.

Since, however, it appears that the presence of large amounts of neutralizing antibody in the blood is indicative of immunity even though its absence is not inconsistent with this state, one can only guess at its origin. Aycock and Kramer have long maintained that it develops because of a widespread distribution of the virus with a process of natural immunization as the result of single or repeated subclinical or unrecognized attacks. This has always impressed me as a very reasonable assumption and encourages one to seek an efficient method for vaccinating human beings. For if it is possible for immunity to be engendered by so light an infection, it ought to be possible to duplicate the results by vaccination.

Since tissue immunity apparently exerts an important role in resistance to and recovery from poliomyelitis, it is to be expected that various other theories of immunity to this disease would be entertained. In this connection Draper¹⁰ has thought that a certain constitutional make-up of young children (broad brow and round face with wide space between the eyes, plumpness, separation of central incisor teeth with difficult dentition, and so on) indicated unusual susceptibility. Aycock also has observed that unusually well developed children, who are however of a more delicate make-up physically and temperamentally than normal children, may be more susceptible than usual. Indeed, Aycock¹¹ believes that some variation in the physiologic activity of the body may produce an increased resistance to poliomyelitis without outside assistance by way of unrecognized infection with virus, for which he has

proposed the name "autarcosis", Jungeblut and Engle¹² offer the suggestion that the mass protection enjoyed by the adult human population may rest primarily on the normal functions of the endocrine balance characteristic of mature age.

It is stated that old monkeys carefully guarded against chance exposure to the virus are more resistant than young animals (which our experience confirms) and it would appear that there is much that is not understood about this subject, so commonly discussed as "maturation immunity". The fact remains, however, that large numbers of young children, and adults as well, contract poliomyelitis every year and either die of the disease or recover with varying degrees of permanent crippling. A safe and efficient vaccine, therefore, is highly desirable, particularly for the period of childhood, until the natural agencies of resistance, whatever they may be, have been developed.

Certainly I cannot agree with those who believe that dependence can be placed on the processes of natural immunization or maturation alone in view of the low attack rate of acute poliomyelitis, because I believe that it may be possible to protect children safely and efficiently by vaccination over the period of their greatest susceptibility.

THE ANTIBODY FOR MONKEY PASSAGE VIRUS IN RELATION TO VACCINATION

But since the only practical source of vaccine for immunization against poliomyelitis is the spinal cords of monkeys infected with remote passage virus, there is at once the important question whether or not the antibody produced by such virus will aid in the protection of human beings against the disease. In other words, does the species of animal furnishing the vaccine alter it in such a way that the antibody produced may fail to protect human beings against poliomyelitis?

Of course it is irrefutably established that vaccine of the cowpox virus, which is presumably the smallpox virus passed through the skin of calves, will protect human beings against smallpox. Furthermore, it is definitely established that vaccines of rabies virus passed through the spinal cords of rabbits will temporarily immunize both human beings and dogs. It also appears that vaccines prepared from the brains of mice infected with the yellow fever virus immunize human beings against that disease, as shown by Hindle¹³ and others. In addition, the successful vaccination of human beings by Rivers and Schwenker¹⁴ with vaccines of the living virus of psittacosis, or parrot disease, prepared from the livers and spleens of infected mice, indicates that the passage of viruses through lower animals leaves their vaccines capable of engendering immunity in human beings. From these instances one might infer that vaccines of remote monkey passage poliomyelitis virus will immunize not only monkeys but human beings as well.

However, as shown by Paul and Trask,¹⁵ the experimental disease produced in monkeys by two human strains of virus did not leave these animals on recovery immune to passage virus and in a few instances recovery from infection with passage virus left the animals susceptible to human virus. Furthermore, the antibody in some human convalescent serums for human virus

7 Howitt Beatrice F J Infect Dis 51: 565 (Nov Dec) 1932
8 Kolmer J A and Rule, Anna M Proc Soc. Exper Biol & Med 31: 48 (Oct.) 1933
9 Harmon P H, Shaughnessy H J and Gordon F B J Prev Med 4: 59 89 (Jan) 1930
10 Draper George Am. J. M. Sc. 184: 111 (July) 1932
11 Aycock, W L J Prev Med. 3: 245 (May) 1929

12 Jungeblut C W and Engle E T Resistance to Poliomyelitis J A M A 99: 2091 (Dec. 17) 1932
13 Hindle E Brit M J 1: 976 (June 9) 1928.
14 Rivers T M and Schwenker F F J Exper Med. 60: 211 (Aug) 1934
15 Paul J R and Trask J D J Exper Med 58: 513 (Nov) 1933

appeared to differ qualitatively for passage virus Weyer¹⁶ has found also that the serums of horses immunized with monkey passage virus was highly neutralizing for passage virus (1 500) but much less so for human virus (1 20). However, Howitt¹⁷ and others have found that serums from horses, goats and sheep immunized over a long period of time with monkey passage virus have given some evidence of therapeutic value in a small group of human cases in the paralytic stage of poliomyelitis, indicating that the antibody produced by passage virus is capable of neutralizing human virus. Furthermore, as shown by Flexner,¹⁸ human convalescent serum neutralizes not only recent but also remote passage virus, thereby indicating that frequent passage of the virus through monkeys does not produce material alteration but also that monkeys vaccinated by remote passage virus develop immunity in part at least to recent human virus.

It would appear, therefore, that the weight of evidence available at present indicates that the antibody produced in human beings by a vaccine of remote monkey passage virus may aid in protection against the human disease, as it probably aids in the protection of monkeys themselves, but the final answer to this question of fundamental importance must await the results of vaccination of human beings and especially those exposed to epidemics of the disease. The vaccine should be highly successful, as Miss Rule and I have found that the serums of children immunized in Philadelphia by my attenuated vaccine of remote monkey passage virus (Rockefeller strain) have completely neutralized human spinal cord virus (Cuneo) sent me by Dr J F Kessel from the 1934 epidemic in southern California as well as the virus in the third monkey passage from another fatal human case in the same epidemic, kindly furnished by Miss Beatrice Howitt of San Francisco. No one knows at present whether or not immunologically specific strains of poliomyelitis virus exist. If they do, the problem of vaccination would be greatly complicated in proportion to the number of strains, just as vaccination against the pneumococcus has been complicated by the known existence of so many different types.

THE METHOD OF PREPARATION OF VACCINE IN RELATION TO IMMUNIZATION

If, therefore, encouragement exists for the immunization of human beings against poliomyelitis with vaccine of remote monkey passage virus, the question arises as to the best manner for preparing it of monkey spinal cord for the safe and effective vaccination of human beings.

As stated by Andrewes,¹⁹ it would appear definitely established that vaccines of dead viruses are enormously weaker than living and attenuated viruses, because the former contain but small amounts of antigenic virus protein while the virus in the latter after injection can multiply perhaps a millionfold in the body and thereby have a far better chance of producing resistance. Furthermore, as recently stated by Rivers²⁰ it would appear that the lasting immunity of virus diseases may be due to the prolonged or persistent sojourn of the viruses in hosts once infected, and if this is true of

poliomyelitis, it is not at all likely that completely "killed" vaccines could produce a durable immunity in this disease.

While vaccines of various viruses apparently inactivated or killed by solution of formaldehyde, phenol, chloroform, ether, heat and other agents have been used with some success in vaccination against rabies, distemper, cattle plague and fowlpox, yet, as stated by Andrewes and more recently by Rivers, it is still an open question with at least some of these vaccines whether or not the viruses are really killed or only attenuated because it is almost impossible at present to determine when a virus has been completely inactivated. In poliomyelitis of monkeys, at least, best results have been obtained with subcutaneous or intracutaneous injections of the living virus by Flexner and Lewis,²¹ Aycock and Kagan,²² Stewart and Rhoads,²³ Rhoads²⁴ and others or by mixtures of virus and immune serum given together or separately. Miss Rule and I were unable to vaccinate monkeys successfully with chloroform and heat inactivated vaccines⁴ and for these reasons I have thought that best results in the immunization of human beings might probably be obtained, as they have in monkeys, with vaccines of living virus, provided a way could be found for safely attenuating the virus.

Of the several agents employed for the inactivation of virus in the preparation of poliomyelitis vaccine, solution of formaldehyde would appear to be of most interest, since it has been used with success in the preparation of diphtheria and tetanus toxoids and other vaccines. Apparently, however, one has to work within a fairly narrow range of concentration of the solution, as too much seems to destroy all antigenic power and too little will not completely inactivate. As stated by Andrewes this is one of the facts which lead some to suspect that an effective vaccine may be not entirely "dead." However, it may be that a large dose of dead virus will immunize as effectively as a small dose of living but attenuated virus, but this is not at all likely. Further, Dunkin and Laidlaw²⁵ have shown that formaldehyde treated canine distemper virus produces only a fleeting immunity in dogs and that an active virus must be employed for obtaining a solid lasting immunity. As stated by Rivers, all the evidence at hand seems to indicate that whatever immunity is produced by inactivated viruses endures only for a relatively short time and that many workers do not seem to be disturbed by this fact, which is so important with vaccines expensive to make and difficult to administer. Furthermore, as suggested by Sabin,²⁶ the antigens engendering the production of neutralizing antibodies may not exist in the viruses but arise from the infected tissues, which, if true, would indicate the need of using active virus in vaccine.

ATTENUATION OF VIRUS

Believing therefore that effective vaccination against infantile paralysis required the administration of active virus, I became interested in the possibility of using living but attenuated remote monkey passage virus and in the course of some chemotherapeutic investigations²⁷

¹⁶ Weyer E. R. Proc. Soc. Exper. Biol. & Med. **29**: 289 (Dec) 1931.
¹⁷ Howitt, Beatrice J. Infect. Dis. **50**: 26 (Jan.) 1932. South western Med. **10**: 320 (Aug.) 1932.
¹⁸ Flexner Simon. Immunity to Human and Passage Poliomyelitis virus. J. A. M. A. **99**: 1244 (Oct. 8) 1932.
¹⁹ Andrewes C. H. Lancet. **1**: 989 (May 2) 1946. (May 9) 1931.
²⁰ Rivers, T. M. Am. J. M. Sc. **190**: 435 (Oct.) 1935.

²¹ Flexner Simon and Lewis P. A. Experimental Poliomyelitis in Monkeys. J. A. M. A. **54**: 1780 (May 28) 1910.
²² Aycock W. L. and Kagan J. R. J. Immunology **14**: 85 (Aug.) 1927.
²³ Stewart F. W. and Rhoads C. P. J. Exper. Med. **48**: 959 (June) 1929.
²⁴ Rhoads C. P. J. Exper. Med. **51**: 1 (Jan.) 1930. **53**: 115 (Jan.) 1931.
²⁵ Dunkin and Laidlaw quoted by Rivers²⁶.
²⁶ Sabin A. B. Brit. J. Exper. Path. **16**: 84 (Feb.) 1935.
²⁷ Kolmer J. A. Rule Anna M. and Madden Bernard J. Lab. & Clin. Med. **19**: 972 (June) 1934.

with sodium ricinoleate, which possesses some detoxifying activity, I considered the possibility of this agent so attenuating the virus as to make it safe for subcutaneous injection, especially since McKinley and Larson²⁸ had already found that monkeys could be sometimes immunized by intraperitoneal injections of this type of vaccine

Miss Rule and I⁴ prepared a vaccine of a 1 per cent emulsion of monkey spinal cord in sterile water with sufficient sodium ricinoleate to give a 10 per cent concentration and in a series of six monkeys succeeded in vaccinating two successfully and one partially. Believing that better results could be obtained with vaccines carrying more tissue-virus and less sodium ricinoleate, we then prepared vaccines carrying 4 per cent of virus with 1 per cent sodium ricinoleate²⁹ and successfully vaccinated eighteen monkeys with subcutaneous and intracutaneous injections,³⁰ since all animals inoculated intracerebrally about one month later with about eighteen minimal infective doses of virus remained perfectly well, whereas the controls developed poliomyelitis in from five to nine days

The virus in the vaccines, however, was not killed, since the injection of 0.3 cc amounts into the brains of monkeys produced paralysis, but usually milder and with a somewhat longer incubation period, suggesting that the sodium ricinoleate may have produced some attenuation, although this is very difficult to determine in view of the varying susceptibility of monkeys to the virus

But furthermore, and very importantly, the subcutaneous and intracutaneous injection into these eighteen monkeys of from five to ten doses of 0.05 to 1 cc per kilogram and amounting to as much as a total of from 5 to 100 cc for a child of 10 Kg (about twenty-five pounds) were without any ill effects whatever aside from local irritation at the sites of injection, which I thought acceptable as possible further evidence of attenuation of the virus³¹

Under these circumstances Miss Rule and I felt justified and safe in taking the vaccine ourselves in July 1934, even though we were without neutralizing antibody in the blood. We both took 0.5, 1.5 and 2 cc. at five-day intervals with no ill effects aside from local irritation at the sites of injection in the arms. Two weeks after the third dose we found our blood containing antibody, as determined by the serum neutralization tests with monkeys in which 0.2 cc of serum mixed with 0.2 cc of 5 per cent virus was injected intracerebrally after standing two hours at 37 C

Furthermore, I was impressed with additional possible factors of safety, namely, the administration of a small first dose followed by two additional doses at weekly intervals, the rapidity with which antibody is apparently produced by this vaccine in both human

beings³² and monkeys,³³ and the subcutaneous route of administration, since it is difficult to infect monkeys by this route even though the virus has been well adapted to this animal³⁴

In addition I have thought that the remote monkey passage virus employed in the preparation of the vaccine may have lost to a large extent its virulence for human beings as a result of a very large number of passages through monkeys during the past many years after the manner of the loss of virulence of the small pox virus by reason of passage through calves and other of the lower animals. Certainly it is difficult to infect monkeys with human spinal cord virus even by intracerebral inoculation, and ordinarily many passages are required before virus becomes highly virulent for these animals and I have thought that the reverse may be equally true³⁵

Under the circumstances I regarded the vaccine as so safe that I administered it to my two sons, aged 11 and 15 years respectively, the former being without neutralizing antibody in his blood. Since then Dr Klugh, Miss Rule and I have given from one to three doses of the vaccine at weekly intervals by subcutaneous injection to a group of twenty-three additional children varying in age from 8 months to 11 years, at the request or with the consent of their parents, with absolutely no ill effects aside from occasional mild constitutional and local reactions at the sites of injection corresponding to those produced by diphtheria toxoid. All children were selected on the basis of preliminary monkey serum neutralization tests and the results, which are given elsewhere,³² have shown antibody production in 84 per cent

I believe, therefore, that sterile vaccine carrying 4 per cent of very finely divided remote monkey passage spinal cord virus is safe by subcutaneous injection for both monkeys and human beings after treatment with 50 per cent glycerol for one week and 1 per cent sodium ricinoleate and 1/80,000 phenyl mercury nitrate at 37 C for twenty-four hours followed by from ten to fourteen days in a refrigerator at 12 to 16 C. It is likely that weak concentrations of solution of formaldehyde, phenol and other chemical agents may also attenuate the virus just as effectively as sodium ricinoleate³⁶

It is true that the three doses advised for human beings³² are much less per kilogram of weight than found necessary for the effective immunization of monkeys but it is a reasonable assumption that human beings will require much less protection than monkeys infected intracerebrally with ten or more minimal doses of virus or by repeated intranasal inoculations. Furthermore, the doses advised were decided on in the interests of safety until more data were available.

28 McKinley J. C. and Larson W. P. *Proc. Soc. Exper. Biol. & Med.* 24: 297 (Jan.) 1927

29 The vaccine is now prepared with the addition of 1/80,000 phenyl mercury nitrate to prevent accidental bacterial contamination during its preparation and administration since 1 per cent sodium ricinoleate is very low in bacteriostatic and bactericidal activity. The brain and spinal cord of each monkey is also tested for the virus of lymphocytic choriomeningitis (Armstrong and Lillie) before the latter is used in the preparation of vaccine. The details of preparation are described by Kolmer J. A. and Rule, Anna M. *An Improved Method for Preparing the Kolmer Poliomyelitis Vaccine with a Note on Its Administration and Safety* J. Am. Pub. Health A. to be published

30 Kolmer J. A. *Am. J. M. Sc.* 188: 510 (Oct.) 1934

31 Since then twenty-four additional monkeys have received five subcutaneous injections of the 4 per cent vaccine at five-day intervals in a dose of 0.5 cc. per kilogram without any evidences of poliomyelitis infection whereas in a series of twenty monkeys receiving similar subcutaneous injections of the straight virus (five doses of 0.2 cc. of 10 per cent virus per kilogram) poliomyelitis developed in one again suggesting that the virus had probably undergone some attenuation in the vaccine

32 Kolmer J. A., Klugh George Jr. and Rule, Anna M. *A Successful Method for Vaccination Against Acute Anterior Poliomyelitis*, J. A. M. A. 104: 456 (Feb. 9) 1935

33 Kolmer J. A. and Rule, Anna M. *Am. J. Clin. Path.* 5: 349 (Sept.) 1935

34 In this connection Dr. William H. Park has recently stated "It is known that when intradermal or subcutaneous methods of injection are used it is difficult to infect monkeys. There is every reason to believe that this is true of children (From the *Crippled Child*" 13: 57 1935)

35 It would appear that Dr. Park also shares this opinion as recently stated. It is also known that it is difficult to adapt the human virus of infantile paralysis to monkeys so that they will develop an attack. The reverse of this is probably true that a virus adapted to infect monkeys has lost much of its virulence for man. (From the *Crippled Child*)

36 In this connection I may state however that the addition of 1/4,000 solution of formaldehyde to the vaccine has resulted in so much inactivation of virus that monkeys could not be immunized by five subcutaneous injections at five day intervals of doses varying from 0.05 to 0.5 cc per kilogram 1/100 phenol and 1/40,000 mercurphen also resulted in some inactivation so that both were less vaccinogenic than the plain ricinoleated vaccine and that carrying 1/80,000 phenyl mercury nitrate (Kolmer and Rule article mentioned in footnote 29)

Just how long the immunity lasts is impossible to state at present, except to mention that monkeys vaccinated about three years ago are still solidly immune to intracerebral injections of virus³⁷. It is likely, however, that some of this resistance may be due to the increasing age of the animals (maturation immunity). Certainly it is reasonable to expect that the immunity engendered by attenuated virus will endure much longer than that produced by "dead" virus and I am hoping that future experience will show that it will suffice at least to protect the majority of children over their age of greatest susceptibility.

THE PRACTICAL APPLICATION OF VACCINATION AGAINST POLIOMYELITIS

But it may be argued that vaccination of young children may deprive them of the opportunity of natural immunization through acquiring subclinical or abortive attacks of the disease which Aycock and others believe are largely responsible for the immunity that is apparent in a large percentage of adults. This is probably based on the assumption that antibody produced by vaccine will prevent infection with virus and thereby prevent the latter from producing immunity. This may be true, but I myself do not care how children and adults as well acquire immunity as long as they safely do so in sufficient degree to protect them against the disease. Protection before natural immunization can occur and especially in times of epidemics seems a more important desideratum than a possible immunity obtained from a hypothetical abortive attack.

As previously stated, antibody production appears to be sufficiently prompt even after the first dose of vaccine to indicate that it may be safely used in epidemics³⁸.

But, since the attack rate is so low in the absence of epidemics, should all children be vaccinated? Unfortunately, there does not exist at present a cheap and quick method for picking out susceptibles, the monkey serum neutralization test for antibody being the only one available. The colloidal gold test of Eberson as well as complement fixation, precipitin and skin tests conducted by Dr Klugh, Miss Rule and myself have proved disappointing, as reported elsewhere³⁹. Schultz, Clifton, Gebhardt and Chambers⁴⁰ had previously found the colloidal gold test of no value as likewise skin reactions by Sabin, Park and Jungeblut⁴¹. It would appear that the monkey is the only animal known at present to be susceptible for antibody tests and it is

too expensive for use on a large scale. Furthermore, the tests require from two to three weeks. Certainly such tests are not required in the case of children aged 4 years or younger, as enough have been done to show that about 80 per cent are susceptible, and even more in the rural districts.

SUMMARY

1 Since acute anterior poliomyelitis is regarded as a virus disease and results in lasting immunity, second attacks being very rare, and since the majority of the viruses appear to be highly capable immunizing agents, great encouragement is given to efforts for producing a safe and effective method for the vaccination of human beings against the disease.

2 Further impetus to such efforts is given by reason of the fact that the mortality has varied from 7.3 per cent to as much as 43 per cent in different epidemics, with as high as from 25 to 45 per cent residual paralysis.

3 While the attack rate is low, except in epidemics, it would appear that the disease is of increasing frequency both as isolated cases and in epidemics.

4 While about 83 per cent of new-born infants have antibody in the blood temporarily, serum neutralization tests with the serums of twenty-nine children under 4 years of age, including nine of our own series, failed to neutralize the virus in about 79.2 per cent and were apparently susceptible.

5 Among 159 children from 5 to 14 years of age, including twenty of our own series, an average of 45.5 per cent were without neutralizing antibody.

6 Of 128 individuals over 15 years of age and largely composed of adults, the serums of 24.7 per cent failed to neutralize the virus.

7 Under these conditions it would appear highly probable that a large percentage of susceptibles are present in all communities, particularly in the case of children under 12 years of age, thus rendering a safe and effective method of vaccination highly desirable.

8 This need is emphasized also by reason of the fact that the passive immunity conferred by the injection of normal or convalescent serum is of very short duration.

9 From 12.1 to as high as 63.6 per cent (average 34.9 per cent) of the serums of 126 individuals recovering from poliomyelitis have failed to neutralize passage virus, presumably because neutralizing antibody was absent or was present in insufficient amounts. Therefore, not all convalescent serums are fit for prophylactic or therapeutic immunization.

10 While humoral and tissue immunity may be due to unrecognized and subclinical attacks of poliomyelitis, it has been suggested also that there may be a type of "maturation immunity" due to constitutional make-up or undetermined physiologic factors.

11 Even if the neutralizing antibody is due to subclinical or unrecognized attacks of the disease, the ease with which it is apparently produced suggests that vaccine may likewise produce it readily and in a large percentage of susceptible individuals.

12 The processes of natural immunization, whatever they may be, should not be regarded as sufficient, since so many and especially children contract the disease before immunization can develop and either succumb or recover badly crippled and handicapped for the remainder of life.

13 Since vaccines of other viruses prepared from the tissues of lower animals successfully immunize

37 In this connection I may state that the results of monkey serum neutralization tests with twenty three of the original group of twenty five children²² conducted in August (one year after immunization) have shown the persistence of antibody. One child without antibody last year (tested one week after the third dose) was found to have a large amount of antibody this year.

38 But from the outset I have realized the possibility and probability of the vaccine being given during the incubation period too late to abort the disease and with the possibility of having the vaccine blamed for the attack. Since January of this year 446 individuals 319 of whom were children from 6 months to 15 years of age have received the usual three doses at weekly intervals in our clinic at Temple University Hospital with absolutely no ill effects aside from some local reactions. During this period the Research Institute of Cutaneous Medicine has distributed 12,812.5 cc. of the vaccine to 582 physicians in thirty six states mostly in the epidemic areas and the William S. Merrell Company of Cincinnati has distributed an additional 8,910 cc. through 137 physicians. These amounts have been sufficient for the immunization of more than 10,000 individuals (mostly children). No one receiving the three doses has developed the disease nor have I any knowledge of the vaccine producing lymphocytic choriomeningitis or demyelization encephalomyelitis. There have been, however, ten instances of poliomyelitis developing after one or two doses of the vaccine the histories and a more complete analysis of data being given elsewhere (Kolmer, J. A. Am. J. M. Sc. to be published) with the statement that at least some if not all of these appear reasonably certain to have been instances of giving vaccine during the incubation period too late to abort the disease.

39 Kolmer, J. A. Klugh, George, Jr. and Rule, Anna M. J. Immunol. 26: 191-199 (Sept.) 1935.

40 Schultz, E. W., Clifton, C. E., Gebhardt, L. P. and Chambers, J. A. J. Immunol. 26: 119 (Feb.) 1934.

41 Sabin, A. B., Park, W. H. and Jungeblut, C. W. Nature of Skin Reactions Produced by Heat Inactivated Poliomyelitis Virus. Arch. Int. Med. 51: 878 (June) 1933.

human beings, and since horses, goats and sheep immunized over long periods of time with monkey passage virus produce at least small amounts of antibody capable of neutralizing human virus, it would appear probable that vaccines of monkey passage poliomyelitis spinal cord would successfully vaccinate human beings

14 The serums of children immunized in Philadelphia with my vaccine of monkey passage virus have neutralized human spinal cord virus from the 1934 epidemic in California, indicating that antibody produced by vaccine of passage virus is capable of neutralizing human virus

15 It appears definitely established that vaccines of viruses killed by heat or chemical agents are generally much weaker immunizing agents than living or attenuated viruses

16 It is possible, however, that large doses of "dead" virus may be slightly vaccinogenic, provided a method is found for concentrating the virus in order to reduce reactions from injections of spinal cord tissue and diminish the added burden placed on the antibody-producing tissues for protecting themselves against the tissue proteins

17 Filtrates of my vaccine of living but attenuated virus are antigenic, but finely divided suspensions of cord tissue seem preferable, in order to secure the maximum of intracellular virus for immunization. The local reactions are slight and skin tests have shown that human beings have not acquired allergic sensitization to the small amounts of spinal cord protein contained in three doses

18 Monkeys have been successfully vaccinated by subcutaneous and intracutaneous injections of virus or by mixtures of virus and immune serum, but these methods are considered too dangerous for the immunization of human beings

19 We have succeeded in immunizing all of forty-two monkeys with a living but attenuated vaccine carrying 4 per cent emulsions of spinal cord in 1 per cent solutions of sodium ricinoleate with no evidences of ill effects aside from local reactions at the sites of injection. Three doses of the vaccine were then taken by Miss Rule and myself without ill effects and with good antibody response

20 Three doses of the vaccine at weekly intervals were given, with the consent of parents, to twenty-five children varying in age from 8 months to 11 years (the majority of whom gave preliminary negative serum neutralization tests for antibody) with absolutely no ill effects and with antibody response in 84 per cent (During the past ten months 446 additional individuals [mostly children] have been immunized at Temple University Hospital with no ill effects, as likewise about 10,000 additional in thirty-six different states mostly in epidemic areas. No person receiving the three doses has contracted the disease, but ten receiving one or two doses have done so, it would appear that the majority of these may have been instances of vaccine being given during the incubation period too late to abort the disease)

21 Attenuation of the virus in the vaccine along with the fact that the first dose is quite small per body weight, with an interval of at least a week for antibody production before the second and third doses are given, appears to constitute important factors in safety

22 Furthermore, it may be that the remote monkey passage virus used in the preparation of the vaccine is of greatly reduced infectivity for human beings and

that subcutaneous injections represent a portal of entry unsuited to infection, since it is difficult to infect monkeys with the straight virus by this route.

23 In some instances, antibody sufficient for the neutralization of virus has been found in the blood of susceptible children as early as ninety-six hours after the first dose, and in monkeys even large doses per body weight do not appear to lower resistance temporarily by the production of a negative phase.

24 It is not yet possible to state the duration of immunity following vaccination, although monkeys vaccinated three years ago are still immune to intra-cerebral injections of virus (Neutralizing antibody has been found to persist in the blood of children immunized one year ago)

25 If the immunity lasts only a sufficient number of years to protect children over their age of greatest susceptibility until maturation immunity has developed, it would appear that vaccination may be very much worth while

26 At the present time the monkey serum neutralization test is the only reliable one for the detection of humoral immunity. While it is too expensive for routine use on a large scale, it is available for those who can afford it and may be sufficiently reliable as a test for immunity. It is hardly necessary, however, in the case of children under 4 years of age, as about 80 per cent are susceptible

2101 Pine Street.

ABSTRACT OF DISCUSSION

DR. WILLIAM H. PARK, New York. Those of us who are interested in this work are watching with keen interest the vaccines prepared by Drs. Kolmer and Brodie. Both have promising possibilities. We know that the Semple vaccine against rabies is apparently a killed virus and is effective. The results of Dr. Kolmer are very similar to those that we have obtained and it seems therefore that there are two vaccines which are probably both safe, and only time can tell which is the better. I think this generous rivalry between the two will be advantageous. Then, of course, there is Dr. Kramer's vaccine, in which the virus and the serum are mixed together in an adjusted mixture, which is neutralized not fully but sufficiently so as not to produce disease in those injected. I believe that by the end of this summer we shall know which of the first two is to be used, or whether both should be used. It may be that the dead vaccine is better adapted to be sent to a distance, although the live virus probably could be preserved in transit. I think it is a very interesting point Dr. Kolmer has brought out, that this virus, which is still quite virulent in monkeys, is apparently not virulent in children in the small doses advised.

DR. H. F. KRAMER, Brooklyn. I should like to ask Dr. Kolmer how far one can go with the neutralization test. It is a perfectly good test if too much is not asked of it. It has its limitations decidedly. Then, what does the neutralization test mean when it is run? Does it give susceptibility? Does it tell whether the person is immune? It is not, so far as I know, a test of susceptibility. Another question on the neutralization test. Some of those figures that were on the screen indicate that a large proportion of people who have a disease have never developed immunity. The figures giving the highest percentage are the smallest figures. The test wasn't done very often. The rule is good solid immunity following disease. Sometimes one sees an individual who has failed to develop immunity but that is extraordinarily rare.

DR. JOHN A. KOLMER, Philadelphia. The significance of antiviral antibody in relation to susceptibility and immunity in acute anterior poliomyelitis must be discussed with great care in view of the limited number of tests reported, because of the expense involved in using a monkey for each serum neutralization test. For this reason it is highly desirable to discover some cheaper test for this antibody to facilitate inves-

tigation on a broader scale than is now possible. At this time, however, I believe that sufficient antibody in 0.5 cc of serum capable of completely neutralizing at least ten minimal infective doses of virus in an exposure of two hours at 37 C is indicative of sufficient resistance to protect the individual against acute anterior poliomyelitis. Effective resistance may be present, however, without demonstrable amounts of this antibody in the blood. This is suggested by the fact that individuals known to have had poliomyelitis are found without antibody in the blood, as shown in my second chart, and yet clinical experience indicates that they may be nevertheless highly immune, since second attacks are rare. I believe that a tissue immunity may be present with or without humoral immunity. For this reason I believe that the presence of large amounts of this antibody in the blood is indicative of immunity but that its absence does not necessarily indicate susceptibility.

THE MANAGEMENT OF RENAL TUMORS, INCLUDING CYSTS

R. M. LeCOMTE, MD

Professor of Genito-Urinary Surgery Georgetown University
WASHINGTON, D. C.

Malignant growths of the parenchyma of the kidney may be classified broadly, for purposes of management, as hypernephromas and carcinomas, they are seldom distinguishable from each other before operation. Hypernephromas have an irregular cellular structure and are radiosensitive, while carcinomas have a fairly typical microscopic arrangement and are apt to be radioresistant. Apart from their histologic structure, sarcomas and teratomas have practically the same characteristics as hypernephromas. Because of diagnostic difficulties, neoplasms of the kidney pelvis must be included here, they are squamous cell growths, similar in structure to those occurring in the bladder, are not sensitive to the roentgen ray and have just as indefinite an evolution as do vesical tumors.

Long and varied experience has shown that the only curative treatment for malignant neoplasms is removal of the affected kidney and its contained or attached growth, together with such neighboring tissues as may have been infiltrated by it. This has been so well and repeatedly demonstrated that in determining the management of a particular case it is necessary only to decide whether benign as well as malignant neoplasms should be given similar radical treatment, to cite what clinical circumstances contraindicate operation altogether and to give, in brief, the desiderata of the operation itself, together with preoperative and post-operative treatment.

Benign growths of the parenchyma are commonly recognized at necropsy. They are usually small and harmless or, if they do become large enough to produce clinical symptoms, have already caused enough change in the kidney to make them malignant by position if not by cellular structure and metastases. The uncertainty as to what the result may be if they are treated by simple excision and the fact that they cannot be readily submitted to the repeated minor attacks which may be required to eradicate them makes it necessary to treat them by nephrectomy. This is only another way of stating that any renal or pelvic neoplasm that can be recognized clinically should be considered as actually or potentially malignant and treated as such. Benign papillomas of the kidney pelvis might seem to be an exception to this rule, but the difficulty of locating all

the growths that may be present in the finer ramifications of the calices, together with their tendency to recur or for similar growths to appear in new locations, makes it inadvisable to treat them by any more conservative means.

Apart from such self-evident circumstances as poor general condition and severe disease with poor function in the opposite kidney, which would naturally preclude successful nephrectomy, the surgeon confronted with a renal neoplasm must carefully consider whether the local conditions referable to the growth itself are such as to make the prospects for cure by operation sufficient to justify the risk that will be incurred in performing it. Failure to observe this can only lead to discredit both to the surgeon and to the operation. Improved mortality statistics will come from earlier diagnoses and earlier operations rather than from accepting hazardous operative risks. These, in turn, will depend on earlier, more searching and more persistent efforts to determine the cause for hematurias that are not characteristic. The presence of remote metastases, usually in the liver, lungs or bones, ordinarily contraindicate operation, but occasionally an exception may be made and nephrectomy done if hemorrhage is unusually great and not controlled by irradiation and perhaps too if renal pain cannot be otherwise controlled. This is to be done only in a patient whose general condition is exceptionally good despite the presence of the tumor and its local complication.

While no sharp lines can be drawn between the groups, patients with renal tumor may be conveniently arranged as to operability, on the basis of local data, into three classes, first, those that are definitely operable, second, borderline cases and, third, the definitely inoperable ones. The first of these includes patients presenting a small or moderate sized mass that is freely movable with respiration and on palpation. In these it is probable that the growth has not yet broken through its capsule and involved neighboring organs and that surgery may be undertaken with a reasonable chance of complete removal and thus of cure. In this category must be placed those patients whose only symptom is pain and whose only sign tumor, without either hematuria or pyelographic evidence. Such cases occur, as a rule, in children and adolescents and are rare but not unheard of in adults. In them only exploratory operation will disclose definitely the nature of the disease and whether it is operable or not.

To the borderline group belong patients whose tumors are fairly large, whether movable or not. Whether or not to attempt a nephrectomy in these cases will depend on the judgment of the surgeon in charge and in many instances, perhaps in the majority, the question can be settled only after exploratory incision has been made. In operating the surgeon should not hesitate to close the wound, without disturbing the growth, if conditions that will prevent its safe or complete removal are disclosed. It is good surgical judgment not to attempt removal at all in cases obviously inoperable, for severe hemorrhage or rupture of the capsule with dissemination of tumor tissue may be brought about even on slight manipulation. While successful cures occasionally occur after heroic operative procedures in which tumor masses are removed from the renal vein or vena cava, consideration is seldom given to other cases in which death occurs from immediate hemorrhage and shock or to instances in which the disease has been disseminated by ill advised and unsuccessful attempts at removal.

To the third or inoperable group belong patients with tumors, either large or small, that are adherent and fixed and are not movable either with respiration or on palpation. These will probably be found to have broken through their capsule and to have infiltrated neighboring organs so extensively that their complete removal is impossible. The presence of engorged superficial trunk veins may further complicate the clinical picture and indicate obstruction of the vena cava either by pressure of the tumor on the outside of the vessel by glands or from extension into the lumen. In such instances, operation is useless and should not be done.

No more than the essentials of operative technic can be given here. The operation is seldom an easy one, the presence of an inaccessible vascular pedicle together with greatly enlarged veins over the surface of the exposed kidney and possible extension of the growth into the renal vein or vena cava or infiltration of nearby organs presenting difficulties that tax both the ingenuity and hardness of the surgeon and the resistance of the patient. No simple rules can be given for handling them. Each will have to be cared for in a manner dependent on the circumstances under which they are encountered.

The lumbar approach may be used in small tumors in which the entire mass is not larger than that which would be considered readily operable by this route if the enlargement were due to some other cause. In larger growths and in any in which it is probable that prompt and accurate access to the vascular pedicle will be difficult or uncertain, an abdominal transperitoneal approach must be considered. This route has the undoubted advantage of securing the vascular pedicle before there is great need for manipulating the tumor itself. In this way a large part of the blood supply is controlled early and the closing of the main vascular trunks thus accomplished may prevent metastases by squeezing of tumor cells into the blood stream during removal of the tumor itself.¹ Since it has been shown that, in hypernephromas, islands of tumor tissues may be present in it remote from the growth, the perirenal fat should be removed with the tumor. Present practice does not favor removal of the adrenal gland unless it is involved in the growth.

In tumors primary in the pelvis, possible involvement of the ureter must be thought of and a complete or total ureterectomy done if it is found to be involved either before or during operation.²

In children the operation may be technically less difficult than in adults, but both the immediate and the remote mortality are considerably greater. The growths are usually proportionately larger, perhaps because the tumor itself is often the first and only symptom and the disease is not suspected until it is well advanced.

Preoperative irradiation induces fibrotic changes in cortical tumors and makes their removal less difficult.³ Although the method has not been used long enough or on a sufficient number of patients to warrant definite conclusions as to its effects on the end results, reports are favorable and it is probable that the method will have a wide vogue, for the surgeon will quite properly favor anything that will diminish the hazards and difficulties encountered in operating for renal tumor. A disadvantage is that patients may consider that the

growth has been completely destroyed by radiotherapy and thus postpone or refuse surgery. This view should be energetically combated, for, while irradiation may alter the tumor beneficially, it will not destroy it completely.⁴ The irradiation requires three weeks, during which it is conceivable that metastases or extension may occur and this may militate against cure in the long run. Radiotherapy should certainly be used in cases classed as either borderline or inoperable in the hope that removal may be made easier or that otherwise hopeless cases may be brought within the possibility of surgical relief.

Postoperative irradiation to eliminate possible rests that have been overlooked or deliberately left behind seems to be indicated. Just how much should be given and where it should be applied is a problem to be worked out in conjunction with the radiotherapist. Radiation is not innocuous in itself⁵ and to be of value must be administered by a thoroughly competent radiotherapist who has at his command apparatus adequate for the task in hand.

Inoperable cases, apart from indicated hygienic, dietetic and medical measures, should be treated by means of radiotherapy.⁶ The majority of renal tumors are hypernephromas, and, since these are generally radiosensitive, an effort should be made to control metastases and recurrences with the roentgen ray. If used skilfully, they may limit the size of the growths or cause them to shrink and somewhat alleviate a hopeless condition.

POLYCYSTIC KIDNEY

In polycystic kidney the symptoms that attract attention to the disease are due either to hypertension or to uremia from progressive loss of kidney function, to the discovery of an abdominal mass or to some complication, usually infection, hemorrhage or stone. The disease is congenital, bilateral and progressive and accordingly the treatment must be carefully individualized to suit the particular case. It must be emphasized that a polycystic kidney should not be removed simply because of its polycystic condition.

Those patients in whom a palpable mass or nephritic or hypertensive manifestations predominate require symptomatic treatment, which is, as a rule, of a purely medical nature. Surgical treatment is required only if some complication develops, no operation having been devised that will influence the progressive enlargement of the cysts and coincidental loss of renal function more than temporarily. If a surgical procedure is to be undertaken at all, the presence of a sufficient functional reserve in the opposite kidney should be assured more carefully than though the polycystic disease did not exist. The tendency at present is to operate in cases in which previously a strictly conservative attitude has been followed. Surgical renal lesions do not differ greatly in their pathologic nature and pathogenesis here from those occurring in a congenitally normal kidney and their treatment need not be changed materially. Puncture or excision of the cysts may have a beneficial effect on general symptoms, and, in a measure, control pain, infection and hemorrhage.⁷ The fact that the remaining polycystic kidney will not be improved by removal of its diseased fellow but will continue to enlarge and finally fail need not be a hindrance to the removal of the diseased polycystic one.

1 Wharton L. R. *Surg. Gynec. & Obst.* 60: 689 (March) 1935
2 Colston, J. A. C. *J. Urol.* 33: 110 (Feb.) 1935
3 Waters C. A. Lewis L. G. and Frontz, W. A. *South M. J.* 27: 290 (April) 1934. Wharton L. R. *Preoperative Irradiation of Massive Tumors of the Kidney Arch. Surg.* 30: 35 (Jan.) 1935. Waters C. A. *Am. J. Roentgenol.* 33: 149 (Feb.) 1935

4 Wharton, L. R. Discussion of Dr. A. E. Bothe's paper *J. Urol.* 35: 459 (May) 1935
5 Hagner F. R. and Coleman S. R. *J. Urol.* 32: 27 (July) 1934
6 Portmann, U. V. *J. Urol.* 31: 721 (May) 1934
7 Walters, W. L. and Braasch W. F. *Surg., Gynec. & Obst.* 58: 647 (March) 1934

if it is otherwise affected so as to present a hazard to the life or health of the patient. The complicated polycystic kidney may be removed for the same reasons that a similarly complicated congenitally normal one would be removed, and with the same or more rigorous precautions as to immediate renal insufficiency and death from anuria.

ECHINOCCIC RENAL CYSTS

Renal hydatid disease is rare in North America⁸ and most of the cases reported have been diagnosed as renal or abdominal neoplasms or cysts before operation. Accordingly, any one doing abdominal or renal surgery should be informed as to the general characteristics of the disease in order to be prepared to handle it adequately should it be unexpectedly encountered at operation. In view of their rarity in the United States, information as to their management must be taken from the literature of other countries where the incidence is greater.

The disease is slow in its evolution and unless treated surgically eventually causes death. Apart from an abdominal or lumbar mass and slight hematuria, no symptom may occur unless the cyst breaks into the kidney pelvis, after which scolices and daughter cysts appear in the urine accompanied by moderate hematuria and often by renal colic.

The thick, opalescent wall should enable a fairly accurate differentiation to be made between a hydatid and solitary cyst when it is exposed at operation. Craig and Lee Brown⁹ designate renal hydatids as open if they have broken into and communicate with the renal pelvic system and as closed if this has not occurred, and consider this an important distinction in determining whether conservative surgery is permissible or not. They state that gross infection of the cyst is generally fatal and that for successful treatment it is essential to avoid this accident.

In dealing with closed renal hydatids according to their technic, the cavity of the exposed cyst is opened by as small an incision as is practicable and its fluid contents are aspirated through a trocar, care being taken to prevent soiling the surrounding tissues lest implantation of the scolices or anaphylaxis result. The cyst cavity is then filled with alcohol for five minutes to kill active elements in the germinal membrane, after which the contents are thoroughly evacuated and the abdominal wound is closed accurately about the opening in the cyst, rubber dam drainage being left down to but not into the cyst. They believe that the latter point is important in avoiding infection of the interior of the cyst, which may occur if large tube drainage is employed. Open cysts are treated by nephrectomy.

SOLITARY CYSTS

Large serous cysts are generally unilocular, single and present in only one kidney, they are indefinite as to etiology, uncertain as to diagnosis and favorable as to prognosis.

The simplest treatment consists in trimming off the cyst wall down to the juncture with the kidney substance, destroying the intrarenal lining membrane with phenol (carbolic acid) followed by alcohol and then closing the remaining cavity, either with or without drainage as seems to be indicated by its size.¹⁰ This

procedure is ordinarily simple and easily executed and affords as good a prospect of permanent cure as does either resection of the kidney or enucleation of the cyst itself from the kidney parenchyma by either blunt or sharp dissection. Either of the latter presents the hazard of starting an uncontrollable hemorrhage that may necessitate nephrectomy. By reason of the long continued fistula that it is apt to follow, marsupialization should be used only if adhesions prevent either nephrectomy or excision of the cyst wall and destruction of lining membrane. Nephrectomy in cysts is reserved for instances in which the kidney is largely destroyed either by the cyst or by intercurrent infection or if some other disease, such as tuberculosis or neoplasm,¹¹ is present and requires it.

Since a large proportion of hemorrhagic cysts have been found on painstaking histologic examination to contain carcinoma cells in their walls, the possibility of a neoplasm as a basic cause must be thought of, if the contents of the cyst are hemorrhagic, and the cyst wall carefully examined for it before one decides on a conservative course. If the wall contains thickened areas or if the internal surface is rough after any layers of partially organized clots have been removed, malignancy may be suspected and nephrectomy done unless it can be safely excluded.

1801 Eye Street NW

TERATOID TUMORS OF THE TESTIS

ARCHIE L. DEAN JR., M.D.
NEW YORK

This paper is a clinical study based on the records of 292 patients with testicular teratomas. It is presented at this time because the increased number of patients permits better evaluation of radiation therapy in this disease and because there have been recent improvements in diagnostic and therapeutic procedures.

PATHOLOGIC ANATOMY

The natural history of the disease must be understood before testicular teratomas can be properly managed. Much is still unknown regarding the origin of these tumors. Ewing's theory probably has widest acceptance. He believes that all teratomas arise from sex cells, most frequently situated in the rete testis but sometimes present in the tunica albuginea. The sex cells are totipotent and for this reason may produce any of the tissues derived from the three primary germ layers. There seems to be a tendency for one type of tissue to outgrow the others, because in most tumors either one tissue predominates or only one tissue is found. After recently reviewing more than 300 microscopic sections of testicular tumors, Ewing stated that he was quite certain that his theory was sound. He said that he was positive of the origin of the common embryonal carcinoma with lymphoid stroma and that in the large group of sections he was able to find every intermediate stage between it and the nonmalignant adult teratomas.

From the clinical standpoint teratomas may be divided into three groups, the adult tumors, intermediate tumors and embryonal tumors. Representatives of

⁸ Livermore, G. R. *Tr. Am. A. G. U. Surgeons* 22: 19, 1929.
⁹ Craig, Gordon and Lee Brown, R. K. *Surg. Gynec. & Obst.* 46: 668 (May) 1928.
¹⁰ Herbst, Robert and Lynalek, L. W. *Solitary Serous Renal Cysts*. J. A. M. A. 96: 597 (Feb. 21) 1931. Walters, Wailman and Watson J. R. S. *Clin. North America* 14: 651 (June) 1934.

¹¹ Colston, J. A. C. *J. Urol.* 19: 285 (March) 1928.
From the Department of Urology, the Memorial Hospital.
Because of lack of space this article is abbreviated in *THE JOURNAL*.
The complete article appears in the author's reprints.
Read before the Section on Urology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

these groups differ considerably in cellular structure and show wide variation in their clinical course and response to treatment

1 Adult teratomas probably comprise less than 10 per cent of all teratomas. In this series they were but 7 per cent of the total number of tumors classified by Ewing. They grow slowly and remain localized. For years they may cause discomfort only on account of their size and weight. Under the microscope, these tumors are found to be composed of adult tissues of one or several types with orderly cell arrangements. Fragments of all organs and tissues have been identified in these growths. Simple orchidectomy is sufficient to cure the patient.

2 The intermediate type of teratoma is partially composed of adult tissues, but it contains malignant embryonal tissue as well. When a complex teratoma gives rise to metastases, the metastatic tumors are nearly always of a uniform composition and consist of the same tissue as the most malignant fraction of the primary growth. Therefore the natural history of these tumors is that of the embryonal portion.

3 The embryonal teratomas are by far the most common type and are noted for their aggressive qualities. They give rise to rapidly growing metastases

TABLE 3—Initial Symptom of 250 Patients

| | Per Cent |
|-----------------------------|----------|
| Painless swelling of testis | 78.0 |
| Swelling with moderate pain | 6.0 |
| Swelling and hardness | 3.2 |
| Hardness | 2.8 |
| Pain in testis | 2.4 |
| Pain and swelling in groin | 2.4 |
| Pain in abdomen | 1.2 |
| Pain in lumbar region | 0.8 |

Certain individuals first noted one of the following symptoms: loss of weight, swelling of leg and thigh, a mass in the abdomen, shrinking of the testis to half the normal size without apparent cause followed by enlargement, the presence of a cordlike growth above the testis.

through both lymphatics and veins. While tumors within this group may be made up of different types of tissue and tumors of the same general type may vary in degree of malignancy, it is rare to find any but the higher grades of malignancy represented.

Observation of many cases has shown that metastatic deposits grow rapidly. Less is known of the rate of growth of the primary tumors. Probably the dense tunica albuginea retards enlargement. Most patients describe a slow but steady growth. Occasionally a tumor reaches a certain size and stops growing for months or years, when enlargement is resumed, usually at a more rapid rate. A slowly growing or quiescent tumor may be traumatized and the rate of growth greatly accelerated. A number of undescended testes, soon after the beginning of enlargement, descended into the scrotum. This was probably caused by the hormone from the anterior lobe of the pituitary gland, because the same result may follow the therapeutic administration of this substance for cryptorchism.

Metastasis occurs relatively early, although there is some variation caused by differences in the structure of the primary tumors. I have seen patients with widespread metastases from tumors no larger than 1 cm in diameter. A number of patients were aware of metastatic tumors before testicular enlargement had been noted. This was more common when the testis was in an abnormal position and could not easily be examined. In most cases lymphatic extension precedes dissemination through veins. The usual route follows lymphatics of the spermatic cord through the pelvic

and lumbar vessels to epigastric nodes and thence up the prevertebral chain through the mediastinum and along with the thoracic duct to the left supraclavicular fossa. Below the level of the epigastric nodes it is rare for metastases to be found on the side of the body opposite the affected testis. Cephalad from the epigastric nodes, metastases from either testis follow the same course. Along this route there are certain regions where metastatic tumors most frequently develop. The most common site for palpable metastases to be found is in the abdomen at the level of the origin of the renal arteries. Epigastric nodes are usually the next invaded, then nodes in the mediastinum and hilus of the lungs, and finally the signal node in the left supraclavicular fossa. Extension along lymphatics is rapid in most cases. By the time a palpable mass is present in the midabdomen it is likely that other, less accessible, regions have been affected. Not infrequently the disease is widespread without any metastases palpable. These facts make it impossible for surgical operations to control the disease.

Metastasis through veins occurred in one third of the patients with metastases. In practically every case they were first demonstrable in the lungs. Excluding the lungs, blood-borne metastases were not found with regularity in any organs, although the brain was invaded next in frequency and in individual cases post mortem examination showed deposits in practically all parts of the body.

The average length of survival of 114 patients who died of teratoma and who had remembered the date of the first symptom was twenty-four months. Since all these men had received treatment, this figure fails to show the actual rapidity with which the disease progresses.

SYMPTOMS

The first symptom in the majority of cases is a painless swelling of the testis, a remarkably insignificant change in the light of possible later developments. Few patients have serious discomfort at first. Those who do usually have undescended testes in which early changes cannot readily be detected. After the first symptom most of the patients notice a gradual but steady enlargement of the testis. In a few cases as have been described, the growth of the tumor is interrupted by a period of quiescence, which may last for months or even years. Most patients notice an early alteration in the consistence of the testis. Usually it feels firm and elastic. It may become quite hard, or differences in density may be felt in different parts. As the tumor increases in size, pain becomes more noticeable. Sometimes the discomfort is in the affected testis, but more often it is described as a dragging sensation in the groin. Since a suspensory gives relief, the distress is probably due to the weight of the tumor. Unless the disease is promptly checked, it may not be long before the patient complains of a dull, aching pain in the lumbar region on the side of the affected testis and notices belching of gas after meals, sometimes associated with loss of appetite and constipation. These symptoms of retroperitoneal involvement occur before the metastasis is palpable. When epigastric nodes are invaded, the symptoms are more striking and are at their worst after eating when the man is likely to vomit. The appetite may not be lost, but, since it is difficult for food to pass onward from the stomach, the body weight and strength decline. Metastases in the chest are usually demonstrable before they cause symptoms. Enlargement of lymph nodes in the medi-

astium or infiltration at the hilus of the lungs may be considerable before symptoms arise. Then the patient may have a sense of fulness beneath the sternum, he may become short of breath, or he may begin to cough. In the same way intravenous metastases in the lung parenchyma may become extensive before symptoms arise. They excite coughing, which later is accompanied by the production of bloody sputum. Hemorrhages into the lungs sometimes occur. Pleural involvement is rare. Metastases in the nodes of the left supraclavicular fossa hardly ever produce symptoms even when they reach great size. Symptoms from brain metastases depend on the area affected. Accurate localization is usually possible.

If metastases spread beyond the ordinary channels, characteristic symptoms may arise, depending on which body functions are affected, but in most of these cases such urgent symptoms are already present that the secondary changes are masked and the full extent of the disease is found only post mortem.

The early symptoms of teratoma, especially testicular enlargement, seem to give the patients concern. Sixty-six per cent of the patients consulted physicians within four months of the first symptom.

DIAGNOSIS

While in most cases the testis is an exposed organ and changes in its size or consistence seem to be readily appreciated by men of average intelligence, teratomas develop so rapidly that by the time the patient first consults a physician metastasis may have occurred. Of thirty-nine patients seen at the Memorial Hospital within three months of the first symptom, 67 per cent had metastases. When it is so essential to make a correct diagnosis without delay, every intrascrotal swelling should be examined with the possibility of teratoma in mind.

The patient is usually a young man who complains of swelling of one testis. After the scrotal contents have been gently palpated in the erect position and varicocele has been ruled out, the patient should be placed in the supine position with the thighs, abdomen, chest and neck uncovered. Inspection shows a unilateral tumor in the scrotum. The average teratoma is about twice the size of a normal testis when the patient first visits his physician. In most cases the skin overlying the tumor is normal. Sometimes if the growth is large the skin is tense and glazed. At the base of the penis there is no swelling as there is with a hydrocele to cause an apparent shortening or retraction of the penis. The abdomen, chest and neck should be carefully observed, because occasionally metastases may be seen, particularly if they are present in the chest wall or in the left supraclavicular fossa.

Only the lightest touch should be used in examining testicular tumors. Palpation usually reveals a smooth, elastic, symmetrically enlarged testis, although stony hard areas may be present or the finger tips may sink into cystic depressions. The shape of a normal testis is maintained because of the dense, inelastic tunica albuginea. The tumor is seldom sensitive. The growth nearly always is limited to the testis, and the epididymis feels normal. Also in most cases there is a clear cut line of demarcation between the testicular tumor and a normal spermatic cord. The records in the present series contain four cases (about one in seventy-five) in which involvement of the spermatic cord was continuous with the growth in the testis. Not infrequently fluid surrounds the tumor. If it is aspirated

without puncturing of the tunica albuginea, no harm is done and the testis can be palpated more easily. Usually the fluid is clear. If it is bloody the growth has probably invaded the epididymis, because all the testis is enclosed within the impermeable tunica albuginea. If pulsation of the spermatic artery can be felt, it is supposed to be evidence of testicular tumor. The tumor does not transmit light.

Metastases are not found in the inguinal lymph nodes unless the scrotum has become involved. Pelvic examination by rectum is usually negative, although in a few cases, mostly late in the disease, a firm rounded mass can be felt somewhat above and lateral to the upper limits of the prostate.

Often the diagnosis is in doubt when based on examination of the testicular tumor alone, especially when a hydrocele has been found or the patient's story suggests an injury, torsion of the spermatic cord, or tuberculosis. If a characteristic metastatic tumor can be discovered, the problem is simplified. Therefore in every case of testicular enlargement the abdomen, chest and supraclavicular fossa should be examined, and when a man has a tumor of the abdomen, chest or left supraclavicular fossa the scrotal contents should be carefully palpated.

Abdominal metastases are found on the same side as the primary tumor and are at the level of, or somewhat caudad to, the umbilicus. When palpable they are single, rounded firm, fixed and not tender. Because they are retroperitoneal, percussion shows that they are overlain with intestine. If the mass is on the left side, a stomach distended by gas will cover the tumor. Metastases in the epigastrium are not easily felt.

Roentgenograms of the chest should be taken as a routine in search of the earliest evidence of intrathoracic metastases. Extensions of the disease through lymphatics cause a widening of the mediastinum or an infiltration of the hilus of the lungs. Intravenous metastases are round dense, sometimes single but usually multiple and are situated in the parenchyma of the lungs. Metastases in the well known signal node in the left supraclavicular fossa may be of almost any size. If they are searched for they are easily found when present and their nature should be readily recognized.

If a patient is examined within a few weeks of orchidectomy, the distal end of the spermatic cord will feel indurated even though it is not the seat of tumor.

The dense tunica albuginea is an important natural barrier to the spread of a teratoma and it should never be incised for the purpose of obtaining a specimen for histologic examination. Whenever this mistake is made the tumor promptly fungates and spreads rapidly. I have found that a biopsy can be safely performed by aspiration through an 18 gage needle if intensive irradiation is given as soon as a positive report has been returned. Since all the steps of an aspiration biopsy can be performed within ten minutes, the patient's safety is not unduly jeopardized. Supraclavicular nodes and other superficial tumors of a suspicious character can also be accurately diagnosed by this method. In addition to the foregoing examinations, the first specimen of urine voided in the morning is referred to the laboratory for the Aschheim-Zondek test.

A minority of the patients in this series were correctly diagnosed at their first examinations. Teratomas were diagnosed as hydrocele, epididymitis, tuberculosis, gumma, hernia, hematoma, and torsion of the spermatic cord. Metastases were thought to be

gallstones or hypernephromas. While incorrect treatment was being given, 195 patients lost an average of six and one-half months before they were referred to the Memorial Hospital. This delay was partially responsible for 73 per cent of the patients having metastases on admission.

THE USE OF THE ASCHHEIM-ZONDEK TEST

Estimation of the amount of follicle-stimulating factor excreted in the urine may be of considerable value in the diagnosis and prognosis of teratoid tumors of the testis. The technic described by Ferguson⁶ must be followed. The usual test for pregnancy is not sufficiently sensitive. Many misunderstandings and serious errors have been caused by this factor having been overlooked. The report should always describe the strength of the reaction in the number of mouse units per liter of urine, because the significance of the test largely depends on quantitative output. Of greater value than a single test are a number of tests performed at intervals. In some instances, to be described later, a series of tests may be required for diagnosis, and in all cases repeated tests are necessary for estimating prognosis.

Like other laboratory tests employed in clinical medicine, the Aschheim-Zondek test is valuable only when correctly interpreted. A clinician using the test in cases of testicular tumors must know its limitations and in each case correlate the laboratory observations with accurate knowledge of the patient's condition.

The reason for the appearance of the follicle-stimulating factor in the urine of men with teratoma is not positively known. Various theories have been presented elsewhere. It is most likely that teratomas produce a hormone which stimulates the basophilic cells of the anterior lobe of the pituitary gland to put out follicle-stimulating factor. Its presence in the urine of a man is abnormal and is an indication for a thorough examination.

For the sake of clearness and brevity the test will be interpreted on the basis of hypothetical cases. Assuming that a man appears for examination with an enlarged testis of a few months duration, that he has received no treatment and that there is no evidence of metastases:

1 If the test is negative it is probable that the patient has no teratoma. It is possible that he has an adult teratoma which has not destroyed the interstitial cells of the testis.

2 If the test shows 500 or less mouse units per liter of urine it is probable that the patient has a teratoma. This may be of an adult type, such as an adult cystic teratoma that has largely or wholly destroyed the interstitial cells of the testis, or it may be a smaller tumor of a low grade of malignancy which has not destroyed the interstitial cells. It is possible that the testis is the seat of syphilis, tuberculosis, interstitial orchitis or any other condition that would cause swelling and complete destruction of the interstitial cells. It should be understood that it is exceptional for a testis affected with syphilis, tuberculosis or interstitial orchitis to have all the function of the interstitial cells destroyed so that a positive test is obtained.

3 If the test shows between 500 and 1,500 mouse units per liter of urine, the tumor is probably a seminoma.

4 An output of between 2,000 and 10,000 mouse units per liter indicates an embryonal carcinoma with lymphoid stroma.

5 An output of more than 10,000 mouse units per liter of urine indicates an embryonal adenocarcinoma or a chorio-epithelioma.

If a man has an untreated tumor of the testis and evidence of metastases, the Aschheim-Zondek test will be positive with probably more than 1,000 mouse units per liter output. In this group also the histologic make-up of the tumors may be indicated by the quantity of follicle-stimulating factor excreted. While in general in untreated cases the output is increased in proportion to the extent of metastases, the increment is less than that caused by a higher grade of malignancy. No condition other than teratoma has been known to present this clinical picture together with a positive Aschheim-Zondek test.

If a patient has been recently castrated for a testicular swelling and there is no evidence of metastasis, a single test is of little value. In these cases, in addition to frequent physical examinations, the test should be repeated every week or two. If histologic examination of the excised testis shows teratoma and the general trend of the tests during several months indicates a constantly diminishing output of the follicle-stimulating factor, the patient was probably cured by operation. If the output of the follicle-stimulating factor steadily increases, it is probable that metastases are present whether or not they are demonstrable by other methods.

If a patient has a testicular tumor without evidence of metastasis and a positive Aschheim-Zondek test has been obtained, it will be discovered in many cases that a short time after the tumor has been given intensive irradiation the test will become negative. This indicates that the tumor was radiosensitive and suggests a favorable prognosis. On the other hand, in those cases in which the test remains practically the same after irradiation as before, the tumor has always been found to be radioresistant and the outcome has been fatal regardless of how intensive the treatment has been. Ferguson has emphasized the invariably bad prognosis of a persistently high output of follicle-stimulating factor after irradiation of the primary tumor. In a number of these cases, prognosis based on histologic examination was relatively good, for the structure of the tumors showed radiosensitivity. The fact that the biologic test proved superior in prognostic value to the histologic examination suggests that other tests may be discovered in the future of greater accuracy than any now known.

There is a large group in which it has been recently learned that the Aschheim-Zondek test is of doubtful value. It is composed of those patients who have had the diseased testis removed surgically or treated intensively with radiation and have been free from evidence of disease for a number of months or years. They may or may not have had metastases when treatment was begun. These men have an irregular output of follicle-stimulating factor, which may vary from zero to 2,000 mouse units per liter within a few days with no demonstrable changes in their physical examinations. The cause of this phenomenon is not known. For some time my associates and I were much disturbed by finding a comparatively high output in a number of patients who had been clinically well for several years. When it became obvious from repeated tests that the reports followed no definite trends and were in no way

6 Ferguson, R. S. *Am J Cancer* 18: 269-294 (June) 1933. Ferguson, R. S., Downes, H. R., Ellis, E. and Nicholson, M. E. *ibid.* 15: 835-843 (April) 1931. Ferguson, R. S. *Pathologic Physiology of Teratoma Testis* J. A. M. A. 101: 1933 1937 (Dec. 16) 1933. *Am J Roentgenol.* 31: 356 (March) 1934.

substantiated by physical observations, it was concluded that in these cases the output of follicle-stimulating factor was dependent on some unknown but late factor of hemicastration. Therefore the Aschheim-Zondek test is not recommended for diagnosis or prognosis later than approximately eight months after irradiation or surgical removal of a testis.

HISTOLOGIC DIAGNOSIS

The histology of teratomas need not be described. It is well known that in the adult tumors various tissues and fragments of organs may be identified and that the embryonal carcinomas are characterized by a highly malignant appearance. There is another microscopic picture, which has not been previously described but which is of great clinical importance. It is seen in radiosensitive tumors after irradiation with such frequency as to make it a pathologic entity. Clinicians and pathologists should recognize the condition, otherwise the patient will lose the benefit of further treatment.

A few irradiated tumors are transformed into a necrotic mass of shadow cells surrounded by a relatively avascular fibrous capsule. The diagnosis of embryonal carcinoma can still be made from the arrangement of the shadow cells, although the individual cells are necrotic. A later stage of this process transforms these necrotic cells into a homogeneous, caseous-looking mass in which no cell outlines can be distinguished and the lesion may be, and in several instances has been mistaken both grossly and microscopically for, a gummatous testis. Later stages of these changes have not been traced, but probably the end result is a relatively avascular cicatrix.

In other tumors, the result of irradiation, in addition to necrosis of tumor cells, is damage to blood vessels, hemorrhage, and conversion of the involved testis into a hematoma. In the end stage the lesion cannot be distinguished from any other hematoma with added radiation changes. Its final organization also has not been traced but there is no reason to believe it different from that of any other hematoma.

A third postirradiation result presents a more complicated picture. One finds the testis transformed into a loose fibrous reticulum, poor in cells. The spaces of the fibrous reticulum represent the former location of strands of tumor cells and more peripherally of testicular tubules, which, in the original lesion, may have been lined by tumor cells. Surrounding each of these spaces left by the disappearance of tumor or testicular parenchyma is a thick, homogeneous, hyaline membrane doubtless in part the remainder of a basement membrane and in part a hyaline thickening of the stroma of the preexisting tumor. An occasional remnant of a hydropic degenerated cell, unidentifiable as to type, may line the hyaline membrane. In the interstices of the spongy, coarse reticulum one finds occasional lymphocytes, probably the remains of the lymphoid stroma possessed by many of these tumors. With time the productive fibrosis increases and results in the obliteration of the spaces, some of which become lined by calcific deposits. Here again the end result seems to be an atrophic hyaline scar tissue poor in blood supply.

TREATMENT

Study of the natural history of the disease shows that the great majority of teratomas are highly malignant and metastasize relatively early. Also, soon after they occur metastases spread with great rapidity to

inaccessible parts of the body. These facts alone should make one hesitate before employing surgery as the treatment of choice. Furthermore, on the basis of end results the recent statistics of Hinman⁷ and the review of Wasterlain⁸ show that there is no justification for either simple orchidectomy or the radical Hinman-Chevassu operation.

Wasterlain concluded that fewer than 6 per cent of the patients were alive four years after simple orchidectomy. This figure corresponds with the incidence of nonmalignant adult teratomas. As to the radical operation, Wasterlain states that in France the four year end results have not justified its original theoretical promise.

Gregoir, who performed the first radical operation, states that twelve of his thirteen patients died between two and twenty-four months following operation. The only survivor is still living after nineteen years, but no metastatic lymph nodes were found in this case. Gregoir concludes that simple castration might have produced the same result.

Hinman gives the only five year end results of radical surgery in the treatment of teratoma testis. He shows that, of 100 patients operated on by American surgeons, seventeen are free from evidence of disease five years after operation.

Five year end results following the use of radiation show its superiority even when a large proportion of the patients had far advanced disease and many were treated by the relatively inefficient early methods.

During the past fifteen years, improvements have been made in the sources of radiation and in the methods by which the agent has been applied. At present we employ the 200 kilovolt roentgen-ray unit and treat patients with the divided dose technic. This method is most efficient in treating deep tumors, so situated in the body that roentgen rays can be directed on them through several different skin portals. Full advantage is taken of the fact that there is a considerable amount of regeneration in the skin and superficial tissues in the time between treatments. When repeated suberythema doses of radiation are given a skin portal with a day or two intervening, a far greater aggregate dose can be given than if a full skin dose were given in a single application. Of course regeneration also takes place in the tumor between treatments, but when a number of portals are used in turn the tumor is irradiated daily while each portal is permitted several days' regeneration between treatments. Therefore the net result of the divided dose technic is a greater total amount of radiation delivered to the tumor with less damage to the overlying tissues.

When there is no evidence of metastases, primary testicular tumors should be irradiated and then removed. Observation of a number of cases in which preoperative irradiation had transformed highly malignant tumors to necrotic debris suggested that, from the theoretical standpoint, it would be advantageous to operate on teratomas after their growth properties had been destroyed. It is impossible to know how frequently operative trauma produces metastases but there is no question as to the cause of the not infrequent local recurrences in the operative wound. In practice, preoperative irradiation has been valuable. We have never had a local recurrence after orchidectomy. Also comparison of the end results when patients were treated otherwise identically shows a difference.

⁷ Hinman, Frank. *Surg. Gynec. & Obst.* 56: 450-461 (Feb., No. 2 A) 1933.
⁸ Wasterlain, A. *J. belge d'urolog.* 3: 149-292 1932.

in the five year survival of 22 per cent in favor of those irradiated before orchidectomy (See groups 1 and 5 under Results)

The primary tumor is measured with calipers and then given three doses of 500 roentgens each in five days⁹ Every few days the tumor is again measured In most cases regression in size is prompt and continues until the affected testis is little if any larger than its

TABLE 4—Results in Group 1

| | | | | | | | | | |
|--|---------------------|-----|-----|-----|-----|-----|-----|-----|------|
| Number of patients | 23 | | | | | | | | |
| Living without evidence of disease | 18 or 78 per cent | | | | | | | | |
| Dead or lost from follow up | 5 or 21.7 per cent | | | | | | | | |
| Years of Life After Irradiation of Patients Now Living | | | | | | | | | |
| 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 |
| 2 | 1 | 1 | 2 | 1 | 1 | 5 | 1 | 1 | 3 |
| Five Year End Results | | | | | | | | | |
| Number of patients | 14 | | | | | | | | |
| Living and well | 11 or 78.5 per cent | | | | | | | | |
| Dead or lost | 3 or 21.4 per cent | | | | | | | | |

TABLE 5—Results in Group 2

| | | | | | | |
|--|---------------------|----|-----|----|-----|------|
| Number of patients | 39 | | | | | |
| Living without evidence of disease | 11 or 28.0 per cent | | | | | |
| Dead or lost from follow up | 28 or 72.0 per cent | | | | | |
| Years of Life After Irradiation of Patients Now Living | | | | | | |
| 0-1 | 12 | 23 | 3-4 | 78 | 910 | 1011 |
| 8 | 1 | 1 | 8 | 1 | 1 | 1 |
| Five Year End Results | | | | | | |
| Number of patients | 21 | | | | | |
| Living and well | 3 or 14.0 per cent | | | | | |
| Dead or lost | 18 or 86.0 per cent | | | | | |

normal mate This shrinkage usually requires from four to six weeks When this stage is reached, orchidectomy is carefully performed The spermatic cord is first crushed and ligated at the subcutaneous inguinal ring, then the tumor with the tunica albuginea intact is gently freed and removed

When measurements show no reduction in the size of a tumor two or three weeks after irradiation, it is removed without further delay In these cases the tumor is either radioresistant or it has been transformed by radiation into a hematoma

The fact that cellular devitalization follows the administration of the amount of radiation which we employ for preoperative use does not mean that the initial regression necessarily is a permanent one Unless supplemented by orchidectomy or additional irradiation, it is possible that the primary regression might be followed by tumor regeneration However, the dose recommended is of such strength that it will cause devitalization of the great majority of teratomas and at the same time leave the overlying tissues in such a condition that they will readily heal after operation¹⁰

With radiation available, the only reason for the operative removal of a radiosensitive teratoma is the preservation of the spermatogenic function of the remaining testis A number of patients have refused orchidectomy and are among those well for more than five years However, they were irradiated repeatedly

9 The following factors are now employed 200 kilovolts with 30 milliamperes of current and filtration of 0.5 mm of copper and 1 mm of aluminum All primary testicular tumors are treated at 50 cm distance all metastases at 70 cm. The skin portals are as large as the size of the patient permits

10 In a group of tumors of different sizes in which microscopic examinations showed that preoperative irradiation had caused complete necrosis computations showed that the amount of radiation received by the portion of the tumor farthest from the source of radiation varied between 0.8 and 1.6 threshold erythema doses The centers of these tumors received between 1.7 and 2.5 threshold erythema doses

because the minimum dosage requirements are not known and in spite of all protective measures the spermatogenic function of the normal testis was destroyed

If, in addition to the primary tumor, a patient has metastases, orchidectomy is seldom performed Treatment of the testis is repeated several times at as short intervals as the skin will tolerate

Whether or not metastases can be found, the pelvic and lumbar lymphatics of the same side as the affected testis and the epigastric region are given full doses of radiation The abdomen is divided into the following six portals (1) lower abdomen anterior, (2) lower abdomen posterior, (3) midabdomen anterior, (4) mid abdomen posterior, (5) epigastrium anterior, (6) epigastrium posterior Two portals are treated daily with a skin dose of 300 roentgens to each until from 2,100 to 3,000 roentgens have been given each portal The two daily exposures are given to different regions, because cross-firing the same region often causes nausea.

When metastases are found in the lungs or mediastinum, enough anterior and posterior portals are mapped out to include all the affected regions Two portals are treated daily with a dose of from 200 to 300 roentgens to each until each portal has received approximately 2,000 roentgens Cross-firing is also to be avoided in treating the chest

The doses of radiation described will cause regressions in the great majority of metastases and will be well tolerated by the average patient However, one must be prepared to change details of the treatment at any time in order to cause the greatest possible regression of the tumor with the least discomfort to the patient

RESULTS

GROUP 1—*Primary Operable*—When first seen at the Memorial Hospital, these patients had primary testicular tumors with no evidence of metastasis Details are given in table 4

TABLE 6—Results in Group 3

| | | | |
|--|-----|-------|--------------------|
| Number of patients | | | 3 |
| Living without evidence of disease | | | 3, or 100 per cent |
| Years of Life After Irradiation of Patients Now Living | | | |
| | 6-7 | 11 12 | 17 18 |
| | 1 | 1 | 1 |
| Five Year End Results | | | |
| Number of patients | | | 3 |
| Living and well | | | 3, or 100 per cent |

TABLE 7—Results in Group 4

| | | | | | | | | | | | | | | |
|--|----------------------|-----|-----|-----|-----|-----|-----|------|-------|-------|-------|-------|-------|-------|
| Number of patients | 162 | | | | | | | | | | | | | |
| Living without evidence of disease | 42 or 26.0 per cent | | | | | | | | | | | | | |
| Dead or lost from follow up | 120 or 74.0 per cent | | | | | | | | | | | | | |
| Years of Life After Irradiation of Patients Now Living | | | | | | | | | | | | | | |
| 0-1 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 |
| 6 | 9 | 2 | 5 | 6 | 1 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| Five Year End Results | | | | | | | | | | | | | | |
| Number of patients | 104 | | | | | | | | | | | | | |
| Living and well | 20 or 19.0 per cent | | | | | | | | | | | | | |
| Dead or lost | 84 or 81.0 per cent | | | | | | | | | | | | | |

GROUP 2—*Primary Inoperable*—In addition to untreated primary tumors, these patients had inoperable metastases when first seen (table 5)

GROUP 3—*Recurrent Operable*—These patients had been operated on in other institutions When first seen at the Memorial Hospital they had local recurrences that were considered operable Nevertheless they were treated with radiation (table 6)

GROUP 4—Recurrent Inoperable—This group, which comprised 58 per cent of the entire series, was made up of patients operated on in other institutions. When first seen at the Memorial Hospital all had metastases and many, in addition, showed local recurrences (table 7).

GROUP 5—For Prophylactic Irradiation—These patients had been operated on in other institutions

TABLE 8—Results in Group 5

| | | | | | | | | | | | | |
|--|----------------------|-----|-----|-----|-----|-----|-----|------|-------|-------|-------|-------|
| Number of patients | 50 | | | | | | | | | | | |
| Living without evidence of disease | 23, or 50.0 per cent | | | | | | | | | | | |
| Dead or lost from follow up | 22, or 44.0 per cent | | | | | | | | | | | |
| Years of Life After Irradiation of Patients Now Living | | | | | | | | | | | | |
| 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 |
| 3 | 3 | 4 | 0 | 1 | 4 | 2 | 2 | 1 | 1 | 1 | | |
| Five Year End Results | | | | | | | | | | | | |
| Number of patients | 28 | | | | | | | | | | | |
| Living and well | 12 or 42.8 per cent | | | | | | | | | | | |
| Dead or lost | 16 or 57.2 per cent | | | | | | | | | | | |

TABLE 9—Five Year End Results for the Entire Series

| | |
|--------------------|----------------------|
| Number of patients | 170 |
| Living and well | 49 or 29.0 per cent |
| Dead or lost | 121 or 71.0 per cent |

They were referred to the Memorial Hospital before metastases could be found. They were treated by the usual methods of irradiation (table 8).

SUMMARY

A clinical study has been made of 292 patients with testicular teratomas. Compared with all admissions to the Memorial Hospital between 1917 and 1929, teratoma testis comprised 3.39 per cent of all tumors of the genito-urinary system, 2.09 per cent of all malignant tumors in males, and 1.008 per cent of all malignant tumors in both sexes. The patients varied in ages between 1 year and 70. The average age was 31.87 years when the first symptom was noticed and 33.5 years at the time of admission to the hospital. Forty three per cent of the patients were between 25 and 35 years of age at the time of the first symptom, while 80 per cent were less than 40. No occupation seemed to predispose men to the production of teratoma. The marital status had no etiologic significance. No importance could be associated with race, creed or color. The right testis was involved in 52.2 per cent and the left testis in 47.6 per cent, a difference of 4.6 per cent. This difference could be accounted for by the greater frequency of undescended testes on the right side. A frequency of 14.28 per cent of the tumors was noted in undescended testes, which substantiates the belief that misplaced testes are especially liable to malignant changes. Trauma played little if any part in tumor production. No constitutional diseases were found that predisposed to teratomas. Positive signs of pulmonary tuberculosis were demonstrated in fewer than 10 per cent of all patients. Operations for hernia had been performed on 12 per cent before testicular enlargement was noticed.

Ewing's theory regarding the common origin of all teratomas was substantiated by his recent review of sections of 300 tumors. There are three principal clinical groups, adult teratomas, intermediate types and embryonal tumors, the latter making up the great majority.

Primary tumors usually grow steadily and metastasize relatively early through lymphatics and veins.

Metastases grow rapidly and spread widely. The average time of survival of 114 patients who died of teratoma was twenty-four months from the onset of the first symptom.

The initial symptom of 78 per cent of the patients was a painless swelling of one testis. Symptoms caused by metastases are more clear cut and urgent. It is essential to make the correct diagnosis without delay because the disease may spread rapidly. Of thirty-nine patients seen within three months of the first symptom, 67 per cent had metastases. Every patient with a testicular swelling should have a thorough examination of the entire body. The Aschheim-Zondek test, when properly performed and correlated with the physical observations is of considerable diagnostic and prognostic value. The microscopic picture of radio-sensitive teratomas after irradiation is characterized by necrosis, hemorrhage and hyaline degeneration, probably followed by cicatrization.

Treatment of a primary tumor without metastases consists in irradiation followed by surgical removal from four to six weeks later. This devitalizes the tumor before operation and saves the spermatogenic function of the healthy testis. When metastases are present orchidectomy is seldom performed, and irradiation alone is employed in the treatment of both primary and secondary tumors.

In a series of 170 patients with teratomas, 72 per cent of which had metastasized, the five year end results after irradiation show 29 per cent of the men living and free from disease. On the basis of these results it seems reasonable to conclude that irradiation is the best treatment for testicular teratomas in all stages of the disease.

30 East Fortieth Street

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. LE COMTE AND DEAN

DR. LAWRENCE R. WHARTON, Baltimore. During the last four years I have irradiated the ordinary Grawitz hypernephroma, the cystic carcinoma, Wilms's embryoma (these were all massive tumors and the results have been very good) and, in addition a cortical tumor of the adrenal, a massive tumor in a child 2 years old with sexual precociousness. This result also was good. I agree with Dr. LeComte that irradiation is not a curative procedure and that tumors of any size should be removed transperitoneally. The tumor must be removed without rupture. An incision in the lumbar region naturally gives one the quickest access to the tumor, but unfortunately that does not answer the problem. The crux of the situation is the renal pedicle. There are three things that have been helpful to me in removing kidney tumors. The patient must lie on his back with his back extended as if for a gallbladder operation. That brings the posterior abdominal wall closer to the surface. The anesthetic must be deep enough to give abdominal relaxation. The incision must be so large that one must never feel that one is working in a hole. The peritoneum is opened, the large intestine is pushed back and the posterior abdominal wall is exposed. In taking out a tumor of the kidney I always start the mobilization of the posterior peritoneum some distance from the tumor, mobilizing it freely all the way up along the intestine, which gives complete mobilization of the large intestine and the duodenum and gets them out of the way. It also gives a clear picture of the planes of cleavage around the kidney so that one does not have to approach the kidney or the tumor first. The tissues around it are mobilized. Having cut the peritoneum, one immediately comes down on the retroperitoneal region. This covers the ureter, the spermatic vessels and the kidney pedicle. In order to find the renal vessels clearly, one can pick up the ureter and follow it up or can mobilize the region of the lower pole and slide up along the pole until the pedicle is found. The planes

of cleavage are seen in this operation as they are not in a lumbar nephrectomy. In general, I would never remove the large tumors of the kidney without preoperative irradiation, and if the tumor is as large as a lemon or an orange I would always do the transperitoneal operation.

DR. HENRY SANGREE, Philadelphia. Dr. LeComte has advanced a new clinical classification of kidney tumors: those that are radiosensitive and those that are treated surgically. My anatomic and symptomatic division has been those tumors that are chiefly cortical and those originating in the kidney pelvis. The plea for early diagnosis and early surgical and roentgenologic treatment is of paramount importance, for it is well known that on the degree of malignancy depends proportionately the completeness of cure and the duration of life. Many tumors, especially those containing embryonal constituents that are considered inoperable, are considerably decreased in size because they are radiosensitive and after irradiation become good surgical risks. In a series of fifty kidney tumors, I had a case of Wilms's tumor, considered inoperable, which was markedly decreased in size by receiving roentgen treatment, and then the tumor was removed surgically. The child lived four and one-half years. Two other patients, one receiving surgical treatment and the other roentgen therapy, survived about one year and three years respectively. These results of kidney tumors in children closely correspond with the concept of the speaker, in that the tumor was the first symptom noticed, and the mortality rate, no matter what procedure was used, was much greater than that obtained in adult life. A point to be stressed is that the extensive irradiation of a tumor with the formation of dense scar tissue surrounding it makes a subsequent nephrectomy more difficult and may often outweigh the advantage gained by irradiation. Careful cystoscopic, pyelographic and urographic investigation is of extreme value in a case of hematuria. The triad of symptoms consisting of pain, tumor and hematuria is characteristic of kidney tumors, and in my series one or all appeared in 82 per cent of cases. Pain, however, was the most prominent symptom, and hematuria occurred least often as the chief complaint. Through such educational symposiums as this an increasingly greater number of cases of kidney tumors will be seen much earlier and a careful urologic and roentgenologic examination made, and through the cooperation of the surgeon, roentgenologist and pathologist a greater number of permanent and lasting cures will be effected, for on the size, extent and degree of malignancy depends hope for earlier diagnosis and earlier surgical cure.

DR. GEORGE C. PRATHER, Boston. While it is wise to continue the campaign for earlier diagnosis in all types of malignant conditions, no doubt urologists will continue to be faced with the problem of handling moderately large kidney tumors. Surgical technic in this problem has probably attained most of the accomplishments of which it is immediately capable, especially when the transperitoneal approach is used as recently described by Wharton. Therefore, if one cannot be assured of less advanced cases and if no remarkable improvement in surgical technic is available, other factors that may be of help must be searched for. In patients with no demonstrable metastases, who seem to have a chance of cure even though the local tumor is large, one might be able to be of service who gets the tumor cut without too much surgical shock and without inducing a spread of tumor cells. Preoperative or postoperative irradiation in the past, with a single or a few massive doses, has been extremely disappointing. I believe that the so-called fractional dose method of radiation treatment should be considered and probably used before operation in all tumors of the kidney cortex. While this requires daily roentgen treatment for approximately three weeks and an interval of approximately three weeks between the completion of this treatment and nephrectomy, it does give promise of being of definite value. The reduction in the size of the tumor makes nephrectomy vastly easier for both the patient and the surgeon. This response has been evident in my two cases. There has been no interference with surgery in the nature of fibrous adhesions and no interference with muscle or skin healing. The areas of devitalized cells in the tumor may also reduce the chance of cell dissemination at the time of operation. Dr. LeComte has rightly emphasized the fact that roentgen treatment will not

kill all the tumor cells in the kidney, so that nephrectomy will continue to be necessary. The delay of six weeks before nephrectomy is not a valid objection. It will take time for all of us to collect sufficient observations on cases handled in this way and such reports will be awaited anxiously.

DR. BENJAMIN S. BARRINGER, New York. The tumor described by Dr. Dean is the one tumor of the body, in its more malignant aspects, in the embryonal type, in which external irradiation alone sometimes cures. The Aschheim-Zondek test has been puzzling because of irregular results, particularly after the testicle has been irradiated. I think that it is of great value, much as the Wassermann test is of value in the diagnosis of syphilis, but before irradiation of the testicle has taken place. I had a case in which I was puzzled as to whether the patient had a teratoma or an infectious testicle. The Aschheim-Zondek test showed a high titer of gonadotropic substance in the urine, and I think that it clinched the diagnosis. In these cases it is of value. Just of what value it is in cases in which irradiation has been done cannot be told at present. I think it should always be used as a Wassermann examination is used, as an aid and not as a final judgment in the diagnosis or prognosis.

DR. RALPH M. LECOMTE, Washington, D. C. My experience has not been the same as Dr. Sangree's with regard to preoperative irradiation of the renal neoplasm making operation more difficult. I think that it has made it easier, it controls a good bit of bleeding, the tumor is smaller and more accessible, and matters are very much facilitated. Irradiation will not cure these renal tumors. Since I have been in Atlantic City I have heard of another case in addition to that of Dr. Wharton in which radiation was used some three or four months ago and the pain and hematuria were stopped. The patient then refused operation and has had a relapse of his bleeding for more than a month. He will not be operated on but will follow through with irradiation and die.

IMMUNOTRANSFUSION AND ANTITOXIN THERAPY IN HEMOLYTIC STREPTOCOCCUS INFECTIONS

CHAMP LYONS, M.D.

BOSTON

Hemolytic streptococci produce disease by virtue of two attributes, namely, the ability of the bacteria to invade the body tissues and the capacity to form toxins. These are separate qualities requiring separate antibodies for their effective neutralization within the body. The immunologic evidence to support this conception is now sufficiently complete to warrant the therapeutic use of specific antitoxin and specific antibacterial antibody.

Bacterial invasiveness connotes the ability of an organism to invade the body and there cause local or disseminated abscesses, cellulitis or bacteremia. The capacity to invade is a primary attribute of virulence, because bacteria must be able to live and multiply in order to produce harmful toxins in the body.

The only definitely known method whereby the body can destroy gram-positive bacteria is the process of phagocytosis and intracellular digestion. Ward and Lyons¹ have recently presented a series of studies on the virulence of and the antibacterial antibody for the hemolytic streptococcus of human origin. The forms virulent for man possess distinctive cultural characteristics, develop capsules in young culture, and resist phagocytosis in blood that does not possess the type-specific antibacterial antibody, or opsonin, in the serum. Phago-

From the Surgical Laboratories of the Massachusetts General Hospital and the Department of Bacteriology and Immunology, Harvard Medical School.

¹ (a) Ward, H. K., and Lyons, Champ. *J. Exper. Med.* 61:515-530 (April) 1935. (b) Lyons, Champ and Ward, H. K. *Ibid.* 61:531-543 (April) 1935.

cytosis by human leukocytes depends on the presence of this specific opsonizing antibody. Mouse protection is also correlated with its presence.

The hemolytic streptococci are a diverse group with an unknown and presumably large number of immunologically different types. The commercially prepared polyvalent antistreptococcus antiserums² were found not to possess this specific opsonizing antibody for any one of a large number of strains tested. So far it has been possible to produce the essential antibody only by the injection of living streptococci into animals. This obviously renders commercial production impracticable at the present time. It was then observed that healthy adults possessed this particular antibody for one or more strains of hemolytic streptococci. The concentration of the antibody in the serum of such individuals was sufficiently high to permit its transfer to nonimmune bloods in detectable *in vitro* quantity if a dilution of 1:8 (1 part of immune serum and 8 parts of defibrinated blood) was used. This experience suggested that transfusion from donors possessing such an acquired immunity might be a practical clinical procedure.

Although these studies have emphasized the importance of bacterial invasiveness and the antibacterial antibody, there is no attempt to minimize the importance of the toxins in the production of the clinical manifestations of hemolytic streptococcus infections. The best known of these toxins are the erythrogenic, or rash-producing, toxins responsible for cutaneous erythema, persistently high fever and rapid pulse. There are at least two, possibly more, of the erythrogenic toxins, and one strain of streptococcus may produce varying quantities of one or both.³ Scarlet fever antitoxins and erysipelas antitoxins owe such therapeutic efficiency as they possess to their capacity to neutralize the erythrogenic toxins. Parish and Okell⁴ have demonstrated that animals immunized to the toxin and then injected intravenously with a toxin-producing strain of hemolytic streptococcus are protected from an acute toxic death but subsequently succumb to a generalized streptococcal infection. This experimental evidence is supported by the numerous clinical reports that the use of antitoxin in scarlet fever has effectively combated the toxic manifestations but has not materially altered the incidence of the invasive complications such as cervical adenitis, otitis media and bacteremia. It is not yet possible to assess properly the importance of those other toxins produced by the hemolytic streptococcus and recognized in the laboratory as fibrinolysin,⁵ hemolysin and leukocidin.

The foregoing considerations make it possible to consider hemolytic streptococcus infection in terms of septic (bacterial invasion) manifestations and toxic (erythrogenic toxemia) manifestations. This paper is a report on the technic of evaluating antibacterial immunity and the selection of donors with a high degree of acquired type-specific antibacterial immunity for purposes of immunotransfusion. A few illustrative cases are presented and discussed to emphasize the importance of treating these infections in the light of our present immunologic conceptions, that is, to administer antibacterial antibody or antitoxin or both when certain indications are present.

² The antistreptococcus serums examined were obtained from three American and one European biologic products company.

³ Hooker S. D. and Follansbee, E. M. *J. Immunol.* 27: 177-193 (Aug.) 1934.

⁴ Parish H. J. and Okell, C. C. *J. Path. & Bact.* 30: 521-528 (July) 1927.

⁵ Tillett, W. S. and Garner R. L. *J. Exper. Med.* 58: 485-502 (Oct.) 1933.

TECHNIC

The phagocytic technic described here has been previously reported.⁶

1 Determination of Antibacterial Antibody in the Blood of Patients—About 8 cc of blood is withdrawn by aseptic venipuncture and defibrinated by shaking in a flask with glass beads, 0.25 cc of blood is measured into a pyrex glass tube 5 cm long and 9 mm wide. One drop (about 0.03 cc) of a young culture of the streptococcus to be studied is added, the tube is sealed in an oxygen flame and rotated for thirty minutes at sixteen revolutions per hour at 37°C. The tube is then flamed and broken open, and one drop of the contents smeared as a blood film. This is stained with Wright's stain and examined with the oil immersion lens. A count is made of the number of intracellular streptococci contained in twenty-five polymorphonuclear leukocytes and the percentage of cells taking part in the phagocytosis is noted. A control slide is usually made from a similar preparation in infant's blood, but this control may be replaced by cultural tests after a little experience.

The bacteria for the phagocytic test are prepared by inoculating one drop of a sixteen-hour broth culture into 4 cc of 50 per cent horse serum neopeptone water^{7a} and incubating until the first clouding occurs—usually from two to four hours. The method of isolating virulent variants has been reported^{7a} and all supposedly pure cultures of such virulent variants are checked repeatedly for failure to show spontaneous agglutination when an eighteen-hour culture in 5 per cent horse serum neopeptone water is mixed with saline solution and heated to 55°C for three hours in a water bath^{7a}.

2 Selection of Donors for Immunotransfusion—The blood serum from each of the prospective donors is centrifugated free from cells. To 0.25 cc of the patient's blood is added one drop of a given donor's serum. Tubes are so prepared for each prospective donor. The bacteria are added as before and the test is repeated. The slide showing the greatest amount of phagocytosis indicates the desired donor.

3 Method of Selecting Antitoxin—In a limited series of cases it has been found that the injection of an erysipelas or scarlet fever antitoxin into the area of erythema accompanying a hemolytic streptococcus infection may produce one of two reactions. There may be a transitory blanching, which disappears as soon as the injection is stopped, or there may be a blanching that persists for from fifteen minutes to two hours. This prolonged blanching has been taken to indicate therapeutic potency, a belief that has been borne out by clinical observation. Antitoxins that do not produce this prolonged blanching have not produced any detectable clinical effect. The presence of toxemia is determined by the clinical observation of erythema, high fever and rapid pulse.

REPORT OF CASES

CASE 1—A. B. C., student nurse, reported off duty because of a painful, throbbing and reddened thumb, which she did not recall having injured. Examination revealed that there was cellulitis of the thumb without appreciable elevation of the temperature or white count. There was an erythema at the base of the thumb without any clearly defined red streaks up the arm. There were, however, definite areas of tenderness along the lymphatic pathways of the arm and it was possible to palpate the thickened lymphatics when grease was applied.

⁶ Ward and Lyons¹ Lyons and Ward¹ Ward H. K., and Enders, J. F. *J. Exper. Med.* 67: 527-547 (April) 1933.

⁷ I am indebted to Prof. Hugh K. Ward, now of Sydney, Australia for advice on the adaptation of the phagocytic technic to clinical usage.

to the skin⁸. There was a small tender axillary node. After twenty-four hours of splinting and hot moist poultices the patient's temperature had risen to 105 F and a subepithelial collection of thin pus was found at the tip of the thumb. This was opened and cultures were taken. Blood cultures were taken and later reported negative. On the morning of the third day in the hospital the entire arm was swollen and tender. The patient's blood was found to contain very little antibacterial

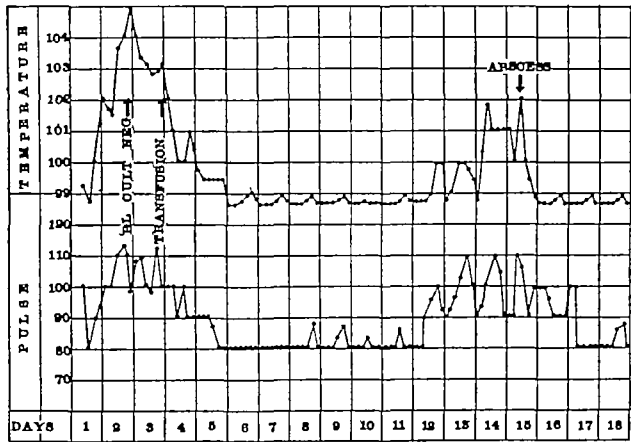


Chart 1—Temperature and pulse in case 1

antibody to the streptococcus from her thumb and that afternoon she was given an immunotransfusion from a donor selected by the method described. Within twelve hours the temperature and pulse rate began to fall, the swelling and tenderness of the arm diminished, anorexia and nausea disappeared and the patient volunteered that there was subjective improvement. After transfusion the blood was again tested and found to have an increased phagocytic efficiency (table 1). On the eleventh day of the disease the axillary node became tender and larger and progressed rapidly to fluctuation. This was drained and the pus yielded a pure culture of hemolytic streptococci. The later convalescence was uneventful. Two months after the patient's discharge her blood was again tested and found to have no antibacterial antibody demonstrable by the phagocytic technic. This would appear to be an instance of passive immunization in the strictest sense of the term. The antibody values of the blood are recorded in table 1.

TABLE 1—Antibody Values of Blood in Case 1

| Day of Disease | Phagocytosis* |
|----------------------------|---------------|
| Third (before transfusion) | 50-28% |
| Fourth (after transfusion) | 100-84% |
| Eleventh | 104-60% |
| Two months later | 6-8% |

* There is no absolute index or maximal value that can be used as a standard to measure the antibacterial antibody. All observations are to some degree relative to previous observations except in those instances in which there is no phagocytic effect. In this and subsequent tables the observed phagocytic values are recorded as 50-28 per cent to state that fifty streptococci were phagocytized by 28 per cent of twenty-five polymorphonuclear leukocytes counted in series.

This case was diagnosed as subepithelial abscess and cellulitis of the thumb, lymphangitis, and axillary adenitis without toxemia. It has not been determined whether the absence of toxemia was attributable to an acquired immunity of the patient or a lack of toxinogenicity on the part of the streptococcus.

Certain very definite conclusions may be drawn from this case.

1 Lymphangitis may exist in the absence of "red streaks."

8 It is my belief that the diagnosis of lymphangitis may be made in the absence of the familiar "red streaks" by the demonstration of tenderness along lymphatic pathways and induration of the lymphatics. This lymphatic and perilymphatic thickening is more easily appreciated if grease is applied to the skin to reduce tactile friction. The erythema of the red streak is blanched when specific antitoxin is injected.

2 Antibacterial immunity may be passively transferred by immunotransfusion with apparent clinical benefit.

3 Hemolytic streptococci may survive and produce suppuration in lymph nodes even in the presence of a presumably effective blood stream immunity.

CASE 2—Z. McB., a farmer, aged 43, had a plastic operation on the tendons of his hand two years after his original infection. On the sixth postoperative day there was an increase in the local induration and a few stitches were removed. On the seventh day there were red streaks up the arm without axillary tenderness. More stitches were removed and hot moist poultices were applied to the arm. On the evening of the eighth day

TABLE 2—Antibody Values of Blood in Case 2

| Time of Test | Phagocytosis |
|--------------------|--------------|
| Onset of infection | 56-32% |
| After recovery | 207-60% |

* See footnote of table 1.

the patient developed a typical scarlatiniform rash over his entire body. The lymphatic pathways of the arm were tender and indurated and there was a visible streak of cutaneous erythema. The erythematous skin was injected with normal horse serum and erysipelas antitoxin but only the latter produced persistent blanching. The patient's blood was found to be actively phagocytic for the hemolytic streptococcus obtained in pure culture from the operative wound. Blood cultures were taken and subsequently reported negative. High fever, rapid pulse and cutaneous erythema persisted. This case was interpreted as one of local wound sepsis with toxemia in the presence of a relatively high blood stream immunity to the bacteria. The deficient antibody to be supplied was clearly the antitoxin. This was done, with immediate fall in temperature and pulse rate and blanching of the rash.

The case is presented to illustrate two apparent facts:

1 Lymphangitis may exist in the presence of demonstrable antibacterial antibodies in the blood stream.

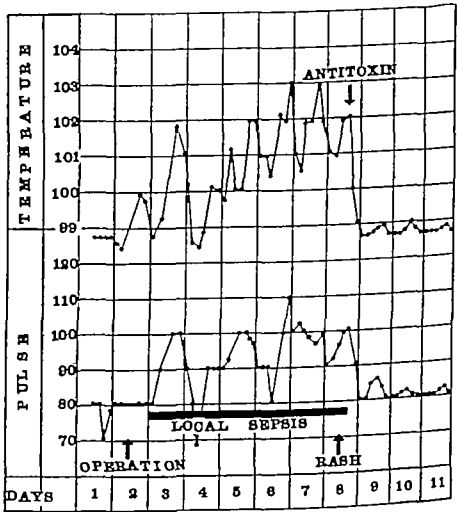


Chart 2—Clinical course in case 2

2 Toxemia may occur in the presence of demonstrable antibacterial antibodies in the blood serum, and it is in these cases that antitoxin alone produces clinically striking results.

CASE 3—R. Z., a woman aged 27, had a plastic operation performed on her hip. A persistent sinus developed in the operative scar. This subsequently became infected with hemolytic streptococci and the patient developed a rapidly spreading erysipelas of the lower half of the body. The blood contained

little antibacterial antibody and the presence of the rash of erysipelas indicated a lack of antitoxin immunity. An erysipelas antitoxin was selected on the basis of the blanching test and given intravenously. This blanching the rash, reduced the pulse rate, and changed the temperature curve from one of persistent elevation to one of the "picket fence" type. It was impossible to find a donor with an acquired immunity to this streptococcus and it was necessary to depend on local treatment of the

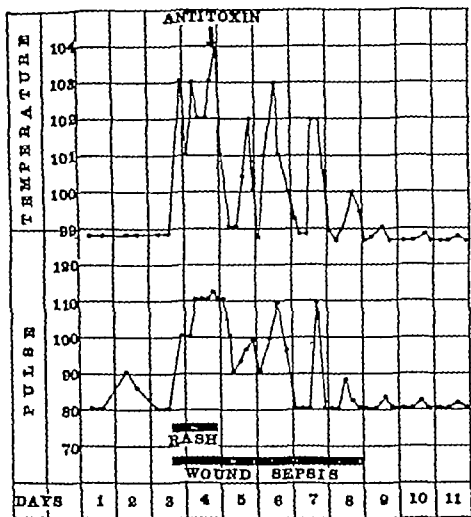


Chart 3—Clinical course in case 3

wound. This case illustrates the persistence of infection following the control of the toxemic manifestations alone. After recovery the patient's blood was found to contain antibacterial antibody (table 2).

This case illustrates two observations:

- 1. Antitoxin controls only the toxemic manifestations of the infection.
- 2. Recovery is correlated with the appearance of antibacterial antibody if it has not been previously supplied by immunotransfusion.

TABLE 3—Phagocytic Values of Eight Patients Before and After Immunotransfusion

| Patient | Lesion | Phagocytosis* | |
|---------|-----------------------------|--------------------|-------------------|
| | | Before Transfusion | After Transfusion |
| Ber | Pneumonia and empyema | 64-82% | 800-90% |
| Cad | Cellulitis and lymphangitis | 50-28% | 100-84% |
| Cen | Chronic phlegdenic ulcer | 50-38% | 275-92% |
| Cos | Postbacteremic abscess | 103-44% | 147-84% |
| Goo | Postbacteremic abscess | 263-84% | 808-100% |
| Had | Bacteremia | 14-16% | 120-50% |
| One | Bacteremia | 30-28% | 9-52% |
| Ria | Bacteremia | 4-4% | 202-96% |

* See footnote of table 1

Table 3 presents the observed phagocytic values of the blood of eight patients before and after immunotransfusion. There are as yet no quantitative standards to establish what constitutes a protective level of immunity, but in every case there has been an increase in the phagocytic activity of the patient's blood after transfusion. The clinical application of this method of passive antibacterial immunization is readily apparent.

COMMENT

An attempt has been made to differentiate between the septic (invasive) and toxic components of the clinical picture observed in hemolytic streptococcus infections. Clinical records have been presented to illustrate the manner in which specific cases may be evaluated.

1. *Septic Element of the Infection*—Under this heading are grouped the signs and symptom complex resulting from bacterial proliferation and dissemination within the body.

- 1. Local cellulitis or abscess
- 2. Lymphangitis
- 3. Lymph node inflammation and suppuration
- 4. Swinging "picket fence" temperature.
- 5. Chills
- 6. Positive blood culture.

It has been previously reported¹ that the hemolytic streptococcus owes its invasiveness to its capacity to resist phagocytosis and that the essential type-specific antibacterial antibody is an opsonin capable of inciting specific phagocytosis. Recovery from infection has been correlated with the appearance of this antibody. A method has been described which permits the determination of a patient's serum opsonin content and the selection of a donor with a high degree of specific acquired antibacterial immunity. These tests require about four hours after the streptococcus has once been isolated in pure culture. It is proposed to use immunotransfusion to increase the bactericidal power of the body at the time of infection.

2. *Toxemic Element of the Infection*—The toxemia of the early infection is characterized by signs and symptoms that are attributable to the dissemination of the erythrogenic toxin.

- 1. Cutaneous erythema
- 2. Sustained elevation of the temperature
- 3. Persistently rapid pulse.

Therapeutically potent antitoxins for most cases may be selected by the Schultz-Charlton test of specific blanching. It is to be emphasized that antitoxin should be expected to be effective only in blanching the rash and lowering the temperature and pulse rate.

3. *General Considerations of Immune Serum Therapy*—The clinical course of early, rapidly progressing hemolytic streptococcus infection appears to have been favorably modified by the use of antitoxin for toxemia and immunotransfusion for the passive transfer of antibacterial immunity when necessary.

The evaluation of the antibacterial immunity of infected patients and the experience with immunotransfusions has disclosed one fact very clearly. Hemolytic streptococci may persist in local lesions and in lymphatic pathways even though the blood serum contains a high concentration of antibacterial antibody. Immunotransfusion has been found to clear the blood stream of patients with bacteremia for varying periods of time but it has not prevented the later development of abscesses, particularly in the afferent lymphatic channels. Antibacterial therapy appears to halt the general spread of the invading organism and in its perfected form may simplify the problem of streptococcus invasion by making it primarily one of the management of localized areas of infection.

CONCLUSIONS

- 1. Hemolytic streptococcus infections are of three clinical types: septic, toxemic, or both septic and toxemic.
- 2. The septic manifestations of the rapidly progressive infection are best combated by transfusion from donors having a high specific antibacterial immunity.
- 3. The toxemic manifestations are best combated by antitoxin plus antibacterial antibody.

THE PREVALENCE OF MILD BRUCELLA ABORTUS INFECTIONS

REPORT OF A CASE

W BEECHER SCOVILLE, MD

NEW YORK

In the last few years the profession has become increasingly conscious of the prevalence of undulant fever. But I do not think it has yet realized how common the subclinical and ambulatory forms may be. I hazard the opinion that many such cases may masquerade under the guise of infectious arthritis, nervous exhaustion, undiscoverable focal infection, and chronic neutropenia.

PREVALENCE

Until recent years the specific agglutination tests have been considered the *sine qua non* for the presence of brucella infection. It is now known that negative agglutinins may be of little significance. From 5 to 16 per cent of the cases proved by cultures, skin tests and animal inoculation give negative agglutinins, and a low titer must be seriously considered in the diagnosis.¹ In addition, an astonishingly large number of persons give positive agglutinations with or without clinical symptoms. In 25 per cent of 1,000 routine Wassermann tests, low titer agglutinins for undulant fever were found and 0.3 per cent yielded a titer above 1:40.² Twenty per cent of the cattle in the United States are infected with *Brucella abortus*, and 40 per cent of these excrete organisms in their milk.³ In 100 tests of epileptic patients drinking infected milk, 41 per cent yielded agglutinations of 1:10 or over and 45 per cent gave positive skin tests.⁴ A careful checking of the physical examinations and temperatures showed that 22 per cent were mild ambulatory cases. In Alice Evans's⁵ famous case lasting six years there were months of disability without a rise in temperature above 99.5 F and other months of normal temperature.

Furthermore, the *Brucella suis* type can account for an epidemic from cow's milk,⁶ and there are different strains of *Brucella abortus* varying in virulence, some of which are not even pathogenic for man.⁷ Therefore, except for *suis* and certain virulent *abortus* strains, milk-borne *Brucella* infections are common but may be very mild or run a subclinical course, and in only a few cases are they typical of what one commonly calls undulant fever.

CLINICAL COURSE

Giordano⁸ analyzed thirty-five cases. The chief symptoms were fatigue, anorexia, low fever, headache,

muscular weakness and joint pains. The onset followed an infection of the upper respiratory tract or bronchitis. The course may be for weeks or years. The fever was not undulant but generally septic with remissions, occipital or cervical headaches were common. Back ache and arthralgia of the small joints without redness or swelling were often the only symptoms of the disease. Eye aches, asthenia, irritability, depression and insomnia were common, constipation and gallbladder pains were frequent. The spleen is only rarely enlarged in the *abortus* type. The blood showed a leukopenia and a relative neutropenia. Simpson⁹ summarizes ninety cases. The average duration was four months. Five per cent gave negative agglutinins. (He used animal inoculation, agglutination and skin tests for diagnosis.) The onset was insidious with an afternoon temperature, headache, and muscle and joint pains. Eighty-nine per cent had only one febrile attack early in the disease. Asthenia was the commonest symptom, the spleen was palpable in a third of the cases. Harris¹⁰ has just studied, with many interesting observations, fifty-one cases occurring in general practice in a rural New York district. The majority of the cases were ambulatory, of long duration, and remissive in type. The fever was low grade, muscle and joint pains were the chief complaint, often suggesting a neurosis, there was a striking pallor without secondary anemia, he observed a leukopenia, a neutropenia and frequent alveolar abscesses.

DIAGNOSIS

Complement fixation tests run parallel to the agglutinations.¹¹ Blood cultures, requiring special mediums, are generally negative in the *abortus* type.⁵ There is much dispute as to the value of low titers in the agglutination tests, 1:50 or 1:100 is considered diagnostic in most state laboratories,¹² but low titers of 1:10 or over are now being stressed in the diagnosis of the ambulatory cases.¹³ The skin test should be a routine diagnostic procedure in all cases showing negative agglutinins. There are three types: the broth filtrate form has been dispensed with because of the possibility of a pseudopositive reaction,¹⁴ a saline suspension of the killed organism gives accurate results but may cause a severe reaction and is always followed by a positive agglutination test thereafter.¹⁵ Nucleoprotein fractions in saline, or fat-free alcohol extracts, of the *brucella* organism are now used by the majority, they probably give a much less general reaction, with equal specificity, and cause positive agglutinins thereafter in only 9 per cent of those tested.¹⁶ The

From the New York Hospital

1 Simpson⁹ Burnet M E. New Diagnostic Procedure of Undulant Fever. *Compt. rend. Acad. Sci.* 174:421 (1922)

2 Jordan C F. Infection in Epidemiology of Undulant Fever in General Population and Selected Groups in Iowa. *J. Infect. Dis.* 48:526 (June) 1931. McAlpin J G and Mickle F L. Bacterium *Abortus* Infection in Man. Results of Agglutination Test Applied to More Than Ten Thousand Human Sera. *Am. J. Pub. Health* 18:609-613 (May) 1928.

3 Traum J. Animal Infections with Bacteria of Genus *Brucella* and Their Relation to Undulant Fever of Man. *Am. J. Pub. Health* 20:935-942 (Sept. 30) 1930.

4 Johns E P, Campbell F J H and Tennant C S. Serological and Clinical Investigations of Individuals Exposed to *Brucella Abortus*. *Canad. M. A. J.* 27:490-497 (Nov.) 1932.

5 Evans Alice. Chronic Brucellosis. *J. A. M. A.* 103:665-667 (Sept. 1) 1934.

6 Beattie C P and Rice R M. Undulant Fever Due to *Brucella* of Porcine Type—*Brucella suis*. Report of Milk Borne Epidemic. *J. A. M. A.* 102:1670-1674 (May 19) 1934.

7 Huddleson I F. Differentiation of Species of Genus *Brucella*, *Am. J. Pub. Health* 21:491-498 (May) 1931.

8 Giordano A S and Sensesch, R L. *Brucella Abortus* Infection in Man. Clinical Analysis of Thirty Five Cases. *J. Lab. & Clin. Med.* 15:421-436 (Feb.) 1930.

9 Simpson W M. Undulant Fever. Brucellosis. Clinico-pathologic Study of Ninety Cases Occurring in and about Dayton Ohio. *Ann. Int. Med.* 4:238 (Sept.) 1930.

10 Harris H J. Difficulties in Diagnosis of Undulant Fever. Preliminary Report of Fifty-One Cases. *New York State J. Med.* 34:1017-1021 (Dec. 1) 1934.

11 Carpenter C M and Boak R A. The Laboratory Diagnosis of Undulant Fever. *J. Lab. & Clin. Med.* 15:437 (Feb.) 1930. Sasano, K T, Caldwell D and Medlar E M. Complement Fixation and Agglutination Tests for *Brucella Abortus* Infection. *J. Infect. Dis.* 48:576-580 (June) 1931.

12 Henry B S and Traum, J. Comparison of Factors Influencing Agglutination Test for *Brucella Abortus*. *J. Infect. Dis.* 47:367-379 (Nov.) 1930. Gentry¹⁰

13 Simpson⁹ Harris¹⁰

14 Giordano A S. *Brucella Abortus* Infection in Man. Intradermal Reaction as Aid in Diagnosis. *J. A. M. A.* 93:1957-1958 (Dec. 21) 1929.

15 Giordano¹⁴ Favorite G A and Culp C F. Intradermal Test in Undulant Fever. Reactions in Healthy and Infected Individuals. *J. Lab. & Clin. Med.* 20:522-526 (Feb.) 1935.

16 Simpson⁹ Huddleson I F, Johnson H W, and Haman E E. Study of Opsonocytaphag Power of Blood and Allergic Skin Reactions in *Brucella* Infection and Immunity in Man. *Am. J. Pub. Health* 23:917-929 (Sept.) 1933. Henry and Traum¹² Giordano and Sensesch⁸ Levin William. Intradermal Test as Aid in Diagnosis of Undulant Fever. *J. Lab. & Clin. Med.* 16:275-281 (Dec.) 1930.

opsonocytaphagic test, as developed by Huddleson, is interesting in determining whether the patient is susceptible, is infected or has recovered. It is an index of the specific phagocytic power of the patient's polymorphonuclears for the brucella organism and the results are clear cut.¹⁷

TREATMENT

Good hygiene, as in tuberculosis, with rest, ultraviolet radiation and a high caloric-vitamin diet, continues the accepted treatment by those inclined to conservatism. "Brucellin," a culture filtrate developed by Huddleson, and *Brucella abortus* vaccine are coming more and more into favor. They are given subcutaneously in increasing doses at three day intervals starting with a minimal dose, with the expectancy of a generalized fever reaction. Excellent results have been obtained in early, and less frequently in chronic, cases.¹⁸ Foreign protein injections are of questionable value.⁹ Pyronine, thionin, mercurochrome and neosphenamine have their lone advocates.¹⁹ To date horse serum sensitized by a culture filtrate has not been successful.²⁰

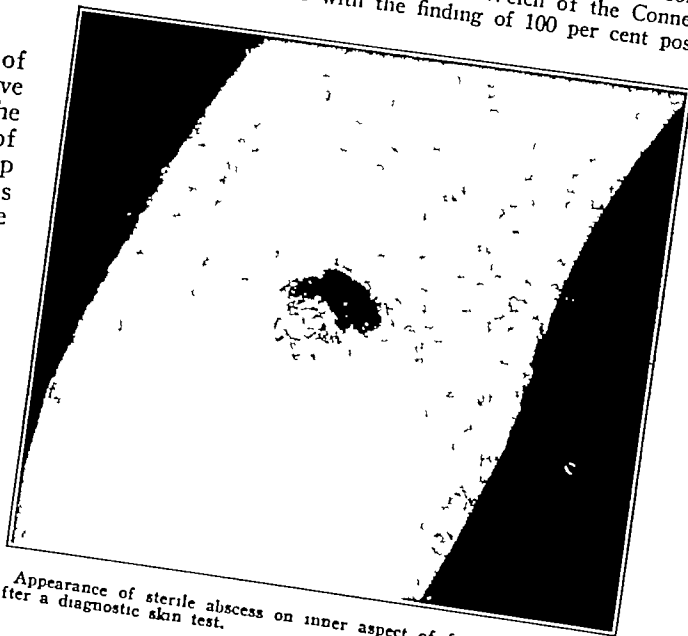
REPORT OF CASE

I cite my own case of a mild ambulatory form of *Brucella abortus* infection without fever and with negative specific agglutinins. It is interesting to note the absence of those symptoms considered diagnostic of undulant fever. An extremely thorough work-up ruled out alternative organic diagnoses, but at various times it was diagnosed a psychoneurosis, undiscoverable focus of infection, and chronic neutropenic state.

A physician, aged 28, in the summer of 1934, after drinking raw cows milk and eating goat cheese in Norway, developed periodic exacerbations of malaise, easy fatigability and generalized muscle and joint pains. The onset was insidious, following heavy exercise and an infection of the upper respiratory tract. These exacerbations lasted from four to five days and continued for six months. At first they were almost constant, but gradually increasing periods of well being intervened. Fever was consistently absent, with 97 forenoon and 98.6 afternoon temperature readings. The physical examination was negative but weight loss, constipation and marked pallor without secondary anemia were present. For six months good hygiene with rest, ultraviolet rays and a high caloric-vitamin diet was practiced. After this the patient commenced work again in New York and was without symptoms except when overfatigued. If this condition occurred, an exacerbation followed, consisting chiefly of muscle and joint arthralgias, especially wherever a previously strained joint existed, but without local redness or swelling. These attacks at present are becoming increasingly infrequent.

Exhaustive clinical, laboratory and roentgen studies were made. The past medical history was negative, including the sinuses, teeth and the respiratory gastro-intestinal and genitourinary systems, there was no history of rheumatic fever or arthritis, sinus teeth and chest roentgenograms were negative. Examination of the eyes, nose and throat was negative (the tonsils and adenoids being out), gallbladder and gastro-intestinal series, prostatic smear, urine, and throat culture were normal. Blood showed normal erythrocytes and hemoglobin but a constant neutropenia at first running 39 per cent neutrophils of

5,200 leukocytes, and slowly improving to 50 per cent neutrophils of 6,500 leukocytes. The smear was normal. The blood sedimentation rate averaged 5 mm in the first hour and 13 mm. in the second hour. The basal metabolic rate was -15. Blood cultures and serum agglutinations were negative for typhoid, paratyphoid and undulant fever. At the end of five months a skin test according to Giordano's technic using 0.1 cc. of *Brucella abortus* antigen of a saline killed suspension was given intradermally at the University Hospital, Philadelphia. Within forty-eight hours there followed a very marked local and general reaction with a fever of 101 F, malaise, arthralgia, slight lymphangitis, and locally a wheal measuring 2 inches by 1 inch, raised and red. This progressed into a sterile abscess which necessitated incision and drainage three weeks later. The vaccine was rechecked for sterility and a culture of the abscess was taken and found to be sterile except for a nonpathogenic diphtheroid organism. For the duration of the abscess the previous symptoms were duplicated in an intensified form with an afternoon rise in temperature of from 1 to 2 degrees and following incision and drainage a complete cessation of all symptoms for one week. Three weeks after this Huddleson's opsonocytaphagic test was done by Dr. Welch of the Connecticut State Laboratories with the finding of 100 per cent posi-



Appearance of sterile abscess on inner aspect of forearm three weeks after a diagnostic skin test.

tive phagocytosis, indicating high resistance to the *Brucella* organism. (The importance of this test is lessened because of the previous abscess formation with possible sensitization.) It is interesting to note that at this time the blood gave a slightly positive heterophil test for infectious mononucleosis, as is frequently found in undulant fever cases.²¹

COMMENT

Here was a case of mild ambulatory *Brucella* infection with normal or nearly normal temperature and negative agglutination titers, but markedly positive skin and phagocytic tests, with enough subjective symptoms to cause incapacitation, yet with little enough objective signs to cause a diagnosis to be made of neurasthenia, chronic neutropenia, and undiscoverable focal infection. This paper suggests one more substitute for that diagnostic wastebasket "neurasthenia and abortus contributing to the etiology of obscure arthritic conditions." It invites conjecture as to *Brucella* suspected cases of *Brucella* infection showing negative specific agglutinins.

²¹ Dr. H. L. Welch, Bureau of Laboratories, Connecticut State Department of Health, personal communication to the author, January 1935.

¹⁷ Huddleson, Johnson and Haman. ¹⁸ Meyer, K. F. and others. *Brucella Phagocytic Index Test*. Soc. Exper. Biol. & Med. 32: 284-286 (Nov.) 1934.
¹⁸ Simpson. ¹⁹ Huddleson, Johnson and Haman. ²⁰ Giordano and Sensen. *Vaccination Treatment of Alcaligenes Abortus Infection in Man*. Deutsche med. Wchnschr. 59: 913-916 (June 16) 1933.
¹⁹ O'Neil, A. E. Preliminary note on Treatment of Undulant Fever with Detoxified Alcaligenes Abortus Vaccine and with Antiserum. Ohio State M. J. 29: 436-439 (July 1) 1933.
²⁰ Henry, Christian. Chapter 25, p. 801. Huddleson, I. F., Johnson, H. W. and Haman, E. E. Report of Bacteriologist Annual Report of Diseases of Veterinary Science, Michigan State College, June 30, 1932, p. 42.
²¹ Personal communication of I. W. Huddleson to Dr. Paul Reznikoff, New York, May 1935.

SUMMARY

Mild ambulatory cases of *Brucella abortus* infection are common. Because of the lack of objective signs and the presence of malaise, asthenia, and muscle and joint pains, they are often included in the category of neurotic, arthritic or cryptogenic infections. Laboratory diagnosis should include skin and possible phagocytic tests as well as agglutinations and cultures. The case cited clinically resembled a mild *Brucella abortus* infection. Exhaustive search failed to reveal any focus of infection. The fever and agglutinations were negative, but the skin and phagocytic tests were markedly positive.

525 East Sixty-Eighth Street.

OUTBREAK OF UNDULANT FEVER DUE TO BRUCELLA SUIIS

BENJAMIN G. HORNING, M.D.

HARTFORD, CONN.

An outbreak of undulant fever occurred in an institution maintained for elderly persons in Connecticut during 1934-1935. There were fourteen clinical cases with three deaths. Blood cultures from two of the fatal cases were positive for *Brucella suis*. This organism was also isolated in pure culture from an abscess in the soft tissue overlying the sternum of a third patient. Epidemiologic, clinical and laboratory evidence supports the view that most of the *Brucella* infection of man in this section is due to the bovine strain¹. This was the first outbreak reported in Connecticut due to the porcine organism.

The population of the institution consisted of 305 inmates and eighty-one employees. The case of a 13 year old boy was included because he used milk from

TABLE 1—Population of Institution

| Age | Inmates | | Employees | | Totals* | | Grand Totals | |
|--------|---------|--------------|-----------|--------------|---------|--------------|--------------|----------|
| | Males | Fe- males | Males | Fe- males | Males | Fe- males | Num- ber | Per Cent |
| 0-9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10-19 | 0 | 0 | 1 | 3 | 1 | 3 | 4 | 1.04 |
| 20-29 | 1 | 0 | 7 | 26 | 8 | 26 | 34 | 8.81 |
| 30-39 | 1 | 0 | 4 | 18 | 5 | 18 | 23 | 5.96 |
| 40-49 | 3 | 4 | 4 | 9 | 7 | 13 | 20 | 5.18 |
| 50-59 | 13 | 9 | 2 | 7 | 15 | 10 | 31 | 8.03 |
| 60-69 | 37 | 33 | 0 | 0 | 37 | 33 | 75 | 19.43 |
| 70-79 | 43 | 72 | 0 | 0 | 43 | 72 | 120 | 31.09 |
| 80-89 | 31 | 41 | 0 | 0 | 31 | 41 | 72 | 18.65 |
| 90+ | 1 | 6 | 0 | 0 | 1 | 6 | 7 | 1.81 |
| Totals | 135 | 170 | 18 | 63 | 153 | 233 | 388 | 100.00 |

the dairy herd maintained by the institution. Table 1 gives the population by age group and sex, table 2 gives data pertaining to each individual case.

Table 3 analyzes the population, cases and case rate by age groups. Table 4 compares the percentage of population and cases under 50 years and over 50 years in the institution and in Connecticut as a whole.

The age distribution of the patients ranged from 13 to 82 years. Approximately 64 per cent of the patients were over 50 years of age. A study of 202 cases of undulant fever in this state shows that only

18 per cent of the patients were over 50 years of age. This apparent difference is explained by the fact that 79 per cent of the institution's population were over 50 years of age, while it is estimated that only about 20 per cent of the population in the state as a whole are over 50 years of age. The attack rate for the total population of the institution was 3.63 per hundred. The attack rate for males was 3.9 and for females 3.4. The outbreak was too small for an analysis to be of statistical significance.

The symptomatology of the cases did not differ from observations recorded elsewhere for this disease. The onset was usually gradual and could not be determined with accuracy. In several cases one or more months elapsed after the last exposure to the source of infection before symptoms were noted. When questioned, the patient would often say that he had tired easily and had lacked strength for some time. Usually the onset was dated from the day of the first chill. Frequently, an early symptom was moderately severe headache, which might be either frontal or occipital. The temperature curve in all cases was of the undulating type. The maximum elevation of temperature usually occurred after 4 p. m. and was followed by a drop of from 2 to 3 degrees, with the maximum remission after 4 a. m. The outstanding symptoms were ease of fatigue, loss of strength, headache, fever, chills and perspiration. Four of the patients had symptoms referable to the upper respiratory tract early in their illness, and eight complained of mild gastric distress. The duration of the illness is given as from the time of onset until the day discharged from the hospital or date of death. It varied from four to forty weeks. Eleven of the patients recovered, three died.

Complications have occurred in only one case thus far, of a woman, aged 25. The onset was in April, and during June phlebitis of the left lower extremity developed. Later there was an abscess in the soft tissue overlying the sternum, which was excised. *Brucella suis* was isolated in pure culture from the abscess. Two elderly patients had chronic arthritis, these symptoms remained about the same during their illness.

Subclinical brucella infection frequently occurs. It had been hoped that blood could be secured from all the inmates in order to obtain some index as to the amount of subclinical infection. This was not possible. Blood was obtained from forty persons without symptoms. Fourteen, or 35 per cent, agglutinated Huddleson's antigen in low dilutions.

Case 4 was instructive. The onset of symptoms was early in August. A clinical diagnosis of undulant fever was made on August 7. Specimens of blood examined on August 7 and August 14 failed to agglutinate Huddleson's antigen. A specimen on August 21 partially agglutinated the antigen through dilutions of 1:200. A specimen on August 29 agglutinated the antigen through dilutions of 1:6,000. The patient had clinical symptoms of undulant fever for at least three weeks before evidence of the disease could be detected serologically. This case emphasizes the importance of repeated laboratory examinations in the presence of suggestive symptoms.

Epidemiologic investigation revealed two possible sources of infection. The institution maintained its own dairy herd and the milk was consumed raw. All the patients had been exposed to the milk as a food. The institution also kept swine. The hogs were butchered every two weeks during the winter, from November 1

From the Bureau of Preventable Diseases, State of Connecticut Department of Health, Millard Knowlton, M.D., director.

1 Gilman, H. L. and Mills, C. H. Cornell Vet. 23:150 (April) 1933. Plastridge, W. N., and McAlpine, J. G. *Brucella Abortus* of Bovine, Porcine and Equine Origin, J. Infect. Dis. 49:127-134 (Aug.) 1931. Connecticut State Department of Health. Unpublished data.

2 Connecticut State Department of Health. Unpublished data.

to March 1. The pork was not kept in cold storage, as only enough was butchered each time to supply meat for two meals.

None of the patients had been near the swine and they had had no contact with the uncooked pork. Thirteen of the patients had eaten the cooked pork, one had not. Careful inquiry revealed the fact that all meat, especially pork, at this institution is thoroughly cooked. No evidence could be found to indicate that the disease had been contracted through contact with the swine or pork.

In the first case the onset apparently occurred in April 1934. It was diagnosed and reported on June 30, 1934. An immediate investigation was made by the state department of health. Raw milk from the institution herd was the only source of infection found. Following the usual procedure, information obtained was given to the state dairy and food commissioner.

The herd belonging to the institution consisted of thirty-six cows and one bull. Blood specimens from the entire herd were drawn under the direction of the state commission of domestic animals and examined at the Storrs Experiment Station. The blood from two of the cows was positive for brucella infection and the blood from a third was suggestive. The positive cows had been in the herd thirty and fourteen months, the third cow had been with the herd fourteen months. Pasteurization of the milk was begun Aug. 1, 1935. Unfortunately, the infected cows were disposed of before the milk could be examined for *Brucella* organisms.

It is unusual in Connecticut to have more than one case of undulant fever on a milk route. Early in this

TABLE 2—Undulant Fever at Connecticut Institution

| No. | Age | Sex | Onset, 1934 | Agglutination Titer | Culture | Tem- pera- ture Range | Dura- tion F Weeks | Occu- pa- tion | Outcome |
|-----|-----|-----|---------------|---------------------|-------------------|--------------------------------|--------------------------|----------------------|-----------|
| 1 | 20 | ♀ | April | 1:6,000 | Abscess B suis | 102 | 30 | Waitress | Recovered |
| 2 | 63 | ♀ | July | 1:6,000 | | 104 | 14 | Inmate | Recovered |
| 3 | 50 | ♂ | July | 1:6,000 | Blood neg | 101.5 | 20 | Inmate | Recovered |
| 4 | 82 | ♀ | Before Aug | 1:6,000 | | 104.2 | 40 | Inmate | Died |
| 5 | 68 | ♀ | Aug | 1:6,000 | | 103.8 | 12 | Inmate | Recovered |
| 6 | 76 | ♀ | Aug | 1:6,000 | Blood B suis | 103.5 | 8 | Inmate | Died |
| 7 | 60 | ♂ | Aug | 1:6,000 | Blood B suis | 102.4 | 14 | Inmate | Died |
| 8 | 20 | ♀ | Sept. | 1:2,000 | Blood neg | 102 | 12 | Clerk | Recovered |
| 9 | 76 | ♂ | Sept | 1:6,000 | | 101.4 | 18 | Inmate | Recovered |
| 10 | 20 | ♀ | Sept | 1:2,000 | | 99 | 12 | Waitress | Recovered |
| 11 | 71 | ♂ | Sept | 1:6,000 | Blood neg | 102.8 | 14 | Inmate | Recovered |
| 12 | 23 | ♀ | Sept | 1:6,000 | Blood neg | 102 | 12 | Nurse | Recovered |
| 13 | 13 | ♂ | Nov | 1:6,000 | | 102 | 5 | Schoolboy | Recovered |
| 14 | 76 | ♂ | Dec | 1:6,000 | | 102.2 | 14 | Inmate | Recovered |

outbreak *Brucella suis* was suspected as the etiologic agent, first because of multiple cases, and secondly because of the severity of the clinical symptoms. This suspicion was verified by the recovery of *Brucella suis* from the blood stream of two of the patients and from an abscess in the soft tissue overlying the sternum in another patient. As stated previously, the pork was thoroughly cooked, there had been no contact with the swine and one patient had never eaten the pork. Also,

no hogs had been butchered later than March 1, 1934, and these cases all apparently had their onset of symptoms after April 1, 1934.

Considerable evidence has accumulated to show that cattle may become infected with *Brucella suis*, both experimentally and in nature.³ Epidemiologic evidence suggested that this outbreak was due to drinking raw

TABLE 3—Population, Cases and Case Rate by Age Groups

| Age | Population | | Cases | | Case Rate Per 100 Population |
|--------|------------|----------|--------|----------|------------------------------------|
| | Number | Per Cent | Number | Per Cent | |
| 0-9 | 0 | 0.00 | 0 | 0.00 | 0.0 |
| 10-19 | 4 | 1.04 | 1 | 7.14 | 25.0 |
| 20-29 | 34 | 8.81 | 4 | 28.57 | 11.8 |
| 30-39 | 23 | 5.96 | 0 | 0.00 | 0.0 |
| 40-49 | 20 | 5.18 | 0 | 0.00 | 0.0 |
| 50-59 | 31 | 8.03 | 0 | 0.00 | 0.0 |
| 60-69 | 75 | 19.43 | 3 | 21.43 | 4.0 |
| 70-79 | 120 | 31.09 | 4 | 28.57 | 3.0 |
| 80-89 | 72 | 18.65 | 2 | 14.29 | 2.8 |
| 90+ | 7 | 1.81 | 0 | 0.00 | 0.0 |
| Totals | 388 | 100.00 | 14 | 100.00 | 3.63 |

TABLE 4—Population and Patients Under and Over 50 Years

| | Institution | | Connecticut | |
|----------------|------------------------|-------------------|------------------------|-------------------|
| | Per Cent Population | Per Cent Cases | Per Cent Population | Per Cent Cases |
| Under 50 years | 20.98 | 85.71 | 80 | 81.68 |
| Over 50 years | 79.02 | 64.29 | 20 | 18.32 |

milk from cattle infected with the swine variety of *Brucella*. The hogs' pens at this institution were located near the dairy barns. On their way to pasture the cows loitered around the pens and ate grass. It is possible that this was the method of infection. On the other hand, one of the cows might have been infected before joining the herd. Blood was drawn from thirty-two of the swine. Nine were positive, seven suggestive and sixteen negative for *Brucella* infection. The strain was not identified from the swine. It is assumed, however, that it was *Brucella suis*, as *Brucella abortus* has not been reported as occurring in swine.

SUMMARY

1. An outbreak of undulant fever with fourteen cases and three deaths occurred in a home for elderly persons.

2. Raw milk from the institution herd was the only source of infection found.

3. The herd consisted of thirty-six cows and one bull. The blood from two cows was positive and from another suggestive for *Brucella* infection.

4. *Brucella suis* was isolated from the blood of two patients and from an abscess of a third patient.

5. Blood was drawn from thirty-two swine kept by the institution. Nine were positive and seven suggestive for *Brucella* infection.

6. The cattle had opportunity for natural infection from the swine.

7. Epidemiologic evidence suggests that the outbreak was due to *Brucella suis* received from drinking raw milk from cows infected with *Brucella suis* from swine.

3. Beattie, C. P. and Rice, R. M. Undulant Fever Due to *Brucella* of the Porcine Type—*Brucella suis*. J. A. M. A. 102: 1670-1674 (May 19) 1934. Gilbert, Ruth and Coleman, Marion B. Undulant Fever in and Milks. J. Infect. Dis. 54: 305-312 (May-June) 1934. Gilman, Huddleson, I. F. The Differentiation of the Species of the Genus *Brucella*. Undulant Fever Symposium. Tr. A. P. H. A. 1929, pp. 18-24. Plaistrige and McAlpine.

FOOD POISONING FROM ICE CREAM
ON SHIPS

J C GEIGER, MD

A B CROWLEY

AND

J P GRAY, MD

SAN FRANCISCO

The heterogeneous factors usually involved in outbreaks of "food poisoning," more especially the vehicular food, the numbers of persons affected, the delayed reporting of the incident to the health authorities and, particularly, the causative bacteria responsible, constitute a problem that too frequently does not lend itself to easy solution. Much of the information obtained has to be discarded since it is irrelevant to the solution of the problem by accepted epidemiologic technique. As an added complication the problem is not infrequently confused by the lack of agreement between data obtained by direct epidemiologic methods and data obtained by bacteriologic study, or specimens of the incriminated food and of feces and urine from the affected individuals even may not be available for bacteriologic investigation.

Ice cream, as a possible and potential vehicle for the causative factor in food poisoning, offers particular difficulty since there is no uniformity or standardization of procedures and practices. In some instances for example, the mix is heated to the boiling temperature, while in others pasteurization temperatures may be used and the time interval may be left to the judgment of the operator with the result that this factor has wide variability. In other instances the freezing process is applied without any attempt at minimizing the bacterial growth by the application of heat to the mix beforehand. It is a recognized public health fact that ice cream mixtures containing milk, which in itself may show a high bacterial colony count and which may be contaminated through possible mishandling and human contact, nuts and fruits, the whole being mixed in utensils not adequately cleaned or sterilized, offers ample and rich opportunities to enhance bacterial metabolism to the end that the ingestion of the product may cause food poisoning, and the probability of this ultimate conclusion from such a series of events is markedly increased if the mixtures are allowed to stand, even for short periods of time, at room temperatures.

The occurrence of at least four outbreaks of food poisoning, epidemiologically traceable to ice cream containing nuts, occurring aboard an ocean liner sailing from the port of San Francisco, led to an investigation of the circumstances surrounding the manufacture, storage, handling and serving of ice cream aboard the vessel. A brief report covering the outbreaks and their background and of the study made subsequently may be of interest.

In the first of the four outbreaks referred to, fifteen passengers and an indeterminate number of the members of the crew were affected Jan 8, 1935. The illness, in which the symptoms and signs presented included nausea, vomiting, abdominal distress (cramps), diarrhea and in some instances numbness of the extremities, had an incubation period of from three to eight hours and the duration was usually less than twenty-four hours. The food common to all those affected was chestnut ice cream, made aboard ship of

milk, cream, eggs and canned chestnuts in syrup. Samples of ice cream and chestnuts were not available for laboratory study at the end of the voyage, but examinations were made of milk, cream and water. The laboratory reported bacteria colony counts per cubic centimeter for the various specimens: milk, 23,000, cream, 210,000, water, 45, at 37 C and 65, at room temperature with *B. coli* absent in all tubes.

An inspection of the ship's galley, made on arrival in San Francisco, resulted in the correction of a few irregularities in food-handling practice, but no irregular circumstance detected was of sufficient magnitude to account for the occurrence of food poisoning. In the conduct of the study, the examination of the silver polish used, for cyanide, and of the insecticides used, as for fluorides, were unproductive of relevant information.

In the other outbreaks, on April 4 or 5, 7 and 17, thirty-eight people were affected, under circumstances very similar to those described in the first outbreak, with the common food factor in hazelnut ice cream. After the second outbreak of April 4 or 5, definite orders were given that the nut-containing ice cream must not be served, but these orders were not obeyed, and hazelnut ice cream was again served on two occasions, April 7 and 17, with approximately thirty people affected. Laboratory studies were made on specimens of hazelnut ice cream obtained at the end of the voyage from the ship surgeon and directly from the hardening room. All three specimens showed bacteria colony counts in excess of 5,000,000 per cubic centimeter of the original material, with profuse growth of a non-hemolytic staphylococcus (*aureus*) and not a few colonies of the coli-aerogenes group, but in no instance was there evidence of the presence of members of the paratyphosus group of organisms and likewise, no evidence of chemical poisons. Specimens of excreta from the individuals affected were not available for bacteriologic study.

On the basis of these incidents it was believed advisable to place a trained observer aboard the ship so that observations might be carried out under the conditions actually existing during the voyage. The observations made and the information obtained from various sources, including members of the crew, revealed the facts that the utensils used in the manufacture of ice cream were not properly cleaned and sterilized and that ample opportunity was afforded for contamination of the ice cream before, during and after freezing and during the holding of the finished product. It was found that preparation of the mix and its freezing were carried on in the galley itself rather than in a separate room equipped for the purpose, with the result that other employees had contact with the utensils and the food product. Not infrequently employees were found to have the habit of dipping their fingers into the mix, thereby tasting and contaminating the product. On one occasion during the voyage, ice cream was prepared in the freezer before the latter was even washed or cleaned (not to mention sterilization), following the previous freezing, all on account of a lack of fixation of responsibility for cleaning and sterilization of the freezer and other ice cream manufacturing equipment. In fact, no steam hose connections were available for proper cleaning and sterilization of equipment.

An investigation of the quality of the ingredients used and of the conditions under which they were stored revealed some interesting possibilities also, for example, nuts were stored in a room in which the dry

bulb temperature frequently reached the level of 98 F and in which the mean temperature approximated 80 F throughout the voyage. In spite of the fact that relatively high prices were being paid, examination showed that the stock on hand was of inferior grade.

The laboratory studies offer confirmatory evidence of the importance of these circumstances. Two specimens of the hazelnut ice cream made aboard ship, one submitted through the ship surgeon, the other obtained by an inspector at the end of the voyage, showed excessively high bacteria colony counts (54 and 51 million per cubic centimeter respectively) with *Staphylococcus aureus* the predominant organism (about 50 per cent). Cultures for *B. typhosus*, *B. paratyphosus* (alpha and beta) and *B. dysenteriae* were negative in both instances. The specimens of shoreside ice cream (shipped at the beginning of the trip) taken during the voyage, when the observer-inspector was aboard, showed lower bacteria colony counts, sample from hardening room (four days at sea), 3,500 colonies per cubic centimeter, sample after portions had been served from the supply, in the galley, 2,100 colonies per cubic centimeter, sample taken on return to San Francisco (originally shipped aboard at the beginning of the trip), 2,400 colonies per cubic centimeter. Specimens of feces from the food handlers involved were examined for *B. typhosus*, *B. paratyphosus* (alpha and beta), *B. dysenteriae* and other members of the paratyphosus-enteritidis group but were found to be negative in all instances. Specimens of drinking water were found to have high bacteria colony counts (500 and 750 at 37 F and 1,000 and 500 at room temperatures), but these were negative for *B. coli*. None of the food poisoning (paratyphosus-enteritidis) group of organisms or staphylococci were found in the hazelnuts themselves or in the latter samples of ice cream, and the silver polish reacted negatively to the chemical tests for cyanide.

As a result of the investigations and observations described, certain of these conditions were corrected, the manufacture of ice cream aboard ship was discontinued, and the ice cream served to the passengers and crew was limited to that purchased and shipped aboard from inspected and controlled manufacturing plants located in ports of call ("shoreside" sources). Since the institution of these changes, there have been no further outbreaks of food poisoning aboard this vessel.

COMMENT

Although food poisoning has been traced to many different types of foods, milk and milk food products because of their inherent character certainly offer very favorable possibilities as the vehicular foods transferring the causative factors of food poisoning and certain transmissible diseases from their sources in man or animal to man. Even though it has been definitely proved on a number of occasions that many of the responsible organisms in these disorders withstand low temperatures and remain viable and capable of producing the disorder under ordinary circumstances, apparently there are still those who believe that freezing destroys microscopic organisms and renders the frozen food product medium sterile, innocuous and safe for the consumer. It is obvious however, to those who are interested in food poisoning and its prevention, and to those who are interested in food preservation, that the solution of the problem so far as ice cream and other milk food products are involved, lies in the same

methods that have been used to solve the problem in fluid market milk and in other foods and food products, namely, standard quality ingredients, cleanliness, appropriate sterilized equipment, proper use of heat (at 142-145 F or higher temperatures for at least thirty minutes), sterile containers and refrigeration as indicated or required. It must be realized by health officials as well as by the industry itself that low temperatures, as within the range of ordinary refrigeration and even very low temperatures in many instances, can be relied on only as inhibiting growth and multiplication of bacteria and certainly not as a method to destroy the organism present. It is essential, therefore, that every safeguard be utilized in the manufacture of ice cream and all other milk food products, with the same rigorous supervision and high standards that obtain in the production processing and marketing of high grade pasteurized market milk. Health officials will do well constantly to emphasize the importance of proper methods and the establishment of adequate safeguards.

SUMMARY

1 Interesting outbreaks of food poisoning, epidemiologically traceable to nut ice cream, occurred rather frequently aboard a large ocean liner sailing from San Francisco.

2 Laboratory studies revealed excessively high bacteria colony counts in specimens of the epidemiologically incriminated nut ice cream. The cultures showed *Staphylococcus aureus*, which may have been the causative factor, to be the predominant organism.

3 Investigations made by an observer-inspector, aboard for a regular trip, revealed many possibilities of contamination of the milk food product, which was made aboard ship.

4 The correction of certain undesirable practices and the use of ice cream from shoreside sources have resulted in no recurrence of food poisoning aboard this vessel.

CONCLUSION

Since the lower temperatures used in ordinary refrigeration and ice cream freezing have only growth-inhibiting and not bacteria-destroying power, and since milk and milk food products, because of their inherent character, offer excellent bacteria culture medium possibilities, ice cream and other milk food products should be subject to rigorous standards in production, processing and marketing, with the provision of every reasonable safeguard to the public health.

101 Grove Street.

The Four Hundred Eggs—All the eggs which are to be used throughout the woman's reproductive life are present in her ovaries at birth, and even before this. Not only that but nature gives her an enormous reserve supply, for each ovary starts out in life with a supply of something like 100,000 of these ova, far more than can ever be used for purposes of possible conception. As a matter of fact, since only one egg is ordinarily given off during each menstrual cycle and since the average duration of the woman's menstruating life is about thirty-two or thirty-three years not much more than 400 eggs are actually extruded from the ovary and are thus exposed to the possibility of fertilization by the male germ cell and only one of five hundred ova achieves admission to this aristocratic four hundred. With the male, nature is even more prodigal in her factor of reserve, for each ejaculation of the male semen is the amount of semen given off by the male in intercourse, contains about 226,000,000 spermatozoa. And yet only one of these is necessary for fertilization.—Novak, Emil. *The Woman Asks the Doctor*, Baltimore, Williams and Wilkins Company, 1935.

Clinical Notes, Suggestions and New Instruments

EMPHYSEMA OF THE CECUM

LEO L. HARDT, M.D., CHICAGO

There have been relatively few cases of intestinal emphysema reported in the literature. Those which have been reported have been associated either with an acute inflammatory process as a result of infection of the intestinal tract, or with injury or some congenital abnormality in conjunction with an inflammatory process. Mackenzie¹ in 1894 reported a case of emphysema of the jejunum. Numerous vesicles of air were found in the submucous tissue and the whole mucous membrane was congested. Hemorrhage into the intestine had taken place and no cause could be found. The patient had acute and chronic pulmonary tuberculosis, but there were no signs either of ulceration or of tubercles in the intestine. Nitch and Shattock² in 1919 reported two such cases. These authors attempted without success to place the etiology of their cases and made extensive studies. The possibilities suggested and ruled out by them were as follows: (1) bacterial infection by *B. aerogenes*, *B. oedematis*, *B. oedematis-maligni* or *B. coli*, (2) gas secretion from the tissue lymph, (3) osmosis, and (4) trauma, either mechanical injury or ulcer or perforation. Twyman³ in 1919 reported a case of emphysema of the cecum and believed it to be due either to the obstruction that he found or to bacterial infection. Lohr⁴ in 1929 reported a case and showed it to be the result of a secondary gas edema of the stomach and bowel due to an infection with the paranthrax bacillus.

REPORT OF CASE

F. C., a man, aged 29, a mechanic, admitted to the hospital, Jan. 23, 1934, had consulted a physician one year before because of stomach trouble, the complaint being gas and bloating in the upper quadrant of the abdomen, with moderate distress. He stated that he was always hungry and could eat any time of the day. At that time the condition was diagnosed as ulcer of the stomach. The distress continued to occur practically every day for a year. Alkaline powders were prescribed, which seemed to relieve the pain and hunger sensations; the symptoms recurring whenever the powders were discontinued. After several months the symptoms in the upper part of the abdomen disappeared, but the patient still had gas and flatulence.

Three days before admission to the hospital he was seized with a severe attack of pain in the right lower quadrant, which after a few hours radiated all over the abdomen and caused him to double up. There was no nausea and no vomiting. He had chills and thought he had a fever on the first day. The pain and rigidity continued up to the time of admission to the hospital. The patient was well developed and apparently in acute distress. The physical observations were negative except for marked tenderness and rigidity of the right lower quadrant of the abdomen. The blood pressure was 120 systolic, 70 diastolic. The temperature was not elevated. Examination of the urine showed a specific gravity of 1.030, an alkaline reaction, and no albumin, sugar, pus or casts. The blood count showed a hemoglobin of 80 per cent, 4,800,000 erythrocytes and 13,100 leukocytes. The differential blood smear revealed 22 per cent lymphocytes, 4 per cent large monocytes, 5 per cent transitionals, 64 per cent neutrophils and 4 per cent eosinophils.

Operation was performed by Dr. R. B. Malcolm. A right rectus incision was made, the anterior sheath was opened, the muscle was displaced laterally, and the posterior sheath was opened. When the peritoneal cavity was entered, no fluid was found. Exploration showed a thickening of the medial and lateral areas of the ascending colon, commencing just distal to the ileocecal valve and extending distally for a distance of about 10 cm., beginning and ending abruptly. On palpation

this thickened area was crepitant and felt exactly like lung tissue. There was no inflammation except a slight hyperemia, and no peritonitis. The appendix was normal. Exploration of other abdominal contents revealed nothing abnormal. Appendectomy was done. There was no odor and no evidence of perforation. There were simply air vesicles of the subserosa. Longitudinal incisions were made on each side, and the air escaped. Two lymph nodes were removed for culture. The air seemed not to invade the subserosa on the anterior surface of the colon but remained in the mesenteric portion, apparently coming from behind and partially encircling the bowel.

Twenty months later, in August 1935, the patient returned for further observation. The only complaint at this time was occasional slight constipation and a moderate degree of flatulence. There were no other gastro-intestinal symptoms. Physical examination was negative. The systolic pressure was 108, diastolic 68. A blood count showed hemoglobin, 90 per cent, erythrocytes, 4,890,000, leukocytes, 8,400, lymphocytes, 25 per cent, large monocytes, 6 per cent, transitional cells, 1 per cent, neutrophils, 66 per cent, eosinophils, 2 per cent.

COMMENT

I have been unable to find in the literature any cases in which the physical signs and symptoms pointed toward an acute inflammatory process and in which a true emphysema, before death, was found in the absence of injury, congenital abnormality or noticeable infection. In this case a pinpoint rupture of the intestine was considered at the time of operation, but nothing was found that substantiated this view. There had been no history of the taking of enemas. Cultures from the sites of the air blebs were negative. As stated, the appendix was removed and found to be normal. A careful examination of the stomach and gallbladder was made, in view of the early suspicion of possible ulcer or gallbladder infection, and there was no evidence of either past or present stomach or gallbladder disease. The question of a vasomotor disturbance based on allergy was also considered. A careful inquiry was made as to any previous history of allergy, with negative results.

CONCLUSIONS

This case we believe to be a true emphysema of the cecum, uncomplicated by inflammation, trauma or congenital abnormality, and without any known etiology.

30 North Michigan Avenue

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
HOWARD A. CARTER, Secretary

COPELAND REFRACTASCOPE ACCEPTABLE

Manufacturer: Bausch & Lomb Optical Company, Rochester, N. Y. Distributors: Riggs Optical Company, Chicago.

The Copeland Refractascope is a modified, self-luminous retinoscope, in which is incorporated a special electric bulb operating on 2½ volts, constructed with a special filament, bent to produce a linear source of light. According to the firm, the filament does not bend when used but may bend if the instrument is accidentally jarred or falls to the floor. The lamp socket into which this bulb is



Copeland Refractascope

fitted is incorporated in a movable bakelite support. It can be rotated through a 180 degree arc and moved to or from the condensing lens in the head of the instrument.

On the outside of the handle of the instrument is a sleeve, connected directly to the bakelite lamp support by means of a screw which places the control of the rotation and movement of the lamp by the operator in a convenient position.

The movement of the source of light to or from the condensing lens changes the angularity of the rays reflected from the mirror in the instrument, causing them to become divergent and convergent. Thus, when the sleeve is at the bottom the rays are most convergent and cross at a point approximately

¹ Mackenzie, H. W. Tr. Path. Soc. Lond. 46: 61, 1894.
² Nitch, C. A., and Shattock, S. G. Proc. Roy. Soc. Med. 12: 46 (Sec. Path.) 1919.
³ Twyman, E. D. Emphysema of the Cecum. J. A. M. A. 73: 1840 (Dec. 13) 1919.
⁴ Lohr, W. Arch. f. klin. Chir. 155: 188, 1929.

9 inches in front of the instrument, producing a "concave mirror effect" The sleeve at its highest position causes the rays to be divergent, which produces a "plano mirror effect"

The Copeland Refractoscope was tested by an investigator for the Council He reported the instrument as satisfactory

In view of the foregoing, the Council on Physical Therapy voted to include the Copeland Refractoscope in its list of accepted devices

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

CERTAIN MANUFACTURERS HAVE SENT ADVERTISEMENTS TO THE MEDICAL PROFESSION SUGGESTING THE USE OF VITAMIN A IN THE PREVENTION OF AND EVEN IN THE TREATMENT OF RENAL CALCULI SINCE THIS ISSUE HAS BEEN RAISED UNNECESSARILY, THE COUNCIL FELT IT ADVISABLE TO PUBLISH A REPORT ON VITAMIN A AND URINARY LITHIASIS THE FOLLOWING REPORT HAS THEREFORE BEEN AUTHORIZED BY THE COUNCIL FOR PUBLICATION

PAUL NICHOLAS LEECH, Secretary

VITAMIN A AND URINARY LITHIASIS

Urinary calculi were known in remote antiquity and have been studied as to cause and treatment throughout many centuries¹ Most of the possible or likely etiologic factors have been given serious consideration and support by different investigators at various times Many lectures reviews and treatises² on this phase of the subject have been published Among the most important of the factors suggested are heredity³ climate,⁴ restriction of the amount of water and its composition (the indirect influence of soil),⁵ food,⁶ infection, both focal, with remote effects in the urinary system,⁷ and direct, local,⁸ other noxious agents,⁹ and urinary stasis¹⁰ Some of these views are hardly susceptible of proof¹¹ and other views have been definitely opposed, as, for example, the view that focal infection¹² or local infection¹³ is the primary agent or even that they play any part in the process¹⁴ The problem must therefore still be considered unsolved That some abnormality of diet, for example, excess of mineral elements, improper

balance of its constituents, especially the inorganic elements, presence in it of some special stone producing substance or other conditions affecting the diet might be the cause has been considered for a long time The idea, however, that a specific deficiency of the diet might be the cause is relatively recent and is the direct outcome of observations and experiments made on animals¹⁵

Since the first mention,¹⁶ in 1910, of the occurrence of urinary calculi in the rat, much work has been done to determine their origin and mode of formation in this animal, partly at least in the hope that any knowledge so gained might throw light on the cause and mechanism of the formation of stones in man Osborne and Mendel¹⁶ in 1917 were the first to draw attention to the probability that a deficiency of a vitamin may be, at least indirectly, responsible for the formation of phosphatic urinary calculi in the rat Their experimental diets were very deficient in what are now known as fat soluble vitamins A, D and E, by no means rich in the water soluble vitamins B and G, and entirely deficient in water soluble vitamin C At that time they suggested that the calculi might be due, indirectly, to the effect of a deficiency of the fat soluble group of vitamins Although many of the investigators who have repeated and confirmed this work have narrowed the effect down to vitamin A,¹⁷ this conclusion was unjustified, because the diets which they used were the same as or similar to those used by Osborne and Mendel, or in certain instances even more deficient in some respects Some investigators who have used the same or similar diets have been cautious and have concluded that deficiency of vitamin A probably played a part in the production but was not the exclusive cause of the calculi which they observed¹⁸ Bliss, Livermore and Prather¹⁹ are the only investigators whose experiments justify their conclusion that deficiency of vitamin A alone can induce the development of urinary calculi in rats For the rat, their diet was deficient in vitamin A alone But other investigators who have also used a diet deficient only in vitamin A have not observed the formation of calculi, and, what is more important in this connection, investigators²⁰ have observed the formation of calculi in rats fed on diets that contained vitamin A in abundance These investigators concluded that a general deficiency of the diet, with an absolute or relative excess of calcium, as compared with phosphorus, was the cause of the formation of the calculi which they found McCarrison²¹ found that the addition of vitamin A or of vitamins A and D to a diet deficient in vitamins A and D, with a disturbed balance of calcium and phosphorus, reduced the incidence of calculi but did not prevent their formation He concluded that the administration of vitamin A played an important but not an exclusive part in the prevention of calculi composed of calcium carbonate and calcium hydroxide, which otherwise occurred with great frequency in rats fed on the diet mentioned

That deficiency of vitamins A and D together is a sufficient condition for the initiation of the changes that lead to the formation of urinary calculi in the rat can be accepted on the basis of the work done by those investigators who claim that the effect is due to deficiency of vitamin A alone,²² whose diet, however, was deficient in both vitamins A and D This conclusion can also be accepted by those who do not commit them-

- 1 Joly, J S Stone and Calculous Disease of the Urinary Organs St Louis, C V Mosby Company, 1929 p 83 Joly⁸ Ravich A Critical Study of Ureteral Calculi J Urol 29 171 (Feb) 1933 Shattock S G A Prehistoric or Predynastic Egyptian Calculus Tr Path Soc London 56:275 1905
- 2 Bliss, Livermore and Prather¹⁹ Counsellor, V S and Priestley J T The Present Conception of Renal Lithiasis, J A M A 104:1309 (April 13) 1933 Fowler H A Stone in the Urinary Tract M Ann District of Columbia 4 93 (April) 1935 Funk Casimir The Vitamins Baltimore Williams and Wilkins Company 1922 p 393 Joly¹ Joly⁸ Keyser¹² Keyser L D Recurrent Urolithiasis Etiologic Factors and Clinical Management, J A M A 104 1299 (April 13) 1935 Ravich¹ Wesson M B Urinary Calculi Cause and Treatment California & West Med 42 258 (April) 1935
- 3 Friedenwald Julius and Ruhrah John Diet in Health and Disease Philadelphia W B Saunders Company 1925
- 4 McCarrison Robert The Causation of Stone in India Brit M J 1 1009 (June 13) 1931
- 5 McCarrison¹ Rost F Ueber Blasen und Nierensteine im Tierreich, Arch f klin Chir 162:701 1930
- 6 Friedenwald and Ruhrah³ Joly J S The Etiology of Stone The Ramon Guiteras Lecture, J Urol 32:541 (Dec) 1934 McCollum and Simmons²³
- 7 Keyser¹² Rosenow E C, and Meisser J G Nephritis and Urinary Calculi After the Experimental Production of Chronic Foci of Infection J A M A 78:266 (Jan 28) 1922 The Production of Urinary Calculi by the Devitalization and Infection of Teeth in Dogs with Streptococci from Cases of Nephrolithiasis Arch Int Med 31 807 (June) 1923 Rosenow E C The Production of Urinary Calculi by the Devitalization and Infection of Teeth in Dogs with Streptococci from Cases of Nephrolithiasis Summary of Results Illinois M J 40 28 (Jan) 1926
- 8 Bliss Livermore and Prather¹⁹ Hager and Magath²⁴ Osborne Mendel and Ferry¹⁶ The Rat and Its Relation to the Public Health¹⁶ Ravich¹ Wells H G Chemical Pathology Philadelphia, W B Saunders Company 1925 p 512
- 9 McCarrison Robert The Experimental Production of Stone in the Bladder Brit M J 1:717 (April 16) 1927 McCarrison²¹ McCarrison²¹
- 10 Bliss Livermore and Prather¹⁹ Keyser¹² Ravich¹ Squier J B Calculous Diseases of the Kidneys and Ureters in Lewis Dean Practice of Surgery Hagerstown Md W F Prior Company, vol 8 chapter 10
- 11 Keyser, L D The Etiology of Urinary Lithiasis an Experimental Study Arch Surg 61:525 (March) 1923
- 12 Hrynishak T Experimentelle Untersuchungen zur Harnsteinbildung Ztschr f urol Chir 40 211 1935 Keyser¹²
- 13 Keyser¹² Perlman S and Weber W Experimentelle Erzeugung von Blasensteinen durch Avitaminose Deutsche med Wchnschr 54 1045 (June 22) 1928 Weitere Erfahrungen mit der experimentellen Blasenstein Erzeugung durch Avitaminose Munchen med Wchnschr 54:2167 (Dec 21) 1930 Ravich¹ VanLeersum E C Vitamin A Deficiency and Urolithiasis J Biol Chem 76:137 (Jan) 1928
- 14 Hrynishak¹² Rost⁸

- 15 Osborne, T B, Mendel L B, and Ferry, Edna L The Incidence of Phosphatic Urinary Calculi in Rats Fed on Experimental Rations J A M A 69:32 (July 7) 1917
- 16 The Rat and Its Relation to the Public Health, Bull 63 U S P H & M H S 1910
- 17 The references given in footnote 22 together with VanLeersum E C Vitamin A Deficiency and Urolithiasis Brit M J 2 873 (Nov. 12) 1927 VanLeersum¹⁵
- 18 Counsellor and Priestley² Funk² Gasparjan, A, and Owtschinnikow N Zur Frage der Steinbildung im Organismus (Avitaminose und Steinbildung), Ztschr f urol Chir 30:365, 1930 McCarrison²¹ McCarrison Robert The Experimental Prevention of Stone in the Bladder in Rats Brit M J 2 159 (July 30) 1927 McCarrison²¹ McCarrison²¹ McCarrison²¹ Perlman and Weber¹³
- 19 Bliss A R, Jr Livermore G R, and Prather E O Jr The Relation of Vitamin A and Vitamin D to Urinary Calculus Formation J Urol 30:639 (Dec.) 1933
- 20 Hager B H and Magath J B The Formation of Vesical Calculi J A M A 90 266 (Jan 28) 1928 McCollum and Simmons²³
- 21 McCarrison²¹ McCarrison and Ranganathan²¹ McCarrison²¹ McCarrison Robert Researches on Stone, Indian J M Res. 19:51 (July) 1931
- 22 Fujiwaki²² Higgins C C The Experimental Production of Urinary Calculi J Urol 29 157 (Feb) 1933 The Experimental Production of Urinary Calculi in Rats Journal Lancet 53 522 (Oct 1) 1933, id Urol & Cutan Rev 38 33 (Jan) 1934 Higgins²⁴ Higgins²⁴ Sakai²⁴

selves²³ definitely to the idea that vitamin A alone is responsible but whose work shows that there was a deficiency of both A and D. Since the addition of phosphate (to balance the calcium and phosphorus in McCarrison's²⁴ diet) failed to prevent stone formation, although it reduced the incidence, this also shows that the diet which was now deficient only in vitamins A and D induced the formation of calculi. However, McCarrison²⁵ hypothesized the existence of some additional unknown stone producing agent in the cereal used in the diet. Practically all investigators are agreed that calculi do not occur in rats or dogs fed on a diet in which the inorganic elements are balanced and which contains an adequate amount of vitamins A and D.

That deficiency of vitamin A alone is a sufficient condition for the formation of urinary calculi in the rat cannot be accepted without reservation. To establish this beyond question will require further experiments like those of Bliss, Livermore and Prather,¹⁰ in which rats and other animals are fed synthetic diets complete in all respects except for a deficiency of vitamin A. The small amount of experimental work done in this connection on the dog²⁶ has served to show merely that dietetic deficiency may play a part in the formation of calculi.

That dietetic deficiency plays a part has been suspected and suggested for man also but, in this country at least, the existence of a serious deficiency of vitamin A in the diet of human beings with urinary stones has certainly not been demonstrated. It would be much easier to make a case for deficiency of vitamin D. The mere fact that urinary calculi are much less common, especially in children, than they were a century ago does not prove that vitamin A deficiency was the cause and that the more abundant use of sources of this vitamin has accounted for the decreased incidence. There have been so many changes in diet and general hygiene in that period that it is hardly fair to single out vitamin A without more adequate evidence. The report of Padua²⁷ pointing out the occurrence of cystolithiasis among Filipinos merely shows the probable effect of general dietetic deficiency and not that of one single vitamin. As a matter of fact he attempted to show some correlation with the occurrence of beriberi, which is due to a deficiency of vitamin B. All this is both pertinent and important, because it indicates the danger of applying to man what is not yet fully established for animals.

That deficiency of vitamin A is a necessary condition for the formation of stones in the urinary tract of the rat is certainly not established. Indeed, there is good evidence to show that this is not the case. By giving excess of magnesium carbonate, Watchorn²⁸ succeeded in inducing the formation of urinary calculi composed of calcium and magnesium phosphate in rats fed on a diet that contained an abundance of vitamin A and was otherwise complete in all respects for this animal. McCarrison,²⁹ Ranganathan³⁰ and Grossmann³¹ also showed that calculi occurred in rats fed on a diet containing vitamin A or vitamins A and D, with an excess of calcium and insufficient phosphorus. McCollum, Simmonds and Becker³² observed urinary calculi in many rats fed on diets containing an abundance of vitamins A and D and an excess of calcium. Ebstein and Nicolaier³³ and Keyser³⁴ found urinary calculi in rabbits

and dogs fed on a supposedly normal diet to which was added oxamid, a crystalloid foreign to the urinary tract. Since they did not give details of the composition of the diet they used, there is no assurance that it contained an adequate amount of vitamins A and D.

If deficiency of one or more vitamins is responsible for the building of stones in the urinary tract of the rat, how does it produce this effect? Many of those who believe that deficiency of vitamin A alone can do it, and those who believe it plays a part, have suggested two main methods, which may act in combination. 1 The calculi form because deficiency of vitamin A in the rat results in keratinization and desquamation of the lining epithelium of the urinary tract, a process that supplies the organic nidus for the deposit of crystalloids.³⁵ 2 The calculi form because deficiency of vitamin A in the diet results in strong urinary alkalization³⁶ either as a primary effect or secondary to infection.

It may be that this alkalization affects the physicochemical condition, chiefly the balance of protective colloids, of the urine, which, it is claimed,³⁷ favors precipitation of the crystalloids. This mechanism of precipitation of urinary crystalloids is denied by some investigators.³⁸ It should be obvious at once that all this applies only to the possible origin of stones that form in an alkaline medium and that it cannot apply to those that do not form in such a medium. It pertains to the types of stone most commonly found in the urinary system of the rat. Practically all investigators³⁹ are agreed that these are composed mainly of phosphates and carbonates of calcium and magnesium, when the diet is deficient only in vitamins A and D, and of calcium carbonate and calcium hydroxide, when, in addition, the diet contains an excess of calcium. Since urinary calculi in man, especially renal, are by no means always of this composition or formed in an alkaline medium, this again indicates the danger of applying to man what has been learned from a study of the rat. This is particularly true in consideration of the possible medical management of urinary, especially renal, lithiasis.

Up to the present time, only Saiki,⁴⁰ Fujimaki⁴¹ and Higgins⁴² have claimed the effective solution of experimental urinary calculi in the rat and dog²⁶ by the administration of a source of vitamin A. Actually they administered a source of vitamins A and D to produce the solution of the calculi, and the experimental diets which they used for the production of the stones were deficient in both of these vitamins. Higgins⁴² has also claimed success in the solution of urinary calculi in man. This has been done by the administration of a diet with an acid ash and a liberal amount of several sources of vitamins A and D. According to Higgins, partial or complete solution of renal calculi has been accomplished in twenty-one cases. Partial solution of calculi by medical means would accomplish but little, except perhaps in the case of impacted ureteral or pelvic stones, the passage of which might thereby be aided. Since Higgins did not try the effect of the acid ash diet alone or of each of the vitamins alone, it is difficult to draw any conclusions from these experiments on man about the value of

23 Osborne, Mendel and Ferry¹⁵ Perlman and Weber¹⁸ VanLeersum¹⁷

24 McCarrison, Robert. On the Causation of Stone in India. *Lancet* 1:1413 (June 27) 1931. McCarrison, Robert, and Ranganathan S. On the Relative Importance of Vitamin A, Radiostoleum, Cod Liver Oil and Sodium Phosphate in Preventing the Formation of Calcium Stones in the Urinary Tract of Albino Rats. *Indian J. M. Res.* 19:55 (July) 1931.

25 McCarrison, Robert. McCarrison²⁵ McCarrison²⁵.
26 Fujimaki Y. Formation of Urinary and Bile Duct Calculi in Animals Fed on Experimental Rations. *Japan M. World* 6:29 (Feb 15) 1926.

27 Padua R. G. Cystolithiasis Among Filipinos in Association with Dietetic Deficiency. *Philippine J. Sc.* 14:481 (May) 1919.

28 Watchorn E. The Effects of Excessive Intake of Magnesium by the Rat, Especially Concerning the Factors Relating to the Production of Renal Calculi. *J. Hyg.* 32:156 (April) 1932.

29 McCarrison, Robert. Further Researches on Stone. *Indian J. M. Res.* 18:903 (Jan) 1931.

30 Ranganathan S. Researches on Stone. Studies in Calcium and Phosphorus Metabolism. *Indian J. M. Res.* 19:1 (July) 1931.

31 Grossmann V. Beiträge zur Pathologie und Klinik der Harnstein krankheit. *Ztschr. f. urol. Chir.* 35:264 1933.

32 McCollum E. C. and Simmonds Nina. The Newer Knowledge of Nutrition ed. 4. New York, Macmillan Company 1929.

33 Ebstein W. and Nicolaier. Ueber die experimentelle Erzeugung von Harnsteinen. *Verhandl. d. Kongr. f. inn. Med. Wiesbaden* 1889 p. 268.

34 Keyser L. D. The Mechanism of the Formation of Urinary Calculi. *Ann. Surg.* 77:210 (Feb) 1923.

35 Higgins⁴² Hryntshak¹² McCarrison⁴
36 Higgins C. C. The Experimental Production of Urinary Calculi.²⁵

Higgins⁴² Osborne, Mendel and Ferry¹⁵ Ravich¹

37 Bliss, Livermore and Prather¹⁰ Joly³ Keyser³⁴ Lichtwitz, L.

Die Bildung der Harnsedimente und Harnsteine, *Ztschr. f. Urol.* 7:1810

1913 Entstehung von Niederschlägen im Harn und in den Harnwegen, Deutsche med. Wchnschr. 39:91 1913 Ord W. M.

Influence of Excess of Colloids upon the Forms of Inorganic Matter, *St. Thomas Microscop. Rep.* 2:1 1871 Ord W. M., and Shattock, S. G.

On the Microscopic Structure of Urinary Calculi of Oxalate of Lime, *J. Path. Soc. London* 40:91 1895 Ravich¹ Schade H.

Beiträge zur Konkrementbildung, München, med. Wchnschr. 56:77 1909 Spitzer W. M. and Hilkwitz Philip.

The Cause of Stone in the Urinary Tract, *J. Urol.* 11:327 (April) 1924 Squier¹⁰

38 Meyer J. Ueber die Ausfüllung von Sedimenten und die Bildung von Konkrementen in den Harnwegen. *Ztschr. f. klin. Med.* 3:613 1929

Newcomb C. The Role of Urinary Colloids in the Prevention of Stone Formation. *Indian J. M. Res.* 18:275 (July) 1930.

39 Bliss, Livermore and Prather¹⁰ Fujimaki⁴¹ McCarrison²⁵ McCarrison²⁵

McCarrison¹⁶ McCarrison and Ranganathan³⁰ McCarrison²⁵ McCarrison²⁵

McCarrison⁴ Osborne, Mendel and Ferry¹⁵ Ranganathan S. Chemical Composition of Urinary Calculi. *Indian J. M. Res.* 18:599 (Oct) 1930.

Ranganathan³⁰
40 Saiki, T. Disposition und Ernährung. *Deutsche med. Wchnschr.* 53:517 1927.

41 Higgins⁴² Higgins C. C. The Medical Management of Urinary Lithiasis, *Cleveland Clinic Quarterly* 2:44 1935.

42 Higgins C. C. The Medical Management of Urinary Lithiasis, *S. Clin. North America* Cleveland Clinic Number 1935 p. 923. The Medical Management of Urinary Lithiasis. *M. Ann. District of Columbia* 4:63 (March) 1935.

each of the three factors used for the partial or complete solution of the calculi. It is not possible to determine from his results whether all three are necessary, and certainly his studies do not justify the conclusion that vitamin A alone was responsible for the effect or even that it played an important part.

It is strange that neither Higgins nor any other investigator has studied the possible concretum producing properties of a diet with an alkaline ash, but otherwise complete in all respects, or the effect of administering only an acid ash diet to rats with calculi in the urinary system developed on a diet deficient in vitamins A and D or, better, deficient in only one of these vitamins. This should be done, because Higgins⁴³ showed that the addition of ammonium chloride alone to his stone producing diet reduced the incidence of urinary calculi. A definite answer to all these questions would go far in helping to determine the justification for the medical treatment of urinary lithiasis and for the unavoidably long delay which this causes if surgical intervention must eventually be employed.

In view of the foregoing considerations, the Council decided that the existing evidence does not warrant claims for the use of any of the vitamins, and particularly of vitamin A, in the prevention or treatment of urinary lithiasis and, further, that no such claims may appear in the advertising of accepted products.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG Secretary

CELLU LOGANBERRIES PACKED IN WATER WITHOUT ADDED SUGAR OR SALT

Distributor—The Chicago Dietetic Supply House, Inc., Chicago

Packer—Eugene Fruit Growers Association, Eugene, Ore.

Description—Canned cooked loganberries packed in water without added sugar or salt.

Manufacture—The method of manufacture is essentially the same as for Cellu Blackberries Packed in Water Without Added Sugar or Salt (THE JOURNAL, Sept. 28 1935, p 1039)

| <i>Analysis</i> (submitted by distributor) — | per cent |
|--|----------|
| Moisture | 89.2 |
| Total solids | 10.8 |
| Ash | 0.4 |
| Fat (ether extract) | 0.6 |
| Protein (N × 6.25) | 1.0 |
| Reducing sugars as invert sugar | 3.5 |
| Sucrose | 0.1 |
| Crude fiber | 2.0 |
| Carbohydrates other than crude fiber (by difference) | 6.8 |

Calories—0.4 per gram 11 per ounce

Claims of Distributor—For diets in which sweetened fruit is proscribed

MELCOSE

Manufacturer—The Baker Laboratories, Inc. Cleveland.

Description—A canned sterilized homogenized mixture of partially evaporated milk, corn syrup (essentially dextrins, maltose and dextrose) and ferric ammonium citrate, U S P

Manufacture—The whole milk used is produced by tuberculin tested herds inspected by the Cleveland City Board of Health and is regularly tested by city and Baker Laboratory inspectors. On receipt at the factory the milk is inspected, weighed, pumped into holding vats drawn into hot wells, heated to boiling, concentrated in vacuum pans to half its

original volume, homogenized and cooled, and the corn syrup and the ammonioferric citrate are added. The mixture is adjusted to standard composition by laboratory analysis, automatically canned, sealed, and sterilized at 116-118 C. for thirty minutes.

| <i>Analysis</i> (submitted by manufacturer) — | per cent |
|---|----------|
| Moisture | 70.1 |
| Total solids | 29.9 |
| Ash | 1.3 |
| Fat | 6.4 |
| 1 rotein (N × 6.25) | 5.4 |
| *Dextrins | 4.7 |
| *Reducing sugars as maltose | 3.0 |
| *Dextrose | 1.0 |
| Total carbohydrates (by difference) | 16.8 |
| Iron (Fe) | 0.002 |

* Estimated from formula and analysis of corn syrup

Calories—1.5 per gram 43 per ounce 47 per fluid ounce

Claims of Manufacturer—For use in infant feeding under the directions of a physician.

JEFFERSON ISLAND EVAPORATED FREE RUNNING IODIZED TABLE SALT

Distributor—Jefferson Island Salt Company, Inc., Louisville, Ky

Manufacturer—Jefferson Island Salt Mining Company, Inc., Jefferson Island, La

Description—Table salt containing 1 per cent added magnesium carbonate and 0.02 per cent potassium iodide

Manufacture—Salt containing 1 per cent magnesium carbonate prepared as described for Jefferson Island Evaporated Free Running Table Salt (THE JOURNAL, Oct. 5, 1935, p 1119), is admixed with potassium iodide and automatically packed

| <i>Analysis</i> (submitted by manufacturer) — | per cent |
|---|---------------|
| Moisture | less than 0.1 |
| Calcium sulfate | 0.1 |
| Calcium carbonate | 0.03 |
| Magnesium carbonate | 0.9 |
| Potassium iodide | 0.025 |
| Sodium chloride (by difference) | 98.9 |
| Silica | 0.006 |

Claims of Manufacturer—For all table and cooking uses. The added magnesium carbonate tends to preserve free running qualities. The iodine in the salt aids in preventing simple goiter caused by insufficient iodine in the diet. Used daily as the only salt on the table and in cooking, it richly supplements the iodine of diets deficient in that element and thus helps to protect against simple goiter.

1 L C BRAND CRYSTAL WHITE SYRUP

2 L C BRAND GOLDEN SYRUP

Distributor—L C Mercantile Company, Inc., Mendota, Quincy, Springfield and Danville, Ill., and Fort Wayne, Ind.

Packer—American Maize Products Company, New York.

Description—1 Table syrup, a corn syrup with added sucrose syrup, flavored with vanilla. The same as Amaizo Crystal White Syrup (THE JOURNAL, July 16, 1932, p 224)

2 A blend of corn syrup and refiners' syrup flavored with vanilla extract. The same as Amaizo Golden Syrup (THE JOURNAL, May 16, 1931, p 1695)

Claims of Distributor—Recommended for use as an easily digestible and readily assimilable carbohydrate supplement to milk in infant feeding and as a syrup for cooking, baking and the table.

VERIFINE BRAND EVAPORATED MILK

Manufacturer—Verifine Dairy Products Company, Sheboygan Wis

Description—Unsweetened, sterilized evaporated milk. The composition and procedure of evaporation and canning are essentially the same as for the usual evaporated milk (THE JOURNAL, April 16, 1932, p 1376)

⁴³ Higgins C. C. Production and Solution of Urinary Calculi. Experimental and Clinical Studies J. A. M. A. 104: 1296 (April 13) 1935

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO, ILL.

Cable Address

Medic, Chicago

Subscription price

Seven dollars per annum in advance

Please send in promptly notice of change of address giving both old and new always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, DECEMBER 14, 1935

ORGANIC AND INORGANIC ARSENIC

Arsenic is one of the oldest of therapeutic substances, in certain forms, notably the sulfides, it has been therapeutically employed since the beginning of the Christian era. With its increasing use in the arts and industry, opportunity for arsenic poisoning, either accidental or with suicidal intent, has been progressively greater. Recently, however, much apprehension has been expressed over the possibility of chronic poisoning with arsenic through the use of its compounds in sprays for fruits and vegetables as well as in foods artificially prepared by the use of chemical reagents contaminated with arsenic. It seems likely that in the forthcoming revision of the pure food law more attention will be given to the amounts of certain of the toxic elements, such as arsenic, fluorine and lead, occurring in food materials.

Many of the so-called toxic elements as well as other more or less unusual metals are fairly constant constituents even of virgin soil, the ash of plants contains these elements. It is not surprising that the tissues of man and other animals are likewise found to have them as rather constant constituents. Thus arsenic has been found in human organs, the amount increasing with age, in normal human urine, and in blood, in which fluid it is said to increase during menstruation. In the case of certain of these "trace" elements, notably iron, copper and manganese, it has been shown that they play an indispensable part in the physiologic well being of the organism.

In view of the ubiquitous distribution of arsenic, considerable interest attaches to the recent report of Coulson, Remington and Lynch¹ in which the metabolism of arsenic in organic combination in certain marine food materials is compared with that of arsenic trioxide. A comparison of the arsenic content of shrimp from various Southern states showed a range of from 3.8 to 130 mg per kilogram of dry material. This permitted the use of experimental rations of both

high and low concentrations of arsenic, shrimp being used as well as the trioxide as the source of arsenic in separate diets. On the stock food extremely poor in arsenic, it was observed that albino rats stored increasing amounts of this element with advancing age, the study showed, furthermore, that the arsenic accumulates in the liver in higher concentrations than in the other tissues. It was shown that the bodies of the animals consuming the shrimp diet rich in arsenic contained from two to four times more arsenic than was present in the controls fed the stock ration, whereas the same amount of arsenic given as the trioxide induced a storage of about sixty times that in the controls. An examination of the absorption of the arsenic showed that less than 2 per cent of the shrimp arsenic was retained, when the trioxide was fed, roughly 80 per cent was retained. Ninety-six per cent of the absorbed organic arsenic was eliminated by the kidney, whereas the excretion was equally divided between urine and feces when the trioxide was given. Similar experiments on human subjects indicated that the degree of retention of the organic and inorganic arsenic was somewhat more nearly alike, though here again more remained in the body when the trioxide was ingested.

These observations indicate that the form of combination in which inorganic elements are presented to the organism may exert a profound influence on the metabolism of the element in question. A recent report² of the difference in the availability of the calcium from two different leafy vegetables further illustrates this thesis. It is obvious, in the light of some of the recent investigations in the field of nutrition, that the formulation of a tenable legal point of view regarding the limits of concentration of some of the toxic elements becomes increasingly difficult.

THE OLFACTORY TRACT AND EXPERIMENTAL POLIOMYELITIS

Epidemiologic and experimental evidence seem to indicate that the virus of poliomyelitis gains entrance to the central nervous system chiefly through the nasopharynx, probably by way of the olfactory nerve. It is an interesting fact that the olfactory nerve fibers are derived from cells situated actually on the surface of the body in the upper part of the nasal cavity. The fibers from the olfactory cells pass through the cribriform plate of the ethmoid bone to the olfactory bulb lying under the inferior surface of the frontal lobe of the brain. The terminal fibers of the nerve are therefore exposed to the external environment. Many years ago it was shown that poliomyelitis could be produced in monkeys by instilling the virus into the nose. Flexner and Clark found that within forty-eight hours after intranasal inoculation the olfactory lobes

¹ Coulson E J, Remington R E and Lynch K M. J. Nutrition 10: 255 (Sept.) 1935.

² Finke M L and Sherman H C. J. Biol. Chem. 110: 471 (July) 1935.

became infective. Poliomyelitis virus has been found in the washings or tissues of the nasopharynx in the experimentally produced disease, in the disease in human beings and in healthy contacts.

Not only were Schultz and Gebhardt¹ able to infect 95 per cent of monkeys inoculated with virus intranasally, but they offered experimental proof that the virus gained entrance to the central nervous system by way of the olfactory nerve. With an electric cautery they sectioned the region of the olfactory bulb and olfactory tract of six *Macacus rhesus* monkeys for a distance of about 2 cm. Fifteen days later they instilled intranasally poliomyelitis virus not only into these monkeys but also into three normal control monkeys. Out of the nine monkeys inoculated intranasally with poliomyelitis virus, only the control monkeys developed the disease, and all three of them did so on the seventh day. Schultz and Gebhardt repeated this experiment sixteen days later, again subjecting the six monkeys that had been operated on to three intranasal instillations of virus, this time using two control monkeys. The animals that had had operation again continued to remain well, while the two controls developed poliomyelitis on the seventh day. Three weeks after the second intranasal instillations, the monkeys submitted to operation were inoculated intracerebrally with poliomyelitis virus to test their susceptibility to the virus. All of them now developed typical poliomyelitis in from five to eight days.

The ingenious experimental work of Schultz and Gebhardt was recently confirmed by Lennette and Hudson,² who, months after sectioning the olfactory tracts of five *Macacus rhesus* monkeys, inoculated them intranasally with the virus. None of these monkeys showed any signs of poliomyelitis, whereas the nine controls whose olfactory tracts had not been sectioned succumbed to poliomyelitis after intranasal inoculation. The Chicago investigators furthermore inoculated five monkeys that had had operation and five normal animals with poliomyelitis virus intravenously on three successive days. None of the animals whose olfactory tracts had been severed showed any evidence of infection, while four of the five control animals succumbed to poliomyelitis. An interesting question arises. Was the virus excreted in the four monkeys from their blood stream onto the nasal mucosa? If so, it should be recoverable from the nasal washings. Continuing the investigation, Lennette and Hudson now gave to four immune and six normal monkeys intravenous injections of poliomyelitis virus on two successive days. The result was that none of the immune monkeys became infected while five of the six control monkeys died of poliomyelitis. On the second, fourth and sixth days of the experiment, the nasopharynx of each monkey was

washed out with sterile distilled water and the washings were pooled in groups comprising those from the immune animals and those from the controls. The pooled washings were passed through a Berkefeld N filter, then concentrated by boiling in vacuo and injected intracerebrally into test monkeys. These experiments were negative except in one animal, which received the pooled washings obtained on the fourth day from a group of normal monkeys. This monkey died of typical poliomyelitis. When the difficulty of detecting poliomyelitis virus in nasal washings is considered, the authors believe that the one positive result is significant.

Another interesting and possibly important experimental study on the prevention of poliomyelitis has been reported by Armstrong and Harrison³ of the U S Public Health Service. At varying times relative to the inoculations they instilled 1.5 cc of a 4 per cent sodium aluminum sulfate solution, alum, into the nostrils of a group of rhesus monkeys inoculated intranasally with poliomyelitis virus. The result was that of twenty-four alum-prepared monkeys only six died of poliomyelitis, whereas among twenty control animals sixteen died of poliomyelitis. The percentage of the two groups of monkeys surviving was therefore 76 and 16, respectively. The mechanism by which the alum exerted a protective effect in these experiments was not definitely determined. The authors believe that it was probably a decrease in the permeability of the mucous membrane of the nose rather than an antiseptic action. This method of prevention is not recommended for human use, however, further study in this direction may lead to effective methods of prevention.

STRUCTURE OF GLUTATHIONE

The progress made in the elucidation of the chemistry and physiology of biologically important substances determines the roles that can be assigned to these compounds in metabolic processes. In some instances, complete chemical knowledge and even synthesis of a compound provides a tremendous stimulus to the development of conceptions regarding its physiologic functions. This is seen, for example, in the large number of publications appearing on the biochemistry and physiology of vitamin C, the ready synthetic production of which in the laboratory, made possible by the establishment of its chemical constitution, has made this vitamin available for experimental and clinical use in the form of pure crystals (cevitamic acid). On the other hand, functional studies of physiologically important substances have often preceded the development of knowledge of their chemical identity, particularly when a type grouping in the compound may be responsible for its metabolic importance. This is true of the tripeptide glutathione, the sulfhydryl grouping of which

1 Schultz E. W. and Gebhardt L. P. Olfactory Tract and Poliomyelitis. *Proc. Soc. Exper. Biol. & Med.* 31: 728 (March) 1934.

2 Lennette, E. H. and Hudson N. P. Relation of Olfactory Tracts to Intravenous Route of Infection in Experimental Poliomyelitis. *Proc. Soc. Exper. Biol. & Med.* 32: 1444 (June) 1935.

3 Armstrong Charles and Harrison W. T. Prevention of Intranasally Inoculated Poliomyelitis of Monkeys by Instillation of Alum into the Nostrils. *Pub. Health Rep.* 50: 725 (May 31) 1935.

and the ready conversion of sulfhydryl to disulfide and back to sulfhydryl have led to the conception of its importance among the substances catalyzing body processes, particularly oxidations and reductions occurring in the tissues

The structure of glutathione was first established as a dipeptide, glutamylcysteine, and this configuration was later confirmed by synthesis. However, reinvestigations of the compound during recent years have clearly demonstrated the presence of a third amino acid, aminoacetic acid (glycine), in the glutathione molecule. Studies of glutathione and its degradation products have produced evidence that it is of the tripeptide constitution, glutamylcysteinyl-aminoacetic acid. Final confirmation of this evidence, however, awaited the synthesis of this substance and the establishment of the identity of the synthetic product with the naturally occurring tripeptide.

The preparation of cysteinyl and cystinyl peptides, that is, peptides in which the carboxyl group of these amino acids has been conjugated with the amino group of another amino acid, is attended with considerable difficulty, largely because of the lability of the sulfur in the molecule under the conditions generally employed in the preparation of peptides in the laboratory. However, the first synthesis of cystinyl peptides has recently been accomplished¹ by careful modification of the classic procedure of Bergmann and Zervas.² Both cystinyl-di-aminoacetic acid and cystinyl-dialanine were prepared in an analytically pure state, with the view to the application of a similar method to the synthesis of glutathione. The latter difficult achievement, however,³ has now been reported from the laboratory of Harrington,³ whose brilliant work in the establishment of the structure and synthesis of thyroxine placed him in the front rank of organic chemists investigating biologically interesting substances. Harrington and Mead have established the identity of their synthetic tripeptide, glutamylcysteinyl-aminoacetic acid, with the naturally occurring glutathione. At approximately the same time, confirmatory evidence of this structure has appeared⁴ in which the synthetic dipeptide cysteinyl-aminoacetic acid has been shown to be identical with a dipeptide obtained from glutathione by a mild hydrolytic procedure. The latter investigation is of interest because it suggests still another method of approach to the synthesis of glutathione by procedures that may make available adequate amounts of this substance for research purposes. This would be of considerable value in investigations designed to add further information regarding the many important physiologic and metabolic functions already suggested for glutathione.

1 White Julius. The Synthesis of Cystinylglycine and Cystinyl dialanine. *J. Biol. Chem.* **106**:141 (Aug.) 1934.

2 Bergmann M. and Zervas L. *Ber. Chem. Ges.* **65**:1192 1932.

3 Harrington C. R. and Mead T. H. *Synthesis of Glutathione*. *Biochem. J.* **29**:1602 (July) 1935.

4 Loring H. S. and du Vigneaud Vincent. The Synthesis of Crystalline Cystinylglycine and Benzylcysteinylglycine and Their Isolation from Glutathione. *J. Biol. Chem.* **111**:385 (Oct.) 1935.

Current Comment

ADVANCE IN MEDICAL SCIENCE IN GERMANY

During the past year THE JOURNAL published a series of articles under the general title "Glandular Physiology and Therapy." This series attracted world-wide attention, requests were received from publishers and translators in seven nations for rights to translate and republish these articles. Among others came a letter from Germany to the effect that the publishers Urban and Schwarzenberg in Berlin were anxious to take over the publication of the book in German. These publishers were offered the same type of arrangements offered to those in other countries. Next came a letter requesting that there be forwarded to Germany the original German text of the paper by Aschheim, this and the article by Zondek were originally written in German and translated for the series in THE JOURNAL. In answer to this request, the copy was forwarded to the German translator. Now comes a letter from the translator reading "I have just received a communication from the publishers Urban and Schwarzenberg in which they inform me that they are unable to publish the planned translation of the series of articles on 'Glandular Physiology and Therapy' since it contains articles by former German professors." Eventually, no doubt, the effects of the return of medicine in Germany from modern science to medievalism will be reflected in the health of the German people.

HANDBOOKS FOR DEBATERS ON SUBJECT OF STATE MEDICINE

In the issue for October 19 THE JOURNAL called attention to some of the handbooks that have been prepared for the use of debaters in the discussion now going on in high schools and universities on the subject of state medicine. On November 12 a debate was held on the radio in which Mr. William Trufant Foster, director of the Pollak Foundation for Economic Research, and Bower Aly, director of forensics at the University of Missouri, discussed the affirmative and Drs. Morris Fishbein and R. G. Leland the negative. This debate is printed in full in the current issue of the *American Medical Association Bulletin*¹ and is available to physicians on request. Another debate handbook² has been prepared by the Debaters Information Bureau, with headquarters in Portland, Maine. Of this, J. Weston Walch is the compiler. It is produced in facsimile typewritten form and consists of about 158 pages, covering much the same ground as the handbooks previously referred to. Among the items recently made available by medical organizations is a mimeographed handbook³ entitled "A Digest of Sickness Insurance," prepared by the Chester County

1 The Radio Debate on State Medicine, *A. M. A. Bull.* **30** 113 (Nov.) 1935.

2 Complete Handbook on State Medicine. J. Weston Walch, chief compiler. Debaters Information Bureau, 45A Free Street, Portland, Maine.

3 A Digest of Sickness Insurance, Chester County Medical Society, West Chester, Pa. Copies obtainable for 30 cents postpaid from R. T. Devereux, M.D., 37 South High Street, West Chester, Pa.

Medical Society in West Chester, Pa This represents largely a compilation of material developed through the Bureau of Medical Economics of the American Medical Association The Wisconsin State Medical Association has prepared its own discussion outline⁴ for the use of physicians This outline also is developed from the pamphlets issued by the Bureau of Medical Economics and by the State Medical Society of Wisconsin and is supplemented by a tentative debate outline for high school use An elaborate handbook⁵ has also been prepared by the Minnesota State Medical Association This contains much material developed by Minnesota writers, with the belief, no doubt well founded, that Minnesota high school students and Minnesota audiences are more likely to be interested in what their own physicians are saying This, indeed, is a further demonstration of the confidence rightly to be held by the patient in his own physician Among the most interesting of the items in the Minnesota pamphlet is the article on "Guild" medicine by Prof Richard E Scammon—a fine scientific plea for the perpetuation of medical ideals and standards

NOBEL PRIZE IN MEDICINE

The Nobel prize in medicine this year was awarded to Prof Hans Spemann, ordinaris in zoology at the University of Freiburg-im-Breisgau, in recognition of his work on what is called the organ-producing effect By this effect is meant, for example, the action that a dissected portion of the upper lip of the primitive orifice of the larva of the water newt exerts on cells in its vicinity when it is transplanted to another portion of the body Apparently these cells obtain, through the action of the implant, a new quality, which permits them to act as the anlage or embryonic cells of the organ that would have developed at the spot from which the transplant was cut That is to say, there develops from these cells a primitive nervous system, an embryonic medullary tube, or perhaps the anlage for the spinal cord and brain The physical-chemical nature of this organ-producing substance is not yet established Spemann assumed at first that the living quality of the transplant was an essential factor in its effect He discovered, however, that the effect is produced also by a dead explant and that under certain circumstances the tissue of the explant may be replaced by other substances These experiments would seem to constitute the beginning of knowledge of the causes of organ development from definite portions of the embryo They are of great biologic significance The Nobel prize winner, Spemann, who is now 66 years of age, was formerly a zoologist at the University of Rostock In 1914 he was appointed assistant director of the Kaiser Wilhelm Institut für Biologie in Berlin-Dahlem, and since 1919 he has occupied the chair of zoology at the University of Freiburg-im-Breisgau He is also editor of the *Archiv für Entwicklungsmechanik*

⁴ Discussion Outline Social Medicine and Sickness Insurance State Medical Society of Wisconsin Madison Wis Copies obtainable from J G Crownhart, secretary State Medical Society of Wisconsin
⁵ Handbook, Minnesota State Medical Association 11 West Summit Avenue St Paul

Medical Economics

PRESENT STATUS OF THE PRACTICE OF MEDICINE IN THE UNION OF SOCIALIST SOVIET REPUBLICS

ARNOLD L LIEBERMAN, M D, PH D
GARY IND

What with wishful thinking, plain ignorance and sheer propaganda, there is such a cloud of confusion on the present-day status of the practice of medicine in the Soviet Union that it seems desirable to put down what facts can be actually verified from unimpeachable official sources and personal observation The material was gathered while I was visiting Russia incidental to the fifteenth International Physiologic Congress I was given every facility to come and go freely As I speak the language, I needed no interpreters or guides My expenses were all defrayed by myself

In order to obtain a fair background of the present situation, one must first grasp the fundamental fact that the Soviets inherited a country endowed with only a meager medical system According to the Great Russian Encyclopedia (volume 31), in 1913 within the confines of the present Russian Federated Socialist Soviet Republic there were listed only 13,154 physicians There were only 37,476 nurses The great bulk of this personnel was concentrated in the larger cities The vast village population was left, practically speaking, to its own devices Whole counties had a couple of nurses as its entire medical staff As a result of the World War and the disastrous civil wars, but little of even this personnel was left over The absence of medical aid and the breakdown of civilized standards led to successive waves of epidemics of cholera, typhus, malaria and similar scourges

In an effort to organize medical cadres as rapidly as possible, the Soviet government proceeded to organize "rapid courses" of training The procedure was roughly like this A promising young peasant or worker was sent through a three year workers' faculty" He received the three R's and the rudiments of a high school course He was paid all the time by the government exactly as if he had continued on his previous job The more talented of the graduates of these faculties were then sent to special condensed medical courses, which would turn out medical graduates in three and one-half years or, in case of "sanitation specialists," in as little as two and one half years No laboratory work of significance and no equivalent of an internship was provided Kaminsky—the commissar of national health—in his authoritative report to the sixteenth All-Russian Congress of Soviets frankly states that the work done by these graduates is "completely inadequate" By early 1935 there was a total of about 53 000 graduate medical men and women in Russia roughly about 46 per hundred thousand of population

In return for having his way paid through school, the graduate is obligated to go to any post assigned to him for the next five years This has meant the village or small city As a result, the country as a whole is acquiring some type of medical man for the first time in its history In actual training he is not better than a superior nurse in the United States, but he has been able to cope, at least in part, with the various plagues, so that mortality and morbidity statistics are showing marked improvement over fifteen years ago although, of course not on a par with comparable statistics in our country

Steps have now been taken to improve the medical graduate. Kaminsky in the report already referred to enumerates the results of the decree of Sept 3, 1934 1 A standard minimum five year course 2 Increasing stipends to teaching staffs and students from 40 per cent to 90 per cent in an effort to ameliorate living conditions 3 Sums running into millions of gold rubles

being spent on creating adequate laboratory and classroom facilities 4 Fairly stiff government examinations before graduation to ensure the quality of the new men 5 Increase in the number of teaching institutions with the aim of ensuring 7,000 new doctors annually All these things are not mere paper dicta, as numerous new buildings are actually going up in Leningrad, Moscow, Kharkov, Kiev and other medical centers of the country If uninterrupted, this program should lead to substantial results in the near future It is to be hoped that this decree will rapidly eliminate the poorer schools which arose out of the necessities of the immediate postwar years

The actual present status of medical aid to the population presents an uneven picture, with generalizations being subject to revision almost monthly In the villages, nuclei of medical practice are being established The young medical graduate is better than nothing at all and he certainly is a focus of some sanitary instruction One can see that in his crude little room or two he is doing excellent pioneer work in smallpox and typhoid control, child care, elementary sanitation, civilizing habits of cleanliness and so on While, on the average, he is doing no surgery and committing countless errors of diagnosis and treatment, still he is a beneficent village influence that was absent twenty years ago

He is aided by the "middle medical personnel", i e, the 'feldsher' (assistant to the physician) and the nurse Many a village in the absence of a doctor receives its entire medical care from these individuals There are close to 150,000 of them today Their average seems to be of quite low standards Kaminsky, again in all frankness, regretfully says that "their training has been a neglected and forgotten field"

At this point I might mention in passing that there is an acute shortage of most indispensable drugs "Paint them iodine and mark them duty" becomes a grim jest when even digitalis and ether are hard to get Again Kaminsky tells of the steps being taken to ameliorate this grave handicap

In the cities the situation is much better The organizational plan is quite simple in theory The city is divided into numerous small districts One or more physicians are on duty all the time in each district to make house calls Then there are polyclinics for ambulatory patients and hospitals for the very ill The whole organization is completely centralized in Moscow, with local units having autonomy only in details Leningrad, with a population of 2,700,000, may be taken as an example This city has 110 outpatient clinics During 1934, 16,290,715 individual calls were made at them Smallpox vaccination is universal More than 700,000 protective typhoid series were given The water supply of the city has been safeguarded by chlorination Milk is pasteurized, but control at the source is admittedly inadequate Food is being inspected at the plants Infant care is an absorbing problem Infant mortality has fallen from 22 per cent before the war to 14 per cent this year Maternal mortality is quite low Abortions are entirely legal, although socially condemned There is extensive birth control education The net of "crèches" or nurseries at factories is being extended as rapidly as possible There are 157 of these, with 11,245 cribs There are sixty-three hospitals with a total of 21,285 beds During 1934 these had 388,678 admissions, with a total of 7,060,985 bed days There are in the entire city 8,780 medical posts with 6,331 doctors available, of whom 519 have had only the "sanitary course" and so are not really physicians in our meaning of the word

Of the city's hospitals the Metchnikov Institute is considered on a par with the best It has 2,500 beds There is no provision for psychiatric, contagious or pediatric cases It approaches in general appearance Guy's in London or the Cook County Hospital in Chicago The director of the hospital is a non-medical man He hires and fires the junior staff The chiefs of departments are appointed direct from Moscow It is a teaching institution with 180 doctors among its 2,000 employees

The mortality at Leningrad has dropped from a peak of 771 per 10,000 in 1919 to 149 per 10,000 in 1934 Tuberculosis is the most important single cause of death 22.7 per 10,000

Dr Bogin, the chief of the Leningrad Health Bureau (and authority for the figures just given) dwelt frankly on their outstanding practical difficulties Because all calls are free, there is an enormous wastage of effort on trivial complaints. Consideration is being given to making a nominal charge for polyclinic calls and a larger charge for house calls in order to reduce the pressure of work on the staff There is insufficient incentive for the junior staff men to do good work They have only one doctor to 3,000 adults Many men in responsible posts are not well qualified Still he appeared optimistic and thought that they would surmount their present difficulties within the next few years Because of the high degree of centralization, there is a total absence of cultism and there are no complications with such organizations as the Anti-Vivisection Society, Also, the factory organizations were being made to realize their difficulties and were extending active practical aid in coordinating medical inspection at the various plants, giving them space, time and other considerations

The economic status of the Russian doctor is still quite bad, although no longer as impossible as it was before the decrees of 1934, already mentioned, and the supplementary law of March 1935 The average doctor today receives from 300 to 400 rubles per "job" If he holds two posts (as many do) he may receive between 600 and 700 rubles a month. A senior staff member may get from 1,000 to 5,000 rubles a month. Furthermore, about 10 per cent of the doctors do private consulting work This is the only nonsocial medical practice still surviving in Russia Because of the low quality of the new graduates, many members of the new bureaucracy, better paid engineers, and so on, when they become ill, ask to have certain men to examine them This they can do by paying the consultant out of their own pocket In practice this means that some of the professors of medicine can earn as much as from 4,000 to 5,000 rubles a month

A word should be said here about what the ruble will really buy It is worth theoretically 87 cents However, it is an open secret that on the illegal "black bourse" a dollar will buy thirty paper rubles But it is really worth more Such an important item on the budget as rent is calculated on a percentage basis of one's salary Furthermore, certain articles of clothing and food were still obtainable in "closed stores" (for institutions employees only) at material reductions in price Bread in the summer of 1935 cost 1 ruble a pound A ten dollar suit cost 400 rubles An excellent theater seat is only 3 rubles. It should be noted that the Soviets are actively deflating the ruble prices are falling steadily If the crops this fall really turn out as they were expected to, further drastic reductions in the high cost of living will become highly probable For the present it would not be far wrong to say that the ruble is about on a par with the French franc This means that on a 400 ruble salary the doctor is earning around \$30 a month. This compares with the 125 ruble a month minimum for unskilled labor, from 200 to 300 for skilled labor from 400 to 600 for an average engineer, and up to 1,000 to 1,500 for the manager of the factory

The social status of the Soviet doctor is again a thing most difficult to evaluate The prewar graduate, the professor of medicine or surgery, the consultant busy practicing the art of medicine, unquestionably command an outstanding niche in Soviet society They constitute about 10 per cent of the profession The young graduate does not have, as yet either the ability or the culture to be in the front rank The average intelligent citizen is faintly contemptuous of his training and frankly fearful of his ministrations At present he seems to be regarded as somewhat better than a skilled artisan but certainly not on the level with a good engineer or a director An

impression cannot be evaluated precisely but is given as my reaction. As his technical quality improves and as his cultural stature grows his social standing will undoubtedly rise.

Summarizing briefly, it seems fair to say that there is today in Russia a medical service which, no matter how modest, is an enormous advance over prewar conditions. While qualitatively it is still very low grade, steps are being taken to remedy the situation in the near future. The Soviets have planned and are doing noteworthy things along the line of maternity care and infant welfare. Lack of space confines me to a mere mention of these excellent features. The average doctor is badly underpaid and terribly overworked. Practical steps are being taken to correct this. However, as of today, the free medical service is rather low grade. The care received by a patient who can afford to select and pay privately for his doctor is on a much higher plane. In practice this seems to mean that the higher brackets of income receive incomparably better service.

One cannot expect the impossible. Even with internal and external peace and general prosperity, the extension of medical education, practice and service to the Soviet Union as a whole at the standard we are accustomed to in our country could not be achieved in the short time that has elapsed since the Russian revolution. Considering their environment, the Soviets have accomplished much. If the economic regeneration of Russia continues, there will be a steady rise in medical standards. But many of their fondest hopes will have to be realized before we shall be able to apply our yard stick and find comparable values.

738 Broadway

Association News

APPLICATIONS TO COMMITTEE ON SCIENTIFIC RESEARCH FOR GRANTS

The Committee on Scientific Research of the American Medical Association invites application for grants of money to aid in research on problems bearing more or less directly on clinical medicine. Preference is given to requests for moderate amounts to meet specific needs. For application forms please address the committee at 535 North Dearborn Street, Chicago.

RADIO BROADCASTS

The American Medical Association broadcasts over the Blue network and certain additional stations of the National Broadcasting Company at 5 p. m. eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time) each Tuesday, presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers a toast: "Ladies and gentlemen, your health!" The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

The next three programs are as follows:

December 17 Animal Diseases in Man W. W. Bauer M.D.
December 24 No broadcast
December 31 No broadcast.

This program is broadcast also on the short waves through KDKA Pittsburgh over station W8XK, 11,870 and 12,210 kilocycles.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

Annual Registration Due January 1—Every person practicing medicine, surgery or osteopathy in Arizona is required by law to pay annually on or before January 1, to the board of medical examiners, a renewal license fee of \$3. Any licentiate who does not renew his license as required is to be penalized \$1 for each day that he practices without a renewal license, not to exceed \$50. The board of medical examiners is to revoke the license of any licentiate who fails to renew his license for three successive years.

ARKANSAS

Society News—A symposium on the menopause was presented before a joint meeting of the Garland and Sebastian county medical societies in Fort Smith, October 8, speakers were Drs. Walter G. Klugh, Arthur G. Sullivan, George B. Fletcher, Charles H. Lutterloh, William E. Gray and Gaston A. Hebert, Hot Springs National Park. The Garland County Medical Society participated and the Army and Navy Hospital cooperated in the fifth annual conference of the Leo N. Levi Memorial Hospital and the Charles Steinberg Clinic in Hot Springs National Park, October 15-16. Speakers included Dr. Joseph Earle Moore, Baltimore, "Diagnosis and Treatment of Neurosyphilis"; Dr. William B. Long, New York, "Medical Aspects of Syphilis in a General Hospital"; Chester N. Myers, Ph.D., New York, "Functional Disturbances of the Liver Following Antisyphilitic Therapy"; Hepatitis and Acute Yellow Atrophy. The Benton County Medical Society was addressed in Rogers, October 10, by Drs. Francis Walter Caruthers and George F. Jackson, Little Rock, on treatment of fractures and common diseases of the skin and their treatment, respectively.

CALIFORNIA

Annual Registration Due January 1—Every practitioner of medicine and surgery holding a license to practice in California is required by law to register annually, on or before January 1, with the secretary-treasurer of the board of medical examiners and at that time to pay a fee of \$2. Failure to pay the required fee within sixty days after January 1 works a revocation of a license and thereafter a license may be reissued only after application and the payment of a \$10 penalty.

Symposium on Heart Disease—The Los Angeles County Heart Association held its fourth annual symposium, December 6-7, in Los Angeles. A joint session with the Los Angeles County Medical Association was a feature of the program in the evening of the first day. Dr. Howard F. West, Los Angeles, presented "The Challenge of Arteriosclerosis," and Dr. John J. Sampson, San Francisco, "The Relation of the Autonomic Nervous System to Normal and Diseased Heart Function." The concluding session, Saturday morning, was given over to a clinical pathologic conference, case reports by clinicians and necropsy reports and demonstrations of specimens by pathologists.

Society News—Dr. Louis E. Phaneuf, Boston, discussed "Surgical Treatment of Uterine and Vaginal Prolapse" before the Los Angeles Surgical Society at the annual dinner meeting, December 13. At a meeting of the Orange County Medical Society in Orange, October 1, Dr. Karl E. Kretzschmar, Los Angeles, discussed "The Injection Treatment of Hernia." Speakers before the Riverside County Medical Society in Riverside, October 14, were Drs. Samuel Ayres Jr. and Norman J. Kilbourne, Los Angeles, their papers were entitled "Infections of the Skin—Bacterial, Fungous and Parasitic" and "Elimination of Pain After Rectal Operation and in Rectal Treatment," respectively. Dr. John B. Doyle, Los Angeles, discussed chronic alcoholism before the Santa Barbara County Medical Society in Santa Barbara, October 14. Dr. Jay Marion Read has been chosen chairman of the heart committee of the San Francisco County Medical Society, Dr. John P. Strickler vice chairman, and Dr. Amos Christie secretary. The committee sponsors the annual heart symposium of the society, which this year was held November 20-21.

CONNECTICUT

Dr Linde Named Health Officer of New Haven—Dr Joseph I Linde, clinical professor of pediatrics, Yale University School of Medicine, has been appointed health officer of New Haven, succeeding Dr Leonard Greenburg, who recently resigned to become associated with the New York State Department of Labor. A graduate of Yale, class of 1908, Dr Linde is a past president of both the New Haven city and county medical societies. He is chairman of the committee on public health of the Connecticut State Medical Society and chairman for Connecticut of the American Academy of Pediatrics. He is 49 years of age.

Blood Test Mandatory in New Marriage Law—The Connecticut State Department of Health announces that after January 1 each person applying for a marriage license must under law have a blood test. Under the new law the applicant for a marriage license must let the family physician take a sample of blood, which he will send either to the laboratory of the state department of health or to one approved by the department. The test will be made and a report mailed to the physician on two forms, one, the usual laboratory report, for the physician to retain, and the other to be presented to the registrar. If the test is satisfactory the physician will sign his official statement and the applicant also signs, in the presence of the physician, the completed statement to be given to the registrar. On receipt of the physician's statement, the registrar will accept the application and on the fifth day following will issue the marriage license if both persons by that time shall have surrendered to him their physicians' statements. The department emphasizes that the blood test must be made not more than forty days before the license is issued, not forty days before the license is applied for.

FLORIDA

Annual Registration Due January 1—Every practitioner of medicine and surgery holding a license to practice in Florida is required by law to register annually on or before January 1, with the secretary of the state board of health, and at that time to pay a fee of \$1. A licentiate failing to register annually is liable to a fine of not more than \$50.

Society News—The Dade County Medical Society was addressed, November 1, by Drs Joseph H Luciman and William C Rentz, Miami, on 'Radiation Treatment of Middle Ear and Mastoid Infections and Oral Sepsis,' respectively. At a meeting of the Duval County Medical Society in Jacksonville November 5, speakers were Drs Samuel R. Norris on "Toxemias of Pregnancy—Case Histories with Autopsies" and Charles B Mabry, 'Use of Unpadded Plaster in the Treatment of Fractures.' Both speakers were from Jacksonville.—Dr Edwin C Swift, Jacksonville, was named president of the Florida East Coast Medical Association November 2. The next annual meeting will be held in Fort Pierce.—Dr Mathew Jay Flipse, Miami, addressed the Palm Beach County Medical Society, October 25, on heart disease.

ILLINOIS

Personal—Mr Homer J Byrd Arlington Heights, has recently been appointed superintendent of registration of the state department of registration and examination.

Dramatized Broadcasts—The Illinois Department of Health began a new series of dramatized broadcasts over Station WCBS in Springfield, December 2. The programs will be presented on Monday and Friday afternoons, portraying in the form of playlets the health adventures and experiences of the Hunter family, who live in the imaginary village of Utopia.

Society News—Dr Anton J Carlson Chicago, addressed a public meeting in Canton, November 25, on pneumonia, the session was sponsored by the Fulton County Medical Society.—At a meeting of the DuPage County Medical Society in Downers Grove, November 20, Dr Harry E Mock, Chicago, discussed treatment of skull fracture.—Dr Leo K Campbell, Chicago addressed the Will-Grundy County Medical Society, November 27, on 'Diagnosis and Management of Diabetes Mellitus.' The society was addressed by Dr Maurice L. Blatt Chicago, December 4, on 'Neuromuscular Diseases in Childhood.'—At a meeting of the Peoria City Medical Society, December 3, Dr Arthur Sprenger, Peoria, discussed 'Recent Observations on the Etiology and Treatment of Urolithiasis.' Dr Leon M Bogart, Flint, Mich, spoke November 19, on 'Abdominal Adhesions.'—At a meeting of the Henry County Medical Society in Kewanee November 7, speakers were Drs Nathan S Davis III and Robert O Ritter,

Chicago, who discussed coronary arteriosclerosis and fractures of the extremities, respectively.—The Mercer County Academy of Medicine was recently organized, meetings will be held twice each month, it was reported.

Chicago

Cooperative Study of Maternal Mortality—Seventy-six hospitals cooperating in a study of maternal mortality in Chicago reported 270 maternal deaths in 1934. Of 38,139 mothers delivered in the hospitals operative intervention was used for 7,765. There were 2,059 abortions reported and 248 ectopic pregnancies. This work is being sponsored by the maternal welfare committee of the Chicago Gynecological Society. The committee is made up of sixty-eight physicians, who represent the seventy-six hospitals in the city doing obstetric work. It is hoped to continue the study until data have been accumulated on 1,000 cases. More than 600 cases have already been studied (THE JOURNAL, August 10, p. 441).

Society News—Dr Chester C Guy, among others, addressed the Chicago Pathological Society, November 11, on "Tumors of the Breast in Children."—Speakers before the Chicago Roentgen Society November 14, included Dr Bernard H. Nichols, Cleveland, on "Roentgenology in the Diagnosis of Obstructive Lesions of the Ureters."—Dr Henry C Sweeney discussed "Recent Trends in the Approach to Study of Silicosis" before the Chicago Tuberculosis Society, November 15.—At a meeting of the Chicago Ophthalmological Society, November 18 speakers included Dr Philip D O'Connor on "Correction of Cicatricial Ectropion by the Detached Skin Graft."—Dr Ben Z Rappaport addressed the Chicago Society of Allergy, November 18 on "Treatment of Patients Highly Sensitive to Pollen."—The Chicago Neurological Society was addressed November 21, among others, by H W Magon, Ph D, and W Kendrick Hare, M S, on "Postural Reactions from Stimulation of the Interior of the Cerebellum."—Dr Harry C Rolnick addressed the Chicago Urological Society, November 21, on "Retrovesical Sarcoma."—The seventy-second annual midwinter meeting of the Chicago Dental Society will be held at the Stevens Hotel, February 17-20.

INDIANA

Outbreak of Scarlet Fever—The occurrence of several cases of scarlet fever in Milan in November prompted the county health officer to order the schools in the city closed for several days newspapers reported. An epidemic was also reported in Rensselaer, but reports, November 21, indicated it to be under control.

Gifts to Museum—A collection of surgical instruments used by the late Dr Joseph L Gilbert, Kendallville, has been given to the Indiana University Medical Museum by his daughters, Mrs Samuel L Shank and Miss Clara Gilbert Indianapolis, according to the state medical journal. Surgical needles, a mahogany case of surgical instruments a rare copy of the second American edition of Gray's Anatomy and a copy of Samuel D Gross's "Lives of Eminent American Physicians and Surgeons of the Nineteenth Century" are included in the collection. Dr Gilbert died in 1928. A tourniquet of the Civil War period has been received from E C Clark of the Akron Surgical House, Indianapolis.

KANSAS

Personal—Dr Riley H Miller Ulysses has been named health officer of Grant County.—Dr John P Kaster, Topeka, chief surgeon of the Atchison, Topeka and Santa Fe Railway system, was guest of honor at a banquet given recently in Topeka by the Santa Fe medical and surgical staff, in recognition of his completion of fifty years as a member of the staff.

Society News—The Sedgwick County Medical Society was addressed, December 3, by Drs Frances H Schiltz and William P Callahan, Wichita, on "Present-Day Status of Liver Function Tests" and Surgical Treatment of Liver and Gall bladder Diseases, respectively. Dr Richard L Sutton, Kansas City, Mo., will address the annual meeting of the society and the woman's auxiliary, December 17, his talk will be entitled 'Snapshots of the South Seas'.

Data on Sickness Insurance—The Kansas State Medical Society has prepared a publication dealing with sickness insurance and state medicine to be used by high school and college students in preparing arguments for the debates on state medicine being held throughout the country. This material supplements that which is being sent to high school and college students from the Bureau of Medical Economics of the American Medical Association.

LOUISIANA

Annual Renewal Due January 1—Every practitioner of medicine and surgery holding a certificate to practice in Louisiana is required by law to have his certificate renewed annually, on or before January 1, by the secretary-treasurer of the state board of medical examiners and at that time to pay a fee of \$2. The board may by unanimous vote revoke any certificate not renewed.

Health at New Orleans—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended November 30 indicate that the highest mortality rate (183) appeared for New Orleans and that the rate for the group of cities as a whole was 111. The mortality rate for New Orleans for the corresponding period last year was 173 and for the group of cities as a whole, 109. The annual rate for eighty-six cities for the forty-eight weeks of 1935 was 113 and the same rate appears for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly rates, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or have a large Negro population may tend to increase the death rate.

MASSACHUSETTS

Dr. Rosenau Gives Cutter Lecture—Dr. Milton J. Rosenau, Charles Wilder professor of preventive medicine and hygiene, emeritus, Harvard Medical School, Boston, delivered the Cutter Lecture on Preventive Medicine, December 4 at the medical school. He discussed 'Epidemics'.

Physician Honored—Dr. Fred B. Lund, formerly surgeon-in-chief, Carney Hospital, Boston, was honored by a testimonial dinner at the Harvard Club, November 6. Dr. William E. Browne was toastmaster. The speakers included Drs. John Cunningham Jr., Louis F. Curran, Louis E. Phaneuf, William H. Robey, Irving J. Walker, Archibald McKay Fraser, William R. Morrison, Boston, and Nathaniel S. Hunting, Quincy. Dr. Lund was presented with a ship's wheel mantel clock as a memento of the occasion.

Society News—The South End Medical Club was addressed by Dr. Francis Lowell Burnett, Boston, November 19, on 'New Principles for Normal Nutrition and Health to Cure Disease'.—At a meeting of the New England Ophthalmological Society in Boston, November 12, Dr. Harry C. Messinger, Providence, R. I., discussed 'Tuberculous Sclerosis with Tumor of Optic Nerve' and Dr. Phillips Thygeson, Iowa City, gave a paper entitled 'Etiology of Trachoma, Analysis of Recent Studies'.—Speakers before the Worcester District Medical Society in Grafton, November 13, were Drs. Charles E. Morgan, Somerville, president of the state medical society, Benjamin M. Cohen, Cambridge, 'Repression and Communicability in Catatonic Stupor' and Bardwell H. Flower, Worcester, 'Parenteral Paralyde'.—Dr. Frederick F. Russell, lecturer in preventive medicine and hygiene, Harvard Medical School, discussed 'Recent Studies in Yellow Fever'.—A 'Virus Disease' before the Harvard Medical Society, November 12, in Boston.

MICHIGAN

Personal—Mr. J. A. Bechtel has been appointed acting executive secretary of the Wayne County Medical Society. William J. Burns recently resigned as executive secretary of the society to accept a similar position with the state medical society.—Dr. Frank D. Johnson has resigned as coroner of Genesee County, and Dr. Rudolph W. Streat has been named to succeed him. Both are from Flint.

Pediatric Meeting—The University of Michigan Pediatric and Infectious Disease Society held its annual meeting in Ann Arbor, November 22-23. Speakers included Drs. Williams McKim Marriott, St. Louis on 'Severe Nutritional Diseases in Infancy and Childhood' and Clement A. Smith, Boston, 'Calcified Abdominal Glands in Children'. Dr. Daniel Budson, Detroit, gave the presidential address Friday evening and Dr. Marriott held an open forum on infant feeding.

Psychiatric Parole Clinic—A psychiatric parole clinic has recently been established at Eloise Hospital with Dr. Martin H. Hoffmann in charge. Present plans call for a staff of eight psychiatrists, nine psychiatric social workers and one psychiatric nurse. Under the new system mental patients in county institutions will be examined and classified and the mild ones returned home. An efficient follow-up system will be established to secure constant supervision of these people, and accommodations obtained for those who require hospitalization but are now at large for want of adequate facilities. Dr. Hoff-

mann is secretary of the Wayne County Medical Society and the Detroit Society of Neurology and Psychiatry. He graduated from State University of Iowa College of Medicine.

Society News—Dr. Edward L. Bauer, Philadelphia, discussed 'Athrepsia, Acidosis and Alkalosis in Childhood' before the Calhoun County Medical Society, November 5 in Battle Creek.—Sir Wilfred T. Grenfell, St. Anthony, Newfoundland, addressed the Wayne County Medical Society, Detroit, December 2. He also delivered a public lecture in the Hotel Statler, Detroit, November 29. Dr. Oliver P. Kimball, Cleveland, also spoke before the medical society at its meeting, December 2, on 'Source and Medical Study of Epilepsy'.—Dr. Myron Metzenbaum, Cleveland, addressed the Michigan Triological Society at Grand Rapids, November 21 on 'Reconstruction of the Nasal Septum in Children'.—A symposium on syphilis constituted the program of the West Side Medical Society of Detroit at Eloise, November 6, speakers were Drs. Arthur E. Schiller, Frank W. Hartman and Robert C. Jamieson and Elizabeth M. Yagle, Ph.D.—Dr. Abraham R. Hollender, Chicago, addressed the Detroit Otolaryngological Society, November 20, on 'The Scope of Physical Therapy in Otolaryngology'.

MINNESOTA

Handbook on Sickness Insurance—The Minnesota State Medical Association has prepared a forty-eight-page handbook dealing with the various aspects of sickness insurance and state medicine, supplementing material available from the Bureau of Medical Economics of the American Medical Association. Excerpts from talks, newspapers and current magazines are included, representing the opinions of certain members of the medical profession, clergymen and lay authorities on the subject. The material is copyrighted but may be used by members of the constituent societies of the American Medical Association. Information concerning the handbook may be obtained from the office of the association, 11 West Summit Avenue, St. Paul.

Dinner to Drs. Will and Simons—The Sixth Councilor District Medical Society gave a dinner in St. Cloud, November 21 in honor of Dr. William W. Will, Bertha, president-elect, Minnesota State Medical Association, and Dr. Edwin J. Simons, Ahwah Ching, newly elected councilor of the district. Officers and committee chairmen of the district attended and speakers included Drs. Morris Fishbein, editor of THE JOURNAL, Chicago, Charles B. Wright, Minneapolis, Jay Arthur Myers, Minneapolis, and Sidney A. Slater, Worthington. Drs. Fishbein and Myers and Edward A. Meyerding, St. Paul, secretary of the state medical association, addressed a public health meeting the same evening, sponsored by the Stearns County Public Health Association and the Minnesota Public Health Association.

MISSISSIPPI

Society News—A health education conference for parents and teachers of Pike County was held in McComb, October 25-27. Speakers included Drs. Felix J. Underwood, state health officer, John A. Milne, Jackson, director of the field unit, state board of health, 'Community Organization and Parent Responsibility', Taswell Paul Haney Jr., McComb, health officer of Pike County, 'Development of Uniform Standards for Medical Examination' and Henry C. Ricks, Jackson, 'Practical Measures in Communicable Disease Control'.

A New State Journal—Beginning January 1, the Mississippi State Medical Association will publish its own journal entitled the *Mississippi Doctor*. The state society will share this publication with the Northeast Mississippi Thirteenth County Medical Society, the North Mississippi Medical Society and the Mid-South Postgraduate Medical Assembly. It will be printed in Mississippi with Dr. William H. Anderson, Booneville, as editor. The *New Orleans Medical and Surgical Journal* has for many years been the official journal of the Mississippi State Medical Association. Publication of the new journal was approved at the annual meeting of the society in May.

NEW JERSEY

Program on Automobile Injuries—At a meeting of the Associated Physicians of Montclair and Vicinity, October 25, in Montclair, three speakers from New York discussed automobile injuries. Dr. William Darrach spoke on first aid treatment, Dr. Armitage Whitman on injuries to joints, and Dr. James M. Hitzrot on injuries to soft parts. Papers were discussed by Drs. Toufick Nicola, New York, Leslie C. Love, Montclair, and Richard T. Hobart, Upper Montclair.

Society News—Dr. Thomas H. Russell, New York, addressed the Bergen County Medical Society, Hackensack, November 12, on 'Postoperative Complications and Their Man-

agement," and Dr Leroy A. Wilkes, Trenton, executive secretary of the Medical Society of the State of New Jersey, discussed the organization and functions of the society.—The Society of Surgeons of New Jersey will meet in Jersey City, January 15, and not Atlantic City, as noted in THE JOURNAL, November 9. Clinics will be held at the Jersey City Medical Center in the afternoon and a dinner at the Carteret Club.—A symposium on endocrinology was presented at a meeting of the Middlesex County Medical Society at the State Home for Boys, Jamesburg, November 20, by Drs Edward Rose and Charles Mazer, Philadelphia, Matthew Molitch, Jamesburg, Albert W Pigott, Skillman, and Maximilian A Goldzieher, Brooklyn. Several papers were presented by members of the resident staff of the school.—Dr Leonard G Rowntree, Philadelphia, addressed the Atlantic County Medical Society, Atlantic City, November 8, on endocrine therapy.—Drs Louis L Williams Jr of the U S Public Health Service and David L Farley, Philadelphia, addressed the Camden County Medical Society, Camden, November 5 on "Malaria—Its Prevention and Treatment" and "Fever of Undetermined Origin," respectively.

NEW YORK

Appointments at Albany College—Dr Thomas Ordway, dean of Albany Medical College, recently announced the appointment of Dr Harry E Himwich, associate professor of physiology at Yale University School of Medicine, as assistant professor of physiology, succeeding Dr F Stanley Randles, resigned. Joseph L Schwind, PhD, associate professor of anatomy at Georgetown University School of Medicine, Washington, D C, was appointed to that position at Albany, succeeding Donald H Barron, PhD. Dr Barron has resigned to pursue research at Oxford University, England.

Annual Registration Due January 1—Every practitioner of medicine and surgery in New York is required by law to apply annually, on or before January 1, to the secretary of the board of medical examiners for a certificate of registration, on application forms furnished by him, and to pay at that time a fee of \$2. The law authorizes the secretary of the board to permit secretaries of duly incorporated medical societies to act as his representatives, to receive and transmit to him such applications and fees. Practitioners are liable to severe penalties for failing to register and for continuing in practice thereafter.

Graduate Lectures at Rochester—A course of lectures arranged by the Medical Society of the State of New York and the Medical Society of the County of Monroe was given at the Rochester Academy of Medicine, October 21-25. Speakers were the following New York physicians:

Dr Fred W Stewart The Changing Concept of Radiosensitivity of Tumors
Dr Robert T Frank Keeping Up with Endocrinology
Dr Russell L Cecil Chronic Arthritis
Dr Edward M Livingston General Abdominal Surgical Diagnosis
Dr Ralph G Stillman, Laboratory Tests and Methods Their Interpretation into Clinical Terms

New York City

Gifts to Columbia—Among gifts to Columbia University recently announced by the secretary are the following for medical purposes:

General Education Board \$17 000 for the subdepartment of tropical medicine and the child development clinic of the Neurological Institute
W K Kellogg Foundation \$10 000 for study of rheumatic fever
Rockefeller Foundation \$2 500 for research in department of practice of medicine and \$750 for the department of psychiatry
E R Squibb and Sons \$2 250 for fellowship fund in the department of biologic chemistry \$1 000 for fellowship in the department of anatomy
Commonwealth Fund \$1 750 for the normal child development clinic in the Neurological Institute
Hardley Corporation \$1 750 for research in the department of psychiatry
William J Matheson Foundation \$1 125 for the Matheson Encephalitis Fund in the department of bacteriology
Louis D Beaumont Trust \$1 000 for research in the institute of cancer research
Arthur M Lampert \$1 000 for the Louis Wiley Memorial Fund in Neurology

Dr Bowman Director of Psychiatric Division.—Dr Karl M Bowman, chief medical officer of the Boston Psychiatric Hospital, has been appointed director of the psychiatric division of Bellevue Hospital, a position made vacant by the resignation of Dr Menas S Gregory in 1934. Dr Bowman was chosen by competitive examination. A graduate of the University of California School of Medicine, Dr Bowman has recently been assistant professor of psychiatry at Harvard Medical School and assistant professor of clinical psychiatry at Boston University School of Medicine. Dr Gregory has been appointed consulting psychiatrist for Bellevue.

Society News—Drs George P Muller, Philadelphia, Shepard Krech and Frederic W Bancroft presented a symposium on mortality in acute appendicitis at a meeting of the

New York Surgical Society, November 27.—Drs Vernon C Rowland, Cleveland, and Samuel J Goldfarb addressed the National Society for the Advancement of Gastro-Enterology, November 27, on "Continuous Acid Adsorption by Aluminum Hydroxide Cream in the Treatment of Peptic Ulcer"—Dr Walter Bauer, Boston, addressed the Medical Society of the County of Kings, November 19, on arthritis. A portrait of the late Dr Frank D Jennings was presented to the society by the alumni association of St. Catherine's Hospital.

NORTH CAROLINA

New Special Society—The North Carolina Eye, Ear, Nose and Throat Society was organized at a meeting in Greensboro, November 14, with Drs Burton W Fassett, Durham, as president and Casper W Jennings, Greensboro, as secretary. The final action followed tentative organization last spring under the name North Carolina Academy of Ophthalmology and Otolaryngology. At this meeting speakers were Drs William S Jordan, Fayetteville, on "The Responsibility of the Refractionist", Michel M Saliba, Wilson, "A New Theory of Light Perception", Alvin C McCall, Asheville, "Glaucoma", Joseph B Greene, Asheville, "Diagnosis and Treatment of Laryngeal Tuberculosis", Harry C Willis, Wilson, "Nasal Neuralgia", and Fred E Motley, Charlotte, "Mastoidectomy".

Society News—Dr Ralph Rhett Rathbone, Washington, D C, was the chief speaker at a meeting of the North Carolina Radiological Society at Greensboro, October 27, on "Treatment of Sinus Diseases and Miscellaneous Diseases"—Dr Edgar V Allen, Rochester, Minn, addressed the Buncombe County Medical Society, Asheville, November 4, on "Peripheral Vascular Diseases"—Drs Joseph A Elliott, Charlotte, and James D Whaley, Charleston, S C addressed the Catawba Valley Medical Society, Lenoir, recently, on skin diseases and nontuberculous infections of the kidney.—At the October meeting of the Tenth District Medical Society, Tryon, speakers included Drs Paul T McBee, Marion, on "Surgical Treatment of Peptic Ulcers," and Cecil C Swann, Asheville, "Relationship of Sinus Disease and Chronic Chest Conditions Particularly Asthma and Bronchiectasis"—Dr Fred M Patterson, Greensboro, was elected president of the North Carolina Urological Association at the sixth annual meeting in Salisbury in October.—Dr John Shelton Horsley, Richmond, addressed the Guilford County Medical Society, High Point, November 7, on "Modern Trends in Diagnosis and Treatment of Cancer of the Colon." Dr James W Tankersley, Greensboro, presented a paper on "Lesions of the Breast."

NORTH DAKOTA

Annual Registration Due January 1—Every practitioner of medicine and surgery holding a license to practice in North Dakota is required by law to register annually on or before January 1, with the secretary-treasurer of the board of medical examiners, and at that time to pay a fee of \$5 if a resident of North Dakota, or \$2 if a nonresident. A practitioner may not lawfully practice if he has not registered. If he does so his license may be revoked and can be reinstated on the payment of unpaid fees and \$0.50 for each month of default.

PENNSYLVANIA

Society News—Dr William J Fetter, Pittsburgh, addressed the Fayette County Medical Society Uniontown, December 5 on "Bone Conditions Important in Medicine."—Dr Samuel J Kopetzky, New York, will address the Harrisburg Academy of Medicine, December 17, on "Petrosal Suppuration."

Annual Registration Due January 1—Every practitioner of medicine and surgery holding a license to practice in Pennsylvania is required by law to register annually, on or before January 1, with the board of medical education and licensure in the department of public instruction and to pay a fee of \$1 or such fee as may be fixed by the department of public instruction. A practitioner who fails to register and who continues to practice is liable to a fine of from \$10 to \$100.

Philadelphia

Advisory Committee on Health Survey—At the request of Surgeon General Hugh S Cumming of the U S Public Health Service, the president of the Philadelphia County Medical Society has appointed an advisory committee for the health survey being made by the service. Members are Drs Francis F Borzell, Edward L Bortz, Francis Ashley Faught, Donald R Ferguson, W Burrill Odenatt and Joseph W Post, and John W Ross, DDS.

Society News—Dr Harris P Mosher, Walter Augustus Lecompte professor of otology and professor of laryngology, Harvard Medical School, Boston, gave the Mutter Lecture,

College of Physicians of Philadelphia, December 4, on "Histology and Pathology of the Esophagus with Clinical Application"—The annual banquet of the Medical Alumni Association of the Medico Chirurgical College was held November 21, with Dr Ralph H Spangler as toastmaster, Dr James Evans Scheehle, Harrisburg, secretary of welfare of Pennsylvania, was a guest of honor Dr Jesse Lynn Mahaffey, commissioner of health of New Jersey, Trenton was elected president—The Philadelphia League for the Hard of Hearing the Germantown Club for the Hard of Hearing and the Speech Reading Club of Philadelphia observed National Hearing Week in October with exhibitions of hearing aids and demonstrations of lip reading—A symposium on peptic ulcer was presented before the Philadelphia County Medical Society, December 11, by Drs Robert A. Kilduffe, Atlantic City, N. J., who discussed laboratory observations, Donald Guthrie, Sayre, surgical aspects Martin E. Rehfuss, medical aspects, and Willis F. Manges, roentgen examinations

TEXAS

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in Texas is required by law to register annually on or before January 1, with the state board of medical examiners, and at that time to pay a fee of \$2. If a practitioner fails to renew his registration within sixty days after January 1, his license is suspended.

Specialists' Meetings.—Dr Charles W. Flynn, Dallas, was elected president of the Texas Surgical Society at its semi-annual meeting in Galveston in October. Guest speakers at the meeting were Drs William T. Pride, Memphis Tenn. on "Anesthesia and Analgesia in Operative Gynecology—End Results," and John R. Caulk, St. Louis, "Surgery of the Ureter."—Dr Emil Novak, Baltimore was guest speaker before the Texas Association of Obstetricians and Gynecologists in Fort Worth December 7. He delivered the J. I. Y. Paine address in the afternoon on "Hormones of the Ovary" and spoke at the evening banquet on "Current Problems in Gynecology." Dr Ben Hill Passmore, San Antonio, president of the association delivered his official address, on "The Influence of Prejudice and Superstition in Obstetrics."

Medical Service for Low Income Groups.—Two plans for distribution of medical service to low income groups have been approved by the executive council of the Texas State Medical Association. After a study of numerous plans, a special committee appointed at the last meeting of the association evolved a plan for larger county societies, based on one now in operation in Bexar County. The essential feature of the Bexar County plan is a medical service bureau with a physician as full time executive officer. The functions of the bureau are to study the economic circumstances of the individual patient, classify him as to his ability to pay for medical service and arrange for the installment payment for such service. If he cannot pay anything he may either be cared for by the physician of his choice as a charity patient or he may be sent to a free clinic. A special arrangement is outlined for control of these clinics. They are asked to cooperate with the county society to the extent of employing a competent investigator to check the financial condition of applicants, which is to be reported to the bureau. According to the budget plan, the patient signs an installment note and pays interest on deferred payments. The bureau retains 10 per cent of all moneys collected to defray overhead expenses. The committee also recommends systematic publicity to inform the public of the society's efforts to provide a means for adequate distribution of medical service. A modified version of this set-up is proposed for small county societies with the suggestion that several counties may conveniently combine their economic activities in sparsely settled regions. Dr Edward H. Cary, Dallas was chairman of the special committee that drew up the plans, and members were Drs Samuel E. Thompson, Kerrville, Witten B. Russ, San Antonio, Claude C. Cody, Houston, and Frederick Fink, San Antonio.

WEST VIRGINIA

Society News.—Dr Henry J. John, Cleveland addressed the Ohio County Medical Society, Wheeling, November 8, on "Routine Treatment of Diabetes Mellitus."—Dr Americus J. Kemper, Clarksburg, was elected president of the West Virginia Public Health Association at the annual meeting in Huntington, October 30.—Drs Chesney M. Ramage and Amos H. Stevens, Fairmont, addressed the Central West Virginia Medical Society, Buckhannon, October 26, on cancer and treatment of tetanus respectively.—Dr Walter W. Spelsberg, Clarksburg, addressed the Monongalia County Medical Society, Morgantown, Novem-

ber 5, on "Ear Conditions in General Practice."—Drs Russel Kessel and Vincent T. Churchman Jr. addressed the Kanawha County Medical Society, Charleston, November 12, on "Pelvic Inflammatory Disease" and "The Common Cold," respectively.—Dr Thomas G. Folsom, Huntington, presented a paper on "Progress of Rheumatic Heart Disease" at the November meeting of the Cabell County Medical Society, Huntington.

GENERAL

Bequests and Donations.—The following bequests and donations have recently been announced.

University of Cincinnati College of Medicine, \$2,500 for a research fund in internal medicine from Mrs. Louis N. Stix, \$1,000 for the Gamble Fund in the department of bacteriology from Mrs. Alfred K. Nippert and \$500 for the hepatic research fund in biochemistry from the Union Central Life Insurance Company.

Mount View (Marathon County Tuberculosis Sanatorium), Wausau, Wis., \$50,000 by the will of Mrs. Eva M. Willard.
St. Joseph's Hospital, Paterson, N. J., \$2,000 General and Barnert Memorial hospitals, Paterson, \$1,000 each under the will of William B. Gourley.

Methodist Hospital, Scottsbluff, Neb., \$3,000 by the will of J. T. Ryan, Ogallala.

Stuyvesant Square Hospital now known as the New York Skin and Cancer Hospital unit of the New York Post-Graduate Medical School and Hospital, \$15,000 from the estate of Miss Helen R. Johnson, Bennington, Vt.

Poliomyelitis Funds Allocated.—The balls held on President Roosevelt's birthday, last January 30, raised \$1,071,000 for aid in fighting poliomyelitis, it was recently announced. Seventy per cent of the receipts was turned back to the communities in which they were raised. The remaining 30 per cent was retained by the committee, which had \$241,000 after paying expenses. Of this amount \$110,000 was allocated in grants for research on poliomyelitis to the following institutions under the direction of the investigators indicated: Harvard University, Boston, Dr. William Lloyd Aycock, Long Island College of Medicine, Brooklyn, Dr. Sidney D. Kramer, New York University, Dr. William H. Park, University of Chicago, Dr. Paul H. Harmon, University of Pennsylvania, Philadelphia, Dr. Joseph Stokes Jr., Stanford University, Dr. Edwin W. Schultz, University of California, Hooper Foundation, San Francisco, Karl F. Meyer, Ph.D., University of Southern California, Los Angeles, John F. Kessel, Ph.D., Western Reserve University, Cleveland, Dr. John A. Toomey and Yale University, New Haven, Conn. Drs. John R. Paul and James D. Trask. The remaining funds will be used for grants to other projects or further grants to the same projects, in accordance with recommendations of an advisory committee consisting of Drs. George W. McCoy of the U. S. Public Health Service, Washington, D. C., Max M. Peet, Ann Arbor, Mich., and Donald B. Armstrong of the Metropolitan Life Insurance Company, New York. No receipts were given to the Warm Springs Foundation, Warm Springs, Ga., this year. All last year's funds went to the Georgia institution.

Society News.—The Southeastern branch society of the American Urological Association held its second annual meeting in Nashville, Tenn., December 6-7. Among speakers were Drs. Burnett W. Wright, Los Angeles, on "Urinary Complication in an Epidemic of Poliomyelitis," Hugh Cabot, Rochester, Minn., "Methods of Diverting the Urine Above the Level of the Bladder," George G. Smith, Boston, "Total Prostatectomy for Cancer of the Prostate," and Thomas J. Kerwin, New York. "Present Value of Electrical Methods in the Treatment of Certain Urologic Conditions."—Officers elected at the annual meeting of the American Academy of Tropical Medicine in St. Louis, November 20-21, are Drs. Richard P. Strong, Boston, president, Wilbur A. Sawyer, New York, vice president, and Ernest Carroll Faust, Ph.D., New Orleans, secretary. At this meeting the American Foundation for Tropical Medicine was organized, with Dr. Earl B. McKinley, Washington, D. C., as executive secretary.—The seventh annual open meeting of the American Society for the Study of Arthritis was held in New York, December 12, at the New York Academy of Medicine. Papers were presented by Drs. Reginald Burbank, New York, on "Treatments in Arthritis," Loring T. Swaim, Boston, "Prevention of Deformities in Arthritis," and Martin E. Rehfuss, Philadelphia, "Experimental Arthritis and the Treatment of That Disease from the Gastro-Enterological Viewpoint."—The Eastern Conference of Radiologists will be held in Baltimore, January 31-February 1, with headquarters at the Lord Baltimore Hotel. Further information about the conference may be obtained from Dr. Charles A. Waters, 1100 North Charles Street, Baltimore.—Dr. Frederick M. Hodges, Richmond, Va., was elected president of the Southern Medical Association at the annual meeting in St. Louis, November 20, and Drs. Quitman U. Newell, St. Louis, and Joseph E. Knighton, Shreveport, La., vice presidents. Baltimore will be the meeting place in 1936.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov 16, 1935

Accident-Proneness

In an address at the Insurance Institute of London, Mr Eric Farmer, reader in industrial psychology at Cambridge University, said that statistical research showed that in any group of individuals exposed to similar risks the majority of the accidents involved a small number and that accident-proneness was a relatively stable individual characteristic, which manifested itself whenever the opportunity was given. Accident-proneness was now recognized as one of the chief causes of accident. How were the accident prone to be detected so that they may avoid being a danger to themselves and to others? One way was by psychologic and other tests, which measured the qualities involved in accident-proneness, so that it was possible to predict which people were most likely to be involved in accidents. An alternative method was to see whether the knowledge gained by statistical means concerning the accident prone could be given practical effect. To judge in any particular case whether the number of previous accidents was a clear indication of accident-proneness, it was necessary to know by how much that number exceeded the average of the group of drivers to which the individual belonged. If the acquisition of this knowledge proved possible and the results confirmed those already obtained, some means might be devised of preventing the small number of people who are found to be highly accident prone from driving. An effective inquiry would require the cooperation of the government and the insurers. Valuable knowledge might be collected concerning those involved in road accidents if for a period of, say, five years every motorist when applying for a license should be required to produce a certificate from his insurers giving the type of policy that he held, the period of holding and the claims made.

The Myth of Race

A book entitled "We Europeans. A Survey of Racial Problems," by Julian S Huxley, D Sc, secretary of the Zoological Society, A C Haddon, FRS, Sc.D, formerly reader in Ethnology, University of Cambridge, and A M Carr-Saunders, professor of social science in the University of Liverpool, has just been published. Dr Haddon is a leading British anthropologist, Dr Julian Huxley, the grandson of the famous zoologist, is a foremost exponent of the modern doctrine of heredity, and Professor Carr-Saunders is well known as a writer on social and statistical subjects. The authors discuss the principles of human heredity, the bases of ethnic classification, and the main ethnic groups of Europe and Europe overseas. At this time it is interesting to read the latest views of leading British experts. They use the term "ethnic group" instead of "race," as they hold that race in the current conception does not exist in Europe. There are different physical types of man, but crossing has always been widespread and therefore no such thing as a pure race exists. A common popular fallacy is to regard a nation as a race. The unity that underlies the conception of 'nation' is cultural, not racial, and every nation is composed of many physical types. With them are found numerous intermediate types and some widely aberrant types. The intermediate types are not due to blending of discrete characters but to mendelian recombinations. Thus in Devon and Cornwall are seen individuals combining light eyes with dark hair, characters derived from the Saxon type on one side of the border with the British type on the other. However, in reviewing this book Sir Arthur Keith differs somewhat with the authors on the question of race. He says "Races as the zoologist

knows them, have disappeared from Europe, civilization has broken them up and there has come into being, to take their places, a multitude of nationalities. Each nation represents an evolutionary unit—an incipient race. If frontiers could be fixed and national aloofness maintained over many thousands of years, races distinctive in a physical sense would emerge." But Keith's view is supplementary rather than contradictory to the authors' teaching. Moreover, it is known that before the dawn of history the crossing of racial types took place and that nowhere in the historical period has the "national aloofness" for thousands of years, postulated by Keith, been maintained. Of the United States, Keith says "The people there have been recruited from all the countries and races of Europe. Yet in mind they have become 100 per cent American. And if their national spirit and frontiers hold for some 5,000 years they will become 100 per cent American in body too."

Examining the claims for what is called "the Nordic race," the authors point out that the fundamental discoveries of civilization are the art of writing, agriculture, the wheel and building in stone. All these originated in the Near East, among peoples who by no stretch of imagination can be called Nordic. In the classical period Aristotle gave reasons why the Nordic barbarians as well as the Asiatic peoples were incapable of rising to the level of the Greeks. The northern peoples, he said, though endowed with plenty of spirit, are wanting in intelligence and skill, while the reverse held for the Asiatics. But the Greeks were endowed with both sets of qualities.

The Nordic myth in Germany is also exposed. The Germans are found to be a mixture of the Nordic and Eurasiatic (Alpine) races, of which the latter type is now predominant. The view that Germany owes her achievements to the Aryan or Nordic elements is also shown to be wrong. The Nordic type is tall, fair and long headed. But, as Weidenreich has shown the greatest Germans, including Beethoven, Kant, Schiller, Leibnitz and Goethe, were all moderately or extremely round headed (cephalic indexes from 84 to 92). In a recent book the national 1st German anthropologist Kossina is in such difficulties that he has to abandon the racial conception and say that "Nordic souls may often be combined with un Nordic bodies." The authors conclude that racialism is a dangerous myth—a cloak for selfish aims, which in their unclad nakedness would look ugly enough.

Voluntary Euthanasia

The formation of the Voluntary Euthanasia Legalization Society has been described in previous letters. Further particulars can now be given as to the bill allowing sufferers from painful and incurable disease to anticipate death. The procedure laid down is as follows: 1 The person desiring to receive euthanasia must be not less than 21 years of age and must be suffering from a disease involving severe pain and of an incurable and fatal character. 2 He must make an application in writing on a special form and must sign it in the presence of two witnesses, one of whom must be an official witness—a magistrate, lawyer, physician or minister of religion. 3 Before applying, the patient must have consulted his nearest relative and set his affairs in order. 4 The application must be sent to a euthanasia referee (to be appointed by the minister of health) accompanied by medical certificates on special forms. One of these certificates must be signed by the physician in attendance on the patient and the other by a physician having certain qualifications or status to be prescribed by the minister of health. 5 The euthanasia referee on receiving the application and before granting permission for euthanasia must satisfy himself by a personal interview with the patient and otherwise that the requisite conditions have been fulfilled and that the patient understands the nature and purpose of the application. 6 Permission to receive euthanasia shall not operate until the expiration of seven days from the date when the euthanasia referee sends the permit to the patient. The referee shall, on

sending the permit, notify the nearest relative that permission has been granted. 7 Within three days of receiving such notice the nearest relative may appeal to a court on the ground that one or more of the requisite conditions have not been fulfilled, and the court may cancel the permit. 8 Euthanasia shall not be administered by other than a physician named in the permit and shall be administered in the presence of one of the official witnesses.

The consultative medical council of the society is an influential body composed of leaders of the medical profession. The president is Lord Moynihan and the vice presidents are Sir Humphry Rolleston and Sir W. Arbuthnot Lane. The moving spirit is the secretary, Dr. Killick Millard, who was formerly a health officer and published in 1931 in *Public Health* an article entitled "Euthanasia—A Plea for the Legalization of Voluntary Euthanasia."

PARIS

(From Our Regular Correspondent)

Nov 1, 1935

The French Surgical Congress

The second subject chosen for general discussion at the meeting of the forty-fourth French Surgical Congress was "Fractures of the Os Calcis." An exhaustive review of this question was given by Paire and Boppe. Fractures involving the articular surfaces are the most serious from the standpoint of prognosis. They usually mean an invalidity of five or six months and, even when consolidation has taken place, there is much functional disability, the pain on walking often persisting for two years, as the result of a chronic subastragalar arthritis. The severity of the fracture and that of its sequelae are not at all in direct relation to each other. The anatomic reduction of a fracture of the os calcis is very difficult. One should never wait longer than a week to attempt reduction by non-operative or operative methods. Every effort must be made to maintain the reduction either by the instrumental (nail) method of Böhler or by noninstrumental extension applied direct to the greater tuberosity.

Paire and Boppe have observed twenty cases treated by the nail method at Böhler's clinic in Vienna during 1933-1934 and followed up at intervals of from six months to two years after the injury. Aside from a few cases in which horizontal or vertical impaction had taken place, perfect anatomic reduction followed Böhler's first (nail) method. From the functional standpoint the results were not above criticism. Aside from a rarefying osteitis, which persisted for five or six months, the patients were unable to walk well until after about the same period. Any movement of the astragalocalcaneal joint is followed by sharp pain and this continues for about a year after the injury, but ankylosis of the joint between the astragalus and the os calcis persists in 70 per cent of the cases.

Leriche has advocated immediate operative reduction followed by fixation, but Paire and Boppe believe that one should be very conservative in this direction because too many cases have been observed in which a 40 to 50 per cent invalidity resulted because of poor technic.

Operative and nonoperative methods of reduction are a step forward in the treatment of these difficult fractures but they still need to be evaluated. Böhler has had better results than have the advocates of operative reduction but the latter is only of comparatively recent origin. Fixation by mechanical means is preferable to bone grafts if operation is decided on.

In the discussion, Böhler of Vienna showed in a film the various steps of his technic. He has treated 200 cases, and in 88 per cent of these no functional disability has resulted.

Jimeno Vidal of Barcelona, basing his opinion on a large number of cases observed at Böhler's clinic and on fifty personal observations at Barcelona maintained that the orthopedic method was far better than open reduction.

Herman of Antwerp endorsed this point of view. The scar following operation remains painful for such a long time that it causes disability in a certain number of cases, as serious as in cases in which no treatment at all has been given.

Leriche of Strasbourg prefers open reduction and fixation of the fragments by mechanical means and is opposed to nail extension as advocated by Böhler. He defended the incision on the outer surface followed by temporary division of the peronei tendons. If the latter are carefully sutured, no disturbance of movement of the foot results.

Trueta Raspall of Barcelona, after an experience of forty-three cases, is opposed to the nail extension method of Böhler. Open reduction does not give better results than orthopedic treatment. Lateral compression and extension for twenty-five days followed by immobilization for ten weeks have appeared to him the most rational treatment. Any disability persisting more than a year can be considered as permanent.

Chavannaz of Bordeaux was pessimistic regarding fractures of the os calcis. He has seen a 25 to 30 per cent permanent disability in twenty of twenty-two cases. Inadequate reduction, the type of fracture, the changes in the soft tissues, and allowing the patient to walk too early are the chief causes of poor end results. Modern orthopedic and surgical procedures offer better prospects than the older methods of treatment.

Hamant and Grimaud of Nancy maintained that their results in forty-two cases treated by the older methods were better than is generally believed to be the case, only an average permanent disability of 10 per cent being noted by them. If orthopedic methods do not give a satisfactory result, operative intervention is indicated. Open fractures demand the most careful attention to prevent serious complications.

OPERATIONS ON THE DIAPHRAGM, EXCEPTING PHRENICECTOMY

Menegaux read a paper on the technic and Costantini on the physiologic effects of operations on the diaphragm excepting phrenicectomy. Sauerbruch of Berlin, Harrington of the Mayo Clinic, Truesdale of Fall River, Mass., and Jentzer and Cheridjian of Geneva took part in the discussion.

Menegaux of Paris cited the following conditions as indications for operative intervention: 1 Congenital malformations (retro-xiphoid and esophageal hiatus hernias). 2 Injuries with or without accompanying visceral herniation. Those of the left half do not heal spontaneously as well as those of the right half, which are favored by the presence of the liver and hence can heal without operation. If a visceral hernia exists it should be operated on early. Foreign bodies are more frequently found than it is generally believed. 3 Lesions of the esophageal hiatus (stenosis, cardiospasm, hernias containing a portion of the stomach and one or more coils of small intestine). 4 Eventration (usually observed only on the left half). 5 Tumors (usually secondary). 6 Subphrenic abscess or hepatic cysts.

A preliminary phrenicotomy may be of help because of the relaxed condition of the diaphragm. Pneumothorax is dangerous and seldom indicated. The latter is true of plastic operations on the bony thorax. During the operation, one should avoid traction on the mediastinum and especially on the pericardium. Anesthesia under positive pressure will greatly diminish the shock of pneumothorax. In the after-care, large doses of morphine are indicated, not only for the pain but to decrease the demands of the body for oxygen. After a description of the technic of the different ways of approach to the diaphragm, the following conclusions as to the indications for each method were given:

1 To approach the left half the combined thoraco-abdominal route, beginning with the abdominal which alone may suffice.

2 To approach the esophageal hiatus and adjacent portion of the left half of the diaphragm. Abdominal approach with a bougie in the esophagus so as to avoid opening the lumen.

If the closing of the hernial opening is difficult, it is advisable to combine at once the thoracic and the abdominal routes of approach

3 For the right half, one can employ either the thoracic subpleural transdiaphragmatic or the transpleurodiaphragmatic route. In cases of combined liver and diaphragm injuries, it may also be necessary to perform a laparotomy

Costantini of Algiers maintained in his paper that the abdominal mode of approach to the diaphragm was much less apt to give rise to serious complications than the transthoracic route with its accompanying pneumothorax. Much has been accomplished in decreasing the ill effects of a pneumothorax since the introduction of anesthesia combined with positive pressure, and Costantini made a plea for its use in all operations on the diaphragm. Even under favorable conditions the technic is difficult and one cannot determine in advance which patients will present marked evidence of shock followed by asphyxia and death. As a rule, recurrence after operations for diaphragmatic hernia is rare. A preoperative diagnosis of strangulation of such a hernia is seldom made

In the clinical study (preoperative) of nonstrangulated cases the condition of the respiratory and cardiovascular apparatus, of the endocrine glands and of the kidneys must be carefully evaluated. The radiologic examination should yield information as to the location and dimension of the hernial opening. The speaker agreed with Menegaux that preliminary measures such as phrenicectomy, pneumothorax or thoracoplasty were rarely indicated unless the operator did not have at his disposal an apparatus for establishing positive pressure

The abdominal route is less dangerous, but one may have great difficulty at times in reaching the dome of the left half of the diaphragm. The thoracic route permits direct liberation of the hernial contents and better facilities for closing the opening in the diaphragm, but one is confronted with the danger incident to the pneumothorax, such as sudden displacement of the mediastinum. A simple intercostal incision on the anterolateral aspect of the thorax, usually at the level of the seventh rib, permits access to all parts of the left dome. The combined thoraco-abdominal route is the most convenient, but the question of pneumothorax must be considered. However, this route is not any more dangerous than the thoracic approach alone and it has the advantage of permitting an easier liberation of the hernial contents when adhesions are present. The best incision for the thoraco-abdominal approach is a paramedian one (left) extending to the seventh interspace. The degree of positive pressure should be a little above the normal atmospheric pressure. It should be increased during the initial and final steps of the operation and decreased in the interval. Pleural drainage should be employed only if there were many adhesions and some bleeding. It should be by siphonage, with constant aspiration. Postoperatively morphine must be given in relatively large doses. For closing the opening in the diaphragm non-absorbable suture material is preferable. When the hernial opening is large and difficult to close, a phrenicotomy (either cervical or intrathoracic) will render the diaphragm flaccid and facilitate greatly the closure of the opening

Sauerbruch of Berlin, who opened the discussion, greatly preferred the thoracic mode of approach to the diaphragm. In a large number of hernias (diaphragmatic) operated on by him, there were only five deaths

Harrington of the Mayo Clinic prefers the abdominal route. He employs fascia lata as suture material, reinforced by linen thread. In hernias with large openings, a preliminary phrenicotomy renders closure a relatively easy procedure. In a total of 105 operations on the diaphragm there were ninety-seven herniotomies with seven deaths. There were two recurrences in the ninety successful cases. Following operation, the function of the diaphragm is not modified unless there has been wide destruction of the phrenic nerve or its branches

Truesdale of Fall River reported thirteen herniotomies (all congenital) in children. The mortality was 7.5 per cent. He preferred nitrous oxide-ether as an anesthetic

BERLIN

(From Our Regular Correspondent)

Oct. 14, 1935

Health Certificates as a Requirement for Marriage

The federal government has just passed a "law to prevent hereditary taints and thereby safeguard the health of the German people." The government seeks to build up a special form of protection for the family by prohibiting the contraction of marriage in the event that the health of either contracting party is of such a nature as to constitute a medical contraindication. The law makes it compulsory for persons who contemplate marriage to report at the bureau of health having jurisdiction, to undergo a medical examination, on the basis of which, if favorable, a so-called *ehetauglichkeitszeugnis*, or certificate of fitness for marriage, will be issued. In the following cases a certificate will be refused: (1) if either of the contracting parties is affected with a disease that may prove contagious and that awakens the just fear that a marked disturbance of the health of the other party or of offspring may result, (2) if either of the contracting parties, after coming of age, has been placed by the courts under a legal guardian, (3) if either of the contracting parties, although not placed under a legal guardian, is affected with a mental disturbance that makes the proposed marriage appear undesirable from the standpoint of public security, and (4) if either of the contracting parties is affected with a hereditary disease within the purview of the law pertaining to the prevention of offspring with hereditary taints

The sterilization law, to which reference is here made, mentions eight groups of diseases that come within the scope of this law. The list of reasons for prohibiting a contemplated marriage is thus raised to eleven. Worthy of note is the fourth provision, that a person, although sterilized, may not enter into a marriage union if his (or her) condition of health comes within the scope of the sterilization law. The legislator, whose duty it is to promote an increase of the population, will not permit a healthy marital partner to remain childless. The practicability of adding "mental disturbances," as in the third provision (not the mental diseases proper as listed in the sterilization law), to the reasons for prohibition of marriage may be doubtful. By "mental disturbances" is probably meant neuroses, depressions and the like, which in view of the summary examination by the health officer called on to issue the certificate, will present no slight difficulties in the way of a definite diagnosis

If both of the contracting partners are foreigners, or if the prospective husband is a foreigner, the law has no application. On the other hand, a foreign woman who plans to marry a German citizen must subject herself to a medical examination. A marriage performed in a foreign country with the object of avoiding the operation of this law is null and void. The penal code provides that the underhanded contraction of a prohibited marriage through false statements, and even an attempt to contract such a marriage, is punishable with a prison sentence of from three months to five years

The aims of this legislation are set forth in a recent pronouncement of Frick, the federal minister of the interior, to the effect that it will insure that only such marriages may be contracted in Germany as will guarantee a healthy offspring. Generations may come and go, but the German people shall live on forever

The so-called Nuremberg law of Sept. 15, 1935, termed "Schutz des Blutes und der Ehre," also forms a part of the marriage control policies of the present German government

The law states that the lawmakers "permeated with the knowledge that the purity of the German blood is a precondition for the continued existence of the German people, and filled with the inflexible determination to make the German nation secure for all future time," have ordered that marriages in which either contracting party is Jewish and the other party is a citizen of German or kindred blood shall be prohibited, and that marriages entered into in a foreign country with a view to circumvent this law shall be null and void. Extramarital congress between Jews and citizens of German or kindred blood is prohibited.

According to official statistics, the upward numerical trend of marriages has persisted. In 1934 the number of marriages per thousand of population was 11.2, which is higher than in previous years. It was only 7.8 in 1913 and 9.7 in 1933. The increase in marriages in 1934 was not so significant in the rural sections as in the cities. In the communes with more than 100,000 inhabitants the marriages were 12.6 per thousand of population, in communes with from 15,000 to 100,000 inhabitants the number was 11.5, and in the rural communes with less than 15,000 inhabitants only 10.2.

An insight into the marriage policies of the government may be obtained also through a scrutiny of the status of the government aid to young couples desiring to marry. In the first quarter of 1935 the law for the promotion of marriages began to show some favorable results. More loans could be remitted because of living births than there were new loans made, and yet the number of marriages did not decrease. There had been eight living births for about seven marriages promoted by government aid. During the first quarter of 1935 there were 34,650 marriage loans granted and 38,904 marriage loans remitted in part. In the second quarter of 1935, 29,662 marriage loans were granted and in 28,356 cases a certain portion was remitted by reason of living births. Between August 1933 and the end of June 1935, 440,826 marriage loans were made and 220,844 loans were remitted in part, in the German reich.

In this connection statistics on divorces, recently published by the federal bureau of statistics, for the year 1933, may be mentioned. In 1933 a total of 42,485 marriages were dissolved by the courts. In 66 per cent of the cases, violation of marital duties (in 1913, 46.8 per cent) constituted the grounds for divorce. Adultery was the charge in 35.2 per cent of the cases (in 1913, 55 per cent). It is apparent, therefore, that adultery as a cause for divorce has declined considerably since the pre-war period. The number of divorces granted because of mental disease has greatly increased (1913 373, 1933, 706). Of the marriages dissolved by divorce in 1933, ninety-three had been contracted within the twelvemonth, 1,035 more than a year but less than two years, 2,384 more than two years but less than three years, and 3,221 more than three years but less than four years. The most critical time appeared to be between four and five years of married life. During this period 3,533 marriages were dissolved. The number of marriages dissolved between the fifth and sixth years was almost as high as between the fourth and fifth, after that a rapid decline was observable. Nevertheless, more than 2,300 marriages contracted between 1908 and 1912 were dissolved in 1933 while about 2,100 marriages contracted previous to 1908 were dissolved. In connection with the child problem, it is interesting to note that nearly half of the marriages dissolved by divorce were childless.

The Health Record Book

For some time the plan of introducing a health record book that would contain data of regular health examinations and would accompany the bearer throughout life has been under discussion. A beginning has now been made with respect to the members of the "Hitler-Jugend," the large and comprehensive youth organization of the national-socialist party. The health record book was introduced some time ago as an experiment

in a certain district, and the observations of the results were favorable. Now the innovation is to be made compulsory in all the families of the members of the Hitler-Jugend, in order to carry out the plan of securing information as to the health of all units of the German people. The medical supervision in schools for the training of leaders, in labor camps and the like, will be greatly lightened in this manner, since the medical observations will always be available. The health record book will have extraordinary importance in occupational guidance. Every two years a supplementary examination, the results of which will be likewise entered in the health record book, will be made.

VIENNA

(From Our Regular Correspondent)

Oct. 24, 1935

Pollitzer's Hundredth Birthday Anniversary

Adam Pollitzer, the founder of scientific otology, who was known to the nineteenth century as the leading otologist of his day, would have been 100 years old a few days ago, if he had lived. The anniversary of his birth was celebrated by all fortunate enough to come in contact with this unusual man. Pollitzer was a representative of an inconspicuous Jewish family in Hungary. He received his training in Vienna, where in 1859 he obtained the doctor's degree in medicine. He studied under Claude Bernard, Helmholtz and Toynbee of London, where he laid the foundations for his masterful researches on the anatomy, pathology and physiology of the auditory organ. He introduced many therapeutic methods for ear disorders, most of which are still in use. He was the main moving force in the creation in 1873 of the first ear clinic in the world, at Vienna, although it was of exceedingly modest dimensions, consisting of two rooms with twenty beds, together with a small laboratory. Nevertheless these small rooms soon became the Mekka of all the otologists of the world, for Pollitzer was an excellent teacher, a man of indefatigable industry and possessed of a very exceptional depth of knowledge, thereby inspiring his more intelligent pupils to undertake most valuable researches. His contributions to the knowledge of the anatomy of the ears, to the pathology of otitis media and of catarrh of the middle ear, and his operative technic of the labyrinth, were milestones in the development of otology. The Pollitzer air douche is still used everywhere, his wall charts illustrating the anatomy of the ear, and his illustrations of the ear drum are still unequalled in beauty and precision. The vast majority of the otologists in Europe were and are his pupils, among whom are men of international reputation. The school and clinic that he founded are still flourishing.

Changes in the Medical Faculty

Prof. Dr. Alfred Fischel, the director of the Institute of Embryology at the University of Vienna, has been placed on the retired list. Born in 1868, he studied in Prague and Vienna, whereupon he devoted himself to experimental pathology and embryology. His textbook on embryology ("Lehrbuch der Entwicklungsgeschichte") is a standard work. The Vienna Institute is indebted to him for its valuable and comprehensive collection of embryologic specimens. Fischel's chief field of research was the origin of monsters.

The Vienna Institute of Legal Medicine has been taken over by Prof. Dr. Fritz Reuter of Graz. He is 59 years of age. After pursuing his studies in Zurich and Vienna he became the head of the department of pathology at the University of Graz, and later he served in a similar capacity in the army. Thereupon his field of activity shifted to Vienna, where he became the assistant of Haberdia. He has published numerous scientific works, two of which, "Forensic Gynecology" and his "Textbook on Legal Medicine," have received widespread recognition.

Professor Dr Carl Sternberg

Another of the most eminent representatives of the renowned Vienna school of physicians has received his final summons. Prof. Dr. Carl Sternberg, the pathologic anatomist, died suddenly, during a trip in a row boat, at the age of 64. He was a native of Vienna and secured all his training in this city. As a young physician he came under the influence of Professor Paltauf, whose position in the field of pathologic anatomy is well established. Sternberg soon became his best collaborator and made so quickly a name for himself that, although scarcely 30, he was appointed privatdozent and served as pathologist of the Vienna Policlinic. In 1906 he accepted a position as anatomic assistant at the large hospital in Brunn, where he remained until 1920. He came, however, every week to Vienna to deliver his lectures. During the war he was the chief pathologist and bacteriologist of the army, and it was owing to his skill and diligence that the wartime epidemics were prevented from spreading in Austria. On returning permanently to Vienna he became prominent as "prosektor" of three large hospitals and general secretary of the Vienna Medical Society. In spite of his manifold professional activities, he found time to write more than 150 scientific treatises. His researches included lymphogranuloma, the lymphatic apparatus and its disorders, the pathology of the intestinal tract (including tumors), and typhoid and cholera. His chief work is his textbook on general pathology and anatomy. He was one of the most active members of the Austrian Cancer Society. He supplied also valuable treatises on "The Bacteriology and Pathologic Anatomy of Paratyphoid" and on "Mixed Infections of the Intestinal Tract."

Tuberculous Arthritis

At a recent session of the Graz Medical Society, Dr. W. Berger and Dr. P. Ludwig reported the results of their research on polyarthritis, in which antituberculosis treatment brought striking improvement. They demonstrated two cases in which very severe joint changes, with complete stiffening of the limbs and helplessness, resulted from articular rheumatism, which had remained resistant to all forms of treatment. Finally, the employment of old tuberculin, autovaccines and natural sunlight restored to a great extent the use of the limbs and brought an increase of weight of about 44 pounds (20 Kg.). By using the Löwenstein method, tubercle bacilli could be demonstrated in the blood of both patients. Two years previously, Löwenstein in Vienna, in collaboration with Reitter, demonstrated tubercle bacilli in blood culture in 68 per cent of 209 cases of "acute articular rheumatism" and in 27 per cent of eighty cases of primary chronic polyarthritis. At the Graz clinic, out of twenty-four cases of chronic polyarthritis, which, according to clinical symptoms, appeared to be undoubtedly of tuberculous origin, tubercle bacilli were demonstrated in the circulation in fourteen. The correctness of the diagnosis was further strengthened by the success that followed the tuberculosis treatment (application of tuberculin, strengthened by autovaccines). Likewise in acute arthritis of the type of articular rheumatism examination of the blood gave positive results even in the cases in which treatment with salicylic acid was successful. Also cases of vegetative endocarditis and of endocarditis lenta peracta were studied. Coronini, Popper and Bodart secured in forty cases of recent vegetative endocarditis forty positive and no negative results, cultures of tubercle bacilli from fresh cadaver blood and heart tissues yielded, in endocarditis peracta, five positive and forty-seven negative results. The two speakers reported also having observed cases of tuberculous endocarditis in which the clinical observations coincided with the examinations of the blood cultures. It seems therefore that a considerable percentage of cases of acute and chronic articular rheumatism not only present clinical evidence of a tuberculous origin but also are associated with tuberculous bacilleemia. On

the other hand, one must not overlook the signs that point to a septic etiology, for in more than 10 per cent of the cases these alone were found in the blood and in the joints. Clinical observations on the two kinds of cases force one to adopt the view that a synergism exists in joint pathology between cocci and tubercle bacilli, furthermore, that there is a clinically non-fungous type of tuberculous polyarthritis, in addition, certain other noninfectious factors play a part—hormonic, constitutional, climatic and thermic factors, and possibly still others.

BUCHAREST*(From Our Regular Correspondent)*

Oct. 23, 1935

The Congress of the National Medical Association

The National Medical Association held its annual congress, September 26-28, in the spacious halls of the association. The attendance superseded all previous records. On account of the miserable economic conditions, physicians cannot afford to go abroad and therefore they satisfy themselves by spending some days in the capital.

Prof. Petre Tomescu, the newly elected president, reviewed the activities of the past year. He regards it as an achievement of the association that with its protestation it warded off revision of those physicians who occupy public offices. The government wanted to reduce the number of state clerks and officials at least 33 per cent for economic reasons. This would have been a disaster to hundreds of medical clerks. The successful intervention of the association against this measure means a great victory. Tomescu attaches great hope to the new medical academy, whose competence is beyond criticism. For the coming year, he set up the following program: 1. The public hygienic organization of the country and the interests of the medical profession demand that a campaign shall be undertaken to overcome the indifference with which the government handles public hygiene problems. 2. Vacant medical positions should be filled. At present hundreds of medical positions in villages are filled by medical students in spite of the great number of unemployed physicians, the reason being that the students offer themselves for much less pay. 3. The abolition of unqualified practitioners should be demanded. All foreign diplomas that have not been notified since the war ended should be revised. 4. A society should be founded to assist impoverished doctors, widows and orphans. One solution of this problem is to make representations to the government to allow a tax stamp of 1 leu (half a cent), to be affixed to every prescription.

The medical congress resolved to request the government to modify certain laws that were adopted lately by the senate. To the law forbidding certain qualified persons from carrying on their profession, the association will propose the addition of the following clause: Physicians, pharmacists and druggists shall be prohibited from practicing their profession except under the jurisdiction of the public health law. The law adopted by the senate does not contain any penalties for practicing quackery, while the public health law has several paragraphs for this purpose. Therefore the association finds it necessary to add these words: "Whoever conducts medical practice contrary to the rules of the public health law commits the crime of quackery and is liable to a penalty of six to twelve months imprisonment and a fine of from 5,000 to 50,000 lei."

The association will demand modification of the law on the falsification of public documents by the insertion of this clause: Any physician who knowingly issues a false medical certificate for use by magistrates or insurance companies commits the crime of issuing a false medical certificate and not, as the law signifies, falsification of a public document, and is liable to imprisonment for from one to six months and a fine of from 1,000 to 2,000 lei.

The chapter on induced abortion needs the following modification. It is not regarded an artificial interruption of normal gestation (1) if the life or health is earnestly threatened, and if this danger cannot be averted by any other way, and if this danger can be eliminated by the interruption of gestation, (2) if one of the parents is insane or suffers from inheritable disease or anomaly and there is a well based suspicion as to the child inheriting this severe bodily or mental disturbance. Impunity is secured only for obstetricians, gynecologists or operative surgeons and only in case the abortion has been induced after a consultation with a specialist in the branch to which the disease pertains. A record has to be made of the discussions carried on at the consultation.

As to professional secrecy, the association suggests the insertion of the following paragraph. An attending physician may be absolved from keeping the secret of his patient in instances specified in the public health law, that is, in all cases in which revealing a secret is conducive to saving the lives or health of patients or communities.

Finally, the congress resolved to demand the insertion of a new paragraph on the baseless defamation of physicians. It is not unusual to blackmail doctors by claiming indemnities for badly treated cases. It frequently occurs that, when patients die after operations, the families of the deceased try to obtain compensation. In some cases doctors prefer to pay a certain amount than to be dragged to court. To prevent these abuses it is desirable that the law embody the following clause suggested by the medical association. Whoever publicly states defamatory things about a physician, referring either to his medical practice or to his private honor, which statements, if true, would involve personal or disciplinary prosecution or public contempt or would injure his professional reputation, commits the crime of "slander against a professional man" and is liable to a penalty of imprisonment ranging from six to twenty-four months and a fine of from 2,000 to 8,000 lei.

BUENOS AIRES

(From Our Regular Correspondent)

Sept. 24, 1935

Transfusion of Preserved Blood

In a previous letter (THE JOURNAL, July 27, p 296) the performance of transfusions of blood made in Bordeaux with blood sent from Buenos Aires by Drs Palazzo and Tenconi was reported. The method and technic for transfusion of preserved blood reported by Drs Palazzo and Tenconi (*Semana méd* 1 766 [March 8] 1934, *Rev sud-am de endocrinol* 18 40 [Jan 15] 1935) have been used by Drs Jeanneney and J Viero of France (*Bull et mem Soc nat de chir* 60 1305 [Dec 15] 1934). The blood, while being taken from the donor, is automatically mixed with sodium citrate and then it is passed through a silk filter before its reinjection. The blood is prepared by suspending 100 cc of centrifugated erythrocytes in 235 cc of a solution prepared with two parts of a 3.8 per cent sodium citrate solution and five parts of either a 10.3 per cent saccharose solution or a 5.4 per cent dextrose solution. Then it is kept in the icebox between 1 and 3 C. The centrifugated plasma is kept by itself. Cultures are made to exclude the presence of bacteria, and the blood groups are determined. Blood thus preserved is ready for transfusion at any time, its use avoids the need of resorting to donors in emergencies, the production of shock is rare, the technic is simple, it is inexpensive and the injections can be made at will with the erythrocytes of the plasma or with mixtures of the two. Drs Palazzo and Tenconi have performed about 395 transfusions during the years 1933-1934. The average time of preservation of the cells used was 76 days. In some cases the cells used had been kept for twenty seven days and the same satisfactory results were obtained.

Economic Difficulties of Hospital Physicians

More than 2,000 physicians give free medical care to the public in the hospitals of Buenos Aires, to which they go daily. As there are no restrictions as to the selection of patients, grave conditions, both for hospitals and for physicians, have originated. The number of patients attending free hospital clinics and dispensaries continually increases, but the hospital incomes do not increase and the means are insufficient to cope with the demands of the public. Some persons, either because they bring letters of recommendation or because they give small donations to the hospitals, are given preferential attention over the poor. The physicians' private practice decreases while their free work in the hospitals increases. Many physicians cannot now make a living, and for this reason the group of hospital physicians agreed to ask a small salary from the hospitals. The Partido Socialista presented a project in which a yearly allowance of 5,000,000 Argentine pesos (about \$1,400,000) can be obtained from the government. The attitude assumed by the physicians has gained publicity through the press and by lectures. The opinions of the physicians are conflicting and, while some believe that it is fair to obtain remuneration for their work, others prefer to have a complete readjustment in the present conditions of the profession, without accepting salaries, a fact that they believe may make the members of the profession subordinate employees in the category of proletarians or place them under the direction of political authorities.

Methylene Blue in Cyanide Poisoning

In THE JOURNAL, August 31, is an editorial which reviews Wendel's article dealing with the action of methylene blue in cyanide poisoning, which the author proved experimentally to be due to the capacity of the stain to form methemoglobin in the blood. The same conclusions were reported in 1933 by Hug (*Rev Soc argent de biol* 9 461 [Oct.] 1933, *Compt rend Soc de biol* 114 947, 1933), who made methemoglobin determinations by means of the Van Slyke gasometric method, after injection of methylene blue. He found that methemoglobin is formed, although in quantities no larger than 17 per cent of the total quantity of hemoglobin in the blood. The weak antidotal action of methylene blue, as compared with that of sodium nitrite, is explained by the slight capacity of the former to form methemoglobin in living animals.

Obituaries

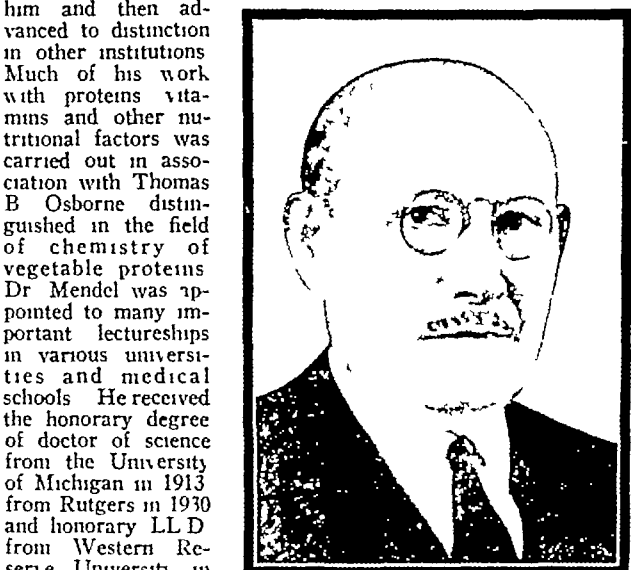
Drs Facundo Largaia, formerly director of the Patronato de la Infancia (a child welfare center) and Ramon Aranguren, formerly director of the Instituto Pasteur antirabico (antirabic center) of the municipality of Buenos Aires, have died.

Marriages

- LESTER L. ANDERSON to Miss Estelle Taylor, both of Stoneville, N C, in Chesterfield, S C, November 11.
CHARLES K. FETTERHOFF, Harrisburg, Pa, to Miss Mary Elizabeth Shue of Mount Union, August 14.
CHARLES H. LACLAIR JR, Uniontown Pa, to Miss Loretta K Mercer of Philadelphia, September 21.
ARTHUR P. KEEGAN, Philadelphia to Miss Mary J Noonan of South Scranton, Pa, September 28.
FRANK HURRON MURRAY, Chester, Pa, to Miss Julia Ralston Young of Swarthmore, September 4.
GEORGE S. MOORE, Hartford City, Ind., to Miss Mary Terhune in Middletown, September 5.
ALFRED CHARLES MOORE to Miss Margaret Wells both of Baltimore, September 21.
OTTO A. MILLER Ashland, Pa, to Miss Helen M Fisher of Reading, September 26.

Deaths

Prof Lafayette Benedict Mendel, Ph D, LL D, member of the Council on Pharmacy and Chemistry of the American Medical Association since 1917 and of the Committee on Foods since its inception, an Associate Fellow of the American Medical Association, died at his home in New Haven, Conn., December 9, after a long illness. Professor Mendel was born in Delhi N Y, in 1872, graduated from Yale in 1891, and received his Ph D in 1893. He continued his studies at Breslau and Freiburg in 1895 and 1896. He became assistant in physiologic chemistry in Yale University in 1892 and professor in 1903. In 1921 he was made Sterling professor. He was a pioneer in the study of nutrition in this country, contributing extensively to the literature in his field and exerting a tremendous influence on scores of men and women who worked and were trained under him and then advanced to distinction in other institutions. Much of his work with proteins vitamins and other nutritional factors was carried out in association with Thomas B Osborne distinguished in the field of chemistry of vegetable proteins. Dr Mendel was appointed to many important lectureships in various universities and medical schools. He received the honorary degree of doctor of science from the University of Michigan in 1913 from Rutgers in 1930 and honorary LL D from Western Reserve University in 1932. He was associate editor of many leading publications in the biochemical field both here and abroad and a member of all the leading organizations in his specialty. For many years he was a prolific contributor on his special topic to the editorial columns of THE JOURNAL. Dr Mendel was awarded in 1934 the Conne medal of the New York Chemists' Club in recognition of his outstanding chemical contribution to medicine. He was also gold medalist of the American Institute of Chemists in 1927. As an educator he was a member of the governing board of the Sheffield Scientific School and of the Graduate School of Yale University of the Russell Sage Institute of Pathology, of the advisory board of the J S Guggenheim Memorial Foundation, and of the Commission on Medical Education. He was author of "Nutrition—The Chemistry of Life Changes in the Food Supply and Their Relation to Nutrition" and of innumerable essays and monographs. During the last two years he was confined to bed and unable to work because of a severe disabling illness. His wife, Alice Friend Mendel, died within the past month.



LAFAYETTE BENEDICT MENDEL
1872-1935

Professor Mendel was widely known for the breadth of his knowledge his grasp of complicated problems in the field of medicine, his clear vision and exceptional common sense in their solution. Educators, industrial representatives and public officials in large numbers constantly sought his advice and counsel. By the warmth of his friendship and his love for humanity he endeared himself to all who knew him.

Herman Morris Adler of Berkeley Calif. Columbia University College of Physicians and Surgeons New York 1901 professor of psychiatry, University of California Medical School, assistant professor of psychiatry, Harvard University Medical School from 1912 to 1917, as well as chief-of-staff at the Boston Psychopathic Hospital, in 1916 made a survey of Cook County Ill, on facilities for the detection and care of mental diseases, under the auspices of the Rockefeller Foundation and the National Committee for Mental Hygiene, in 1917 was appointed state criminologist and director of the Juvenile Psychopathic Institute, Chicago during the war served as a

major in the medical corps of the U S Army, on special duty in disciplinary psychiatry at military prisons, professor of criminology and head of the department of social hygiene, medical jurisprudence and criminology, University of Illinois College of Medicine, Chicago, 1919-1928, adviser to the California Department of Institutions, since 1926 director of the Behavior Research Fund, consultant to the National Committee on Law Observance and Enforcement, member of the Illinois State Medical Society, the Massachusetts Medical Society, the American Neurological Association, the American Psychiatric Association, the New England Society of Psychiatry, the Association for Research in Nervous and Mental Disease, the American Psychopathological Association, the Central Neuropsychiatric Association, the American Orthopsychiatric Association and the American Association of Pathologists and Bacteriologists, author of the section on Medical Science and Criminal Justice in the Criminal Justice Survey of the Cleveland Foundation in 1921, aged 59, died, December 7, in Boston, of pneumonia following an operation.

Samuel Gordon Dabney of Louisville, Ky, University of Virginia Department of Medicine, Charlottesville, 1882, Hospital College of Medicine, Louisville, 1883, professor emeritus of otology, rhinology and laryngology, and for forty five years connected with the University of Louisville School of Medicine, member of the American Academy of Ophthalmology and Otolaryngology, fellow of the American College of Surgeons, on the staffs of the Louisville City Hospital and the Norton Memorial Infirmary, aged 75, died, October 15, of chronic nephritis.

Ralph Vincent Robinson of Pittsburgh, University of Pittsburgh School of Medicine, 1911, member of the American Roentgen Ray Society and the Radiological Society of North America, instructor in roentgenology at his alma mater, served during the World War, on the staffs of the Presbyterian and Children's hospitals and the Falk Clinic, aged 51, died, October 5, of cerebral hemorrhage.

James Edwin Rush of Pittsburgh, University of Pittsburgh School of Medicine, 1920, formerly head of the department and professor of hygiene and public health, University of Kentucky, Lexington, at one time field director of the American Society for the Control of Cancer, on the staff of the Tuberculosis League Hospital, aged 48, died, October 14, of heart disease.

George Merrill Gelser, Rochester, N Y, Cornell University Medical College, New York, 1907, member of the Medical Society of the State of New York, trustee, for many years, and past president of the Rochester Academy of Medicine, on the staff of the Rochester General Hospital, aged 53, died, October 21, of coronary occlusion and arteriosclerosis.

Robert Haller Newman of Knoxville Tenn., University of Louisville (Ky) Medical Department, 1905, past president of the Knox County Medical Society, served during the World War, on the staff of the Knoxville General Hospital, aged 55, died October 13, in the Fort Sanders Hospital, of chronic myocarditis and nephritis.

James Allen Marshall of Pontiac, Ill., Detroit College of Medicine, 1886, past president of the Livingston County Medical Society, for thirty-five years attending surgeon at the Illinois State Reformatory, aged 74, died, November 15, in the Passavant Memorial Hospital, Chicago, of carcinoma of the transverse colon.

Henry De Witt Shankle of Washington C H, Ohio College of Physicians and Surgeons, Baltimore, 1889, member of the Oklahoma State Medical Association, served during the World War formerly connected with the Veterans Administration Facility, aged 68, died, September 26.

Everette Odell Arnold, Corpus Christi, Texas, Baltimore Medical College 1909, veteran of the Spanish American and World wars formerly in the U S Public Health Service and medical examiner of the U S Veterans' Bureau, aged 61, died recently, in a local hospital, of tetanus.

Samuel Milan Kitchen, Nashville, Tenn., Vanderbilt University School of Medicine, Nashville, 1935, intern at the Davidson County Tuberculosis Hospital, aged 24, died, September 1, in the Vanderbilt University Hospital, of pneumonia, metastatic septicemia and osteomyelitis.

LeRoy Delmar Cratty, Wilkesburg, Pa., University of Pittsburgh School of Medicine, 1913, member of the Medical Society of the State of Pennsylvania for many years on the staff of the Western Pennsylvania Hospital, Pittsburgh, aged 45, died, October 26.

Edgar Rand, Huntsville, Ala., Medical College of Alabama Mobile, 1879, member of the Medical Association of the State of Alabama past president and secretary of the Madison County Medical Society, aged 79, died, September 8.

Joseph Perry Standley, St Joseph, Mo, Kentucky School of Medicine, Louisville, 1889, member of the Missouri State Medical Association, aged 66, died, November 8, in the Missouri Methodist Hospital, of a skull fracture received in an automobile accident

Wallace Eugene Miller, Mount Hermon, La, Tulane University of Louisiana Medical Department, New Orleans, 1910, aged 50, died, October 3, in the Elizabeth Sullivan Memorial Hospital, Bogalusa, of diabetes mellitus and carbuncle of the neck

Clarence Whitfield Buckmaster, Yonkers, N Y, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1894, city health officer formerly member of the school board, aged 63, died, October 7

William Brink Rosecrans, Brooklyn, Albany (N Y) Medical College, 1901, member of the Medical Society of the State of New York, on the staff of the Wyckoff Heights Hospital, aged 61, died, September 25, of pulmonary embolism

Ferdinand Comfort Sommer, Bloomsburg, Pa, Jefferson Medical College of Philadelphia, 1929, member of the Medical Society of the State of Pennsylvania, aged 30, died, October 15, at the Jefferson Hospital, Philadelphia, of meningitis

Zina A Spendley, Chenango Forks, N Y, Eclectic Medical College of Pennsylvania, Philadelphia, 1869, member of the Medical Society of the State of New York, aged 92, died, October 11, of cerebral embolism and arteriosclerosis

Katharine Stemen Hughes, Kansas City, Kan, College of Physicians and Surgeons, Medical Department Kansas City University, 1896, member of the Kansas Medical Society, aged 73, died, October 23, of sarcoma of the mesentery

Frederick Henry Langhorst, Elgin, Ill, Rush Medical College, Chicago, 1900, fellow of the American College of Surgeons, aged 64, on the staffs of St Joseph's Hospital and Sherman Hospital, where he died, September 27

Harold Victor Mangun, Ackley, Iowa, State University of Iowa College of Medicine, Iowa City, 1925, past president of the Hardin County Medical Society, aged 35, died, September 27, in Iowa Falls, of lobar pneumonia

Walter Geddes Hope, Albuquerque, N M, Jefferson Medical College of Philadelphia, 1886 an Affiliate Fellow of the American Medical Association, aged 75, died, September 22, in Los Angeles, of hypostatic pneumonia

Eugene Holdeman, Elkhart, Ind, Medical College of Indiana, Indianapolis, 1897, member of the Indiana State Medical Association, for many years county coroner, aged 61, died, October 14, of bronchopneumonia

Charles Moore Burrows, Albion, N Y, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1889, aged 69, died, October 2, of arteriosclerosis and gangrene of the left foot

Charles Claud Greenfield, Argenta, Ill, St Louis College of Physicians and Surgeons, 1904, member of the Illinois State Medical Society, aged 56, died, September 13, in Decatur, of strangulation of the bowel

Leo DeLance Parry, Easton, Pa., Maryland Medical College, Baltimore, 1912, on the staff of the Warren Hospital, Phillipsburg, N J, and the Easton Hospital, aged 45, died, October 13, of carcinoma

Robert Lee Nance, Bedford, Va, University of Louisville (Ky) School of Medicine, 1933, aged 29 intern at the Boston City Hospital, where he died, October 13 of acute tonsillitis and pulmonary embolus

Allen Benson Clark, Joplin, Mo, Columbus Medical College, 1890, member of the Missouri State Medical Association, city health officer, formerly member of the school board, aged 70, died, September 15

Maurice Buchsbaum, Gary, Ind, Rush Medical College, Chicago, 1905, member of the Indiana State Medical Association, aged 68, died October 24, in the Mount Sinai Hospital, Chicago, of carcinoma

Charles Gustaf Nordin, St Paul, University of Minnesota Medical School, Minneapolis, 1910, aged 50 died, October 9, in the Northern Pacific Beneficial Association Hospital, of carcinoma of the liver

Carey E Wamsley, Newport Ky, Miami Medical College, Cincinnati 1906, on the staff of the Speers Memorial Hospital, Dayton, aged 55, died, September 24, in the Christ Hospital, Cincinnati

John Shepard May, Boston Jefferson Medical College of Philadelphia, 1897, member of the Massachusetts Medical Society, aged 64, died, October 10, in the City Hospital, of coronary sclerosis

John Parker Stoddard, Muskegon, Mich, Bellevue Hospital Medical College, New York, 1867, member of the Michigan State Medical Society, aged 100, died, October 11, of cerebral hemorrhage

William M Hatfield, Mulhall, Okla, State University of Iowa College of Medicine, Iowa City, 1886, for many years president of the Mulhall district school board, aged 77, died, October 16

Robert S Freedman, New York, College of Physicians and Surgeons, Medical Department of Columbia College, New York 1895, aged 76, died, November 13, of uremia and acute nephritis

Irvine R Bush, Ardmore, Pa, Jefferson Medical College of Philadelphia, 1883, member of the Medical Society of the State of Pennsylvania, aged 76, died, October 15, of heart disease

Roy Mason Sweeney, Sapulpa, Okla, St Louis College of Physicians and Surgeons, 1907, past president of the Creek County Medical Society, aged 52, died, October 18, of carcinoma

Nat K King, Laredo, Texas, Louisville (Ky) Medical College, 1893, medical officer in charge of the U S Public Health Service, served during the World War, aged 60, died, October 14

Adrian Ramon Bustillo, Tampa, Fla, Universidad de la Habana Facultad de Medicina y Farmacia, Cuba, 1922, on the staff of the Centro Asturiano Hospital, aged 36, died, October 4

Albert William Swearingen, Los Angeles, College of Physicians and Surgeons, Keokuk, Iowa, 1885, Jefferson Medical College of Philadelphia, 1888, aged 75, died, September 27

Andrew Henderson, Powell River, B C, Canada, McGill University Faculty of Medicine, Montreal, Que., Canada, 1880, aged 82, died, September 19 in St Paul's Hospital, Vancouver

John Ralph Sickler, Frankfort, Ind, University of Pennsylvania Department of Medicine, Philadelphia, 1902, aged 58, died, October 14, of cerebral hemorrhage and arteriosclerosis

Hiram Zebulon Frisbie, Elkland, Pa, Jefferson Medical College of Philadelphia, 1894, member of the Medical Society of the State of Pennsylvania, aged 68, died, October 11

James Logan Shiland, Santa Barbara, Calif, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1882, aged 78, died, September 15

John Blake White, New York, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1874, aged 85, died, November 4, of heart disease

Charles E Stephenson, Columbia S C, Meharry Medical College, Nashville, Tenn, 1903, aged 60, on the staff of the Good Samaritan Hospital, where he died, October 6

George Tupper Swandale, Kenosha, Wis, Bellevue Hospital Medical College, New York, 1878, aged 80, died, October 9, in the Kenosha Hospital, of intestinal obstruction

William Ross Martin, Brooklyn, Omaha Medical College, 1891, member of the Medical Society of the State of New York, aged 69, died, October 13, of heart disease

William H Newlin, New London, Ind, Eclectic Medical Institute, Cincinnati, 1890, aged 70, died, October 27, of heart disease, arteriosclerosis and prostatic hypertrophy

George Cutler Upham, Biddeford, Maine, Bellevue Hospital Medical College, New York, 1882, member of the Maine Medical Association, aged 78, died, October 13

Eugene Henry Bryan, Penryn, Calif, Hospital College of Medicine, Louisville, Ky, 1894, member of the California Medical Association, aged 67, died, October 8

William H Zorger, Champaign, Ill, College of Physicians and Surgeons, Keokuk, Iowa, 1886 member of the Illinois State Medical Society, aged 75, died, September 22

James Dowlen Jones, Emerson, Iowa, Barnes Medical College, St Louis 1896, aged 68, died September 19, in Kellerton, of bronchopneumonia and leukemia

Milton Edward Beitenman, Cascade, Iowa, Creighton University School of Medicine, Omaha, 1924, aged 39, was killed, October 17, in an automobile accident

Henry Roscoe Lawrence, Atlantic City, N J, Jefferson Medical College of Philadelphia, 1881, also a druggist, aged 78, died, October 15, of coronary disease

Oscar Eugene Wright, Fairview, Ky, University of Tennessee Medical Department, Nashville, 1896, aged 63, died, October 13, of carbolic acid poisoning

Emmett E Irwin, Russellville, Ark., Georgia College of Eclectic Medicine and Surgery, Atlanta, 1908, aged 48, died suddenly, September 29, in Fort Gaines, Ga

May Tower L Bigelow ♂ Denver, University of Colorado School of Medicine, Denver, 1915, formerly member of the state legislature, aged 69, died, October 27

Peter Francis Brosius ♂ Hazelton, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1900, aged 60, died, November 2, of heart disease.

Charles Allen Snyder, Dubuque, Iowa, Michigan College of Medicine, Detroit, 1882, aged 81, died, October 14, in the Finley Hospital, of cerebral sclerosis

Horace Sheridan Moran, Wakefield, Mass., Harvard University Medical School, Boston 1893, aged 68, died suddenly, October 18, of cardiovascular disease

Franklin F Mendenhall, Fishers, Ind., Medical College of Indiana, Indianapolis, 1898, aged 79, died, October 24, of cerebral hemorrhage and arteriosclerosis

Charles Francis Payne, Dayton Texas Barnes Medical College, St. Louis, 1908 served during the World War, aged 59, died, October 11, of pneumonia

Otis Austin Sweet, Eminence, Ind., Medical College of Indiana, Indianapolis 1903, formerly county coroner, aged 57, died October 24, of lobar pneumonia

Henry Tyus Cox, Groesbeck Texas, Baylor University College of Medicine Dallas, 1922, aged 38, died recently, in a hospital at Houston, of nephritis

William Kydd Ross, Toronto Ont., Canada McGill University Faculty of Medicine, Montreal, Que., 1883, L R C P, Edinburgh, 1883, died, October 27

Edward G Abernethy, Algoma Miss (licensed in Mississippi in 1903), member of the Mississippi State Medical Association, aged 60, died in October

Joshua Giddings Lewis, Lakewood Ohio, Cleveland Medical College, 1866, aged 90, died, October 15, of cerebral hemorrhage and arteriosclerosis

William A Wenz, Indianapolis, Medical College of Indiana, Indianapolis, 1894, aged 63, died, October 9, of acute myocarditis and bronchopneumonia

Andrew Mills Eagon, Staten Island, N Y., Bellevue Hospital Medical College New York, 1890, aged 74, died, October 17, of chronic nephritis

Joseph Markow Polisar ♂ Brooklyn, Long Island College Hospital, Brooklyn, 1912, on the staff of the Beth El Hospital, aged 51, died, October 14

J Taylor Grant Minnes, Niagara Falls, Ont., Queen's University Faculty of Medicine Kingston, Ont., Canada 1929, aged 34, died October 16

George Alexander Durnin ♂ Bottineau N D., University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1904, aged 59, died October 25

Leonidas H York, Louisa, Ky., Eclectic Medical Institute Cincinnati, 1882, aged 84, died, September 19, of heart disease and mitral regurgitation

George Lipscomb Izard, Mobile, Ala., Tulane University of Louisiana Medical Department, New Orleans, 1888, aged 69, died, October 6, of colitis

Herbert Elwell Woodbury, Indianapolis, Harvard University Medical School, Boston, 1899, aged 66, died, October 29, of coronary occlusion.

Jay Atwood Whitaker, San Francisco, George Washington University School of Medicine, Washington, D C., 1912, aged 49, died, September 22

George Martin, Baldwin, Wis., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1874, aged 82, died, September 27

Thomas H Shelton, Okmulgee, Okla., St. Louis College of Physicians and Surgeons, 1905, aged 64, died, September 10, of chronic myocarditis

Frank Givens, Rutledge, Mo., College of Physicians and Surgeons, Keokuk, Iowa, 1877, aged 81, died, September 28, of chronic myocarditis

Edward Clarence Lynch ♂ Montebello, Calif., John A. Creighton Medical College, Omaha, 1906, aged 51, died suddenly, September 18

Edwin Alden Leavitt, Worcester, Mass., Tufts College Medical School Boston, 1896, aged 70, died, October 17, of cerebral hemorrhage.

Christopher Lorenzo Oatman, Collinsville, Ill., Barnes Medical College, St. Louis, 1899, aged 58, died, October 4, of chronic myocarditis

Spencer W Smith, Leesville, Ind., University of Louisville (Ky.) Medical Department, 1882, aged 79, died, October 12, of myocarditis

Amos E Parker, Baltimore, University of Maryland School of Medicine, Baltimore, 1872, aged 86, died, September 19, of bronchopneumonia

Henry Clay Littlejohn, Los Angeles Kentucky School of Medicine, Louisville, 1881, aged 84, died, September 10, of cerebral embolism

James Henry Souther, Threeforks, Ky., Vanderbilt University School of Medicine, Nashville, Tenn., 1878, aged 84, died, October 3

Elvin W Jaquish, ♂ Punxsutawney, Pa., Medico-Churgical College of Philadelphia, 1913, aged 49, died, October 8, of hypertension

Daniel MacNeil, Glace Bay, N S., Canada, Dalhousie University Faculty of Medicine, Halifax, 1913, aged 51, died, September 10

Samuel H Harris, Nashville, Tenn., Georgia College of Eclectic Medicine and Surgery, Atlanta, 1886, aged 72, died, September 23

Benjamin Franklin Hand ♂ Waynesboro, Miss. Memphis (Tenn.) Hospital Medical College, 1907, aged 53, died, September 25

Charles Edgar Benson, Kingsville, Md., Maryland Medical College Baltimore, 1904, aged 55, died, October 30, of phlebitis of the left leg

Emma Ernsberger, Cairo, Ohio, Laura Memorial Woman's Medical College, Cincinnati, 1897, aged 73, died, October 11, of carcinoma

David M Gibson, St. Louis, Homeopathic Medical College of Missouri, St. Louis, 1890, aged 68, died, September 24, of heart disease.

Granville Gordon Little, Walkerville Ont., Canada, University of Toronto Faculty of Medicine, 1905, aged 52, died, October 25

James Oliver Moore, Adams, Ky., University Medical College of Kansas City, Mo., 1901, aged 61, died, October 6, of leukemia

William John McGeary ♂ Allison Park, Pa., Bellevue Hospital Medical College, New York, 1893, aged 68, died, October 2

Hugh B Sanders, Louisville, Ky., University of Louisville Medical Department, 1884, aged 76, died, October 8, of coronary occlusion.

Ira A Marshall, Ironton, Mo., Beaumont Hospital Medical College, St. Louis, 1889, aged 72, died, September 19, of nephritis

Winnifred Green, Louisville, Ky., Kentucky School of Medicine, Louisville, 1903, aged 66, died, October 4, of coronary occlusion

Elisha L Reeves, Decatur, Ill., Eclectic Medical Institute Cincinnati, 1890, aged 69, died, September 30, of angina pectoris

John MacDonnell, Boston, College of Physicians and Surgeons, Boston, 1894, died, October 11, of carcinomatosis and uremia

Sophia Penfield, Danbury, Conn., New York Medical College and Hospital for Women, 1869, aged 91, died, September 26

Charles Marion Rains, Bohannon, Va., College of Physicians and Surgeons, Baltimore, 1877, aged 77, died, October 28

Linnaeus Marshall Drown, Denver, Toledo Medical College, 1900, aged 61, died suddenly, September 14, of myocarditis

Walter Henry Parker, Brewster, Mass., Baltimore Medical College, 1896, aged 63, died, October 12, of coronary sclerosis

Homer E Jamison, Millburn Ill., College of Physicians and Surgeons of Chicago, 1894, aged 77, died, November 9

William Henry Robinson ♂ Boston Harvard University Medical School, Boston, 1893, aged 67, died September 28

Charles Albert Baldwin, West Los Angeles, Calif., Cleveland Medical College, 1874, aged 81, died, September 20

Wyatt C Caraway, Forest Miss., Louisville (Ky.) Medical College, 1883, aged 78, died, October 16

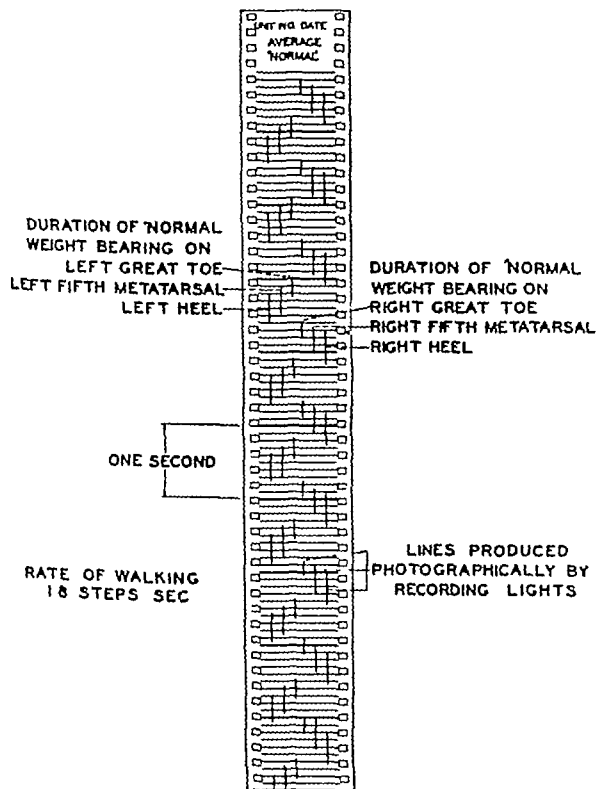
Correspondence

OBSERVATION VERSUS MEASUREMENT IN FIRE WALKING

To the Editor —With much interest I have read reports of fire walking by Kuda Bux. This includes the item in the London letter (THE JOURNAL, October 19, p 1282)

Again herein the statement is made "his feet making contact with the burning embers for some five seconds each time." I am enclosing herewith illustrations which support the belief that this statement may have been on the basis of opinion without relation to any accurate method of measurement

For a number of years I have been recording human gait. I have nearly 2,000 records at the present time. Approximately 1,000 of these are of normal individuals, accurately timed in seconds and tenths of seconds carried out to the third decimal. Each person, un instructed as to the rate walked a distance of 50 feet at the average rate of 1.8 steps per second. The weight-bearing time from the contact of the heel with the floor until the great toe left the floor was 0.65 second, for only 0.05 second was the entire plantar surface of the shoe in contact with the floor. These figures reveal the function of the foot through the shoe under normal conditions. Work now in progress with a different type of contact for recording strongly suggests that at this rate of walking there may be no interval of time at which the entire plantar surface of the foot is bearing weight. It is well to hold in mind that all of the foregoing applies to normal individuals walking under normal conditions

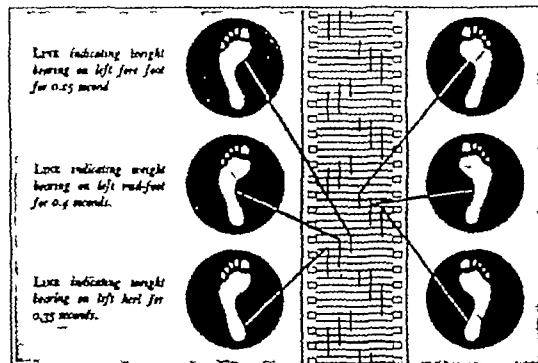


Normal gait record drawn from average of fifty records

This is important in relation to the statements of the prevailing conditions under which Kuda Bux walked on fire. It is reasonable to believe that under such influences the heel and longitudinal arch were elevated the feet assuming the position of a toe-dancer or as when one is sprinting. It is not necessarily remarkable, therefore, that the court plaster in the arch of the foot failed to show evidence of having been scorched. On a

basis of all facts mentioned herein, it seems reasonably possible that the position and time interval in which this particular individual brought his feet in contact with the hot embers was not such as to produce evidence of blisters

It should be remembered also that Kuda Bux was highly trained in this particular feat. His reaction was correspondingly suited to prevailing conditions, having been conditionally reflexed by repeated experiences since he was 14 years of age. The fact that two other individuals wholly inexperienced in the



Duration of weight bearing on forefoot midfoot and heel

practice failed to meet the task is not necessarily proof that the result of his experience was entirely the result of faith

That one may not be able to account for the influence of faith in this Kuda Bux demonstration is not of itself justification for denying the possibility. It is evident, however, that attention should be called to the time relationship of the contact of the foot with the burning embers of stated temperature. Until more accurate figures are available than those which have been quoted in THE JOURNAL and elsewhere, it seems pertinent to retain an open mind.

R. PLATO SCHWARTZ, M.D., Rochester, N. Y.

FACTS FROM A GOVERNMENT TRANSIENT CLINIC

To the Editor —This communication is being written after two years work in a federal transient bureau of an industrial center on the Great Lakes. Most of the families come from the West and the South.

I presumed when I started my work that most of the transient families and single girls would be suffering from a neurosis due to economic insecurity. This is not true in the family group. A normal family life minimizes other stress and strain. The single girls, however, show instability, in most cases a neurosis. They come from broken homes in most cases and fail to adjust in any environment. They live alone in furnished rooms and complain of being lonely, but when put in groups or in normal homes they become a source of friction.

Families and individuals from the South show an inadequate knowledge of what to buy in the line of foods. I do not mean any technical knowledge of vitamins or minerals but the common information we all have concerning vegetables, fruits and milk. Two persons developed a neuritis as the result of vitamin B deficiency. They bought corn meal, navy beans and salt pork almost exclusively, although the grocery order was ample to include a normal diet. One mother objected to suggestions, stating that she could not afford anything else. When told that kale and boiling beef would be cheaper and go as far as her selection of food, she confessed knowing nothing about kale turnips and many of our common foods.

An attempt is made to vaccinate all nonvaccinated persons and protect all children from diphtheria and whooping cough. Most persons coming from the Southern states are not vac-

cinated and protest by saying ridiculous things as "You're not going to cup my arm off," showing the lack of general education in many sections

The children as a whole are not undernourished. Out of thirty-two, twenty were underweight according to the Baldwin-Wood charts and twelve normal or overweight. Many of the "normal" children showed poor posture according to the standard that a plumb line drawn from the external auditory meatus should fall through the middle of the shoulder and hip joint. Six of the twenty underweight children attained normal weight when given a quart of milk daily and a cereal high in mineral and vitamin B.

In starting the work I was convinced that living quarters played a great part in keeping a child in good physical condition. This may be true of the adolescent, but I found no correlation between crowded, furnished rooms and poorly nourished children, and comfortable homes and healthy children.

Points brought out by the work are that

1 Persons in family groups as a whole are stable emotionally. The single girls as a group show instability.

2 Persons from the South select a deficient diet, often developing a deficiency disease.

3 Many persons from the Southern and Western states know nothing of immunization. A careful watch should be made to immunize persons as they migrate into large cities.

4 Small children do not seem to react to poor living conditions. Their only requisite is food sufficient in quality and quantity.

MARY FETZER MAZZA, M.D., Cleveland

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address but these will be omitted on request.

WINTER ITCH

To the Editor—A woman, aged 51, complains of itching of the chest arms and face coming on only in the winter. This has appeared for five or six winters perhaps more. During the summer months she is free from the pruritus. With the onset of cold weather, this itching appears usually toward evening lasting throughout the night. The itching is intense. There are no lesions save excoriations from scratching or rubbing. The patient has artificial dentures, cholecystectomy and appendectomy were performed four and one-half years ago. She was treated for residual gallstones by several physicians, but recently I have been able to avert and ameliorate attacks of pain by use of coronary dilator drugs, antipruritic drugs and lotions are without effect, change of bedclothes, linens and covers are of no avail. Ovarian therapy has not helped. The patient is unable to obtain a restful night during the winter. Please advise as to diagnosis and suggested treatment. Blood chemistry and the icteric index are within normal limits. Kindly omit name in publication.

M D Wisconsin

ANSWER—How often does the patient bathe? How much soap does she use? The simplest explanation of the winter itch is that her skin is too dry from excessive use of soap, lack of perspiration, dry cold air outdoors and dry warm air indoors. She should cease the use of soap except on the face, hands and feet and in the folds of the body. She should use rose water ointment, preferably with 10 per cent boric acid, after each bath before the skin is wholly dry. Baths should not be hot, rather lukewarm, followed if possible by a cool douche.

LEAD POISONING IN TOBACCO CHEWERS

To the Editor—What if any are the harmful effects of chewing tobacco while exposed to the fumes of lead daily without a mask? This is an industrial question asked of me for decision. Will you kindly give me your opinion and references in the literature?

M D New Jersey

ANSWER—This question as interpreted, is whether or not the probability of lead poisoning is increased as a result of tobacco chewing by workers during periods of exposure to lead. So simple a matter as this has led to highly divergent opinions. In nearly every report based on any industrial hygiene survey on lead-using departments or industries, a sentence or

two may be found referable to tobacco chewing. In some reports, definite statements may be found recommending the prohibition of tobacco chewing. In others, equally strong recommendations may encourage tobacco chewing as a commendable preventive measure. The facts are these. In some lead-using trades, such as painting, the fingers may become smeared with lead, which may be transmitted to the mouth with every chew of tobacco, and particularly with shredded tobacco in contrast to plug tobacco, which is now little used. This has led to an unfavorable attitude in painting and similar trades. Advocates of tobacco chewing point out with accuracy that tobacco chewers carefully avoid swallowing saliva and are given to much spitting, thus removing from their mouths some of the lead that may be present as a result of dust or other exposure. Further it is to be recognized that some chewing tobaccos contain lead as a result of lead compounds used as insecticides during the growing stage of tobacco. The amount is not large, but it may be detected in qualitative amounts in many samples. In this particular instance the query points out that the exposure of lead is in the form of fume. This is a special factor which must be considered in addition to the transfer of lead to the mouth by fingers contaminated by lead.

EDEMA OF CONJUNCTIVA

To the Editor—A white man, aged 63, has been a locomotive engineer for the last twenty-five years. In the past four months he has noticed a slight swelling of his eyelids especially in the morning and following a day's work on the railroad driving a locomotive 300 miles. Both eyelids of each eye are involved. The swelling has been receding during the day only to return the next morning. Recently (in the past two weeks) it has persisted throughout the day. There are no other complaints. There is no history of illnesses, operations or allergy. Physical examination is completely negative, except for the palpebral edema. The corneas are clear, the conjunctivae slightly injected. The eyegrounds negative. The nose is clear and the teeth have all been removed. The blood pressure is 140 systolic 93 diastolic. The heart and lungs are normal. The abdomen is normal. The extremities show no edema. Laboratory studies reveal blood urea 13.0 Gm creatinine 1.5 blood sugar 110, red blood cells 4,850,000 white blood cells, 7,500 hemoglobin, 88 per cent differential counts normal. Urinary studies show no albumin, sugar or casts on repeated examinations. I am unable to explain the cause of this local edema. Could it be due to the occupation, with exposure to the wind while driving the locomotive? Could you suggest any further studies or explain the cause of this condition? Any treatment?

JOHN C ULLERY, M.D., Philadelphia.

ANSWER—Edema of the conjunctiva and eyelids may be due to such a variety of causes that a rather careful study of each individual case is a necessity. Among the commoner causes are chronic conjunctivitis, chronic inflammation of the accessory nasal sinuses, trichinosis, mild tenonitis, or meibomianitis. It is possible that, in the case here cited, exposure to the continuous wind while running a locomotive may be the exciting factor. It is suggested that the patient be instructed to wear fairly air-tight goggles, such as are used by airplane pilots when in open cockpit planes, and that a mild nonirritating wash be prescribed.

CARBON MONOXIDE POISONING

To the Editor—Last spring I was called to see several members of one family who were all suffering from dizziness, prostration and faintness. Even the family dog had fainted. Recently gas had been installed for heating purposes and the air was much vitiated by the natural gas used in the heating plant. The degree of the contamination must have been high. Fresh air restored them all. Now there is a suit of damages pending. I have not been able to find satisfactory literature on the subject. What are the pathologic changes in such cases and amount and duration of the injury?

N C IKENYAN, M.D., Charleston, Ill.

ANSWER—There is every indication that the described accident represents carbon monoxide poisoning, unless in fact partial asphyxiation was brought about by accumulation of natural gas to the point at which an oxygen deficiency developed. Natural gas commonly contains only a low concentration of carbon monoxide, although artificial gases may be rich in carbon monoxide. In the absence of carbon monoxide in the gas or as a product of incomplete combustion, the gases making up natural gas are chiefly asphyxial in their action. Carbon monoxide goes further in its harmful action in that much lower concentrations are dangerous and because an actual combination takes place between hemoglobin and the carbon monoxide to the end that, even though oxygen is present in the atmosphere, it may not be taken up or partially may be prevented from being taken up by the presence of carbon monoxide in combination with the hemoglobin. Unless the acute manifestations were severe, and unless sequelae developed within a period of two weeks after the last exposure, it is quite believable that no persistent harm may have been produced. These

patients are prone to develop neuroses, neurasthenic states and insomnia, and occasionally actual psychoses arise. The ultimate outcome of nonfatal gassing from asphyxiants largely depends on the extent of injury to the brain during periods of anoxemia. Minute diffuse hemorrhage often leads to permanent neurologic or psychiatric disturbances. The circumstances described in the query suggest a defective installation or perhaps improper operation. Every effort should be made to ward off the possibility of a recurrence of the accident described. In the event of remaining doubt, tests for the presence of carbon monoxide should be made with some such instrument as the continuous carbon monoxide indicator, one or more of which usually are available in most cities and frequently may be found in state department of health laboratories. Ampule detectors may be purchased at low cost. When one of these ampules (which contain palladium chloride in acetone) is broken and suspended in an area suspected of containing carbon monoxide, its contents will turn black in the presence of that gas. This method is sensitive only to a minimum of 0.05 per cent, which percentage constitutes a distinct hazard. Any one of the following publications will furnish extensive additional data:

Henderson, Yandell and Haggard H W. Noxious Gases. New York: Chemical Catalog Company, 1927.
Carbon Monoxide Poisoning and the Automobile Exhaust. Review of Literature by the Special Subcommittee of the Committee on Public Health Relations of the New York Academy of Medicine. Bulletin of the New York Academy of Medicine, August 1926, pp. 402-440.
Hamilton Alice. Industrial Toxicology. New York: Harper & Brothers, 1934.

SINUSITIS IN CHILDREN

To the Editor.—A boy $5\frac{1}{2}$ years of age, weight 45 pounds (20 Kg), height 46½ inches (142 cm), has a persistent pulse of 100 to 120 during the day and from 76 to 84 while sleeping. No pathologic condition exists in the heart although there is quite an irregularity while sleeping. The temperature varies from 99 to 99.6 F. The weight has been constant for about six months and the appetite has been poor. The child has been active and does not tire easily. About a year ago following an acute nasopharyngeal infection his tonsils and adenoids were removed and there has been a slight elevation of temperature and increased pulse rate since then. There is moderate enlargement of the anterior cervical glands and frequent sneezing especially in the morning with frequent attacks of coryza. Roentgenograms of the chest and sinuses give negative results. Three tuberculin tests (one old tuberculin one Mantoux, and one purified protein derivative) have all been negative. Because of symptoms and what observations have been made this condition has been diagnosed as sinusitis. The child rarely complains of headaches. There is no kidney disturbance and the bowels are normal. The boy is an only child of healthy parents and has had good care. He has had iron, vitamin and malt tonics during the past year and attended kindergarten the last half of the past school year. The school activity was very tiring to him. He has been immunized against scarlet fever and diphtheria and has been vaccinated for smallpox. During the past two years he has had measles, whooping cough and chickenpox. Please advise me on the following points: 1. In the absence of roentgen evidence is one still justified in considering the condition as being due to sinusitis? 2. Would mixed stock vaccines aid in clearing this up? 3. Is a pulse rate of 100 to 120 and a temperature of 99 to 99.6 unusual in children of that age? 4. Is it logical to allow this boy the activity of other children of the same age?

MD, Nebraska

ANSWER.—The paranasal sinuses as a rule are not fully developed until the middle period of childhood. The ethmoid cells are present at birth. The sphenoidal sinus is very small in the first year, and the frontal sinus is not present as a rule before the third year. The maxillary sinus develops at about the same period. The sinuses may become infected as soon as they are developed. The diagnosis of sinusitis should be made on the basis of clinical symptoms and confirmed by the x-rays. In the absence of clinical observations and evidence furnished by the x-rays, the existence of sinusitis is improbable.

2. If the diagnosis of sinusitis cannot be established the use of mixed stock vaccines would not be indicated. There is considerable question in the minds of bacteriologists and clinicians whether mixed stock vaccines are of value even when sinusitis is present.

3. A moderate elevation of temperature and an increase in pulse rate are not uncommon in neuropathic and delicate children, though in every instance one should accept this statement only after a careful and most complete examination in order to exclude infection, organic or endocrine disorder or a functional disturbance that comes from fatigue or overactivity. Many an asthenic child shows a slight elevation of temperature and an increased pulse rate and eventually grows to be normal and robust.

4. The child should be permitted to partake of as much exercise and activity as his strength will allow. When he becomes fatigued he should temporarily desist from activity.

LATENT MALARIA

To the Editor.—A woman aged 40 has suffered for the last ten or twelve years from weakness and severe pains which seem to run through her veins. At times she has what she calls "shakes" when she seems to become cold. I have seen her in only one of these attacks a mild one she said and at that time her temperature was 103 F and she seemed to me to be having a malarial chill. That was four or five months ago and there have been no recurrences. The pains of which she complains come on every few days; in fact, she says that she is rarely comfortable but that the more severe suffering occurs at irregular intervals. The suffering seems to be intense and on one occasion I gave her half a grain of morphine before any substantial relief was obtained. After an attack she is very weak; she has spent at least three fourths of her time for several years in bed. She is fairly well nourished and her appetite and her digestion are good. The blood pressure is around 105 systolic and 65 diastolic. The heart is normal; the temperature usually about 98. The urine is normal. Menstruation is normal. There was some anemia a few months ago but this responded to iron therapy. She has been pregnant three times since this condition began and she says that as well as she can remember she felt well and had no "shakes" during the time she was pregnant. During the five months that I have been attempting to treat her she has had iron and other tonics and responded very well as far as her blood picture is concerned but gained little or no strength. Quinine was given on the supposition that an atypical malaria might be causing the trouble. There have been no more "shakes" and no fever but the pain and weakness have remained unchanged. Mentally the woman seems to be quite well balanced and shows absolutely no evidence of hysteria or other mental illness. Can you give me any suggestion as to etiology and treatment? Because of the fact that she was well when pregnant I have thought of using an extract of pregnancy urine but the cost has been against that; however, if in your opinion such treatment would be logical I will try it.

MD, Colorado

ANSWER.—Most likely, this patient has had latent malaria for many years. The treatment with quinine stopped the chills and fever, but the pain and weakness that have remained may be associated with some malarial infection, which still persists. A careful blood examination should be made to determine the presence of a malarial infection and this should include stained blood smears. If the examination should reveal any evidence of malaria a prolonged, thorough course of quinine should be given, and it would be well to combine this with iron and small doses of arsenic. The patient should take a high caloric, well balanced diet with enough vitamins and she should be encouraged to do some daily gymnastic exercises. Even though the blood examination should not at this time reveal any evidence of malaria, it may still be wise to follow the plan outlined.

PARATHYROID DYSFUNCTION IN PREGNANCY

To the Editor.—Two women aged 26 and 40 complain of 'an achy tightness in the lower limbs coming on about the fourth month of pregnancy and lasting for from three to five months after delivery. This discomfort usually starts in the buttock or calf and extends to the arch of the foot and the toes. It comes on only after sitting or lying still for a while and relief comes only after movement or massage if the limb happens to be cold. Unless something is done the sense of tension becomes so great that the limb jerks involuntarily. There is no history of chorea or rheumatic infection in either patient. Calcium therapy was tried in the case of the younger woman without relief. The older woman has had this through repeated pregnancies which were normal; the younger was a primipara and had slight preeclamptic symptoms during the last two weeks. Can you give me any suggestions as to etiology and therapy?

MD, Colorado

ANSWER.—The symptoms mentioned by the correspondent are too vague to enable any one to make a positive diagnosis. Several conditions might be thought of: an unusual form of tetany, circulatory disturbance due to varicose veins in the pelvis, or faulty circulation in the extremities, neuritis on the basis of vitamin deficiency, some form of essential anemia, a disturbed water balance.

The theory of parathyroid dysfunction seems to cover the situation the best, and treatment along such lines would be indicated.

ATROPINE BEFORE ANESTHESIA—DIVINYL OXIDE

To the Editor.—Could you tell me if the injection of $\frac{1}{2}$ -to grain (0.4 mg) of atropine previous to a chloroform anesthesia is a safeguard against the cardiac syncope that sometimes occurs in this anesthesia? I have heard that it is. Also could you send me information concerning the new obstetric anesthesia recently introduced—divinyl oxide? I should like to know where it may be purchased and its approximate cost and whether it has the disadvantage mentioned in the case of chloroform.

ALBERT T. HUME, MD, Chetok, Wis

ANSWER.—The action of the vagus nerves can be inhibited with atropine if it is given in sufficient dose, it is obvious that whatever benefit the patient derives from atropine is through this particular effect of the drug, and unless the patient has an idiosyncrasy to atropine it is wise to administer it as part of the preliminary medication before chloroform is adminis-

tered. J. T. Gwathmey (Anesthesia, second revised edition, New York and London, Macmillan Company, 1924, pp. 372-273) recommends the use of $\frac{1}{100}$ grain (0.6 mg.) of atropine for adult men or $\frac{1}{160}$ grain (0.4 mg.) for adult women, and morphine as a preliminary to chloroform anesthesia. This is particularly true when surgical anesthesia is to be produced with chloroform, but it is also desirable when only the stage of analgesia is to be produced.

Vinethene is the proprietary name of Merck & Company, Inc., for divinyl oxide. The product has been submitted to the Council but does not stand accepted as yet. The Council published a preliminary report on the product Jan. 6, 1934.

USE OF GONADOTROPIC EXTRACTS AND PROGESTIN IN HABITUAL ABORTION

To the Editor—Among other articles read in *THE JOURNAL* at different times I came across the subject of treatment of habitual abortion by the use of Antuitrin S or follutein. That was in the issue of March 23. I have a patient who has been desirous of having children and has been pregnant four different times. Because of abortions she has been unable to bring the children to term the closest being seven months. She is now again pregnant at seven months, was in my office today and again thinks she is going to have trouble. Can you refer me to any kind of serum to be given that might be more certain than Antuitrin S is known to be, or can you give me some good advice that I might pass on to this would-be mother? I would appreciate any good suggestions of later knowledge you may have.

M. D. North Carolina

ANSWER.—There are no clinical reports capable of proving that the gonadotropic principle of pregnancy urine (of which follutein and Antuitrin-S are commercial preparations) prevents abortion. There is a considerable amount of clinical experience supporting the theory that the corpus luteum helps to preserve pregnancy by preparing the uterine mucosa and inhibiting uterine contractions, but the use of the extracts now on the market has not been uniformly successful—sometimes they seem to hurry abortion. One of the most convincing series of cases was presented by Falls, Lackner and Krohn at the Atlantic City session. These authors recommend the use of commercial preparations containing progesterin (the hormone of the corpus luteum) in threatened and habitual abortion, these may be given a trial. There are many causes of habitual abortion: syphilis, kidney disease, focal infections, hypothyroidism, infantile uterus, avitaminosis and the like. This patient should be kept in bed absolutely, the foot of the bed elevated 10 inches, the bowels moved without straining, progesterin given (as described by Falls, Lackner and Krohn), thyroid given if the basal metabolic rate is low or even if normal, a generous diet containing all the vitamins, and calcium and iron.

HERPES GENITALIS

To the Editor—For the last eight months I have been treating a single woman aged 33 for what I diagnosed as herpes genitalis but after every menstrual flow the condition reappears. She states that there is a burning itching sensation about the vulva, followed in a few hours by the appearance of small discrete red spots which rapidly become vesicles and then crust over and disappear in the course of from seven to ten days. I have tried local and general treatment including topical applications of 40 per cent silver nitrate 5 per cent iodine, gentian violet the actual cautery trinitrophenol suppositories, changing the brand of pads used using no talcum powder general intravenous treatment with neocarsphenamine (three doses), calcium and iron tonics, together with ointment of ammoniated mercury and of zinc oxide, but all to no avail. She has no leukorrhea. She states that she has occasional intercourse. The Wassermann reaction is negative. Smears are negative for gonococci and Trichomonas. Can you suggest anything as a possible diagnosis and treatment, excluding venereal warts and faulty hygiene? Please omit name.

M. D. Ontario

ANSWER.—The patient evidently suffers from herpes genitalis, a most annoying and stubbornly recurrent condition.

Aside from the discovery and removal of the cause, such as genital disorder or diseases of the urinary tract or rectum, the treatment is essentially symptomatic. Occasionally, roentgen therapy is almost specific. Nerve resection merits consideration in severe cases.

STAMMERING

To the Editor—Please give me the best possible information on treatment for stammering as to the necessity of going to a school or whether it could be done through the mail or whether the age would limit the possibility of cure. The patient I have in mind is a man aged 33.

CUTHBERT J. LEAVY, M.D. Freeport, Ill.

ANSWER.—Thirty-three years is a good age, as responsibility and determination are present, although treatment takes longer at that age. If the patient has stammered all his life, it will take anywhere from nine months to two years. Large cities

have specialists in the treatment of stammering. Cleveland shows the best school statistics, as it has practically eliminated adult stammering. Private schools for stammering are often unreliable, sometimes good. Treatment by mail cannot be watched and varied according to the peculiarities of the case.

CONGENITAL DEAFMUTISM

To the Editor—A man now 25 years of age had at birth bilateral supernumerary thumbs. These extra appendages were smaller than the normal thumbs but were complete to the extent that they had the usual joint structures with apparently healthy blood and nerve supplies. The mother of the patient was anxious to have these congenital thumbs removed but the family physician advised against their too early removal, stating that if the operation was performed at too young an age it would cause the patient to be a mute. However, the mother became impatient at the advice of the physician and took her son at the age of 2 years to a nearby medical center. At this time the patient appeared normal in every respect with no pathologic disturbance of any of the cranial nerves. The supernumerary appendages were removed by a surgeon, and from two to three weeks following the operation the patient became a mute. He has not spoken a word since that time, apparently devoid of his speech and hearing faculties. He has been seen by prominent specialists who have given a hopeless prognosis but can offer no explanation as to the etiology of the mutism. All neurologic tests are negative except for the loss of the auditory and speech sensations. There appears to be no organic disease present. All laboratory tests including the Wassermann and Kahn tests are negative. The family history is irrelevant. Evidently the family physician had a definite reason for advising against the operation. I would appreciate greatly an explanation of the etiology and physiology of the case. I might add that the child has been mentally alert at all times and has made good progress intellectually in an institution for mutism. Is there any possible treatment or is the prognosis entirely unfavorable?

M.D., Michigan.

ANSWER.—This patient undoubtedly is a congenital deaf mute and would not have learned to talk unless the cause of the deafness could have been removed early in life. As he was only 2 years old at the time of the operation, it is not likely that he had learned to talk before that time. The family physician probably knew or suspected that the child was abnormal and was afraid that the operation might later be blamed for the failure of development, and events proved his wisdom.

OPERATION FOR UNDESCENDED TESTIS

To the Editor—A man aged 43 has been afflicted with undescended testicles since his birth. They are just above the pubic bone and can be felt. No operation has ever been attempted. Some weeks ago he visited a prominent clinic. What he was told or was not told I do not know. Anyway since visiting the clinic he has been badly scared and nervous, and he worries greatly about his condition. I want the best advice possible as to what if anything, should be done with the patient. Is an operation in order and if so what? What chance is there of making adjustments at this age? Please give definite advice and information. Kindly omit name.

M.D., Kansas.

ANSWER.—The most favorable age to operate on patients with undescended testicles is before the age of puberty. Many patients have been operated on past the age of puberty well on into middle life, with good results. The mobility of the testicle does not indicate the length of the cord. For illustration, a man, aged 34, had one testicle in the peritoneal cavity. This testicle was brought down by operation with little or no difficulty, with a normal result. The question of malignancy has been overexaggerated in the literature. In more than a hundred cases only two were found to be malignant, both patients being in their twenties. The indications for operation are sterility, cosmetic reasons, pain, pain due to trauma, and a malignant condition. There is nothing for the patient to be worried about. An operation would do him no harm and possibly would do him a lot of good. If the patient is sensitive about his appearance or has pain, an operation would be indicated, the gubernaculum technic being used to make the fixation. According to the literature no one can state that the patient when operated on past puberty will be fertile. Fertility has nothing to do with impotence. This patient probably never will be satisfied until an operation is done.

STROPHANTHUS IN CORONARY DISEASE

To the Editor—In your answer to a query concerning the use of strophanthus in coronary disease (*THE JOURNAL*, November 9, p. 1543) you state that the only real indication for drugs of the digitalis group in coronary disease is when auricular fibrillation is present. Another important indication for the use of digitalis in coronary disease is when congestive heart failure is present as manifested by either moist rales at the lung bases, a palpable and tender liver or edema of the extremities. The digitalis group will prove of value in such instances even with heart rhythm perfectly regular.

EMMET F. HORINEZ, M.D., Louisville, Ky.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country March 14. Oral examination for Group A and B applicants will be held in Kansas City Mo. May 11-12. Applications for written examination should be filed with the secretary before Jan. 15. Sec. Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada, March 28. Applications must be filed not later than February 28. Oral clinical and pathological examination of all candidates will be held in Kansas City Mo. May 11-12. Applications must be received not later than April 1. Sec. Dr. Paul Titus, 1015 Highland Bldg. Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY Kansas City Mo. May 11. Asst. Sec. Dr. Thomas D. Allen, 122 S. Michigan Ave. Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St. Louis Jan. 11. Sec. Dr. Fremont A. Chandler, 180 N. Michigan Ave. Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY Kansas City, Mo. May 9. Sec. Dr. W. P. Wherry, 1500 Medical Arts Bldg. Omaha.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY New York Dec. 30. Sec. Dr. Walter Freeman, 1726 Eye St. N. W. Washington D. C.

ARIZONA Basic Science Tucson Dec. 17. Sec. Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

COLORADO Denver, Jan. 7. Sec. Dr. Harvey W. Snyder, 422 State Office Bldg., Denver.

DISTRICT OF COLUMBIA Washington Jan. 13-14. Sec. Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg. Washington.

HAWAII Honolulu, Jan. 13-16. Sec. Dr. James A. Morgan, 48 Young Bldg. Honolulu.

ILLINOIS Chicago, Jan. 28-30. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

MINNESOTA Basic Science Minneapolis Jan. 7-8. Sec. Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

MEDICAL Minneapolis, Jan. 21-23. Sec. Dr. Julian F. Du Bois, 350 St. Peter St. St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Feb. 12-14. May 6-8. June 22-24 and Sept. 14-16. Part III tentatively scheduled as follows: Chicago, Jan. 7-9 and New York, Jan. 13-15. Ex. Sec. Mr. Everett S. Elwood, 225 S. 15th St. Philadelphia.

NEBRASKA Basic Science Omaha Jan. 7-8. Dir. Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEW YORK Albany Buffalo New York and Syracuse Jan. 27-30. Chief Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg. Albany.

NORTH DAKOTA Grand Forks Jan. 7-10. Sec. Dr. G. M. William, 44 S. 3d St. Grand Forks.

RHODE ISLAND Providence Jan. 23. Dir., Department of Public Health, Dr. Edward A. McLaughlin, 319 State Office Bldg. Providence.

SOUTH DAKOTA Pierre, Jan. 21-22. Dir. Division of Medical Licensure, Dr. Park B. Jenkins, Pierre.

TENNESSEE Memphis, Dec. 18-19. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

WASHINGTON Basic Science Seattle Jan. 9-10. Medical Seattle, Jan. 13-15. Dir. Department of Licenses, Mr. Harry C. Huse, Olympia.

WISCONSIN Basic Science Milwaukee Dec. 21. Sec. Prof. Robert A. Bauer, 3414 W. Wisconsin Ave., Milwaukee. Medical Madison Jan. 14-16. Sec. Dr. Robert E. Flynn, 410 Main St. La Crosse.

Connecticut July Examinations

Dr. Thomas P. Murdock, secretary, Connecticut Medical Examining Board, reports the written examination held at Hartford, July 9-10, 1935. The examination covered 9 subjects and included 70 questions. An average of 75 per cent was required to pass. Thirty candidates were examined, 23 of whom passed and 7 failed. The following schools were represented:

| School | PASSED | Year Grad | Per Cent |
|--|--------|-----------|----------|
| University of Maryland School of Medicine and College of Physicians and Surgeons | (1934) | 78 1* | |
| Tufts College Medical School | (1933) | 82 8* | |
| (1934) 75 75 1* 75 2 78 1* 78 7 (1935) 81 8 | | | |
| University of Michigan Medical School | (1933) | 79 3 | |
| Washington University School of Medicine | (1934) | 84 7 | |
| Columbia University College of Physicians and Surgeons | (1933) | 81 2 | |
| (1935) 80 80 5* 82* | | | |
| Long Island College of Medicine | (1934) | 78 6 | |
| Syracuse University College of Medicine | (1933) | 77 7 | |
| University of Pennsylvania School of Medicine | (1933) | 83 7 | |
| University of Texas School of Medicine | (1933) | 75 83 9 | |
| University of Vermont College of Medicine | (1934) | 75 | |
| McGill University Faculty of Medicine | (1923) | 75 | |
| Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia | (1934) | 75 | |
| Universität Bern Medizinische Fakultät | (1934) | 79 7* | |
| School | FAILED | Year Grad | Per Cent |
| George Washington University School of Medicine | (1934) | 72 5 | |
| Georgetown University School of Medicine | (1934) | 72 5 | |
| University of Louisville School of Medicine | (1934) | 69 6 | |
| Tufts College Medical School | (1935) | 71 6 | |
| Jefferson Medical College of Philadelphia | (1934) | 73 5 | |
| Woman's Medical College of Pennsylvania | (1933) | 70 7 | |
| Leipzig Maximilians Universität Medizinische Fakultät, München | (1934) | 66 6† | |

Fifteen physicians were successful in the oral examination held at Hartford July 23, for endorsement applicants. The following schools were represented:

| School | PASSED | Year Grad | Endorsement of |
|--|------------------------|-----------|----------------|
| Yale University School of Medicine | (1932) | (1933)* | N B M Ex. |
| Georgetown University School of Medicine | | (1925) | New York |
| University of Maryland School of Medicine and College of Physicians and Surgeons | | (1931) | Maryland |
| Tufts College Medical School | (1931), (1932), (1934) | 2) | N B M Ex. |
| Albany Medical College | | (1933)* | N B M Ex. |
| Columbia University College of Physicians and Surgeons | (1903) | | New York |
| (1933) (1934) N B M Ex | | | |
| Cornell University Medical College | | (1929) | New York |
| Long Island College of Medicine | | (1931) | New York |
| Vanderbilt University School of Medicine | | (1932) | S Carolina |

* License has not been issued

† Verification of graduation in process

Missouri June Examination

Dr. E. T. McGaugh, state health commissioner, reports the written examination held in St. Louis, June 12-14, 1935. The examination covered 14 subjects and included 105 questions. An average of 75 per cent was required to pass. Two hundred and two candidates were examined, 195 of whom passed and 7 failed. The following schools were represented:

| School | PASSED | Year Grad | Per Cent |
|--|-------------|------------------|----------|
| University of Colorado School of Medicine | | (1934) | 86 |
| Howard University College of Medicine | | (1934) | 81 2, |
| 82 6 84 2 84 2 86 8 7 9 | | | |
| Loyola University School of Medicine | | (1935) | 91* |
| Northwestern University Medical School | | (1933) | 89 5 |
| (1935) 82 5 85 1 86 6* 86 7 87 1 | | | |
| Rush Medical College | (1934) 87 1 | (1935) 83 9 | 89 90 1 |
| University of Illinois College of Medicine | | (1935) 86 86 1,* | 87 4 |
| University of Kansas School of Medicine | | (1934) | 84 88 |
| Tulane University of Louisiana School of Medicine | | (1934) | 85 3 |
| St. Louis University School of Medicine | | (1934) | 82, |
| 82 2 83 83 7 84 8 85 6 (1935) 78 6 78 9 80 7, | | | |
| 81 2 81 2 81 4 81 8 81 8 82 1 82 7 83 83 83 1 | | | |
| 83 1, 83 2 83 3 83 3 83 5 83 6, 83 6 83 6, 83 7, 83 7, | | | |
| 83 9 84 84 84 84 84 2 84 2 84 4 84 7 84 7 84 8 | | | |
| 84 9 85 1, 85 2 85 2, 85 2, 85 2 85 3 85 4 85 5 85 6 | | | |
| 85 6 86 86 1 86 3 86 5 86 6 86 7 86 7 86 9 87 | | | |
| 87 1 87 2 87 2 87 2 87 3 87 3 87 4 87 8 87 9 88 9 | | | |
| 89 89 89 4 89 5 90 90 | | | |
| Washington University School of Medicine | | (1933) | 83 8, |
| (1934) 85 9 (1935) 79 2 81 1, 81 3 81 3 81 5 81 5, | | | |
| 81 9 81 9 82 2 82 3 82 5 83 83 2 83 3 83 3, 83 5, | | | |
| 83 5, 83 6 83 7 83 8 83 8 83 9 83 9 84 84 84 1, | | | |
| 84 2 84 2 84 2 84 3 84 4 84 6 84 7 84 7 84 8 85 | | | |
| 85 85 1 85 2 85 2 85 3 85 4, 85 4 85 5, 85 5 85 5 | | | |
| 85 6 85 7 85 7 85 8 85 9 86 86 86, 86 2, 86 2 86 2 | | | |
| 86 4 86 5 86 6 86 7 86 8 86 8 86 9 87 87 2, 87 3 | | | |
| 87 5 87 7 87 7 87 9, 88 88 7, 88 7, 88 8 89 89 5, | | | |
| 90 3 90 9 | | | |
| University of Oklahoma School of Medicine | | (1934) | 83 3 |
| 83 5 87 7 | | | |
| Baylor University College of Medicine | | (1934) | 87 1 |
| University of Wisconsin Medical School | | (1934) | 80 7, |
| 83 3 84 8 86 7 | | | |
| University of Toronto Faculty of Medicine | | (1934) | 87 5† |
| Medizinische Fakultät der Universität Wien | | (1932) | 79 |
| Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät Breslau | | (1934) | 77 9† |
| Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultása Budapest | | (1934) | 83† |
| Licentiate of the Royal College of Physicians of the Royal College of Surgeons Edinburgh and of the Royal Faculty of Physicians and Surgeons Glasgow | | (1933) | 87 5 |
| University of Edinburgh Faculty of Medicine | | (1934) | 85 2 |

Twenty-four physicians were licensed by reciprocity and 1 physician was licensed by endorsement from May 7 through July 30. The following schools were represented:

| School | LICENSED BY RECIPROCITY | Year Grad | Reciprocity with |
|--|------------------------------|-----------|------------------|
| University of Arkansas School of Medicine | (1933) | | Arkansas |
| American Medical Missionary College, Chicago | (1900) | | Iowa |
| Rush Medical College | (1930) | | Kansas |
| University of Illinois College of Medicine | (1929), (1930) (1932) (1934) | 2) | Kansas |
| University of Louisville Medical Department | | (1921) | Kentucky |
| University of Louisville School of Medicine | | (1934 3) | Kentucky |
| Detroit College of Medicine | | (1907) | Michigan |
| University of Minnesota Medical School | | (1930) | Minnesota |
| St. Louis College of Physicians and Surgeons | Missouri (1919) | | Tennessee |
| St. Louis University School of Medicine | (1925), (1926) | | Colorado |
| Washington University School of Medicine | (1933) | | Indiana |

| | | |
|--|-------------------------|------------------|
| University of Nebraska College of Medicine | (1933) | Nebraska |
| Meharry Medical College | (1931) | Tennessee |
| University of Tennessee College of Medicine | (1932) | Tennessee |
| University of Virginia Department of Medicine | (1931) | Virginia |
| School | LICENSED BY ENDORSEMENT | Year Endorsement |
| Washington University School of Medicine | | Grad of |
| | | (1931) N B M Ex |
| * This applicant has completed the medical course and will receive his M.D. degree on completion of internship | | |
| † License has not been issued | | |
| ‡ Verification of graduation in process | | |

Book Notices

Aphasia A Clinical and Psychological Study By Theodore Weisenburg M.D. and Katharine E. McBride Ph.D. Cloth Price \$5 Pp 634 with 28 Illustrations New York Commonwealth Fund London Oxford University Press 1935

Of all the problems of neurology, the problem of understanding the aphasia has been one of the most difficult confronting both the clinician and the researcher. An analysis of the literature reveals that some recent textbooks still closely adhere to the motor-sensory classification, while others follow the lead of Head. Why the technics developed by the clinical psychologist have never previously been applied to this field, where they would be more apt than the purely "physical" approach, is a question that arises in one's mind immediately on realizing the mode of attack of these authors to their problem. The psychologists have developed standardized tests of reading and of speech in all their various divisions. These tests have been used in school systems, but psychologists, not being M.D.'s, have been unequipped to go into the hospital to study aphasia and, having inadequate knowledge of neural anatomy, were unable to approach the problem adequately. The present volume, using Weisenburg's neurologic knowledge and McBride's psychologic technics, does do so. The book naturally begins with a historical introduction demonstrating the development of the theories and ideas about aphasia from the time of Broca to the present. Naturally, the work of Hughlings Jackson, Marie, Head and Goldstein is stressed, but the whole literature is covered in sufficient detail although not completely, so that one may gain a thorough idea of the problems confronting Weisenburg when he undertook this study. The whole field was disordered, for where previously authors had felt that they were on safe grounds in dealing with aphasia, the work of Head confused the whole issue. The authors point out that, in addition, Head devised several tests which are really very useful. The present work makes no attempt to undertake a thorough reclassification of those disorders called aphasia but rather divides them up into three types, the expressive, the receptive and the expressive-receptive types. There is a fourth group, the amnesic. Under each type is a discussion and one or more cases are presented to illustrate the point, and these cases are demonstrated in such a way that one can see the value of psychologic tests of reading and speech and really understand the nature of each individual problem. The tests themselves are discussed in a chapter in the early part of the work and are more fully described in an appendix. All the information physiologically, neurologically and psychologically that would aid in the understanding of the processes involved are described fully in each case. Also given are a number of illustrations showing drawings made by the various patients, as well as some illustrations of hand writing. There are several tables, which illustrate better than description the results. The conclusions which the authors have at the end of the discussions of cases seems convincing and sound, a number of interesting and heretofore unrealized factors are discussed. An example of one of them is the fact that aphasic cases which seemingly are neurologically similar vary greatly one from the other in the results of their psychologic tests. The authors carefully control their study by giving these tests to a group of normal persons and also to a group of nonaphasic neurologic patients and the distinctions that are drawn and the various comparisons that are made are interesting and instructive. Most neurologists and psychologists who are interested in speech correction or analysis cannot afford to be without this book. It is so carefully done and so attention compelling that it might

even prove to be worth its cost to the general practitioner. One may predict that its newness of view and attack may cause a question to arise as to its value in the minds of the older men who are already specializing in this type of work, but it would not be rash to say that it should eventually prove itself to be a solid piece of constructive research.

Onchocerciasis with Special Reference to the Central American Form of the Disease By Richard P. Strong Ph.B. M.D. S.D. Professor of Tropical Medicine Harvard University Medical School Jack H. Sandground D.Sc. Assistant Professor of Tropical Helminthology Harvard University Medical School Joseph C. Bequaert Ph.D. Assistant Professor of Entomology Harvard University Medical School and Miguel Muñoz Ochoa M.D. Parasitologist Salubridad Publica Guatemala. Contributions from the Department of Tropical Medicine and the Institute for Tropical Biology and Medicine No. VI. Cloth Price \$4 Pp 234 with 103 Illustrations Cambridge Harvard University Press 1934.

This is a monograph on the Central American form of onchocerciasis, a helminth infection of man, producing swellings around the adult worm, mainly on the head. It is associated with ocular complications resulting in blindness in extreme cases. Dr. Strong, who investigated the disease in Guatemala in 1931 and 1932, contributes the larger section, containing the epidemiologic and endemologic studies, clinical and pathologic observations, ocular complications, transmission, immunity, microfilaricidal substances, public health aspects, prophylaxis and treatment. Dr. Sandground attacks the knotty problems of the classification of *Onchocerca* and critically analyzes the inadequate literature regarding this human helminth and related worms from the horse, cattle and antelope. He gives complete accounts of the adult male and female *Onchocerca caecutius* from Guatemalan cases. Dr. Bequaert describes the insect vectors of the larval stages or microfilariae, namely, the black flies or Simuliidae, of the area of the disease in Guatemala, with studies of their life cycle, eggs, larval and pupal stages, enemies and parasites, seasonal incidence, biting and feeding habits, duration of life, prevention, protection and control. Dr. Ochoa adds a succinct summary of epidemiologic facts derived from his observations on the disease in Guatemala.

Onchocerciasis is sharply restricted to coffee growing districts at an altitude of from 2,500 to 5,000 feet, but not all plantations are afflicted. It occurs largely among Quiche Indians, who form 95 per cent of the population and contribute 98 per cent of the cases. Absence of the disease on a plantation cannot be traced to environmental factors or to absence of *Simulium*, the insect vector. It may be due merely to absence of infected human beings. This irregularity in distribution and lack of early records of the disease support the hypothesis of relatively recent introduction of the worm but are not conclusive on this point.

Three species of *Simulium*, all living in the larval stages in swiftly flowing mountain streams, may become insect vectors. The adult flies are small, from 1.5 to 3 mm in length, fly by day about settlements and plantations, and suck the blood of man from exposed skin of the face and legs. The adult worms live in the tumors, usually on the head. The larval worms, or microfilariae, live in the fluid of the tumor, in the corium of the skin around the tumor, and also migrate to the cornea, iris, conjunctiva and some other parts of the eye, but not in the blood. The saliva of the biting fly seems to attract the microfilaria, and large numbers of the worms are found in flies after feeding on an infected man. Mosquitoes, which draw blood from deeper levels of the skin, were not found to ingest microfilariae. The larval worms pass through three phases in the muscles and other organs of the fly, and increase in length and activity in the final infective stage. When a fly with the infective stage bites man, the worms escape from the mouth parts of the fly and enter the lesion. In less than a year a tumor, containing adult worms, develops in the skin.

The habits of the natives expose them to bites of the flies. More men are infected than women. Tumors may develop on the children only a few months of age. The compression of the scalp by hat bands and the custom of supporting back loads by a head band may contribute to the location of the tumor of the Central American form of onchocerciasis in the scalp. In comparable African infections the tumors are rarely on the head. The disease occurs also in restricted coffee producing regions in the provinces of Chiapas, Oaxaca and Guerrero in Mexico, where rather heavy infections have been reported. The origin

of the disease, first reported in Guatemala in 1915 and in Mexico in 1926, remains a mystery. The investigations of Dr Sandground reveal no significant differences between the Central American worm *Onchocerca caecutiens* Brumpt and the African *O. volvolus* Leuckart. The insect vectors are different in the two continents and the location of tumors is predominantly but not exclusively different. There is no critical evidence of the introduction into tropical America of the African type of disease by African Negroes. It is possible that differences in the biting habits of the insect vectors in the two continents accounts for the clinical differences in the human host.

This monograph is a fine example of an extensive, comprehensive and critical, cooperative study of epidemiology, endemology, pathology, transmission and therapy of a puzzling obscure and, in some respects, mysterious tropical disease involving man, the black flies, and two diverse stages of a nematode worm, perhaps in two continents, and the consequences of the African slave trade.

The Structure and Composition of Foods. By Andrew L. Winton, Ph.D. and Kate Barber Winton, Ph.D. Volume II. Vegetables, Legumes, Fruits. Cloth. Price \$15. Pp. 904 with 303 illustrations. New York: John Wiley & Sons Inc., London: Chapman & Hall Ltd. 1935.

All persons requiring readily available information on the macroscopic and microscopic structure and chemical composition of vegetables and fruits have been looking forward to the printing of the second volume of this highly useful and practical reference compendium. It is another example of excellence of the contributions of recent years being made by American scientists to the technical literature and is the only one of its kind in the English language. The subject matter is well ordered and simply presented. All varieties of fruits and vegetables, even those practically unknown on the American market and table, are represented. The products are grouped according to botanic families. The section on the potato is illustrative of the scope of the material presented. This includes general information, macroscopic structure, microscopic structure, chemical composition, composition of parts of the tuber, influence of locality on composition, relation of development to composition, influence of methods of culture, fertilizers and degree of maturity, changes during storage, losses on boiling, and discussion of potato proteins, acids, carbohydrates, pectins, glucosides, enzymes and mineral constituents. Products of lesser importance of course are less comprehensively discussed. The data are gleaned from world technical literature. The vitamins are outside the province of the book. The authors have devoted much painstaking effort to the compiling of the vast store of data and information in this valuable volume and greatly enriched the fund of available information on food composition, for which many will be duly grateful.

Mechanics of Normal and Pathological Locomotion in Man. By Arthur Steindler, M.D., F.A.C.S., Professor of Orthopedic Surgery, the State University of Iowa, Iowa City. Cloth. Price \$8. Pp. 424 with illustrations. Springfield, Illinois and Baltimore: Charles C. Thomas, 1935.

This long awaited book is the combination of many years of the hardest type of labor on this and related subjects. It reveals a tremendous amount of allied research and study especially in higher mathematics. The author has even been perfecting himself in a knowledge of calculus. As a student of orthopedic surgery in America, he is of course well recognized. It is anticipated that this book will stimulate interest and further study of this important subject, which at first seems abstract but which in its application is intensely practical. It concerns such conditions as poliomyelitis, arthritis, fractures, dislocations, postural defects and scoliosis. The chapters that are especially good are those on the mechanics of the human gait, the pathomechanics of the gait, the physical properties of bone and the dynamics of muscle action. The chapter entitled "From Ancients to Haller" is a classic. It would be impossible to produce this type of book without the cooperation of an unusual anatomist. This the author had in the late Dr. Prentiss. Much of the discussion is difficult to understand. The line drawings and photographs are fine. The publishers deserve much credit. Many American or English illustrations would have been more easily understood than some of those taken from foreign publications. It is hoped that in the second edition this and other irregularities will be smoothed out. Many illustrations are too

small, and the print requires a magnifying glass. A few illustrations are not very illustrative. There are some duplications: for example, figure 7 ($\lambda \lambda$) is the same as figure 13 ($\lambda \lambda$). Figure 6 ($\lambda \times 15$) is the same as figure 8 ($\lambda \times 14$). Figure 6 ($\lambda \times 14$) is marked "flexors" and it should be "extensors". Figure 1 (λ) is marked McMurray instead of McMurich. The volume is excellently written, is unique in its approach to its subject and should promptly be recognized as the best book in its field.

Man the Unknown. By Alexis Carrel. Cloth. Price \$3.50. Pp. 346. New York & London: Harper & Brothers, 1935.

In this volume we observe Alexis Carrel, philosopher, as he surveys the human being with a background of knowledge of physiology, biology and medicine. His introductory chapters indicate the extent of our knowledge and many of the points at which new research is needed. He then discusses the necessity for understanding man as the greatest of all sciences, and indicates some of the technical difficulties encountered in this study. Here he indicates the position which animal experimentation may occupy in the course of such research. Especial attention is paid to the necessity of work on dogs. From this point Dr. Carrel passes to a consideration of various special functions and of the manner in which these functions are disturbed by disease. He emphasizes particularly the effects of the glands of sex and the part played by the male and female elements in reproduction. Especially significant is a paragraph on the working of the normal body.

The difficulties with the volume from the point of view of the physician begin with the fourth chapter on mental activities. Here Dr. Carrel must depart from established scientific fact and enter into the field of imagination. He accepts the ideas of telepathy and clairvoyance and he analyzes the esthetic, mystical and religious senses. He realizes, however, that mental activities depend also on physical activities and in this chapter provides an exaltation of the testis as a motivating organ, which should give considerable stimulation to the rejuvenationists. In fact, he proceeds in chapter 5 to a discussion of longevity and rejuvenation and he wisely concludes that "added years without health and strength would be a calamity. The number of centenarians," he says, "must not be augmented until we can prevent intellectual and moral decay and also the lingering diseases of old age." The human being will not, he believes, ever vanquish death or physiologic time. Dr. Carrel then considers the adaptive functions of mankind and finally the individual human being and the remaking of man. He recognizes the impossibility of overcoming biologic laws but at the same time emphasizes the desirability of applying the scientific knowledge we now have for greater health and great power.

Here then is a book full of sound thought on many topics but unscientific so far as the author enters into the imaginative field in relationship to processes that are not yet understood. Certainly the book will repay the time spent on it by any thinking man. It is unfortunate, however, that the publisher in choosing a type for the book has selected one so ornamental as to make reading a little difficult.

Clinical Tuberculosis. Edited by Benjamin Goldberg, M.D., F.A.C.P., F.A.P.H.A., Associate Professor of Medicine, University of Illinois College of Medicine. With the collaboration of thirty-three contributors. In two volumes. Cloth. Price \$22. Various pagination with 649 illustrations. Philadelphia: F. A. Davis Company, 1935.

This consists of chapters prepared by a large number of authors and edited by Dr. Goldberg. Almost all phases of the disease are covered from epidemiology, bacteriology, pathology, complications, diagnosis, classification, treatment and prognosis to prevention. The first chapter, by Drolet, on epidemiology, takes into consideration the tuberculosis record for New York, Philadelphia and Boston for 120 years. He illustrates definitely that the mortality has been decreasing for more than fifty years. He calls attention to the fact that until recently in many places the tuberculosis mortality rate was highest during the first year of life but that now the picture has been radically altered. For example, in 1900 in the ten original registration states 350 male infants under 1 year of age died of tuberculosis for every hundred thousand living, but by 1929 the mortality rate for male infants had dropped from 350 to 58.

Among female infants in 1900, 295 died of tuberculosis per hundred thousand living, but in 1929 this figure had dropped to 52, while the rate for young women between 20 and 25 years was 120 per hundred thousand living in 1929. Drolet believes that this marked decrease in infant mortality is due to segregation of open cases of tuberculosis and increased home and sanitary supervision of all members of families with tuberculosis. This chapter contains much valuable information concerning tuberculosis among the various races of people, as well as the effect of occupation and other factors on the disease. The chapter on the pathology of pulmonary tuberculosis, by Jaffe, deals first with the primary form of the disease and finally with the clinical form. Rankes classification is followed. Ornstein and Ulmar have presented excellent chapters on the physical diagnosis and classification of pulmonary tuberculosis, in which a complete description is given of the various abnormal physical signs. These chapters are followed by a rather elaborate discussion of the roentgen examination by Potter. The concluding chapter in the section on diagnosis is written by Goldberg, who discusses the subject of differential diagnosis. The entire subject of therapy from diet, strict bed rest, through collapse therapy, is well presented by a number of authors, including Matson, Coryllos, Hedblom and Mayer. The two volumes are profusely illustrated and contain a large amount of valuable information for all physicians interested in tuberculosis.

Pellagrole Dermatosen an Gelsteskranken mit besonderem Hinblick auf das Vorkommen solcher bei Schizophrenen und mit Beiträgen zur Beleuchtung gewisser ätiologischer und pathogenetischer Verhältnisse bei Dementia praecox und Pellagra. Von Paul J. Reltter Dr. med. Abteilungsarzt am Sct. Hans Hospital II Dänemark und Jakob Jakobsen. Paper. Pp. 125 with 20 illustrations. Copenhagen. Levin & Munksgaard. Leipzig. Georg Thieme. 1935.

This is a clinical study of 955 mental patients in a Denmark asylum, in 182 (19.3 per cent) of whom pellagroid skin lesions were found, mainly of a hyperkeratotic type on the elbows, knees, hands and face. The highest incidence was seen in the encephalitis cases (60 per cent), next in the schizophrenic group (21 per cent) and third (8.6 per cent) in the manic depressive class. Fourteen cases were considered to be true pellagra on account of the association of a severe dermatitis with stomatitis, diarrhea and neurologic symptoms. Other skin disorders, such as acne and rosacea, were frequently found in the dementia praecox group. As controls, 881 criminals in the state prison were investigated to determine the effect of a low vitamin diet on the frequency of skin changes, and only 4.5 per cent were found to have pellagroid dermatoses. Investigations of the gastric contents and blood changes in the dementia praecox group with skin lesions showed the frequent association of hypochlorhydria and achylia with lymphocytosis and eosinophilia. The observations recorded are of interest in showing the frequent occurrence of "pellagroid" dermatoses in mental cases, although nothing new has been added to explain their pathogenesis. Similar observations have been made in this country in the so-called pseudopellagra occurring in alcoholic addicts.

The Patient's Dilemma. A Public Trial of the Medical Profession. By S. A. Tannenbaum M.D. and Paul Maerker Branden. Cloth. Price \$2.50. Pp. 278. New York. Coward McCann Inc. 1935.

The medical author of this book apparently graduated from the College of Physicians and Surgeons, New York, thirty-seven years ago. He is now exposing the hideous truth about the commercial side of the practice of medicine. When he gets all through with his exposure he has done nothing but expose his own ignorance of the situation. Perhaps a better recognition of the true state of affairs would have kept him from such an out-and-out exhibition of bad taste, exaggeration and malice as is represented by this volume.

At the time of this writing the book has already been before the public for some months and it apparently has fallen with a dull and unexciting thud. Apparently the author intended to rouse public wrath and to shake public confidence in the medical profession but has served only to reveal the great confidence that actually exists and the inability of scandal mongers within or without the profession to shake that confidence. It would be, therefore, a work of supererogation to analyze the

volume page by page. One finds the usual criticisms relative to fee splitting and to the abuse of physical therapy apparatus for purposes of income. One finds attention called to the small incomes of a good many doctors and to the large charges occasionally associated with major medical procedures. The book is utterly inadequate in its consideration of present plans for medical practice and in its defense of socialized medicine.

Some Thoughts of a Doctor. By Frederick Parkes Weber M.A. M.D. F.R.C.P. With a preface by Sir W. Langdon Brown M.A., M.D., F.R.C.P. Regius Professor of Physic in the University of Cambridge. Cloth. Price 6s. Pp. 183. London. H. K. Lewis & Co. Ltd., 1935.

These essays, thirty-one in number, range from such subjects as "Nature and God" and "The Rights of Nations" to "The Gambling Spirit" and "Exercise, Work, Rest and Sleep." They represent the meditations of a scholarly physician over various aspects of life and living. The same breadth of information which the author has shown in his medical writing is exemplified in his essays on subjects far removed from medicine. Many of them are reminiscent of Osler's treatises, though they are highly individual and original in thought. While the writer lacks an engaging literary style, the essays are stimulating. The physician will enjoy taking issue or agreeing with the author on the many subjects he has treated provocatively.

A Textbook of Clinical Neurology with an Introduction to the History of Neurology. By Israel S. Wechsler M.D. Professor of Clinical Neurology, Columbia University. New York. Third edition. Cloth. Price \$7. Pp. 826 with 162 illustrations. Philadelphia & London. W. B. Saunders Company. 1935.

This edition appears with minor changes in the text throughout and with the valuable addition of a chapter on the history of neurology. This chapter, although containing a good deal of factual material, does not accomplish its purpose as an addendum to the book at large. It is unfortunate that selected bits of neurologic history are not placed in the various chapters of the diseases to which the history refers. Otherwise the book is essentially like the second edition with a few minor alterations. Dr. Wechsler has had the good judgment to maintain the book in the form and style that created its intense popularity. The book is an excellent and valuable introduction to clinical neurology.

Recent Advances in Diseases of Children. By Wilfred J. Pearson, D.S.O. M.C. D.M. Physician in charge of Children's Department, University College Hospital, London and W. G. Wyllie M.D. F.R.C.P., Physician to Out Patients Hospital for Sick Children, Great Ormond Street, London. Third edition. Cloth. Price \$5. Pp. 666 with 61 illustrations. Philadelphia. P. Blakiston's Son & Co. Inc. 1935.

The authors of this concise treatise have maintained the editorial policy of the previous editions in presenting a connected outline of the diseases in childhood. For the most part many of the chapters have been recast and revised. Those who are familiar with the previous editions will find an apparent similarity, but this is only in form. The authors have sought mainly to formulate principles for solving problems of disease in children. These do not change as often as scientific data, but the reader often benefits by their restatement. The book is unique in its style and manner of presentation, and the physician and student will benefit by its concise correlations. It is not recommended as a textbook in pediatrics but as a complementary volume.

Aids to Ophthalmology. By N. Bishop Harman M.A. M.B. F.R.C.S. Consulting Ophthalmic Surgeon, West London Hospital. Eighth edition. Cloth. Price \$1.25. Pp. 242 with 203 illustrations. Baltimore. William Wood & Co. 1935.

This is a pocket size quiz compend type of book which attempts to cover the anatomy, physiology, diseases, refraction and surgery of the eye, without an attempt to be complete in and of itself. There are many Unusual diseases "are intentionally omitted." There are numerous illustrations and several tables. A chapter on eye conditions in school children is based on 22,000 examinations in London. The diseases and refractive errors of this group are discussed. One chapter deals with the visual requirements for the various governmental and municipal services and industries in Great Britain. The book is concise and is of value when preparing for examinations or reviewing the subject but is too brief to serve as a textbook.

Medicolegal

Malpractice Facial Paralysis and Deafness Following Mastoidectomy—One of the physician-defendants performed a "radical" mastoidectomy on plaintiff. Facial paralysis and deafness in the ear involved resulted. The plaintiff, contending that he had consented only to a "simple" mastoidectomy, sued the defendants for performing an unauthorized operation and for negligence in connection with the operation. The jury returned a verdict for the plaintiff for \$30,000 and, after first rendering judgment on the verdict, the circuit court reversed itself and ordered a new trial. The plaintiff appealed to the Supreme Court of Wisconsin.

If, said the Supreme Court, the radical operation was performed without the consent of the patient, either express or implied, then the operator was guilty of an assault and would be responsible for damages resulting therefrom. The court, however, agreed with the circuit court that the case was ineptly submitted to the jury with the result that there was a lack of findings by the jury on which to base a valid judgment as to the amount of damages resulting from the "radical" operation as distinguished from the "simple" operation. The case should have been submitted in such a form as to exclude from consideration, in assessing damages, the expense, pain and natural or necessary results of the "simple" operation to which the patient concededly submitted. While it may be difficult to draw an exact line between the extent of the "simple" operation and the beginning of the "radical" operation under the circumstances of the case, the assessment of damages must nevertheless be made with that distinction in mind. This error was of sufficient gravity, in the opinion of the court, to warrant the granting of a new trial.

The trial court committed no error in permitting a physician, licensed in Iowa, to testify as an expert witness for the plaintiff. Section 147.14 (2), Wisconsin Statutes, provides, in part:

Practitioners in medicine, surgery or osteopathy licensed in other states may testify as experts in this state when such testimony is necessary to establish the rights of citizens or residents of this state in a judicial proceeding and expert testimony of licensed practitioners of this state sufficient for the purpose is not available.

When a party has shown, said the court, the taking of adequate steps to secure the aid of Wisconsin physicians, and that he has been unable to secure it, he may call as a witness an expert from without the state. It was for the trial court to determine whether or not the plaintiff in this case had in good faith attempted to secure the aid of Wisconsin physicians, and, having so determined, in the absence of a showing of an abuse of discretion, the determination is final. The action of the trial court in granting a new trial was affirmed.—*Paulsen v Gunderson (Wis)*, 260 N W 448

Evidence Exhibition of Injured Knees to Jury—Sylvia Mayson was employed as an entertainer in a cabaret. As a result of a collision between the taxicab in which she was riding and a truck, she sustained injuries and sued the cab company and the owner of the truck. The trial court gave judgment for her and the defendants appealed to the Court of Appeals of Maryland.

At the conclusion of the plaintiff's testimony, and after she had exhibited scars on her face, neck and forehead to the jury, her counsel requested permission to exhibit to the jury the injuries to her knees. Counsel stated that his desire to have his client exhibit her knees was because of her occupation, she having testified that her vocation was that of entertainer, dancer and singer, and that the disfigurement of her knees vitally affected her in this respect. The trial court in acceding to counsel's request, stated that while ordinarily such scars on the knees would not be an element of significance, yet in view of the plaintiff's occupation the evidence was admissible in this case. The admission of this form of evidence, said the Court of Appeals, was entirely in the discretion of the trial court, and there was no impropriety or error in its admission. The plaintiff had testified that she had two "brush burn wounds" on her knees, the scars of which remained. The exhibition of her

knees merely corroborated her oral testimony in this respect. In its ruling, the Court of Appeals cited *Chicago & A R Co v Clausen*, 173 Ill 100, 50 N E 680, a case in which the Supreme Court of Illinois upheld the lower court in permitting a plaintiff to exhibit to the jury a rupture alleged to have been a result of an accident.

Finding no error in the rulings of the trial court, the Court of Appeals affirmed the judgment for the plaintiff.—*Zeller v Mayson (Md)*, 179 A 179, *Rubenstein v Same (Md)*, 179 A 179

Evidence Opinion of Expert Witness Based on the Opinions, Inferences and Conclusions of Other Witnesses—The opinion of an expert witness, said the Court of Appeals of Maryland, however qualified he may be to speak, cannot be predicated, either in whole or in part, on the opinions, inferences and conclusions of other witnesses. A witness who is qualified as an expert, who has heard the entire testimony in the case, and who assumes the truth of it all, may base his opinion on such testimony, where not conflicting, but the opinions of other witnesses may not be incorporated in the question or taken into account in giving his answer.—*Mt Royal Cab Co, Inc v Dolan (Md)*, 179 A 54

Medical Practice Acts Jurisdiction to Reinstate Revoked License in Court Not Board—The plaintiff, a physician, was convicted of violating the Harrison Narcotic Act and sentenced to the penitentiary. While he was so confined, the board of medical examiners revoked his license to practice medicine and the board's action was sustained by the Supreme Court of Iowa. *State v Hanson*, 201 Iowa 579, 207 N W 769. After serving his sentence, the plaintiff returned to Iowa and began anew to practice medicine but was enjoined from continuing to do so. Subsequently, the board of medical examiners, with the consent of the district court, gave him what the court refers to as a "sort of license to practice under" another physician, which license was later withdrawn. On numerous occasions, the plaintiff petitioned the board of examiners to reinstate his license and on May 11, 1933, the board passed a resolution denying the application for reinstatement, contending that a statute, passed after the revocation of the license, transferred from the board to the district court jurisdiction in all matters relating to revocation of licenses. Thereupon the plaintiff instituted the present proceedings to compel the board to issue the license. From a decree by the district court in favor of the plaintiff, the board appealed to the Supreme Court of Iowa.

At the time the plaintiff's license was revoked, said the court, the medical practice act conferred on the board of examiners the right to revoke or suspend a license "for such a time as the board of medical examiners may determine." Subsequent legislation, however, divested the board of this right and conferred it on the district court of the county in which the physician involved resides. Hence, the board correctly in this case concluded it had no jurisdiction to reinstate the plaintiff's license. The district court erred in considering the merits of plaintiff's case. The sole issue was a question of jurisdiction. The decree of the district court was therefore reversed.—*Hanson v State Board of Medical Examiners (Iowa)*, 260 N W 68

Charitable Hospitals Liability for Negligence in the Selection of Servants—The plaintiff filed complaint against the defendant, a charitable hospital, alleging that the hospital was negligent in selecting incompetent and unskilful employees through whose negligent care and treatment she was injured. The trial court dismissed the complaint, and the plaintiff appealed to the Supreme Court of Wisconsin.

The plaintiff contended that the defendant, although it was a charitable institution, must use due care in the selection of its employees to whom it entrusts the care and treatment of its patients, and that this is a nondelegable duty, for the non-performance of which the hospital is responsible. It was conceded that a charitable hospital is not liable for the negligence of its employees. The basis of this rule, said the court, is that these hospitals perform a quasipublic function, akin to

that performed by municipalities in performing governmental functions, and justice and public policy require that the doctrine of respondeat superior shall not be applied. But, said the Supreme Court of Wisconsin, the reason for the rule as applied to the negligent acts of servants applies with equal force whether the negligent act is of a nurse or other employee employed by the hospital, or the negligence of its manager or managing board in selecting the nurse or other employee. The hospital can act only through its agents in selecting its employees. The agent who selects the employee is an agent of the hospital in no different sense than is the employee thus selected. The duties of the two agents are different, but the agency relation is the same, and if the doctrine of respondeat superior does not apply to the acts of one, it should not to the acts of the other. On reason, therefore, if a charitable hospital is exempt from liability for negligent acts of its incompetent employees committed on its patients, it is exempt from liability for negligence of its managing agents in selecting those incompetent employees. Precisely the same reason lies for exemption in both cases and it lies to precisely the same extent. A physician is in many cases the managing agent of a hospital. That such a hospital should be exempt from liability for the tort of its managing agent in himself negligently performing an operation which he was incompetent to perform, and should be liable for the negligence of the same physician in delegating another physician to perform it who was incompetent and negligently performed it, is utterly irreconcilable, the court concluded. The judgment of the trial court, dismissing the complaint, was affirmed.—*Schunacher v Evangelical Deaconess Soc of Wisconsin (Wis)*, 260 N W 476

Malpractice Tonsillectomy Performed on Intoxicated Patient—The defendants removed the tonsils of plaintiff's husband under a general anesthetic. Three hours later he died. Attributing the death to the fact that the defendants operated on the patient when he was intoxicated, the plaintiff sued. The trial court gave judgment for the defendants and the plaintiff sought a reversal in the court of civil appeals of Texas.

The expert testimony in this case, said the court, does not show that any negligence on defendants' part was the proximate cause of the patient's death. During a period of two days the patient consumed approximately 7 pints of intoxicating liquor. About 7 o'clock in the evening of the second day, after eating a large meal, he went to a hospital for the purpose of having his tonsils removed by the defendants. He was operated on about 8 o'clock that evening, the operation consuming between forty and forty-five minutes. Following the operation the patient's condition was good. About 11 45 p. m. his pulse suddenly became very weak, his respiration slow and shallow, and he died. The plaintiff's only expert witness did not testify that the patient's death was caused by the negligence of the defendants. He did testify that if a drunken person is operated on that certain bad results may follow, that a general anesthetic given to a drunken person will sometimes throw him into delirium tremens, that a drunken person will require more anesthetic than a sober person, and that there is great danger of heart failure and pneumonia. The undisputed evidence, the court said, showed that the patient did not develop pneumonia, that it did not take more than the usual amount of anesthetic to produce insensibility, that the patient did not vomit as a result of the anesthetic, that the patient's blood pressure was normal, that he did not develop delirium tremens, and that he did not have heart failure either while the operation was being performed or after the operation within the period which the expert witnesses stated it could have occurred as a result of the intoxication. The preponderance of evidence established the fact that the patient's death was the result of a blood clot getting into the blood stream and finding its way to the heart. Eight expert witnesses testified that the patient's death was not due to the fact that he was operated on while intoxicated; none testified that intoxication had anything to do with his death. A physician is not a warrantor of cures nor does the rule of *res ipsa loquitur* apply in a malpractice case. The fact that the operation was not successful does not establish the fact that the physicians were negligent and that such negligence was the proximate cause of the death. Even if there were

evidence that the patient's intoxication was a proximate cause of his death, the evidence also shows, with at least equal clarity, that an embolism may have been the sole proximate cause of the death. The jury will not be permitted to guess which of two causes may have caused the death, verdicts must be based on something more than speculation, conjecture or inference.

The plaintiff contended that it was the duty of the defendants to secure her permission before operating on her husband. While it is true, said the court, that a physician must secure the consent of the parent to operate on a minor, a wife is not the guardian of her husband and her consent is not necessary before a physician is authorized to perform an operation on him.

Concluding that there was no medical expert testimony to establish the fact that the patient's death was proximately caused by the negligence or want of proper care and skill on the part of the defendants, the judgment of the trial court for the defendants was affirmed.—*Barker v Heaney (Texas)*, 82 S W (2d) 417

Malpractice When Arbitration Agreement Does Not Deprive Court of Jurisdiction.—The Ross Loos Medical Group entered into an agreement with the Los Angeles Police Relief Association, whereby the medical group became obligated to furnish certain medical and allied services to subscribers or members of the relief association, and their families. The wife of a member of the relief association alleged malpractice in treatment given her by a physician attached to the medical group, and she and her husband sued the group. The defendant medical group alleged that the cause of action was subject to compulsory arbitration under the terms of the agreement, which provided, in part, that—

Complaints made by either or any of the parties interested shall be forthwith investigated by the Committee of the Relief Association and of the Medical Group. In the event the explanation offered is not satisfactory a board of arbitration shall be selected. Such Board shall meet in arbitration without unnecessary delay and their decision shall be final.

In the judgment of the district court of appeal, second district, division 2, California, the arbitration provisions of the agreement do not apply to personal damage claims by individuals but only to methods and conditions of contact between the contracting parties and their individual members. The arbitration provisions contemplate only an inquiry into a grievance that has been first submitted to a joint committee for explanation, and malpractice is more than a grievance answerable by an explanation. The arbitration agreement did not deprive the trial court of jurisdiction.—*Spanach v Superior Court of Los Angeles County (Calif)*, 43 P (2d) 339

Society Proceedings

COMING MEETINGS

- American Association for the Study of Neoplastic Diseases Baltimore, Dec. 19 21 Dr. Eugene R. Whitmore 2139 Wyoming Avenue N W Washington D C Secretary
- American Student Health Association New York Dec. 27 28 Dr. Harold S. Diehl University of Minnesota Medical School Minneapolis Secretary
- Eastern Section American Laryngological Rhinological and Otolological Society Newark N J Jan. 3 Dr. Henry B. Orton 24 Commerce St. Newark N J Chairman
- Middle Section American Laryngological Rhinological and Otolological Society Milwaukee Jan. 11 Dr. William E. Grove, 324 East Wisconsin Avenue Milwaukee Chairman
- Mid Western Section American Laryngological Rhinological and Otolological Society St. Louis Jan. 15 Dr. Harry W. Lyman Carleton Building St. Louis Chairman
- Puerto Rico Medical Association of Santurce Dec. 13 15 Dr. Euripides Silva Ave. Fernandez Juncos Parada 19 Santurce Secretary
- Society of American Bacteriologists New York Dec. 26 28 Dr. I. L. Baldwin College of Agriculture University of Wisconsin Madison, Wis. Secretary
- Society of Surgeons of New Jersey Jersey City Jan. 15 Dr. Walter B. Mount 21 Plymouth St. Montclair Secretary
- Southern Section American Laryngological Rhinological and Otolological Society Jackson, Miss. Jan. 18 Dr. Robin Harris Lamar Building Jackson Miss. Chairman
- Western Section American Laryngological Rhinological and Otolological Society Del Monte, Calif. Feb. 1 2 Dr. Carroll Smith Paulsen Building Spokane, Wash. Chairman

Current Medical Literature

AMERICAN

The Association Library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J Obstetrics and Gynecology, St Louis

30 459 608 (Oct.) 1935

- Contributions of Great Britain to Gynecology and Obstetrics B M Anspach Philadelphia—p 459
Study of a New and Potent Ergot Derivative, Ergotocin F L Adair M E Davis M S Kharasch and R R Legault Chicago—p 466
Theca Cell Tumors S H Geist New York—p 480
Some Newer Aspects of Reproductive Physiology E. Novak Baltimore—p 495
Experiences with Amniotin in Treatment of Gonococcal Vaginitis in Children R W TeLinde and J N Brawner Jr Baltimore—p 512
*Protein Stabilization in Preeclampsia and Eclampsia B Harden W S McElroy and R R. Huggins Pittsburgh—p 524
*Treatment of Dysmenorrhea by Presacral Sympathectomy F E Keene Philadelphia—p 534
Place of Colpectomy in Treatment of Uterine and Vaginal Prolapse L E. Phaneuf Boston—p 544
*Analysis of End Results of Labor in Primiparas After Spontaneous versus Prophylactic Methods of Delivery A H Aldridge and P Watson, New York—p 554
Clinical and Bacteriologic Observations in Trichomonas Vaginitis E. Allen L B Jensen and I H Wood Chicago—p 565
Hypothyroidism as a Problem in Women Basal Metabolism Study of Six Hundred Cases. C H Davis Milwaukee—p 570
Toxemia of Pregnancy J R Goodall Montreal—p 577
*Ovary Stimulating Factors and Antihormones C. F. Fluhmann San Francisco—p 584
Recent Advances in Hysterography T O Menees and J D Miller Grand Rapids Mich—p 590
When Is Surgery Indicated in Retrodisplacement of Uterus? G H Gardner, Chicago—p 596

Protein Stabilization in Eclampsia—Harden and his associates studied the changes in the maternal constitution incident to so-called physiologic gestation, the clinical features of preeclampsia and eclampsia (with reference to the clinical use of an alcoholic extract of liver) and the application of protein stabilization as a measure of study of preeclampsia and eclampsia. The results of their study indicate that the most profound clinical alterations demonstrable in preeclampsia and eclampsia are in the field of protein metabolism that this has a direct application in the final outcome is more than probable. Any plan of prevention and treatment must take into consideration such measures as will tend to maintain the protein of the mother within the limits of normal pregnancy.

Treatment of Dysmenorrhea by Presacral Sympathectomy—Keene states that presacral sympathectomy for dysmenorrhea is limited in its usefulness to young women, and hence its value must be judged not only in terms of relieving pain but also by its effects on menstruation and pregnancy. The operation severs the chief sympathetic nerve supply to the bladder and rectum as well as the uterus and a satisfactory result must include unimpaired function of these organs. His experience, and that of others reported, justify the belief that presacral sympathectomy has a place in the treatment of properly selected cases of functional dysmenorrhea, but its adoption is warranted only when less radical measures have failed. In organic dysmenorrhea, presacral sympathectomy may be used with advantage to supplement operations on the pelvic organs. Ordinarily the operation is not difficult, but conditions may be encountered rendering its performance tedious and hazardous. The operation relieves pain in the majority of cases and does not interfere with menstruation, spontaneous parturition or motor control of the bladder and rectum.

End Results of Labor in Primiparas—Aldridge and Watson observed that the incidence of birth injuries to mothers and babies, and of postpartum complications, was in direct proportion to the incidence of prolonged labor abnormal pelves

faulty presentation and large babies, which resulted in the application of increased pressure to the maternal soft parts and to the fetus during labor and delivery. Elective low forceps after perineal incision can justly be regarded as a prophylactic procedure in patients who would deliver spontaneously if allowed to do so. Perineal incision, when used in conjunction with any type of vaginal operative delivery, consistently reduced the incidence of birth injuries and postpartum complications. Prophylactic methods of delivery should be used by men trained both in obstetrics and in gynecology in hospitals properly equipped to give obstetric care. All women should have the protection of delivery in hospitals under supervision of men trained in gynecology and obstetrics.

Ovary-Stimulating Factors and Antihormones—Fluhmann conducted experiments to study the occurrence of "anti-hormones" in the blood of experimental animals injected daily for a long period of time with gonadotropic extracts. The injection into rats of a preparation of human pituitary gland for ninety or 119 days resulted in the production of substances capable of inhibiting the action of gonadotropic extracts prepared from both human hypophyses and from blood of pregnant women. A species specificity was demonstrable, however, as it proved ineffective with sheep pituitary extracts. The administration to rabbits of a human pregnancy blood gonadotropic extract for seventy-four days resulted in the production of substances capable of inhibiting similar extracts, but it was ineffective against either human or sheep pituitary gland preparations. Antihormones in the blood of women during the first ten days of the puerperium could not be demonstrated.

American Journal of Orthopsychiatry, Menasha, Wis

5: 217 350 (July) 1935

- Evaluation of Juvenile Courts and Clinics Introduction to Theory of Evaluation H B Elkind and M Taylor, Boston—p 217
Hyperactivity in Children Having Behavior Disorders A T Childers Cincinnati—p 227
Children's Attitudes to Parents H Meltzer, St Louis—p 244
Heilpädagogische Station of Children's Clinic at the University of Vienna J J Michaels Boston—p 266
Nicknames of Institutional Children S Z Orgel and J Tuckman New York—p 276
Psychometric Practice in Adults of Superior Intelligence. F L Wells and N W Hylan, Boston—p 286
Biologic Method in Psychiatric Case Work. M Harrington Napanoch N Y—p 302
Phobia of Impregnation and Its Relation to Psychoneuroses. T R Robie Montclair N J—p 318
Personality of King Lear as a Young Man I S Wile, New York—p 325

American Journal of Public Health, New York

25 1081 1174 (Oct) 1935

- Health Information on the Air A Blanchard San Francisco—p 1081
*Basophilic Aggregation Test in Lead Poisoning Epidemic of 1934 1935 C P McCord F R Holden and J Johnston Cincinnati—p 1089
Relationship Between Electrophoretic Migration Velocities Virulence and Types of Diphtheria and Diphtheria-like Bacilli K P Dozois and K F Rauss—p 1099
Public Health Expenditures in Selected Cities by Nonofficial Agencies J Wallace and L Feldman, New York—p 1103
New Germany Teaches Her People Account of Health Exposition of Berlin H E. Kleinschmidt, New York—p 1108
Standardization of Methylene Blue Reduction Test by Use of Methylene Blue Thiocyanate H R. Thornton and R B Sandin, Edmonton, Alta—p 1114
Campaign Against Tuberculosis in College Students. C E Shepard, Stanford University Calif—p 1118
An Experimental Critique of the Allen Method of Evaluating Bactericidal Action of Antiseptics K H Lewis and L F Rettger New Haven Conn—p 1125
Relative Toxicologic Effects of Synthetic Ethanol and Grain Fermentation Ethanol in Blended Whiskies C W Muehlberger, Chicago—p 1132
Aims of School Health Service. D W Gudakunst Detroit—p 1135

Basophilic Aggregation Test in Lead Poisoning—McCord and his co-workers assert that in the 1934-1935 epidemic of lead poisoning in the automobile industry 6,900 basophilic aggregation examinations of the blood were made. In addition, during this period 1,100 tests were made in other industries. This number includes approximately 500 control examinations made on workers who were not exposed to lead. Positive basophilic aggregation tests have served as an index for lead absorption prior to the appearance of clinical manifestations of lead poisoning. This test has proved to be of value in

the diagnosis of early cases of lead poisoning. The procedure is suited to application by any physician or laboratory carrying out any blood examinations. The basic principle in the basophilic aggregation test is the enumeration of red blood cells containing basophilic substance, in contrast to the customary procedure of qualitative or quantitative examination for stipple or polychromatophilic cells. The native state of basophilic material in unaltered red blood cells is not known, but in the process of laking and staining red cells this substance may be artificially aggregated into readily visible masses. In normal human adults, these aggregates rarely exceed 1 per cent of the total number of erythrocytes, but in persons exposed to lead the percentages ordinarily lie above this normal maximum, when considerable lead is being absorbed or when clinical lead poisoning is imminent. Finding more than from 1 to 15 per cent and especially more than 2 per cent in persons exposed to lead at once suggests lead absorption and the possibility of approaching lead poisoning, or the actuality of early lead poisoning. In chronic lead poisoning this test usually is not, but may be, positive. As lead poisoning progresses to extended chronicity, the reliability of the procedure diminishes. The test has been utilized in industries using lead to determine the number of exposed workers absorbing lead, as some proof of existing lead hazards, as a guide for the transfer of workers absorbing lead to lead-free departments, as a measure of the efficacy of preventive devices and practices and as a means for the detection of malingers. There are varied types of diseases leading to positive basophilic aggregation tests, but in groups of workers in lead industries, presumably normal except for the possible effects of lead exposures, the positive basophilic aggregation test stands in some relation to lead absorption and its subsequent action.

American Review of Tuberculosis, New York

32 343-480 (Oct.) 1935

- Comparison of Roentgenologic and Pathologic Findings in Experimental Pulmonary Tuberculosis in Rabbits. Part I. Primary Tuberculosis. H. E. Burke. Ray Brook, N. Y.—p. 343.
- Id. Part II. Reinfection Tuberculosis. H. E. Burke. Ray Brook, N. Y.—p. 382.
- Atypical Acid Fast Micro-Organisms. III. Chromogenic Acid Fast Bacilli from Human Beings. M. Pinner. Tucson, Ariz.—p. 424.
- Id. IV. Smooth-Growing Tubercle Bacilli. M. Pinner. Tucson, Ariz.—p. 440.
- *Spore-Bearing Anaerobic Bacterial Flora of Tuberculous Cavities. F. C. Farago. Budapest, Hungary.—p. 446.
- *Presence of Bacillus Welchii in Tuberculous Cavities. F. C. Farago. Budapest, Hungary.—p. 452.
- Serologic Study Emphasizing Hydrogen Ion Concentration of Blood in Conjunction with Red Cell Sedimentation Test, Leukocytic Index and Complement Fixation Test. K. T. Sasano. Mount McGregor, N. Y.—p. 458.
- Biologic Effects of Beryllium. R. N. Loomis and E. Bogen. Olive View, Calif.—p. 475.

Bacillus Welchii in Tuberculous Cavities.—Farago obtained positive cultures of *Bacillus Welchii* from 100 per cent of tuberculous cavities bacteriologically studied within a few hours of death. Other species of pathogenic and nonpathogenic anaerobes were isolated in a smaller percentage of cases. Of the *Bacillus Welchii* strains cultivated from cavities, 42 per cent proved to be pathogenic. Sputum from tuberculous patients also gave positive results in 10 per cent of the cases. The author believes that the isolation of *Bacillus Welchii* from a definite though small percentage of sputum from tuberculous cavities lends support to the view that their presence in the cavities at necropsy is not due to dissemination of the organisms after death. While there can be little doubt that conditions suitable for the growth of anaerobic organisms exist in these cavities, the path of invasion by anaerobic bacilli is problematic. Spirochetes have been found in bronchiectatic cavities, but these organisms are present in the pharynx, whereas Branham and Levinthal failed to discover any anaerobic bacilli in the mouth, nose or pharynx. The question of whether these organisms exert any harmful effect on the host is difficult to answer. The fact that in a certain number of cavity cases there was evidence of the formation of antibodies against the hemotoxin and the toxin of *Bacillus Welchii* would suggest that the products of the organism are absorbed from the cavity, but whether in sufficient amount to affect the health of the patient or to retard the process of healing it is impossible for the author to say at present.

Annals of Internal Medicine, Lancaster, Pa.

9: 359-500 (Oct.) 1935

- Further Studies on Thymus and Pineal Glands. L. G. Rowntree, J. H. Clark, A. Steinberg, A. M. Hanson, N. H. Einhorn and W. A. Shannon. Philadelphia.—p. 359.
- *Artificial Pneumothorax in Treatment of Lobar Pneumonia. B. Burbank and E. Rothstein, Brooklyn.—p. 376.
- *Immunologic Applications of Placental Extracts. Effectiveness by Oral Administration. C. F. McKhann, A. A. Green, L. E. Eckles and J. A. V. Davies. Boston.—p. 388.
- *Fever Therapy in Gonorrheal Arthritis and Chorea. T. G. Schnabel and F. Fetter, Philadelphia.—p. 398.
- Dermatomyositis. Report of Case with Review of Literature. I. H. Marcus and J. Weinstein. Brooklyn.—p. 406.
- *Fatal Diabetic Coma with Acute Renal Failure. M. E. Holmes, Syracuse, N. Y.—p. 426.
- Incidence and Significance of Roentgenologic Niche in Duodenal Ulcer. B. R. Kirkin and H. A. Burch. Rochester, Minn.—p. 436.
- Personality and the Endocrines. Study Based on Fourteen Hundred Quantitative Necropsies. W. Freeman. Washington, D. C.—p. 444.
- The Relationship of the Flat Chest to Intelligence. S. A. Weisman, Minneapolis.—p. 451.
- Acute Lymphatic Leukemia in a Child of Four Years with Severe Granulocytic Phase Preceding a Remission. L. B. Flinn. Wilmington, Del.—p. 458.

Artificial Pneumothorax in Treatment of Lobar Pneumonia.—Burbank and Rothstein treated twenty cases of lobar pneumonia by artificial pneumothorax, with a resulting mortality of 10 per cent. Of their cases, at the onset of treatment, nine had consolidation of the left lower lobe, four of the right lower lobe, two of the right lower and middle lobes, two of the entire right lung and one each of the right upper lobe, of the right middle and upper lobes, and of both lobes of the left lung. With reference to age, the principal factor to be considered is the function of the lungs, as affected by the presence of emphysema and chronic bronchitis. These pulmonary conditions increase with increasing age. The authors have arbitrarily set 60 years as the upper limit, paying less attention to the chronological age than to the presence of diminished breath sounds, fixed barrel chest, numerous rhonchi and a past history of dyspnea on slight exertion. No patients should be treated unless acutely ill, otherwise the percentage of recoveries will be increased falsely. Patients who are febrile past the sixth day are not suitable for treatment while pneumothorax is still in the experimental phase, as many such patients in whom no complications exist will recover. Patients presenting small effusions probably do not offer any contraindications, but until the percentage of empyemas with pneumothorax treatment is established it would be wise not to treat them by this method. None of the authors' patients experienced any immediate pain, shock or discomfort. Relief of pain was permanent, usually after 500 cc. Relief after the first treatment occurred in ten cases, after the second treatment in six more, and four had no pain at any time. There were no immediate complications. Of the twenty patients, two developed empyema. Both were operated on (rib resection and open thoracotomy) and are gradually recovering. Both cases were due to *Streptococcus haemolyticus*. Absorption takes from two to three weeks. Delirium developed in five cases, in three it required restraint. Delirium tremens developed in one case of chronic alcoholism. This patient died. Three patients developed contralateral lobar pneumonia, one of these died. The beneficial effects of pneumothorax are apparently related only to the relief of pleural irritation. There is practically no collapse as seen on the roentgenogram of the involved lobe and no noticeable effect on toxicity, nor is it reasonable to assume a diminution of blood or lymph drainage from the involved areas. The rationale of the therapeutic effect appears to the authors to be as follows. Respiration becomes free, painless and of increased depth. This lessens the exertions of the patient, the cyanosis and anoxemia, and the chance of contralateral diminished aeration with atelectasis and secondary pneumonic involvement. Relief from pain allows the patient to rest comfortably. Sleep is made possible without the use of opiates. Coughing is made almost painless. Productive coughing ensures proper drainage from the diseased area. None of the patients developed abdominal distention. A large part in the development of this troublesome symptom may be played by diaphragmatic pleurisy. Roentgen studies showed air between the lung and the diaphragm in almost all cases and

the relief thus afforded at this point is, the authors feel, directly connected with the absence of distention

Immunologic Applications of Placental Extracts — McKhann and his associates review studies to determine the practicability of immunologic application of placental extracts, particularly in the prevention and modification of measles, and report investigations which indicate that the immune bodies of placental extracts may be effective following oral administration. Tests have been made largely by determination of immunity to scarlet fever as measured by the Dick test. Twenty-two children with positive tests have been rendered Dick negative by oral administration of extract in cold water on an empty stomach. The duration of the negative stage has been variable but has been prolonged to as much as eighteen days if iced alkaline carbonated water is used as the vehicle. The reversal of the Dick test could not be obtained with any regularity in adults. Oral administration of the extract has not been accompanied by reactions.

Fever Therapy in Gonorrheal Arthritis and Chorea — Schnabel and Fetter induced fever by circulating humidified hot air in the Kettering hypertherm in treating nine acute and nine chronic cases of gonorrheal arthritis and twelve cases of Sydenham's chorea. Of the nine patients with acute gonorrheal arthritis, six were cured, two were markedly improved and one was moderately improved. Of the nine with chronic gonorrheal arthritis, five were cured, three markedly improved and one moderately improved. Nine patients with chorea were cured and two were markedly improved. One died as a result of a disturbance of his heat regulating mechanism. No patient having either of these diseases failed to respond favorably to this form of treatment. It is believed that fever therapy offers the best chance of cure for both gonorrheal arthritis and chorea.

Fatal Diabetic Coma with Acute Renal Failure — Holmes presents five cases of fatal diabetic coma, all with blood nonprotein nitrogen retention of more than 100 mg per hundred cubic centimeters, observed in the past five years. All cases fell properly in the class of diabetic acidosis as judged by the usual clinical and laboratory criteria: excessive hyperglycemia, reduction of the alkali reserve of the plasma, glycosuria and ketonuria. The principal features of the cases were the failure of the acidosis, as exemplified by the plasma carbon dioxide combining power, to clear in response to insulin therapy, and the development of evidence of renal insufficiency. All patients seemed to respond favorably to treatment at first and all revived for a brief period a few hours after treatment was begun, only to lapse back into a fatal stupor and finally die in apparent uremia. Oliguria was noted in all cases and anuria, for from six to twenty-two hours, in four individuals. Casts and red and white blood cells were present in the urine of all patients. Albuminuria, although slight at first, increased as the coma progressed. The nonprotein nitrogen of the blood, while not markedly elevated early, gradually mounted in each case until before death it exceeded 100 mg per hundred cubic centimeters, in one case it exceeded 300 mg per hundred cubic centimeters on the eighth day. Edema was noted in three instances toward the end, and convulsions (hypoglycemia not present) developed in one patient. While moderate amounts of acetone were present in the urine in all cases, diacetic acid was absent in one and present only in small amounts in the urine of the other four. The increase in the blood nonprotein nitrogen is probably not entirely an index of failure of kidney function, since concentration of the chemical constituents including urea is brought about by dehydration always present in severe diabetic coma. However, in the series, the grade of nitrogen retention was much greater than that reported as a result of dehydration, and the retention occurred late after the anhydremia had apparently been overcome by the administration of large amounts of fluids. The presence of oliguria, anuria, albumin, casts and red blood cells in the urine, edema, and in one patient convulsions, can leave little doubt that the severe azotemia in these cases was due to direct retention as a result of acute functional renal failure. Several factors have been suggested as being concerned in the development of this type of renal failure: shock, dehydration disturbance of the plasma electrolytes increased destruction of endogenous protein, insulin and pathologic change in the kidney. Most of these factors are probably interrelated.

Annals of Medical History, New York

7: 409-502 (Sept.) 1935

- A French Epidemiologist of the Sixteenth Century E W Goodall London England—p 409
Galen's Writings and Influences Inspiring Them J Walsh, Philadelphia—p 428
Roziere de la Chassagne and the Early History of Percussion of the Thorax G Dock Pasadena, Calif—p 438
History of Development of the Technic of Herniotomy E. Andrews Chicago—p 451
Sir Thomas Browne and the Disease Called the Morgellons C E. Kellett Newcastle-on Tyne, England—p 467
Early Medical Magazines in America H B Shafer Great Neck L I N Y—p 480
Therapy in Gonorrhea Historical Review H L Wehrbein, Brooklyn—p 492

Annals of Otol., Rhinol and Laryngology, St. Louis

44: 305-608 (June) 1935 Partial Index

- Intramucosal Test for Hypersensitivity in Allergic Rhinitis L. W. Dean L D Linton and C S Linton St. Louis.—p 317
Indications for Bondy Type of Modified Radical Mastoid Operation H I Lillie, Rochester Minn.—p 337
Review of the Interrelationship of Paranasal Sinus Disease and Certain Chest Conditions with Especial Consideration of Bronchiectasis and Asthma J G McLaurin, Dallas Texas—p 344
Syndrome of Pain and Paralysis Arising from Inflammations of Prevertebral Space A W Proetz St. Louis—p 371
*Ménère's Symptom Complex Endolymph Decompression with Symptomatic Improvement Report of Case S N Parkinson Oakland, Calif—p 382
Impermeable Cicatricial Stricture of Esophagus Treated by Modification of Iglaueur Technic H J Moersch Rochester, Minn.—p 407
Confusing Symptoms in Acoustic Nerve Tumors C. T. Uren and B C Russum Omaha—p 442
Selective Treatment of Malignancy About the Head T C Galloway Evanston Ill.—p 450
Pathways of Approach to Petrous Pyramid M F Jones New York.—p 458
Method to Determine Percentage of Deafness in Malingers F W Dixon Cleveland.—p 483
Clinical Relationship of Infections in Upper Respiratory Tract to Certain Types of Chronic Uveitis Preliminary Report W D Gill, San Antonio Texas.—p 486
New Surgical Approach to Mediastinum Through Pyriform Sinus S E Roberts, Kansas City Mo.—p 493

Ménère's Syndrome and Endolymph Decompression with Improvement—Parkinson reports a case of so-called Ménère's syndrome and suggests the descriptive term recurrent aural crisis. Endolymph decompression, as described by Portmann, was performed on the involved side. The effect was promptly and favorably to modify the course of symptoms sufficient to rehabilitate the patient. Continued deterioration in auditory and vestibular function indicates that the disease process has not been terminated in spite of symptomatic relief. The relation of endolymph decompression to the symptomatic course of this disease may be significant in studies aimed at etiology and pathology. It seems consistent with Furstenburg's work on salt retention. It suggests that the endolymph is concerned in the pathology and in the production of the characteristic attacks.

Archives of Ophthalmology, Chicago

14: 527-698 (Oct.) 1935

- Detachment of Choroid After Cataract Extraction Clinical and Experimental Studies with Report of Seventy Five Cases C S O'Brien, Iowa City—p 527
Light Stimuli of Minimal Measured Duration as Means of Perimetry L L Mayer Chicago—p 541
Use of Coley's Mixed Toxins in Ophthalmology Further Observations J Levine New York—p 554
Closure of Angle of Anterior Chamber in Glaucoma Its Bearing on Operations for Relief of Hypertension M U Troncoso New York—p 557
*Corneal Ulcers Due to Common Allergen S J Parlato Buffalo—p 587
Dilated and Tortuous Retinal Vessels Report of Case of Congenital Arteriovenous Communication D Kravitz and R I Lloyd Brooklyn—p 591
Circulation of the Aqueous IV Reabsorption of Colloids J S Friedenwald and H F Pierce, Baltimore—p 599
Acute Metastatic Syphilitic Corneal Abscess Clinical and Histopathologic Study Bertha A. Klien, Chicago.—p 612
Empirical Treatment of Uveitis F H Newton Dallas Texas—p 618

Corneal Ulcers Due to Common Allergen.—Parlato presents a case of corneal ulcers, the cause of which was traced to a hypersensitivity to orris root. Specific treatments were given, and for the past two years there has been no recurrence.

of the ulcers. The accompanying disease of the lids and the rest of the conjunctiva have disappeared. Evidence is submitted to show that ethylmorphine hydrochloride is contraindicated in the palliative treatment of corneal ulcers. An allergic study of other cases of corneal ulcers will elicit the basic etiologic factors and thus increase the percentage of successful treatments. The timely recognition of hypersensitivity in many cases of chronic conjunctivitis in which the condition proves refractory to the usual forms of treatment may help to prevent the formation of corneal ulcers and the subsequent impairment of vision.

Archives of Pathology, Chicago

20: 507-664 (Oct.) 1935

- *Gross and Histologic Changes in Knee Joint in Rheumatoid Arthritis
F Parker Jr and C S Keefer Boston—p 507
- *Diffuse Cortical Contusion of Occipital Lobe C B Courville, Los Angeles—p 523
- Lipids in Liver of Cat During Bile Stasis and Biliary Decompression
A Cantarow H L Stewart and M M Lieber Philadelphia—p 535
- Renal Denervation Effect of Daily Injections of Colon Bacilli and Pitressin on Denervated Kidney of Dog G Milles Chicago and M Hardgrove Milwaukee—p 548
- Mechanism of Acute Inflammation V H Moon Philadelphia—p 561
- Late Changes in Liver Induced by Mechanical Obstruction of Hepatic Veins J P Simonds and F H Jergesen Chicago—p 571

Changes in Knee Joint in Rheumatoid Arthritis—Parker and Keefer compared the lesions of three cases of rheumatoid arthritis with those of degenerative and infectious arthritis. They obtained necropsies in two of the cases; the process was in a comparatively early stage in one and was far advanced in the other. The early case occurred in a person who died from cinchophen poisoning. They observed that destruction of the articulating cartilage takes place by solution and by dedifferentiation of cartilage into connective tissue once its surface has been covered with connective tissue. It is replaced with cancellous bone by a process of ossification from the periphery. The destruction of cartilage by connective tissue growing into the cartilage from the subchondral spaces is minimal and not a fundamental pathologic process in the disease. It is seen when new bone formation goes on in such areas. From their observations the authors state that the fundamental process in rheumatoid arthritis is an inflammatory process in the periarticular tissues and synovial membrane. The other anatomic changes are secondary to this essential change, that is to say, the destruction of cartilage, the atrophy of bone and new bone formation. A part of the process can be explained on the basis of disuse of a joint together with the loss of cartilage that occurs following the connective tissue overgrowth. Any theory that attempts to explain the pathogenesis of rheumatoid arthritis must take into account the mechanism by which the changes in the periarticular tissues come into being. The lesions in the cartilage, which are so distinctive of degenerative arthritis, are quite different from those resulting from destruction of the cartilage by overgrowth of connective tissue. The theory that degenerative and rheumatoid arthritis result from the same underlying factors is untenable.

Diffuse Cortical Contusion of Occipital Lobe—Courville bases his discussion of diffuse cortical contusions of the occipital lobe, which are relatively uncommon, on eight cases in which necropsies were performed. With the exception of those due to depressed fractures, they assume certain characteristics which are of interest in the study of traumatic intracranial lesions. Diffuse contusion of the occipital lobe, characterized by a diffuse reddish coloration and softening of the affected cortex without gross morphologic disorganization results from two types of mechanical disturbance. The lesion may be primary and acute, resulting from forcing of the occipital cortex against the falx or tentorium when the head in motion strikes some relatively immovable object. The force of the blow is expended on the sides or top of the head. Although in the primary type the contusion of the brain is usually found on the same side as that of the injury to the scalp, it occurs on the opposite side of the occipital lobe and is therefore a contrecoup. The secondary type is the result of local pressure by an expanding lesion, such as edema or subdural or intracerebral hemorrhage. In this type there is no necessary relationship between the side of the original injury and that of the contusion. In any case the lesion

is essentially a diffuse hemorrhagic softening of the cortex resulting from a rupture of small cortical veins incident to the sudden reversal of current in these vessels in the primary type, or to persistent and increasing obstruction by continued pressure in the secondary type. Microscopically, the cortical and subcortical tissues are found to be infiltrated with blood. The softening and disintegrating tissues are ultimately filled with compound granular corpuscles. The appearance of the ultimate lesion is unknown, since no example has as yet been studied.

Arkansas Medical Society Journal, Fort Smith

32: 79-92 (Oct.) 1935

- Cicatricial Stricture of Esophagus L H Landry New Orleans—p 79
- Review of Four Hundred and Forty Four Cases of Breast Lesions
M J Kilbury Little Rock—p 83

Colorado Medicine, Denver

32: 761-864 (Oct.) 1935

- Hold Tight Where You Are Presidential Address. W W King Denver—p 773
- Practical Method for Control of Dangerous Infections in Oral Surgery
J W Seybold Denver—p 778

Delaware State Medical Journal, Wilmington

7: 203-218 (Oct.) 1935

- Medical Ethics Then and Now J D Niles Townsend—p 203
- The Nasal Accessory Sinuses From the Standpoint of the General Practitioner E R Mayerberg Wilmington—p 206
- Plea for Prolonged Postnatal Care and Periodic Pelvic Examination of the Adult Female C L Hudiburg Wilmington—p 210

Endocrinology, Los Angeles

19: 509-632 (Sept-Oct.) 1935

- Conditions Necessary for Continuous Growth of Hypophysectomized Animals H M Evans R I Pencharz and Miriam E Simpson Berkeley Calif—p 509
- *Paget's Disease (Osteitis Deformans) R C Moehlig and J M Murphy Detroit—p 515
- Silhouette Method for Comparing Volumes of the Two Parts of the Adrenal Glands in Small Animals J C Donaldson Pittsburgh—p 523
- *Relationship Between Parathyroid Glands and Sex Hormones in Tetany E P McCullagh and J E Kearns Jr Cleveland—p 537
- Studies on Effect of Human Blood Serum on Growth of Rat. E K Shelton L A Cavanaugh and M Louisa Long Santa Barbara Calif—p 543
- Hypoglycemic Headache P A Gray and H I Burtness Santa Barbara Calif—p 549
- *Mental Retardation Associated with Endocrine and Nonendocrine Conditions M B Gordon and L Kuskin with technical assistance of B Berkowitz Brooklyn—p 561
- *Organotherapy in Mental Retardation Associated with Endocrine and Nonendocrine Conditions M B Gordon L Kuskin and J Ann Brooklyn—p 572
- Interpretation of Lowered Basal Metabolic Level D L Sexton St. Louis—p 579
- Effect of Pitocin Pitressin and Antuitrin on Fat Tolerance Tests H Blotner Boston—p 587
- Significance of Different Types of Cells of Anterior Pituitary W Susman, Manchester England—p 592
- Relation of Lipids to Estrin and Progesterin in Corpus Luteum of Sow E M Boyd and C A Elden Rochester N Y—p 599

Paget's Disease (Osteitis Deformans)—Moehlig and Murphy observed that in twelve cases of Paget's disease five gave a family history of diabetes mellitus. In two cases more than one member of the family had diabetes, and in one of these both parents died of diabetes and a brother, still living, is so afflicted. It was noted that a sister in this family had had a parathyroidectomy for generalized osteoporosis. There was at least one member in each of the families of the twelve patients who was 70 inches (178 cm) or more in height. There were five different patients in whose families the weight of one or more members exceeded 200 pounds (91 Kg). Two of the subjects with Paget's disease had leiomyomas. The authors suggest that the function of the pituitary gland is involved primarily in the production of the disease process and that the function of the parathyroid is involved secondarily. From a practical therapeutic standpoint the first consideration would be one of constitutional prophylaxis, that is, a eugenic one in that the tall, obese individuals, especially those with a familial diabetic history, should not intermarry. In view of the fact that there is a familial diabetic history and the patients have a low

carbohydrate tolerance, victims of Paget's disease should be treated as diabetic, with weighed diet and insulin

Parathyroids and Sex Hormones in Tetany.—The sex glands have a pronounced effect on the neuromuscular excitability in human parathyroid tetany. McCullagh and Kearns did not find variations in amounts of sex hormones in the body to be correlated with alterations in the levels of serum calcium and phosphorus, and it appears probable that they affect neuromuscular excitability through a separate mechanism. The application of radiation therapy to the ovaries is suggested as a possible means of controlling some of the aggravating factors in tetany in selected cases.

Mental Retardation.—Gordon and Kuskin studied 666 mentally retarded children, of whom 266 showed signs of endocrine disorder. Mental retardation occurred with the greatest frequency in association with (in the order named) childhood myxedema, hypothyroidism, pituitary obesity (adiposogenital dystrophy and thyropituitary type), anterior pituitary deficiency of growth and goiter. Mentally retarded infants with endocrine conditions were found to cut teeth, walk and talk at a later date than mentally normal infants in the same endocrine groups. Practically all children with childhood myxedema in this series were mentally retarded and showed delay in all developmental fields. There was found a greater tendency for mental retardation associated with childhood myxedema and hypothyroidism to appear in the first two years of life. Mental retardation in association with pituitary disturbances appeared to a greater extent after the second year of life. A concomitant appearance of mental retardation and endocrine dyscrasia was found to the greatest extent in childhood myxedema, to a lesser degree in hypothyroidism and to the least extent in pituitary conditions. It appeared that mental retardation occurs more frequently after an acute illness in association with pituitary disturbance and hypothyroidism than with childhood myxedema. A history of trauma is present only in the pituitary group and in not a single instance in the thyroid class in this series. Congenital syphilis played an insignificant part in the production of endocrine disorder (5.5 per cent). The incidence of congenital syphilis was only 8 per cent in the nonendocrine group of mental retardation. Every child with mental retardation should be studied from a comprehensive endocrine point of view.

Organotherapy in Mental Retardation.—Gordon and his associates treated 155 mentally retarded children who showed endocrine dyscrasia and 162 children showing nonendocrine mental retardation. The treatment consisted of organotherapy (desiccated thyroid and pituitary gland), remedial measures of associated disabilities such as chronic diseases, proper diet, educational measures and improvement of social conditions. Diet, improvement in social conditions and elimination of physical disabilities had no effect on the mental status in any child. The change in mentality was due then to the action of organotherapy or of the educational measures. The part played by the latter is great, but, since practically all children of school age, especially those in the lower intelligence quotient classes, had the benefit of an educational program it must be concluded that any beneficial results are to be attributed to the effects of glandular preparations. A tendency to continued improvement was observed in 45 per cent of the endocrine group and in 1.2 per cent of the nonendocrine group. Fair or temporary results were obtained in 34 per cent of the endocrine and in 34.6 per cent of the nonendocrine group. A tendency to continued improvement following the administration of desiccated thyroid and pituitary glands was observed only in cases of mental retardation associated with endocrine disorder. The highest incidence was noted in anterior pituitary deficiency, childhood myxedema, hypothyroidism and pituitary obesity, in the order named. Better results (58 per cent) were obtained in thyroid disturbances than in the hypopituitary group (30 per cent).

Florida Medical Association Journal, Jacksonville

22:141-188 (Oct.) 1935

Discussion of a Group of Common Skin Diseases C. A. Andrews Tampa—p. 155

Osteochondritis Deformans Juvenilis Coxae J. H. Branan Pensacola—p. 160

Treatment of Eclampsia C. B. Wright, St. Petersburg—p. 164

Some Surgical Errors C. D. Christ Orlando—p. 166

Illinois Medical Journal, Chicago

68:293-384 (Oct.) 1935

Meningococcic Meningitis Importance of Intravenous Therapy A. L. Hoyne Chicago—p. 307

Pneumoconiosis W. D. McNally, Chicago—p. 311

Fractures of Transverse Processes of Lumbar Vertebrae R. T. Pettit Ottawa—p. 318

Treatment of Vertebral Fracture with Secondary Paralysis E. Hauser Chicago—p. 320

Medical Problems of Today and the Future O. West Chicago—p. 322

Complications of Diabetes Mellitus C. J. McMullen, Chicago—p. 327

Team Work in Head Cancer T. C. Galloway Evanston—p. 331

*Tubercle Bacilli on Lips of Patients with Active Pulmonary Tuberculosis L. Gulbrandsen and R. Keller Chicago—p. 336

Exposure to Cold as Factor in Etiology of Lobar Pneumonia A. J. Nedzel Chicago—p. 340

Importance of Intradermic Reactions C. A. Earle Des Plaines—p. 345

Simplified Technic of Abdominal Supravaginal Hysterectomy E. Jonas Chicago—p. 347

*Use of Prostheses over Unsightly Eyes. C. O. Schneider, Chicago—p. 349

The School Teacher as Source of Tuberculosis Infection Report of

Ray Study D. O. N. Lindberg Decatur—p. 350

Short Wave Therapy in Acute Inflammations About the Head and Neck.

M. H. Cottle Chicago—p. 354

Can Medicine Solve Its Own Problems? B. C. Crowell Chicago—p. 358

The Poor Gallbladder Risk E. S. Murphy Dixon—p. 363

Is Medical Relief a Forerunner of State Medicine? B. C. Roloff Chicago—p. 367

Diet in Diseases of Skin F. R. Schmidt, Chicago—p. 376

Tubercle Bacilli on Lips of Patients.—Gulbrandsen and Keller show that viable tubercle bacilli reside on the lips of patients with open pulmonary tuberculosis. Tubercle bacilli exposed on the surface of the body in this way have abundant opportunity to be transferred from the lips to the hands and fingers, or from the lips to whatever utensil or article comes into contact with them. As a result, persons working or living in an environment of tuberculosis have as much possibility of becoming infected with the tubercle bacillus through actual contact as one would of becoming infected with other types of bacteria from typhoid or diphtheria carriers. Opie and McPherson found that when roentgen examinations were used for the recognition of pulmonary lesions, husbands and wives in marital contact with tuberculosis under varying conditions were infected from five to nine times as often as persons with no known contact with the disease. Evarts, Potter and Dunn followed the children of 136 families into adult life. At least one parent in each family was known to have had tuberculosis. Among 554 children of these families, the tuberculosis mortality in offspring between the ages of 15 and 39 years was two and three times as high as among the general population of the same class of people. Meyers, Diehl and Lees pointed out that 39 per cent of nurses in training, in a tuberculosis service of thirty beds, presented positive reactions on entrance, whereas three years later on graduation, 100 per cent had positive tuberculin reactions. Apparently tubercle bacilli are being disseminated along avenues that are not encompassed by present methods of tuberculosis control, that is, prevention of droplet infection. As more is understood in regard to this disease, these measures must be supplemented by closer attention to existing sources of infection. The patient with tubercle bacilli in his sputum must be looked on as a "carrier" of tubercle bacilli with the same public health status as a carrier of typhoid or diphtheria. Consequently, if measures are to be taken to prevent dissemination of tubercle bacilli exposed on a body surface in this way, these measures must be concentrated on the patient. The authors' recommendations consist of instructing the patient with regard to personal hygiene. Along with the proper disposal of sputum he should be taught that tubercle bacilli reside constantly on his lips, and therefore any object that comes in contact with these structures such as fingers, hands, tableware of any type and towels, have an opportunity of becoming contaminated with tubercle bacilli. Adequate facilities should be provided for washing the hands and lips at frequent intervals, in order to maintain the self-disinfecting power of the skin at its highest activity at all times. All the principles of medical asepsis as practiced in regard to other infectious and communicable diseases should be instituted in the care of tuberculous patients. Tubercle bacilli found on the lips of patients having open pulmonary tuberculosis can survive for periods of one hour and forty minutes and still be viable.

Use of Prostheses over Unightly Eyes—In a case in which enucleation was considered, Schneider recommended the wearing of a very thin contact glasslike prosthesis over the injured eye. The patient has been wearing the thin prosthesis continuously and with perfect comfort and satisfaction. This experience leads the author to believe that (1) enucleation for an unsightly but comfortable eye may not be indicated, (2) an artificial eye can be made thin enough to be worn successfully over an unshrunk globe, (3) a patient can soon wear such a prosthesis with comfort, and (4) the mobility of the prosthesis, when riding over a natural globe with normal musculature, is certain to be much better than when the prosthesis is resting on any sort of stump.

Journal of Infectious Diseases, Chicago

57: 129-222 (Sept. Oct.) 1935

- Phenomenon of Local Skin Reactivity to Bacterial Filtrates in Relation to Rous Chicken Sarcoma Antibodies G Shwartzman New York—p 129
- Survival of Virus of Infectious Laryngotracheitis in Bursa of Fabricius and Cloaca of Chickens After Intrabursal Injection J R Beach Berkeley Calif—p 133
- Scarlet Fever Immunization of Nurses G W Anderson and W I Reinhardt, Boston—p 136
- Bacillus Siamesis Pathogenic Variety of Bacillus Subtilis L Siribaed National Health Laboratories Siam Asia—p 143
- Benzidine Blood Agar (Penfold) for Isolating Streptococcus Scarlatinae, Ruth Tunnichiff Chicago—p 147
- Survival of Tubercle Bacilli Subjected to Vacuum of High Order T S Potter Chicago—p 149
- Bacterial Fermentations and Structure of Glucosamine A G Wedum and A W Walker Chicago—p 160
- *Scarlet Fever Toxin I Method of Purification and Concentration G F Dick and A K Boor Chicago—p 164
- Resistance of Vitamin B₁ and B₂ Deficient and Normal Rats to Intra-cerebral Injection of Herpes Virus E V Cowdry A M Lucas and C F Neff St Louis—p 174
- Chemical Separation and Biologic Activity of Polysaccharide Constituent in Brucella Cells A D Hershey I F Huddleston and R B Pennell Lansing Mich—p 183
- *Study of Variation in Corynebacterium Diphtheriae, Gladys L Hobby New York—p 186
- Some Studies of Infectious Laryngotracheitis Continued Propagation of Virus on Chorio-Allantoic Membrane of the Hens Egg C A Brandy Manhattan Kan—p 201
- Reversible Inactivation of Bacteriophage with Safranin A P Krueger and D M Baldwin Berkeley Calif—p 207
- Pathogenicity of Brucella Abortus for White Mice, W H Feldman and C Olson Jr Rochester Minn—p 212

Scarlet Fever Toxin—Dick and Boor show the advantages of a purified and concentrated toxin for skin test and immunologic purposes and for a study of the chemical and physical properties of this substance. They have prepared a purified and concentrated scarlatinal toxin containing 20,000,000 or more skin test doses per gram and of low nitrogen content by a combination of fractional precipitation with ammonium sulfate, treatment with an aluminum hydroxide preparation, dialysis and evaporation.

Variation in Corynebacterium Diphtheriae—Hobby studied the morphologic and colonial variation in Corynebacterium diphtheriae and observed the relation of bacteriophage to this variation. Working with a particular strain, which has been designated RB-2T, variation in both liquid and solid mediums has been investigated. A spontaneous variation leading to a change from the rod to the coccoid form, and the reverse, has been observed. Mucoid, smooth, rough and minute colonies of the rod form of this strain and mucoid and smooth colonies of the coccoid form have been isolated. A rough type, consisting of filamentous, branching rods, has been derived from the smooth phase of the coccoid form. A transformation from the smooth phase of the coccoid form to the smooth phase of the rod form may occur through the intermediate stage of the rough phase derived from the coccoid form. Single cell cultures of the coccoid form in the mucoid and smooth phases have been shown to be completely susceptible to the action of races of bacteriophage isolated (1) from the intestinal contents of typical cases of diphtheria, (2) from the intestinal contents and peritoneal washings of guinea-pigs infected with diphtheria bacilli and (3) from broth cultures that have stood at room temperature for from four to six weeks. Single cell cultures of the rod form in the mucoid smooth and rough phases are completely resistant to the bacteriophage. Eight races of bacteriophage,

isolated under anaerobic conditions from lysogenic variants of the smooth type of the rod form, are active against the coccoid form in the mucoid and smooth phases but not against any other forms of this strain. No correlation between virulence and toxigenicity has been observed. Results show that the virulence of the rod form is increased by the presence of bacteriophage, which is active in vitro only against the coccoid form. The ability of the coccoid form to produce toxin has been shown for the first time, thus indicating a fundamental relation between this form and the characteristic rod form.

Journal of Nutrition, Philadelphia

10 351-460 (Oct 10) 1935

- Spectrum Analysis of Hen Eggs and Chick Tissues W F Drea, Colorado Springs Colo—p 351
- Basal Heat Production of Rhesus Monkey (Macaca Mulatta) N Rakieten, New Haven Conn—p 357
- Effects of Increasing Calcium Content of Diet in Which Calcium Is One of Limiting Factors H C Sherman and H L Campbell, New York—p 363
- Calcium and Phosphorus Needs of Preschool Children Amy L Daniels, Mary K. Hutton, Elizabeth M Knott, Olive E Wright and Mary Forman Iowa City—p 373
- Effect of Deficient Diets on Total Ash Calcium and Phosphorus Content of Bones Ruth Yeager and J C Winters Austin Texas—p 389
- Augmentation of Toxicity of Fluorosis in the Chick by Feeding Dehydrated Thyroid P H Phillips Honora English and E. B Hart, Madison Wis—p 399
- Minimal Vitamin A Requirements with Particular Reference to Cattle H R Guilbert and G H Hart Davis Calif—p 409
- Is Work of Kidney Due to the Excretion of Urea a Factor in Specific Dynamic Action? A G Eaton, Shirley C Cordill and J L Gouaux New Orleans—p 429
- Effect of Male Hormone on Protein and Energy Metabolism of Castrate Dogs C D Kochakian and J R Murlin Rochester, N Y—p 437

Kansas Medical Society Journal, Topeka

36 397-440 (Oct.) 1935

- Experimental Surgery of Kidney O S Lowesley, New York—p 397
- Statistical Study of Osteomyelitis at the University of Kansas Hospital J B Weaver Kansas City—p 402
- Common Disorders of Large Bowel P W Morgan Emporia—p 406
- Practical Notes in Prenatal Examinations R. B. Schutz Kansas City Mo—p 410
- *Primary Spindle Cell Sarcoma Associated with Primary Scirrhus Carcinoma W C Curphey Kansas City—p 412

Primary Sarcoma Associated with Primary Carcinoma.—Curphey discusses a case of two malignant tumors occurring simultaneously in the same breast, which he considers belong in the group of separate primary malignant growths, principally because of the existing anatomic arrangement. In the light of Russell's experimental work it is possible that the carcinoma might have had sarcoma propagating properties similar to mouse tumor 100. This is unlikely in the present instance because the metastatic carcinoma in the liver had no associated sarcomatous growth, there was no tendency for the sarcoma to overgrow the carcinoma, a phenomena that occurred almost invariably in Russell's mouse tumor. That the carcinoma might have been secondary to the sarcoma is also plausible according to the observations of Nicholson. In other words, either of the two tumors might have stimulated the growth of the other or both might be entirely independent and caused by the same ultimate factor that is responsible for all malignant growth.

Maine Medical Journal, Portland

26: 151-164 (Oct.) 1935

- The Role of the Pituitary Gland C B Popplestone Rockland—p 157
- Pulmonary Tuberculosis Presenting Thoracic Surgical Problems Case Edited by J Gottlieb and C Steele Lewiston—p 158

Military Surgeon, Washington, D C

77: 177-238 (Oct.) 1935

- Wound Ballistics Studies in Mechanism of Wound Production by Rifle Bullets G R Callender and R W French—p 177
- Disposal of Excreta in Civilian Conservation Corps Camps H C Michie—p 202
- Malignancy and Tuberculosis P B Matz—p 207
- Duodenal Ulcer Treated with Larostidin Report of Two Cases B A Abl—p 216
- Practical Value of Nicloux Test for Ethyl Alcohol in Defining Intoxication for Purpose of Determining Line of Duty E. F. Curtin—p 219
- Prevention of Venereal Disease F J Vokoun—p 221
- Army Medical Personnel Early in the Nineteenth Century G F Lull—p 223

New England Journal of Medicine, Boston

213:699-740 (Oct 10) 1935

- Lesions of Cervix Uteri Diagnosis and Treatment C H Davis Milwaukee—p 699
- Changes in Maternal Mortality and Their Significance. C E Mongan, Somerville Mass.—p 705
- Resection of the Presacral Nerve in Gynecology F A Pemberton Boston—p 710
- *Observations on Symptomatology of Cholelithiasis with Especial Reference to Vomiting R Zollinger, Boston, and E Young Cleveland—p 714
- Further Case Studies of Lumbosacral Pathology with Consideration of Involvement of Intervertebral Disks and Articular Facets C E Ayres, Worcester, Mass.—p 716
- Trichobezoar A Hurwitz Boston—p 721

Symptoms of Cholelithiasis—Zollinger and Young distended the gallbladder or common duct in six patients. Under a short gas oxygen anesthesia or local infiltration of procaine hydrochloride the stones were removed from the gallbladder or common duct, and a sterile balloon was inserted which could be distended and the pressure recorded. When the patient had recovered sufficiently from the anesthesia to answer all questions intelligently, the gallbladder or common duct was distended. Distention of the gallbladder produced a feeling of indigestion or deep epigastric discomfort without the usual pain referred to the back or discomfort in the right hypochondrium. Nausea and vomiting did not occur, regardless of the degree of distention. Distention of the common duct produced a more severe epigastric distress, but again pain was not referred to the back. Inspiratory distress was characteristic of distention of either viscus. The chief difference between distention of the gallbladder and of the common duct was the occurrence of nausea and vomiting with the latter. The significance of these observations was then determined from a study of the clinical histories of 100 cases of cholelithiasis and chronic cholecystitis with a negative history for jaundice, 100 cases of acute cholecystitis and 100 cases of proved stone of the common duct. The authors' observations, which showed that vomiting followed distention of the common duct were in accord clinically in that distention of the biliary ducts, as by a calculus, produced a high percentage of involuntary vomiting as compared with calculi within the gallbladder. They believe that a calculus in the cystic or common duct in patients having pronounced involuntary vomiting should be considered in the group of indications for exploration of the common duct.

New Jersey Medical Society Journal, Trenton

32:565-624 (Oct.) 1935

- Physiologic Rest of Nose Unrecognized Factor in Treatment of Upper Respiratory Infections E L Wood Newark—p 571
- Evolution or Revolution in Medical Methods A C Christie, Washington D C—p 576
- The Washington D C Medical Dental Service Bureau The Medical Economic Project of Physicians and Dentists of the District of Columbia. R. Garrett Washington D C—p 577
- Treatment of Backache from Orthopedic Standpoint A J Davidson and M T Horwitz Philadelphia—p 580
- The Painful Back Clinical Examination and Diagnosis A M Rechtman, Philadelphia—p 582
- Mistaking Other Diseases for Coronary Thrombosis J B Herrick Chicago—p 590
- Coronary Disease and Coronary Thrombosis in Youth Analysis of Four Cases Under the Age of Thirty Years Twenty One Cases Under the Age of Forty Years and One Hundred and Thirty Eight Cases Under the Age of Fifty Years P D White Boston—p 596
- Treatment of Certain Vascular Complications in Diabetes Mellitus A. A. Epstein New York—p. 606

Coronary Disease in Youth—White states that the male sex is overwhelmingly the victim of coronary disease in early life. The young patients of his series all used considerable tobacco. The question of ancestral longevity and inheritance is undoubtedly important. His data give some support to the widely held notion that it is of fundamental importance to inherit long lived ancestors. Two points of some interest concerning the young patients with coronary disease are that they live city lives and have not exercised consistently. Infections do not seem to play much of a part in the production of serious coronary disease nor does diet, although further study may show that, as in diabetes, it is the combination of faulty metabolism with faulty diet that is important. The author has collected the data in cases of coronary thrombosis and of uncomplicated angina pectoris occurring in patients less than

40 years of age, examined in the last fifteen years, for comparison with his total series of cases of coronary thrombosis and of angina pectoris at all ages. He compares certain features about these cases and others in children less than 5 years of age with similar features concerning a group of very old persons, ranging in age from 80 to 105 years and for the most part in good health. In the latter he found that he could use the data that Pearl has been collecting somewhat in the same way concerning nonagenarians and centenarians.

New Orleans Medical and Surgical Journal

88 203-264 (Oct.) 1935

- Rôle of Uterine Cervix in Focal Infections H W Kostmayer, New Orleans—p 203
- *Etiology of Functional Puberty Bleeding and Its Treatment by Hormone Therapy J T Witherspoon and C G Collins New Orleans.—p 205
- Prevention and Control of Amebiasis C F Craig New Orleans—p 209
- The Phobia of High Blood Pressure C L. Eshleman New Orleans—p 219
- Importance of Ear Nose and Throat in Their Relationship to Focal Infection G J Tagmino New Orleans—p 225
- Conservative Treatment of Diseases of Ear, Nose and Throat. J R Hume, New Orleans—p 229

Functional Puberty Bleeding and Its Treatment by Endocrine Therapy—When no pathologic condition of the pelvis, as elicited by bimanual examination, could account for bleeding in young girls, Witherspoon and Collins instituted endocrine therapy before any curettage was performed. The technic of the treatment consisted in the daily administration to the bleeding patient of 1 cc of a preparation of the anterior pituitary-like gonadotropic principle from the urine of pregnant women, alone or in combination with 2 cc. of a commercial preparation containing the anterior pituitary growth factor. These injections are given intramuscularly and are continued until the bleeding stops. Assuming this cessation of flow to be the end of a menstrual period, no further therapy is given until the onset of the next period. With the onset of flow, daily injections are again given until the flow of the second period ceases. In like manner treatment is carried through a third period. After treatment for three months, no treatment is administered during the fourth period, in the hope that the menstrual rhythm has reestablished itself. If such is not the case, treatment should be carried on a while longer. In the authors' experience three periods of treatment were usually sufficient to reestablish the normal menstrual rhythm. About equal results were obtained whether the gonadotropic principle was used alone or in combination with the growth principle. The only untoward symptoms noted were an occasional local reaction at the site of the injections. This could be somewhat alleviated by decreasing the dosage given, starting with smaller doses or by diluting the amount of the injection with an equal volume of physiologic solution of sodium chloride or a 0.5 per cent solution of procaine hydrochloride. That actual conversion of the hyperplastic endometrium over into the secretory, premenstrual phase did not always occur is readily attested in several cases by the rapid cessation of flow, within from twelve to twenty-four hours, after the injections. The most likely explanation would seem to be that the effect is exerted on some unknown bleeding factor, which possibly is similar in nature and function to the principle that controls the cessation of the normal menstrual flow.

Philippine Islands Med Association Journal, Manila

15 459-514 (Sept.) 1935

- Staphylococcus Bacteriophage I Susceptibility of Sixty Four Philippine Strains of Staphylococci to Four Races of Imported Polyvalent Staphylococcus Bacteriophage A Pio de Roda Manila—p 459
- *Agranulocytosis Following Quinine Administration Report of Case W Vitug A. Chavez and G F Austria Manila—p 464
- Watermelon Seed in Air Passages Report of Cases V C Alcantara and G de Ocampo Manila—p 469
- Some Facts on Malaria P I de Jesus Manila—p 476
- Infant Mortality in the Philippines Its Present Status and the General Death Rate. F Z Cruz, Manila—p 479

Agranulocytosis Following Quinine Administration.—Vitug and his associates point out that some patients who take quinine often complain of marked body weakness, besides the usual auditory disturbance. It is probable that the granulocytic mechanism of such patients is adversely affected by the

drug Their patient received no drug other than quinine bisulfate While the patient was taking the drug her temperature (which had been normal) rose suddenly on the fifth day and remained at 40 C (104 F) for several days Following the mere suspension of quinine, the fever dropped to 37.8 C (100 F) The authors are inclined to interpret this fact as evidence that the drug acted as a bone marrow depressant, with special stress on the myelocytic center Discontinuance of the drug allowed granulopoiesis to proceed normally and thus contributed to the lowering of the temperature The prompt increase of the granular leukocytes following a blood transfusion coinciding with a further drop of the temperature to the normal level seems to substantiate the hypothesis of Roberts and Kracke that one of the functions of the granulocytes may be to aid in heat control The slight but progressive fall in the total leukocyte and polymorphonuclear counts noted on the readministration of quinine to the patient at a reduced dosage after she had recovered from her leukopenic crisis is to the authors positive proof that they are dealing with a quinine-induced agranulocytosis

Public Health Reports, Washington, D C

50 1401 1440 (Oct 11) 1935

Nonflammable Pyrethrum Spray for Use in Airplanes C L Williams and W C Dreessen—p 1401

*Age Incidence of Specific Causes of Illness Based on Records for Nine Thousand Families in Eighteen States Visited Periodically for Twelve Months 1928 1931 S D Collins—p 1404

50 1441 1484 (Oct 18) 1935

Bacteriologic Examinations of Oysters and Water from Narragansett Bay During the Winter and Spring of 1927 1928 L M Fisher and J E Acker—p 1449

Age Incidence of Causes of Illness—Collins presents the results of periodic canvasses of 8758 white families living in 130 localities in eighteen states and including 39,185 individuals Each family was visited at intervals of from two to four months for a period long enough to obtain a sickness record for one year On the first call a record was made of the number of members of the household, together with data about sex, age, marital status and communicable disease history of each person On succeeding visits the canvasser recorded all illness that had occurred since the preceding call, with such pertinent facts about each case as the date of onset, the duration of disability and of confinement to bed, the nature of such medical service as was obtained, and the termination of the illness The surveyed families include representation from nearly all geographic sections, from rural, urban and metropolitan areas and from all income classes, and consist of both native born and foreign born persons The proportions of these various elements included are not identical with those in the population of the United States, but the variations are not generally large In other respects also the surveyed group is not dissimilar to families in the general white population of the United States The age incidence of all the specific diseases that were reported in sufficient numbers to approximate a reasonably accurate age curve are depicted in graphs and tables While there are irregular chance variations in many of the curves, they serve to indicate the general picture of the age incidence of even the less frequent diagnoses

Texas State Journal of Medicine, Fort Worth

31 365-426 (Oct) 1935

Tumors of Mouth and Jaws W M Reppeto Dallas—p 370
Some Congenital Anomalies of Oral Cavity B Shelmire Dallas—p 375

Thrombocytopenic Purpura T C Terrell Fort Worth—p 380

Trend of Modern Obstetrics C T Collins Waco—p 383

Early Diagnosis of Tuberculosis as Public Health Problem J Potts Fort Worth—p 387

Treatment of Tuberculosis in the Home R B Homan Jr El Paso—p 389

Sanatorium Treatment of Tuberculosis R S Norris Sanatorium—p 392

Tuberculosis Control Program in Texas J W Brown Austin—p 395

Prevention of Tuberculosis Z T Scott Austin—p 395

Phrenic Nerve Resection as an Adjunct to Artificial Pneumothorax W D Anderson San Angelo—p 398

Electrotherapeutic Measures in Benign and Malignant Skin Diseases E C Fox Dallas—p 402

X Ray in Diagnosis of Childhood Tuberculosis R B Homan Sr R H Homan and R B Homan Jr El Paso—p 406

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

10 337 396 (Oct) 1935

*Urinary Disorders Occurring in Neonatal Period W S Craig—p 337
Blood Counts of New Born Infants in Relation to Icterus Neonatorum L C Martin and S M Evans—p 355

*Recurrent Swelling of Parotid Glands R S B Pearson—p 363
Further Study of Antirachitic Factors in Human Milk I A Sabn and M M Fikri—p 377

Inquiry into Value of Autohemotherapy in Juvenile Asthma. K Maddox and R F Back—p 381

*Ketogenic Diet in Persistent Pyuria Pearl Summerfeldt, Marion M. Johnston and Mildred J Kaake.—p 389

Urinary Disorders in Neonatal Period—Craig describes the abnormal microscopic and bacteriologic observations in the urine of sixty-one new-born children with urinary disorders and gives details of the clinical signs and symptoms The urinary observations are compared with those in a series of healthy new-born children The abnormalities present in the urine were varied Organisms were present in every case and pus was present in large amount in fifty-three cases excessive deposits of uric acid and urates were noted in twenty cases, in five of which there was no pyuria A characteristic clinical picture is found in association with urinary conditions in the new-born Onset of the illness is usually indefinite prolonged anuria, especially when accompanied by fever or occasional vomiting is suggestive of a commencing urinary condition and justifies immediate diuretic treatment Later, restlessness, thirst and sweating develop and color changes are characteristic of the illness at its height Collapse occasionally occurs and high fever is common, but in a few cases the course is afebrile. Convulsions are of grave significance. Symptoms are closely related to the excretory activity of the kidneys, and treatment should be directed toward the promotion and maintenance of adequate diuresis This is best attained by the giving of fluids at frequent intervals and the administration of alkalis and weak tea A follow up of children after their discharge from the hospital showed that recovery is complete, remissions rarely occur and the subsequent general health of the children is not impaired. Urinary infection in the neonatal period occasionally occurs either as a complication of intracranial birth injury or in association with severe alimentary disturbance. In fatal cases pathologic changes are slight they are most often found in the substance of the kidney and rarely involve the pelvis of the organ

Recurrent Swelling of Parotid Glands—Pearson cites eleven cases of recurrent swelling of the parotid gland characterized by the absence of infection and by the frequent history of allergy In three cases, allergic manifestations frequently coincided with the development of the swellings In one of these the passage of plugs containing large numbers of eosinophils from the parotid duct is described It is suggested that these swellings may be allergic in nature The possible mechanism of the swellings is discussed and obstruction of the ducts is thought to play a prominent part Infection may in some cases be superimposed on an allergic basis

Ketogenic Diet in Persistent Pyuria—Summerfeldt and her associates state that to compare the ketogenic diet with the surgical treatment of persistent pyuria is difficult, as the principle of surgical treatment is to relieve the obstruction to allow free drainage and to reduce the pressure atrophy on the kidney, aiming at some restoration of kidney tissue if no further obstruction occurs With this treatment these children usually do well, but in seven cases in which cultures of the urine were taken for from eight months to four years after the relief of the obstruction, micro-organisms were still found to be present. With the ketogenic diet and the production of sterile urine it can well be argued that kidney infection is eliminated, but just how rapidly or to what extent the hydronephrosis will progress is not known. This will have to be controlled with further intravenous pyelography and cystoscopic examinations That this form of treatment is not always effective is shown by the fact that 21 per cent did not become bacteria free, though one case was not under observation long enough for a fair trial.

In 14 per cent there was a recurrence of the pyuria in six months and eight months and in the remaining 65 per cent of cases the results are good. Surgical treatment of chronic pyelitis serves merely to relieve the anatomic irregularity with the idea that the establishment of adequate drainage will remove the focus of infection. No bactericidal principle is provided to hasten the return of proper healthy function. The ketogenic diet does not correct anatomic anomalies but does provide the bactericidal agent. From a study of the two types of treatment it would appear that a combination is to be recommended to obtain the best results.

British Medical Journal, London

2: 651 710 (Oct 12) 1935

- Psychoses of Adolescence W S Dawson—p 651
Remote Results of Puerperal Sepsis E Maclean—p 656
Treatment of Tuberculous Empyema M P Suaman—p 659
Observations on Infection by *Plasmodium knowlesi* (Ape Malaria) in Treatment of General Paralysis of Insane C E van Rooyen and G R Pile—p 662

2 711 770 (Oct 19) 1935

- Readjustments in Medical Study Medical Curriculum G Newman—p 711
Tropical Medicine Introductory Address G C Low—p 715
Intussusception P L Hipsley—p 717
Induction of Labor L G Higgins—p 721
Artificial Pyrexia in Epilepsy Note F L McLaughlin—p 724

***Plasmodium Knowlesi* in Treatment of Dementia Paralytica**—In order to overcome certain difficulties associated with the induction of benign tertian malaria for the treatment of dementia paralytica, van Rooyen and Pile employed the naturally occurring ape malaria parasite *Plasmodium Knowlesi*, which they have successfully transmitted to twelve human subjects. They investigated the practical applicability of substituting this type of parasite for *Plasmodium vivax* in the treatment of dementia paralytica and present two cases that illustrate the application of this form of infection in the treatment of the disease. Clinical notes concerning the course of ape malaria occurring in man, the action of certain antimalarial remedies on this type of infection and various experimental data are also discussed. The work has been carried out with a strain of parasite originally obtained from the Malaria Survey of India, supplied by Rickard Christophers of London.

Glasgow Medical Journal

6 177 224 (Oct.) 1935

- Alveolar and Diffuse Carcinoma of Prostate Gland Simulating Carcinosarcoma D F Cappel—p 177
Prognosis in Nephritis J N Cruickshank—p 184
Certain Observations on Treatment of Cervical Metastases in Cancer of Mouth R G Hutchison—p 198

Journal of Tropical Medicine and Hygiene, London

38: 237 248 (Oct 1) 1935

- The Reticulocyte Response in Mice Rats Guinea Pigs and Monkeys Infected with *Treponema Duttoni*, *Trypanosoma Gambiense* and *Plasmodium Knowlesi* A Robertson—p 237
Bronchomycosis Due to *Monilia Tropicalis* Case A Castellani and T Standering—p 244

Lancet, London

2: 811 868 (Oct. 12) 1935

- Attitude of Surgery to Hematemesis G Gordon Taylor—p 811
Outbreak of Scabies in Mental Hospital F E Kingston—p 815
Anesthesia by Closed Method T A B Harris—p 817
Treatment of Colles's Fracture. E A Devenish—p 821
Congenital Atresia of Duodenum in a Child Aged Thirteen Months T G D Bonar—p 822

Scabies in a Mental Hospital—Kingston discusses and stresses the inadequacy of sulfur ointment in the treatment of scabies. In view of the dogmatic optimism to be found in textbooks of dermatology with regard to the treatment of scabies by sulfur ointment he emphasizes the following of the recorded observations. Of ten certain cases of scabies in mental patients, not one was cured by two courses of sulfur ointment treatment. A total of thirty three courses of treatment resulted in five cures and five failures. At room temperature an adult female sarcoptes will survive complete embedding in sulfur ointment for twenty-four hours. At room temperature the eggs will survive and continue to develop for four days in sulfur ointment and it does not prevent the larvae

from hatching out. On the other hand, sulfur ointment is more lethal for the sarcoptes than petrolatum, killing the parasite in half the time. A 2 per cent solution of sulfated potash in water is markedly toxic for the parasite but loses its potency if allowed to become neutralized by the carbon dioxide of the atmosphere. This fact prevented any satisfactory experiment with the reagent at the strength of the sulfated potash bath as usually prescribed (i.e., about 1:1,500). The author experimented with sulfur, turpentine and paraffin and found it to be disappointing clinically. Apparently potent when applied directly to the parasite at a concentration that caused little or no irritation to the skin it frequently failed to cure the patient even when given as rather liberal applications on three successive days. On the other hand for a certain type of patient it is undoubtedly superior to sulfur ointment. The treatment may be repeated the following week without ill effect, and this course is probably advisable in any well established case. The preparation is simple and cheap, and the opening up of burrows, although doubtless of benefit, is not an essential factor in the treatment.

Medical Journal of Australia, Sydney

2 397-428 (Sept 28) 1935

- *Comparison of Basal Metabolic Rates Obtained by Gasometric Analysis and Formulas T J F Frank—p 397
Some Notes and Comments on Surgical Records of the Brisbane Hospital During Last Quarter of Century E S Meyers—p 405
Convergence Accommodation and Pupil Contraction G Phillips—p 412

Basal Metabolic Rates Obtained by Gasometric Analysis and Formulas—Frank made a comparison of basal metabolic rates by indirect calorimetry (Douglas bag and Haldane gas analysis), and by Read's, modified Read's and Gales' formulas in 250 patients. There is a large margin of inaccuracy in the determinations by the formulas. In only approximately one fifth of the cases was there an error of less than 5 per cent, while in more than 30 per cent of the cases there was an error of more than 20 per cent. Frequently when low basal metabolic rates were obtained by gas analysis the formula gave higher readings. The reverse occurred in hyperthyroidism, and here lower readings were observed frequently. The formula might find some practical value as a method in difficulties if its limitations are recognized. Possibly it might be used to follow up patients with hyperthyroidism who are under treatment provided the initial value of the gasometric result is known. Even here its results are not conclusively diagnostic. The percentage and margin of error by the formulas are too great and incalculable. It does not allow a sufficiently certain estimation, especially in important and difficult cases. Therefore the author feels justified in issuing a warning against making a final diagnosis from the use of formulas alone. Deviations of gasometric basal metabolism from the normal alone are insufficient proof of an endocrine upset and are not to be used diagnostically except in association with the total clinical picture. The gasometric analysis for determination of the basal metabolic rate cannot be supplemented or replaced by formulas.

Journal of Oriental Medicine, Dairen, South Manchuria

23 21 36 (Sept) 1935

- Renal Arteries in the Chinese K Miyashita—p 21
Nasal Septum in the Chinese N Toida—p 23
Study on the Form of Calcaneum and Olecranon Pain in the Heel G Irie—p 25
Influence of Injection of Placental Extract on General Growth and Development of Various Organs in New Born Rabbits Y Matsuura—p 27
Influence of Grape Sugar and Isomylolysin on Ethersulphuric Acid Excretion in Urine of Rabbits Subjected to Morphine Injections K Maeda—p 28
Studies on Bacterial Catalase, Especially Catalase of Dysentery Bacillus S Fukuda—p 29
Etiology of Congenital Hemolytic Jaundice Y Saito—p 30
Studies on Trichomonas Vaginalis Donné Cultivation of Trichomonas Vaginalis K Matsuda—p 31
Feet's Disease Case Y Morita—p 32
Paraportiasis Case T Akiyama—p 33
Studies on Vital Staining of Bacteria I Influence of Pigment on Growth of Tubercle Bacilli and Nonpathogenic Acid Fast Bacilli Cultivated in Kirchner's Medium to Which Ajinomoto Was Added K Fukumoto—p 34
Id. II Pigment Affinity of Tubercle Bacilli and Nonpathogenic Acid Fast Bacilli K Fukumoto—p 35
Cysticercus Cellulosa Hominis Case T Matsuura—p 36

Presse Médicale, Paris

43: 1505 1520 (Sept 28) 1935

*Laryngeal Crises and Certain Vasomotor Crises of Head J A Chavany and S Daum—p 1505

Vasomotor Crises in Tabes—Chavany and Daum describe three cases of laryngeal crisis occurring in tabes dorsalis. They say that the light form is a simple spasm without dyspnea, properly speaking, but with immediate congestion of the face. The lesser form involves true dyspnea with a suffocating spasm. The dominating element is the contracture of the constrictors of the larynx. The vasomotor signs appear secondary to the asphyxial state. In the severe form there is sudden congestion of the face followed by pallor, usually with loss of consciousness, convulsions and sometimes sudden death. The mechanism of these attacks is poorly understood. The abruptness of onset suggests a reflex mechanism, but the excitant is unknown. The neurovegetative explanation accords with some of the clinical phenomena. Thus it accounts for the disproportion between excitant and intensity and severity of the responses encountered. The condition occurs frequently in tabes, and it is known that neurovegetative disturbances are common in this disease. The evidence, therefore, though not conclusive is highly suggestive.

43: 1537 1560 (Oct 5) 1935

*Cavitation Form of Dilatation of Bronchi F Bezançon R. Azoulay and A Martin—p 1537

*Vomitings from Air Swallowing in Nursing P Lereboullet M Lelong and P Aimé—p 1541

Tonus and Passive Retraction of Heart. R. Lutembacher—p 1546

*Treatment of Pulmonary Abscess by Intravenous Injections of Alcohol R Simon and E Magrou—p 1551

Cytotoxic Action of Certain Metals on Human Osteoblasts Cultivated in Vitro G Menegaux and D Odiette—p 1555

Treatment of Pulmonary Tuberculosis Anterolateral Thoracoplasty of Monaldi E Berthet—p 1558

Cavitation Form of Bronchiectasis—Bezançon and his co-workers describe three personally observed cases and one case reported elsewhere of large solitary bronchiectatic cavities surrounded by normal lung tissue. The actual existence of the cavity and its bronchiectatic nature were verified in one case by necropsy. In another case, stereoscopic roentgenograms showed the connection of the cavity with the bronchus and the existence of associated ampullary dilatations. In the other two, intrabronchial iodized poppy-seed oil confirmed the diagnosis. Clinically the condition shares the general symptomatology of bronchiectasis. In no instance was there any previous pulmonary or bronchial history before the sudden onset of serious hemoptysis accompanied by abundant expectoration. The microscopic appearances of these cavities are similar to those found in general bronchial dilatations.

Emesis in Infants Due to Air Swallowing—Lereboullet and his associates studied the vomitings that occur in infants from swallowing air. Roentgenologic examination has allowed several obscure points to be elucidated. The physiologic action of the pharynx in allowing much more air to be swallowed with liquids than with solids or semisolids is the principal factor. The mode in which air acts is apparently by creating the intragastric pressure necessary to provoke gastric contraction. The rapidity of the distention plays an important part in producing this condition, which is thus shown to be physiologic rather than pathologic. Three measures of treatment are given. The process may be avoided by direct introduction, by means of a tube, of the liquid food into the stomach, thus avoiding the function of the pharynx. Increase in the consistency of the food does much to decrease the amount of air swallowed. Finally, taking the left lateral decubitus position immediately after eating favors the pyloric evacuation of the intragastric air and decreases the gastric distention.

Treatment of Pulmonary Abscess—Simon and Magrou report four cases of nonpurulent pulmonary abscesses treated by means of intravenous injections of alcohol by the Landau method. This consisted in the daily injection of 10 cc. of a 20 per cent solution of alcohol intravenously. The amount and percentage strength of the solution were sometimes increased later. Serial roentgenograms were made. In two of the patients one could speak of recovery, in the other two marked improvement resulted. The mechanism of action is still uncertain,

but they conclude that this method of treatment may be attempted with a high degree of success, without serious complications, and may be continued without fear when improvement has begun to be noticed.

Schweizerische medizinische Wochenschrift, Basel

65: 1021 1040 (Oct 26) 1935 Partial Index

Biology of Toxicomanias H W Maier—p 1021

*Blood Transfusions in Chronic Inflammatory Skin Disorders. H Kuske—p 1025

Osteochondromatosis of Knee Joint Case E Ducrey—p 1026

Use of Hypnotics in Psychotherapy J J López Ibor—p 1029

Blood Transfusions in Chronic Skin Disorders.—Kuske describes the history of a patient with a generalized arsenamine exanthem in whom, after all other methods of treatment had failed, a blood transfusion was tried. The first transfusion of 350 cc of blood resulted in a considerable improvement of the general condition. A second transfusion resulted in further betterment, so that the local treatment of the skin could be discontinued. Blood transfusions proved effective in three other cases of arsenamine dermatitis. The author cites a case of generalized seborrheal eczema in which the usual therapeutic armamentarium had been exhausted. A single transfusion of 200 cc. of citrated blood was soon followed by a great improvement. The author employs the following technic of transfusion. He withdraws from 200 to 300 cc. of blood from the donor, mixes it in a ratio of 10:1 with a 3.5 per cent solution of sodium citrate, adds to this approximately 100 cc. of physiologic solution of sodium chloride, and then transfuses it slowly.

Riforma Medica, Naples

51: 1383 1420 (Sept. 14) 1935

Alimentation According to Individual Constitution N Pende—p 1383

Carcinoma of Breast in Man Cases E Palumbo—p 1386.

*Diagnostic Importance of Dry Preparations of Organic Fluids. P De Gara—p 1393

Diagnostic Use of Dry Preparations of Organic Fluids.—De Gara examined eighty specimens, both normal and pathologic, of cerebrospinal fluid, of gastric juice and of pleural and ascitic exudates by the test reported by Henning and co-laborators (*Klin Wchenschr* 13: 251 [Feb 17] 1934, abstr *THE JOURNAL*, April 28, 1934, p 1445). The test consists in the microscopic examination of the dried drop of the organic fluid for certain observations made in the original technic. The author states that the test can be used advantageously for detection of albumin, which, when present, becomes manifest in the marginal ring zone, the extension of which is proportional to the content of albumin in the fluid. The drop on the slide, treated by Milton's test in these cases, gives positive results. The technic of Henning's test is simpler than that of other tests for detection of albumin, while the results of the former agree with those of the latter. As the dry preparations are hygroscopic, they can be kept indefinitely in closed containers with calcium chloride.

Semana Médica, Buenos Aires

42: 969 1044 (Oct. 3) 1935 Partial Index

Early Tuberculous Infiltration Evolution and Treatment F Etcheverry Boneo and L R Valle—p 969

Bronchopulmonary Moniliasis F C Tucchi J E. Mosquera and A Toce—p 983

Sedimentation Speed of Erythrocytes in Cutaneous Caruncle Its Prognostic Value R. Consighiere—p 989

*Treatment of Burns by Vitamins and Camphor in Oil C O Franzetti—p 998

Treatment of Burns by Vitamins and Camphor in Oil—In treating severe and infected burns, Franzetti reports satisfactory results from a combined internal and local treatment that consists in the administration of daily doses of from 20 to 30 drops of a solution of vitamins A and D, prepared at a concentration of 12,000 vitamin units each per cubic centimeter of the solvent, and the application of camphor in oil (at a 7 per cent concentration) dressings over the entire burned area. The local infection, general intoxication, edemas, vomiting, fever, tachycardia and albuminuria that complicate large, deep seated and infected burns rapidly diminished until complete disappearance. The renal functions rapidly become normal and the local results, especially those related to the formation of scars, are gratifying. The author has treated several cases with success.

Archiv für Gynäkologie, Berlin

150:429-584 (Sept 14) 1935 Partial Index

- Genesis of Congenital Skin Defects. L. Brings—p 449
Ovarian Hormones and Carbohydrate Metabolism. Ovarian Hormones and Blood Sugar Content. E. de Amilbia, M. M. Mendizábal and J. Botella Llusá—p 453
Growth of Sarcoma in Cervical Stump Following Supravaginal Amputation of Uterus on Account of Myoma. R. Reckmann—p 478
*Formation of Hydrosalpinx as Late Result After Sterilization Operation. Crushing and Ligation of Tubes. T. Koller—p 485
Late Injuries of Kidney Following Toxicosis and Influence of Later Pregnancies on Residual Conditions of Renal Gestosis. G. Effkemann—p 493
*Postpartum Aspects in Case of Plural Births and Similarity Diagnosis. F. Steiner—p 509
*Increase in Blood Pressure. Indication of Incretory Disturbance in Myoma. E. Strassmann and R. Philipp—p 537

Hydrosalpinx After Sterilization.—Koller describes the histories of three women in whom hydrosalpinx developed after a sterilizing intervention. In the first case one tube was treated according to Madlener's method, while the other tube was closed by double crushing and ligation. In the second case the tubes were crushed and ligated at three points. The third case was that of a woman in whom in the course of an operation for extra-uterine pregnancy the other tube was closed by a simple ligature. The author considers the closure of the tubes by an infection or the artificial closure by a ligature the chief cause of the later development of hydrosalpinx. He is unable to say to what extent postoperative circulatory disturbances increase the transudation but points out that the most severe sacosalpinx developed in the tube on which Madlener's operation was done, a method in which crushing and ligation of a larger portion of the tubes will always lead to changes in the circulation. The author also cites a number of animal experiments. On the basis of the observations described here and of a great number of sterilizations, he reaches the conclusion that a sterilizing intervention should be preceded by a control of the temperature, of the number of leukocytes and of the sedimentation speed of the erythrocytes, and that it should not be done unless these tests indicate normal values. Sterilization should not be done until at least eight weeks has passed after a confinement, an abortion or a general disorder. In case of thrombotic disturbances or of genital inflammations, the waiting period should be still longer. Careful peritonization of the region of the wound is necessary. Ligated portions of tissue and those the nutrition of which is impaired should if possible be secured by retroperitoneal burying (prevention of ileus). The sterilization methods should employ as simple a method as possible. The author says that his clinic has used within the last year subperitoneal resection without ligation of the tubes and with subsequent peritoneal suture. He advises that all surgical sterilizations be made at the isthmus portion of the tubes near their connection with the uterus. He thinks that in this manner it will be possible to prevent the formation of a hydrosalpinx or of a later, ascending pyosalpinx. If the operation reveals inflammatory changes of the tubes or if there is a possibility of closure in the ampullar portion and at the abdominal ostium, the total resection of the tubes, eventually with wedge excision from the uterine fundus, is advisable. It is hoped that this will prevent the formation of a hydrosalpinx or of a flare-up of latent infections.

Plural Births.—Steiner says that until a decade ago it was generally assumed that uniovular twins are always covered by one chorion and that twins who have two chorions are always binovular. In recent years, investigations have disclosed that the results of the examination of the placenta do not always tally with the similarity diagnosis. To determine whether discrepancies exist between similarity diagnoses and postpartum observations, the author's institute has collected twin placentas since 1928. The number of chorions and amnions was determined by macroscopic and microscopic studies, and in some cases the placental circulations were examined by means of contrast injections and stereoröntgenoscopies. The twins were subjected to similarity diagnoses between the sixth and twelfth months and again during later years. The similarity examinations in 100 twins of the same sex and with dichorionic placentas disclosed that twenty-four were uniovular and that seventy-five were binovular. Studies on twenty-nine monochorionic-diamniotic and on three monochorionic-monoamniotic twins

disclosed that they were all uniovular. One hundred and thirty-six sets of twins of different sexes had dichorionic placentas. The author observed no monochorionic placentas in twins of different sexes. Double placentas were found in dichorionic uniovular twins just as frequently as in binovular twins and in twins of different sexes. He points out that so far the research on twins has disclosed nothing that would justify a departure from the opinion that monochorionic-diamniotic twins are always uniovular and thus biotypical. The presence of a monochorionic-diamniotic placenta proves that the twins in question are uniovular. Monochorionic-monoamniotic twins are most likely uniovular. In order to make the diagnosis "monochorionic-diamniotic placenta" it is necessary, in addition to the macroscopic determination of a simple placenta and of a septum that consists of two membranes, to discover anastomoses between the two placental circulations. A microscopic examination of the septum should be made, because it is the only means of deciding the diagnosis if vascular anastomoses cannot be found. The same rules apply to the examination of the placentas of triplets or of other plural births. Among seven sets of triplets, the author discovered two trichorionic binovular sets. The examined individuals of plural births who had a common chorion were without exception uniovular. The similarity between dichorionic uniovular twins is the same as in case of monochorionic uniovular twins. Dichorionic uniovular twins are true uniovular twins.

Increase in Blood Pressure an Indication of Incretory Disturbances in Myoma.—To clarify the problem of whether the development of myoma is connected with circulatory disturbances that are not the result of loss of blood, Strassmann and Philipp determined the blood pressure values of 500 patients with myoma and compared them with the blood pressure values of 500 patients of the same age groups who had different disorders. They found that low values (under 120 mm of mercury) were present in 15.4 per cent of the patients with myoma and in 28.6 per cent of the other patients. High blood pressure values (over 140 mm of mercury) were found in 43.6 per cent of the myoma patients and in 33 per cent of the other patients. These figures are the more noteworthy since they include also the myoma patients in whom severe hemorrhages had depressed the blood pressure values. Of the myoma patients who had a regular menstrual cycle (460 women), 42.16 per cent had values over 140 mm of mercury whereas in the regularly menstruating women with the other disorders (387) this percentage was 25. Since the menopause and the menopausal increase in blood pressure appear later in myoma patients than in other women, the comparison of those in both groups, who menstruate regularly, reveals the blood pressure increasing factor of the myoma disorder more clearly than the comparison of corresponding age groups. The authors emphasize that the increase in the blood pressure in the myoma patients is not a direct result of the tumor but that both are coordinate symptoms of a superordinated incretory disturbance, which may be considered a dysfunction of the ovary, the thyroid and the adrenals. This is indicated also by the increased basal metabolic rate, the electrocardiographic aspects and the outcome of Kauffmann's diuresis test in patients with myoma. The authors point out that, although for the gynecologist the local aspects of the uterus are the most important in case of myoma, it should not be overlooked that this is a general disorder the circulatory and incretory disturbances of which deserve attention. On the other hand, the internist should not fail to search for a myoma in the corresponding disorders of other organs.

Deutsche medizinische Wochenschrift, Leipzig

61:1663-1710 (Oct 18) 1935 Partial Index

- Experiences with Eugenic Sterilization in Women. G. Haselhorst—p 1663
Inguinal Sterilization According to Menge. P. W. Siegel—p 1666
*Rare Gynecologic Disorders in Children and Young Girls. C. Clauberg—p 1668
Obstetric Anesthesia in Clinic and Private Home. H. Buschbeck—p 1670
*Fertility Vitamin E and Its Therapeutic Significance for Gynecology. E. Gierhake—p 1674

Rare Gynecologic Disorders in Children.—Clauberg says that leukorrhea is the chief disorder for which the gynecologist is consulted in the treatment of children and young girls. The

first thing to be done in these cases is the bacteriologic examination in order to determine whether the vulvovaginitis is of gonorrheal origin. If this is not the case, two factors must be considered which are nearly always responsible for leukorrhea in children and young girls, namely, irritation by foreign bodies and malignant tumors. The author reports the case of a girl, aged 4, in whom a peculiar vaginal tumor existed. Radium proved to be ineffective in the treatment of the highly malignant tumor, and the child died. On the basis of the histologic examination, the tumor must be regarded as an angioendothelioma. The author says that such tumors are much less frequent than irritation by a foreign body and asserts that onanistic practices are more common in small girls than is ordinarily believed. He describes the case of a girl, aged 6, in whom manipulations with a slate pencil were found to be the cause of the leukorrhea, and in a girl aged 8, small stones and two safety pins were extracted from the vagina. He cites the case of a girl who fell astride an iron bar, on which she tried to balance herself. There was hemorrhage from the vulva but no severe external injury. When the bleeding continued an intervention became necessary, in the course of which it was found that the vagina had been completely torn off. In the last part of his report the author describes the injuries sustained by a child, aged 2 years and 3 months, who was raped.

Vitamin E—Gierhake reports his own studies on the so-called fertility vitamin. He made tests on rats and chickens and found that the lack of vitamin E in the diet is followed by sterility by changes in the instinctive behavior of the animals and by changes in the hairs and feathers, respectively, that is, there is evidence of an excretory disturbance, particularly of the anterior lobe of the hypophysis. Histologic studies on the hypophysis of the animals receiving a diet in which vitamin E was lacking revealed changes similar to those that develop following castration. There are indications that the lack of vitamin E results primarily in an impairment of the gonads, which in turn produces the changes in the hypophysis. Following the method suggested by Evans and Burr, the author succeeded in preparing from the oil of wheat germ a concentrated extract of vitamin E a few drops of which reestablished fertility in female rats made sterile by a diet lacking in vitamin E. After mentioning the physical and chemical properties of this extract, he discusses its therapeutic application, pointing out that in several countries preparations of vitamin E have been used with good results in human and veterinary medicine. He thinks that treatment with vitamin E is indicated in habitual abortion, in cases in which there is a tendency to premature births, and in all cases of female sterility in which a dietetic insufficiency seems to play a part.

Klumsche Wochenschrift, Berlin

14: 1489 1520 (Oct 19) 1935 Partial Index

Electrocardiographic Studies on Spasmophilic Children. R. Aschenbrenner and P. Bamberger.—p. 1494

Mechanism of Vitamin C Formation in Lens. H. K. Muller.—p. 1498

Traumatic Neurogenic Form of Diabetes. W. Kretschmer.—p. 1501

*Therapy of Essential Thrombopenia During Childhood. E. Schiff.—p. 1504

Testing of Optokinetic Nystagmus for Detection of Simulated Blindness. K. Bach.—p. 1505

Therapy of Essential Thrombopenia—Schiff describes the history of a boy, aged 9, who presented the typical symptoms of essential thrombopenia. The child was given a diet consisting of fresh fruits, vegetables, liver and five egg yolks and 0.15 Gm of cevitic acid daily. After a few days of this treatment there was considerable improvement in the bleeding tendency. The bleeding time likewise improved rapidly, although the number of platelets was still comparatively small. Moreover, after about twelve days the capillary resistance had improved considerably and the thrombocytes increased constantly, so that after one month they numbered 200,000 and at the end of four months 413,000. The author raises the question as to what caused this thrombocytosis, the cevitic acid or the fat-soluble vitamins and provitamins contained in the egg yolks. In order to gain some insight into this problem, he employed a somewhat different treatment in another child with essential thrombopenia, a girl aged 7. The child was treated in the same manner as the boy, except that she received

no egg yolks and liver. It is noteworthy that in this child there was a considerable decrease in the number of thrombocytes during the first eight days of treatment. However, in spite of the small number of thrombocytes, the bleeding tendency and the bleeding time improved. After the cevitic acid was administered intravenously, the number of thrombocytes increased rapidly, but beginning with the twenty second day of treatment the child received the cevitic acid only orally. In comparing the two cases, the author points out that in the first child, who received the cevitic acid only by mouth and, in addition, was given egg yolks, the increase in thrombocytes was more rapid than in the second child, in whom the cevitic acid was administered by mouth as well as intravenously. The author is as yet unable to decide whether the more rapid increase in the thrombocytes of the first child was the result of the egg yolks or whether individual differences in the two patients are responsible for the different results. These two cases indicate also that there is no parallelism between the bleeding time and the number of thrombocytes.

14: 1521 1560 (Oct 26) 1935 Partial Index

Posterior Lobe of Hypophysis in Hypertension. A. Gómez Marciano.—p. 1525

Adrenals in Hypertension. W. von Lucadou.—p. 1529

Biologic Significance of Phosphate Ester of Erythrocytes. E. Freudenberg.—p. 1530

*Experimental Foundations of Percutaneous Insulin Action. S. Hermann and H. Kassowitz.—p. 1531

*Clinical Observations on Percutaneous Action of Insulin in Diabetic Patients. H. Pribram.—p. 1534

*Hemostatic Action of Pectins Particularly in Hemophilia. G. Sack.—p. 1536

Experiences with Henry's Malaria Reaction in Inoculation Malaria. R. Brandt and L. Horn.—p. 1538

Experiments on Percutaneous Insulin Action.—Hermann and Kassowitz demonstrate in experiments on animals that insulin in the form of a suitable ointment is not only absorbed by the skin but can be applied in measurable doses so as to produce repeatedly the same effects. They determined that the skin absorbs insulin in two ways, which, for the sake of clearness, are designated as "vertical" and "horizontal." In reality the percutaneous insulin action consists of two components, the one designated as the "vertical" produces a reduction in the blood sugar as in case of subcutaneous injection, whereas the "horizontal" results in a slower but also a more protracted insulin action. The authors observed that, to realize the full insulin action it is necessary to remove the fat and cholesterol from the skin and to alkalinize or at least neutralize, the skin, because the free organic acids that exist in the skin or in the sweat of omnivorous animals prevent the percutaneous insulin action. Theoretical reasoning seems to justify the hypothesis that a part of the percutaneously applied insulin is absorbed by the lymph, whereas the other part goes by the shortest route to the musculature.

Percutaneous Action of Insulin in Diabetic Patients.—Pribram points out that the experiments of Hermann and Kassowitz demonstrated that an insulin ointment applied under the proper conditions to the skin of rabbits and dogs is capable of reducing the blood sugar. This induced him to make experiments on healthy persons and on diabetic patients. Tests on healthy persons revealed that insulin rubbed into the skin is absorbed and produces a reduction of the blood sugar. He tried the percutaneous insulin administration on more than twenty patients with diabetes mellitus. The observations made in these patients are summarized as follows: 1 Insulin applied to the skin reduces the blood sugar content. 2 The quantity of insulin required for percutaneous administration is much greater than that required for subcutaneous administration (five times as much). 3 The amount of insulin required generally varies between 50 and 300 units. 4 The skin should be cleansed and the ointment applied according to the method of Hermann and Kassowitz. The sites of application are alternately the regions of the biceps and of the anterior portions of the thighs. 5 The immediate effect of the percutaneously administered insulin is small, and short tests generally prove ineffective, however, if the injection is done with persistence, favorable results can be obtained in many cases. The author concedes that percutaneous insulin treatment is unsuited for severe cases of diabetes mellitus.

Although the large insulin doses make the injection method rather expensive, the method has the advantage that it effects a more protracted action, and, since sudden and severe reductions in the blood sugar do not have to be feared with this method of application, it would seem advisable for diabetic patients who have circulatory disturbances. The author describes several cases in which he employed the treatment. The first case demonstrates that if the same dose is adhered to the efficacy of the insulin injection increases gradually.

Hemostatic Action of Pectins—Sick describes his experiences with a solution of apple pectin. He administers this solution either by injection in the form of a sterile 15 per cent solution or by mouth in the form of a 5 per cent solution. Depending on the severity of the hemorrhage, he administers from 20 to 80 cc, partly by subcutaneous injection and partly by intragluteal injection, the latter being the most effective. As soon as the coagulation time had been reduced, the patient was given four times daily 10 cc of the pectin solution by mouth. The author employed the pectin treatment in thirty-two cases: ten gastric hemorrhages, seven pulmonary hemorrhages, three renal and vesical hemorrhages, two intestinal hemorrhages, six other cases (nasal and dental hemorrhages and so on), one patient with icterus and three patients with hemophilia. All these cases, some of which were rather severe, responded promptly to the treatment. The author describes some of the histories, particularly those of the hemophilic patients. It was always possible to reduce the abnormally high coagulation time to normal values. The pectin solution proved its hemostatic value also when locally applied, and its administration never produced undesirable effects.

Münchener medizinische Wochenschrift, Munich

82: 1709 1748 (Oct 25) 1935 Partial Index

Digitalization Before Surgical Interventions T Altenkamp—p 1709
Sterilization of Catgut Linhart—p 1711

*Serodiagnosis of Scarlet Fever E Weichherz—p 1712

*Treatment of Epidemic Parotitis K Oxenius—p 1714

*Treatment of Hemorrhoids T Sutter—p 1715

Röntgen Irradiation of Tonsils H Loebell—p 1715

Serodiagnosis of Scarlet Fever—The serodiagnosis of scarlet fever suggested by Weichherz employs substrates (antigen and antibodies, respectively) from the blood of scarlet fever patients. He prepared one from the blood serum of a patient who had had scarlet fever for four days, the other from the blood serum of a scarlet fever convalescent. He used the globulin fraction as antibody substrate and the albumin fraction as antigen substrate. The serums to be tested were incubated with these two substrates and then treated further according to the method used by Fuchs in the diagnosis of cancer. The author employed this test in seventy cases of scarlet fever and obtained correct results in sixty-eight. The reaction was always negative in measles, varicella and medicinal exanthems. These promising results induced the author to make this brief preliminary report, which is to be followed later by a more detailed one.

Treatment of Epidemic Parotitis—Oxenius considers prolonged rest in bed (two weeks) unnecessary in the treatment of epidemic parotitis but he admits that several days rest in bed might be advisable for the prevention of complications. In reviewing the measures that most therapeutic textbooks recommend for the treatment of parotitis he expresses the opinion that oral irrigations with hydrogen peroxide are inadvisable. Instead he advises particularly for children gargling and oral irrigations with a mild tea of peppermint sage or camomile, pointing out that these teas are much more pleasant in that they do not produce the deadened feeling in the oral mucous membrane that is produced by hydrogen peroxide. Moreover he suggests that the sucking of medicated tablets is likewise helpful. In view of the favorable result obtained with antiphlogistic cataplasms in the treatment of inflammations of the lymph nodes the author decided to use these cataplasms in the case of epidemic parotitis and obtained good results. These cataplasms require only one change in twenty-four hours and were well liked by the patients.

Treatment of Hemorrhoids—Sutter shows that the withdrawal of the blood from the nodules and their surroundings is highly important in the treatment of hemorrhoids. In order

to effect this, two factors are important: (1) emptying of the veins by muscular activity of the legs and (2) the diversion of the blood into other parts of the body. The author shows that both of these factors are accomplished by swimming, but that mere bathing is ineffective. He describes three cases in which swimming proved helpful in the treatment of hemorrhoids.

Wiener klinische Wochenschrift, Vienna

48: 1311 1342 (Oct 25) 1935 Partial Index

Thirty Years of Liver Pathology H Eppinger—p 1313

*Clinical Value of Bendien's Reaction for Diagnosis of Cancer T Hogenauer and Thilde Grobl—p 1320

Point of Attack of Thyroxine B von Issekutz—p 1325

Present Opinions on Etiology of Essential Hypertension E Kylin—p 1330

Bendien's Reaction for Diagnosis of Cancer—Hogenauer and Grobl review the technic of Bendien's test and the results obtained by other investigators. Then they describe their own experiences with the test on 116 cancer patients and 143 control cases. They obtained positive results in 103 of the cancer patients. However they also obtained positive results in sixty-nine of the control cases. They conclude from this that the positive outcome of Bendien's test does not justify the diagnosis of cancer. The negative outcome of the test, together with other factors that militate against cancer, however, may eventually corroborate the absence of cancer. Bendien's reaction is of but slight value for the clinical diagnosis of cancer.

Zentralblatt für Gynäkologie, Leipzig

59: 2465 2528 (Oct 19) 1935 Partial Index

Simple Procedure for Sterilization of Women G Haselhorst—p 2466
Choice of Method for Surgical Sterilization of Women C Holtermann—p 2472

*Treatment of Retarded Births R Berg—p 2483

*Two New Methods of Ventrosuspension by Cutting of Round Ligaments R Milner—p 2484

Treatment of Retarded Births—Berg says that the same reasoning which led to the administration of belladonna during the period of dilatation induced him to try methyloctenylamine, a spasmolytic preparation. He found that the injection of 1 cc of this preparation was highly effective in overcoming the rigidity of the uterine os. During the period of expulsion he obtained favorable results with the combined subcutaneous injection of 1 cc of the same preparation and with from 15 to 3 Voegtlin units of posterior pituitary. He found that this combination had a better effect than posterior pituitary alone. He gained the impression that spasmolytic preparation has the effect of an activator. He maintains that with this treatment the period of expulsion is shortened without detrimental effects.

Ventrosuspension by Cutting of Round Ligaments—Milner says that in case of prolapse of the vagina and the uterus the methods employed hitherto for ventrifixation did not obviate the danger of ileus. He achieves mobile anterior fixation of the uterus by cutting the round ligaments. For cases in which the round ligaments are so short that they cannot be pulled through the anterior abdominal wall or for those in which attachment to the anterior fascia (the posterior one being usually too weak) was made impossible by this shortness, the author devised what he considers a new way of ventrosuspension. He cuts the round ligaments as far laterally from the uterus as possible, separates them from the broad ligaments, sutures the slits into the broad ligaments, covers the round ligaments with peritoneum and then pulls them through the anterior abdominal wall according to Gilliam's method. The author employed this method also in a case in which the round ligaments were not too short but too thin. He says that whether the fascia of the abdominal wall is divided in the longitudinal or the transverse direction depends on the individual case. It is important that the round ligaments are not crushed with a clamp in that portion with which they are to be attached. The pulling through of the simple round ligament instead of a loop has the advantage that the opening may be smaller. This smallness is of importance for the prevention of hernias and of prolapse of the omentum. If his technic is used suturing of the lateral portion of the round ligament is unnecessary. The use of the cut ligaments gives greater freedom as far as tightness and height of the attachment are concerned, especially in the rather frequent cases in which

chiefly the uterus is prolapsed. This method permits also a restriction of the operations that constrict the vagina. The intervention is possible in two ways: transperitoneal or subperitoneal. In the latter case there is no danger of ileus, whereas in the former it exists only as far as the lateral clefts between anterior abdominal wall and round ligaments are concerned. The other threat of ileus in transperitoneal attachment can readily be prevented by peritoneal sutures.

Sovetskaya Vrachebnaya Gazeta, Leningrad

Sept 15 (No. 17) pp 1321-1400 1935 Partial Index

Obscure Infections and Their Significance in Infections of Children
M. G. Danilevich — p 1330

*Symptomatology of Pernicious Anemia S. I. Sherman — p 1339
Oxygenated Bath Therapy of Insomnia I. S. Vainberg — p 1348
Foreign Bodies in Intestine N. Ya. Gandelman — p 1361
Buffer Capacity of Morphologic Elements of the Blood B. M. Chuistov — p 1364

Pernicious Anemia—Sherman studied seventy-six cases of pernicious anemia. He concludes that the most characteristic features of the blood picture in the acute stage of the disease is the presence of megalocytes and a pronounced polysegmentation of the neutrophils. Other characteristics, such as acute anemia with a high color index, leukopenia, neutropenia, lymphocytosis, monopenia, aneosinophilia, eosinopenia and thrombopenia, are seen as well in hyperchromic anemias of types other than the Biermer-Erlach type. Patients with pernicious anemia show pronounced alterations in the functions of the small and large intestines, manifested as a rule by the presence of a fermenting, putrid colitis (92 per cent). Of these, 84 per cent had an enterocolitis. Study of feces on Schmidt's diet demonstrated lack of utilization of fats in 92 per cent and lack of digestion of muscle fibers in 70 per cent. The ferment function of the pancreas was decreased in half of the studied cases. In the majority of the cases faulty carbohydrate metabolism was present. This was manifested by a low blood sugar on fasting, a high glycemic coefficient on administration of sugar, and failure to return to normal figures two hours after the beginning of the sugar tolerance test. The author emphasizes the diagnostic importance of glossitis as an early symptom. This was present in 90 per cent of the cases. Subjective neurologic and vascular symptoms play an important part in the clinical picture of pernicious anemia.

Acta Medica Scandinavica, Stockholm

86 127-454 (Oct. 29) 1935 Partial Index

*Sarcoid of Boeck, a Disease of Importance to Internal Medicine. Report of Four Cases H. A. Salvesen — p 127
Resorption and Oxidation of Alcohol in Alcohol Addicts C. G. Bernhard and L. Goldberg — p 152
Effect of Salyrgan, Theophylline and Caffeine on Diuresis Glomerular Filtration and Proteinuria H. Berglund and B. Sundh — p 216
Nanthoproteic Reaction in Blood as Test of Renal Function H. Rasmussen — p 302
*Aspects of Latent Edema Tendency in Tonsillar Angina A. Kristenson — p 315
*Genesis of Oval Erythrocytes H. Scharf Hansen — p 348
*Observations on Insulin-Epinephrine Treatment by Clausen Method T. T. Andersen — p 361

Sarcoid of Boeck—Salvesen emphasizes that the sarcoid of Boeck is of interest to the internist because it is not merely a skin disease but, like Hodgkin's disease, may involve the entire organism. It is a systemic disease with especial preference for the lymphatic system. The author describes the histories of four patients: one man and three women ranging in age from 38 to 56 years. Two of the patients presented symptoms that had not been described in Boeck's sarcoid. One of the women suffered from a contracted kidney with peculiar clinical aspects. Besides skin sarcoids and pulmonary lesions of the usual type, she had low blood pressure and neuritis of the optic nerves. Another woman, aged 38, had a heart lesion with right bundle branch block of an unstable type, partly dependent on the heart rate. The author reproduces a number of electrocardiograms. One of them taken under the influence of amyl nitrite, shows transition from normal conduction to block and from block to normal again. The man had glandular tumors, iridocyclitis, enlarged spleen and extensive pulmonary infiltration for three years before the skin sarcoid appeared. In the three

patients examined for it there was a considerable increase in the serum protein, owing to a greater amount of globulin.

Latent Edema in Tonsillar Angina—Kristenson is convinced that infections involve always a toxic impairment of the body tissues. One of the most frequent functional disorders resulting from the toxic action of infections is a cardiovascular disturbance. The cardiac action and the peripheral circulation are impaired. Manifestations of the latter disturbance are changes in the fluid exchange between the blood and tissues. The volume of the involved portion of the body enlarges to the extent to which the disturbance in the fluid exchange between blood and tissues increases the fluid content of the tissues. This increase in volume can be measured by different methods. The author describes the method that he employed first on normal persons, then on patients with mild infections and finally on patients with tonsillar angina. In healthy persons fifteen minutes of standing increased the volume of the leg by from 0.6 to 2.5 per cent. This increase disappeared within thirty minutes after the horizontal position had been assumed. In persons with infections of the upper air passages, particularly in those with tonsillar angina, the course of the test was different, either the increase in volume was greater than in normal persons or it did not disappear with the normal rapidity when the horizontal position was assumed. The author concludes from this that the existing infection produces a tissue impairment with functional disturbance of the fluid exchange between the blood and the tissues.

Genesis of Oval Erythrocytes—After remarks about the occurrence of oval erythrocytes in various species of animals, Scharf Hansen points out that in human subjects they appear during pernicious anemia in the form of macro-ovalocytes and usually disappear after successful liver therapy. However, the literature also reports cases of healthy persons in whom comparatively high percentages of oval erythrocytes were observed. Recently the author observed a woman, aged 50, who was hospitalized on account of chronic rheumatism. Examination of the blood revealed 67 per cent hemoglobin and 402 million erythrocytes. Closer inspection of the erythrocytes after staining with May-Grünwald-Giemsa demonstrated that the majority of the erythrocytes were oval, some of them of small elliptic shape. Repeated examinations of the blood always revealed the same oval erythrocytes amounting to approximately 90 per cent of the total number. In order to determine during what stage of the erythropoiesis the oval form developed, a sternal puncture was made which disclosed entirely normal conditions, that is, the erythroblasts and erythrocytes were all round. This indicates that the oval form does not develop until after karyorrhexis has taken place. Studies on the reticulocytes revealed that the transformation into ovalocytes takes place during or immediately after the reticular stage of the erythrocytes. In order to determine whether ovalocytosis is hereditary the blood of three of the seven children of the woman was examined. Two girls had only round erythrocytes, whereas a boy, aged 14, had some oval erythrocytes. To be sure, in him the ovalocytosis was not as pronounced as in his mother. Nevertheless, his case indicates that ovalocytosis may be hereditary. Studies of the form of erythrocytes of normal and anemic persons disclosed that ovalocytes (disregarding megalocytes) occur regularly and amount to from 1 to 20 per thousand of the erythrocytes. The number of the ovalocytes seems to increase slightly with age and with the degree of anemia. The author assumes that the ovalocytes might represent the final stage, "the stage of destruction" of all erythrocytes and that the cause of ovalocytosis may be an endocrine factor.

Observations on Insulin-Epinephrine Treatment—The favorable results obtained by Clausen with the combined administration of insulin and epinephrine induced Andersen to try this method. The amount of epinephrine added was 0.1 mg to 5 cc. of insulin. This addition of epinephrine caused no local reactions. Andersen employed this treatment in seventeen cases. None of these patients showed detrimental effects. Those in whom the insulin treatment alone had produced hypoglycemic symptoms were entirely free from them after the epinephrine had been added. The author considers this form of treatment especially useful in diabetic patients with a tendency to hypoglycemic reactions.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 105, No 25

CHICAGO, ILLINOIS

DECEMBER 21, 1935

INTERMITTENT PRESSURE AND SUCTION

IN THE TREATMENT OF CHRONIC OCCLUSIVE
ARTERIAL DISEASE

EDGAR V ALLEN, M D
AND
GEORGE E. BROWN, M D
ROCHESTER, MINN

The historical background for the use of alternate suction and pressure in the treatment of vascular disease has been reviewed by Herrmann and Reid¹. In spite of the fact that such treatment is a century and a quarter old, a great deal of credit is due to Landis and Gibbon² and to Reid and Herrmann³ for reviving it, for perfecting the mechanism by which it is applied, and for testing the value of the treatment both physiologically and clinically. Herrmann and Reid⁴ have proposed the name "pavaex" for this treatment, the term signifying passive vascular exercise, and the changes in pressure being gradual. Landis⁵ has retained the denotation "alternate pressure and suction," the changes in pressure being sudden. At the clinic, we have used the unit devised by Herrmann and Reid since February 1934. In the present paper we attempt to evaluate this therapeutic procedure from a review of cases in the literature in which it was used and from a survey of our own experiences with it. Unfortunately, there have appeared from nonmedical sources extremely enthusiastic reports. These have made imperative a sound survey based on actual clinical trial.

REVIEW OF LITERATURE

Physiologic Studies of Normal Subjects and Studies on a Circulation Schema—Alternate suction and pressure in the treatment of occlusive vascular disease has a physiologic basis. Landis and Gibbon have shown that it increases the flow of water through a circulation schema. The results seem to be based on Pousselles' law that the amount of fluid flowing through a rigid tube depends on the fall of pressure along that tube. Landis and Gibbon further demonstrated that the rate at which the extremities of normal subjects cooled when such subjects were placed in a cool environment

was slowed by the changing environmental pressure. They found, likewise, that the warmth of cool extremities of normal subjects was increased by alternating suction and pressure.

Studies on Patients with Occlusive Arterial Disease, Surface Temperature—Landis and Gibbon studied five patients with occlusive arterial disease. The average rise in the temperature of the digits exposed to suction and pressure was 71 degrees C, whereas the temperature of the opposite extremity increased on an average of 19 degrees C. Subsequently, Landis reported observations of sixteen patients with occlusive arterial disease. The digits of feet exposed to alternate pressure and suction became warmer by an average of 76 degrees C, whereas the rise in temperature of opposite extremities averaged 18 degrees C. In several publications Herrmann and Reid also reported an increase in the temperature of the skin of subjects with occlusive arterial disease although definite figures were not given. Reid⁶ likewise reported an increase in the temperature of the skin. The duration of this increase in temperature of the skin as a result of treatment persists about seventy-two hours according to Herrmann and Reid,⁴ although there is a gradual diminution in the surface temperature after about twelve hours. Landis stated that the hyperemia is maintained for several hours. Evidence that vasodilatation persists permanently after discontinuance of treatment has not been presented, although Landis stated that it usually becomes more and more lasting as treatment continues. Herrmann and Reid reported that they had no information concerning the permanence of the increase in temperature.

Effect on Pain—There are four common types of pain observed in chronic occlusive arterial disease: Intermittent claudication is distress produced by exercise which is relieved by rest. Rest pain is a more or less constant distress occurring independent of exercise. We recognize three main types: (1) that in the region of ulceration or gangrene, (2) that associated with ischemic neuritis, and (3) that following sudden arterial occlusion, which appears to be due to widespread arterial spasm. Unfortunately for attempts at evaluation, references in the literature are all too frequently vague as regards type of pain. Statements made were that the major symptoms were relieved or that the patients were subjectively improved. Such statements confuse the issue and make true evaluation difficult.

Pain of Ulceration or Gangrene—Landis reported that four patients with frank gangrene or large sloughing ulcers received little or only temporary benefit. Amputation was necessary in all four cases. Seven

Dr. George E. Brown died Nov. 28, 1935.

From the Division of Medicine, the Mayo Clinic.

¹ Herrmann L. G. and Reid M. R. The Conservative Treatment of Arteriosclerotic Peripheral Vascular Diseases. *Ann. Surg.* 100: 750-60 (Oct.) 1934.

² Landis E. M. and Gibbon J. H. The Effects of Alternate Suction and Pressure on Blood Flow to the Lower Extremities. *J. Clin. Investigation* 12: 925-961 (Sept.) 1933.

³ Reid M. R. and Herrmann L. G. Treatment of Obliterative Vascular Diseases by Means of Intermittent Negative Pressure Environment. *J. Med.* 14: 200-204 (June) 1933.

⁴ Herrmann L. G. and Reid M. R. Pavaex (Passive Vascular Exercise) Treatment of Obliterative Arterial Diseases of the Extremities. *J. Med.* 14: 524-529 (Dec.) 1933.

⁵ Landis E. M. Observations on the Diagnosis and Treatment of Peripheral Vascular Disease. *Ann. Int. Med.* 8: 282-295 (Sept.) 1934.

⁶ Reid M. R. Diagnosis and Treatment of Peripheral Vascular Diseases. *Am. J. Surg.* 24: 11-35 (April) 1934.

⁷ Goldsmith Grace A. and Brown, G. E. Pain in Thrombo-Angiitis Obliterans. *Proc. Staff Meet. Mayo Clin.* 9: 201-202 (April 4) 1934.

patients with indolent or slowly enlarging ulcers were entirely or almost entirely relieved of pain. De Takats⁸ reported that all his patients afflicted with rest pain were promptly relieved but that the pain returned when treatment was discontinued. Shipley and Yaeger⁹ reported prompt relief in two cases. Landis and Hitzrot¹⁰ reported total relief of pain in regions of ulceration in five of six cases of diabetes and arteriosclerosis, and improvement in one case. In the same condition, rest pain unassociated with trophic lesions was relieved entirely in four cases and was improved in one case. Of seven cases of thrombo-angitis obliterans, pain associated with ulceration was relieved permanently in three cases and improved in two cases, in the two remaining cases, pain was relieved only during a period of treatment. In an additional case of thrombo-angitis obliterans, rest pain that was not associated with ulceration was relieved. In two of three cases of arteriosclerosis with ulceration, pain was relieved, in one case, relief was experienced only during a treatment.

Pain Associated with Sudden Arterial Occlusion. Herrmann and Reid¹ reported ten such cases, in all of which pain was relieved promptly. De Takats specifically noted relief in one of his cases and stated that all patients with rest pain were relieved during treatment.

Intermittent Claudication. Landis noted lengthening of the walking distance before claudication occurred in five of six cases. In de Takats' series no improvement was noted in cases of thrombo-angitis obliterans, but increased tolerance to distance was noted in four cases of "endarteritis obliterans." Landis and Hitzrot noted improvement in claudication in two of three cases of diabetes and arteriosclerosis and all six cases of thrombo-angitis obliterans. Herrmann and Reid reported complete relief in one case of sudden arterial occlusion.

Inadequately Defined Pain. Shipley and Yaeger reported subjective improvement of three patients. Herrmann and Reid¹ reported complete relief in three of nineteen cases, in eight cases there was improvement, and in eight others improvement was not noted. In all these cases a diagnosis of "predominant involvement of the arterioles of the feet" was made. In forty-six cases a diagnosis of "predominant involvement of the secondary arterial pathways" was made, and in twenty cases it was reported that patients were "completely relieved of all major symptoms." Twenty-two additional patients were "greatly improved" as far as pain was concerned.

Effect on Frank Gangrene.—The affected extremities of all four of Landis's patients required amputation. Herrmann and Reid¹ reported that 16 per cent of sixty-five patients with "predominant involvement of secondary arterial pathways," and "predominant involvement of the arterioles of the feet" due to arteriosclerosis, required amputation of the affected extremities. Gangrene seemed to be definitely limited, and in some instances amputation was possible at a lower level as a result of treatment. All ten patients who had sudden arterial occlusion, some of whom might reasonably be expected to have gangrene later, avoided it as a result of treatment. Three patients

with sudden arterial occlusion observed by de Takats did not show improvement as far as the gangrene was concerned.

Effect on Indolent Ulcers.—De Takats reported the healing of an ulcer in a case of "endarteritis obliterans" and the marked tendency of another ulcer to heal in a case of arteriosclerosis obliterans. Shipley and Yaeger reported the healing of ulcers in a case of thrombo-angitis obliterans and in another case of thrombo-arteriosclerosis obliterans. Landis noted no improvement in the appearance of gangrenous sloughs in two cases of thrombo-angitis obliterans and only temporary improvement in one case of thrombo-arteriosclerosis obliterans. In four cases of thrombo-angitis obliterans and in three cases of thrombo-arteriosclerosis obliterans, indolent ulcers healed. Landis and Hitzrot reported acceleration of or complete healing in eight cases of arteriosclerosis and diabetes, amputation was necessary in one case because of osteomyelitis and in one case because of a persistent slough and necrosis of a toe that occurred six months later. Ulcers healed entirely or markedly in four of six cases of thrombo-angitis obliterans, amputation being necessary in the other two cases, and ulcers healed in two of three cases of arteriosclerosis, amputation being necessary in the third case.

From these reported observations, one can draw the conclusions that the surface temperature of the treated extremity usually increases significantly during a treatment and that the duration of this increase has not been definitely determined. As yet no definite evidence has been presented that permanent vasodilatation has been induced by repeated treatment. Indolent ulcers may heal as a result of treatment. Rest pain is usually relieved while the patient is receiving treatment, but it frequently returns, in some cases the pain disappears more or less permanently. Claudication is usually benefited. Gangrene can be avoided in cases of sudden arterial occlusion if the patients are treated soon after occlusion occurs.

EXPERIENCE AT THE MAYO CLINIC

Sixty patients have been treated at the clinic with the passive vascular exercise unit, thirty-two of these over sufficient periods to allow some evaluation of the method. Sixty or eighty millimeters of negative and 20 mm of positive pressure (four cycles to each minute) were used as a routine procedure. All patients were confined to the hospital and only minimal activity was allowed. Those with gangrene or ulceration received anodynes and alcohol, anesthetics and stimulants to epithelial growth were applied locally, as needed, and foot soaks of saturated boric acid were given. Most of the patients took postural exercises and the feet were kept warm in a cradle or cabinet by heat from carbon filament bulbs. Additional treatment given is indicated in the accompanying tables. In these tables and in the discussion that follows, the terms "ischemic neuritis" and "trophic pain" are used to describe conditions as indicated by Goldsmith and Brown.

Ischemic Neuritis.—Seven patients with thrombo-arteriosclerosis obliterans and four with thrombo-angitis obliterans were treated at the clinic (table 1). In all but two cases pain was relieved during a period of treatment. In these two cases, distress was increased by treatment and could not be tolerated. Of the nine other patients who obtained relief during a period of treatment, three were permanently and completely

8 de Takats Géza. Obliterative Vascular Disease. Preliminary Report on Treatment by Alternating Negative and Positive Pressure. J A M A 103: 1920-1924 (Dec. 22) 1934.

9 Shipley A M and Yaeger, G G. Passive Vascular Exercise in the Treatment of Peripheral Circulatory Disease. Surg. Gynec. & Obst. 59: 480-485 (Sept.) 1934.

10 Landis E M and Hitzrot, L H. The Clinical Value of Alternate Suction and Pressure in the Treatment of Advanced Peripheral Vascular Disease. Am J M Sc 189: 305-325 (March) 1935.

TABLE 1—*Effect of Passive Vascular Exercise on Pain in Ischemic Neuritis in Seven Cases of Arteriosclerosis Obliterans and in Four of Thrombo-Angitis Obliterans*

| Case | Arteries Completely Occluded* | Pain of Ischemic Neuritis, Grade Arteriosclerosis | Duration of Treatment Obliterans | Other Treatment† | Results |
|------|-----------------------------------|---|----------------------------------|---|---|
| 1. | Right F P DP PT | 2 | 11 hours in 8 days | | Complete relief of pain |
| 2. | Right DP PT Left DP PT | 1 | 14 hours in 9 days | | Relief of pain during treatment but returned each time in about 3 hours |
| 3. | Right DP, PT Left P DP PT | 2 | 27 hours in 26 days | | Pain relieved 65 per cent‡ |
| 4. | Right P DP PT | 2 | 51 hours in 33 days | | Complete relief during treatment pain returned in 2 to 5 hours (no permanent pain relief) |
| 5. | Left F, P, PT + DP | 4 | 154 hours in 60 days | Irradiation of lumbar spine with roentgen rays | Complete relief during treatment pain returned in 15 to 60 minutes, pain relieved permanently about 60 per cent |
| 6. | Right, P DP, PT Left DP PT | 2 | | | Pain made worse |
| 7. | Left P DP PT Right DP PT | 2 | 8 hours in 14 days | | Pain relieved during treatment permanent relief 65 per cent |
| 8. | Right amputation Left P PT, DP | 2 | 16 hours in 10 days | 4 injections of typhoid vaccine | Marked relief of pain |
| 9. | Right amputation Left P DP PT | 3 | 15 hours in 15 days | Irradiation of lumbar spine with roentgen rays four injections of typhoid vaccine | Almost complete relief of pain which recurred in 6 weeks and was again almost completely relieved by same treatment |
| 10. | Right PT DP Left PT | 2 | | | Made pain worse |
| 11. | Right amputation | 2‡ | 7 hours in 7 days | 6 intravenous injections of typhoid vaccine | 54 days of treatment pain entirely relieved ulcer almost healed |

* Right and left apply to the right and left legs, respectively and F P DP and PT to the femoral popliteal, dorsalis pedis and posterior tibial arteries respectively

† This treatment is in addition to the routine treatment employed at the clinic referred to in the text

‡ Percentages are only rough estimates

§ Small ulcer on left internal malleolus

TABLE 2—*Effect of Passive Vascular Exercise on Trophic Changes and Associated Pain in Thrombo-Angitis Obliterans*

| Case | Arteries Completely Occluded* | Trophic Changes | Rest Pain Grade | Duration of Treatment | Other Treatment† | Results |
|------|------------------------------------|--|-----------------|-----------------------|--|--|
| 12. | Left amputation Right F PT P DP | Indolent ulcer over right internal malleolus | 1 | 26 hours in 23 days | 1 intramuscular injection of sulfur in oil | Complete relief of pain almost complete healing of ulcer |
| 13. | Left DP PT Right DP PT | Gangrene right first and second toes | 3 | 64 hours in 43 days | 16 intravenous injections of typhoid vaccine in 70 days | Almost complete relief of pain gangrene dry and well demarcated |
| 14. | Right DP Left DP PT | Unhealed amputation wounds and left first and fifth toes gangrene left third and fourth toes | 0 | | Amputation left fourth toe on thirteenth hospital day and of left second and third toes on forty-eighth hospital day | Healing complete on seventy-eighth day |
| 15. | Left P DP PT Right DP PT | Ulcer in nail bed of right first toe | 2 | 54 hours in 27 days | 3 intravenous injections of typhoid vaccine | Complete relief of pain during treatment no permanent benefit ulcer unimproved |
| 16. | Right DP PT | 2 ulcers base left first toe and gangrene distal third of toe | 2 | 29 hours in 17 days | 7 intravenous injections of typhoid vaccine in 23 days | Complete relief of pain during, and from 1 to 6 hours after treatment no permanent relief 1 superficial ulcer healed gangrene unaffected |
| 17. | Right DP | Large ulcer on right first toe and small ulcer on right fifth toe | 1 | 47 hours in 51 days | 7 intravenous injections of typhoid vaccine | Total treatment 93 days pain entirely relieved ulcer almost entirely healed |
| 18. | Right P PT DP Left P PT, DP | Ulcer on left fifth toe | 2 | | | Pain increased by treatment |
| 19. | Right P PT DP Left P PT DP | Gangrene of right fourth toe | 2 | | | Pain increased by treatment |
| 20. | Right P PT DP Left P PT DP | Ulcer on dorsum of right foot | 2 | 34 hours in 26 days | Repeated intravenous injections of typhoid vaccine peripheral neurectomy sympathectomy | No relief of pain ulcer progressed in size |
| 21. | Right F P DP PT Left P DP PT | Ulcer on outer side of left foot | 3 | 23 hours in 14 days‡ | | No benefit |
| 22. | Right amputation Left P DP PT | Gangrene of left first second third and fourth toes | 2 | 6 hours in 12 days | Intravenous injections of salt solutions and typhoid vaccine | Pain increased by treatment gangrene not benefited amputation necessary |
| 23. | Right DP Left P DP PT | Gangrenous ulcers on left first toe | 2 | 70 hours in 21 days | 6 intravenous injections of typhoid vaccine two intravenous injections of hypertonic salt solution | No benefit amputation necessary |

* Right and left apply to the right and left legs respectively and F P DP and PT to the femoral popliteal dorsalis pedis and posterior tibial arteries respectively

† This treatment is in addition to the routine treatment employed at the clinic referred to in the text

‡ Lumbar sympathectomy four months before

§ Elsewhere

relieved and four were permanently relieved to a degree of about 50 to 75 per cent. In two cases relief was experienced only during active treatment, but pain returned shortly after the extremity was removed from the glass boot.

Trophic Pain—Six of the twelve patients with thrombo-angitis obliterans experienced permanent relief of pain (table 2). In three cases pain was increased by treatment and in three cases it was unchanged. Trophic pain was present in five of the seven cases of thrombo-arteriosclerosis obliterans, relief was experienced in three and absent in two of these cases (table 3).

Trophic Changes and Gangrene—Of the ten patients with thrombo-angitis obliterans who could tolerate the method, four had very marked improvement of gangrene or ulcers and six had none. Two of the four patients who were markedly benefited received repeated intravenous injections of typhoid vaccine, the one with digital gangrene and ulceration had normal pulsations in the posterior tibial artery. The prognosis in this type of case is almost invariably good. Marked benefit was noted in trophic changes in five of the

Pain Associated with Sudden Arterial Occlusion—Two patients with sudden arterial occlusion were treated on the second and sixth days, respectively, after the onset of the condition. In both cases pain and discoloration of the foot were increased by treatment. One patient who had sudden arterial closure about eight hours before treatment was begun was completely relieved of pain but gangrene occurred.

Skin Temperature—Determinations of the temperature of the skin of thirty-five patients were made before and after sixty-eight treatments. The average temperature before treatment was 29 C (84.2 F) and the average at the end of the sixty-eight treatments was 31 C (87.8 F), a net gain of 2 degrees C. The increase in the temperature of the skin as a result of treatment doubtless would have been larger if temperatures at the beginning of the treatments had been less than 29 C. The significance of these readings of skin temperature is vitiated somewhat by the fact that, while the room temperature varied within normal limits, it was not constant. The duration of the increases in temperature was not definitely determined, but it was less than twenty-four hours, for almost without excep-

TABLE 3—Effect of Passive Vascular Exercise on Trophic Changes and Associated Pain in Thrombo-Arteriosclerosis Obliterans*

| Case | Arteries Completely Occluded† | Trophic Changes | Rest Pain Grade | Duration of Treatment‡ | Results |
|------|--------------------------------|---|-----------------|------------------------|---|
| 23 | Right P DP PT Left P DP PT | Small ulcer on left first toe | 0 | 43 hours in 30 days | Ulcer healed |
| 24 | Right DP | Permanent cyanosis of left second toe with moderate edema | 2 | 22 hours in 12 days | Complete relief of pain almost complete recovery of toe |
| 25 | Right DP PT Left DP PT | Small ulcer on heel | 0 | 6 hours in 5 days | Ulcer healing |
| 26 | Right DP PT Left DP PT | Superficial denudation of left second and third toes | 1 | 15 hours in 8 days | Complete relief of pain denudation improved |
| 27 | Right amputation Left DP PT | Ulcer on left fourth toe | 2 | 20 hours in 17 days | No benefit |
| 28 | Right DP PT Left DP PT | Infarction right first toe | 1 | 16 hours in 9 days | No relief of pain toe improved |
| 29 | Left amputation Right DP PT | Ulcer on medial side of right first toe | 1 | 116 hours in 60 days | Progression of ulceration amputation necessary |

* Diabetes in cases 25 and 29.

† Right and left apply to the right and left legs respectively and F P DP and PT to the femoral popliteal dorsalis pedis and posterior tibial arteries respectively.

‡ Includes routine methods of treatment used at the clinic.

seven cases of thrombo-arteriosclerosis obliterans. The most conspicuous failure was in the last case. In spite of almost ten weeks of treatment, a small superficial ulcer progressed, eventually necessitating amputation. In all the cases in which improvement was noted, the lesions at the beginning were minimal.

Amputation was necessary in all of three cases of sudden arterial occlusion because of gangrene. Two patients were referred to us and passive vascular exercise was begun on the second and sixth days, respectively, after the onset of the condition. Progressive gangrene developed in one case following sudden arterial occlusion, in spite of almost continuous treatment begun only eight hours after the occlusion occurred. Pain was completely relieved.

One patient had frozen his fingers severely while lying intimated in the snow for an unknown period of time in subzero weather. Seventy-five hours of treatment in fifteen days did not in any regard avoid the necessity for amputation of the digits.

Intermittent Claudication—Three patients with thrombo-angitis obliterans were specifically tested for evidence of improvement of claudication. A standard test was used. The patients walked at the rate of 120 steps a minute until they could not continue. They received, respectively, twenty-six, eighteen and forty-three hours of treatment. No benefit was noted.

tion the temperature twenty-four hours after completion of treatment was approximately the same as when treatment was begun. In no instance was there evidence of a permanent increase in the temperature of the skin as a result of repeated treatments.

Comparison of Results of Passive Vascular Exercise with Those of Other Methods—As a preliminary it is well to state that occlusive arterial diseases, especially thrombo-angitis obliterans, are notoriously subject to exacerbations and remissions, to periods of quiescence and activity. Even those most experienced in caring for patients with these diseases may have difficulty in determining what results follow natural changes in the course of the disease and what results are induced by artificial means. Experience with a large number of patients is helpful.

The chief aim of all treatment is preservation of affected limbs. Too frequently overlooked, however, is the fact that in many instances amputation is the happiest solution when it obviates long periods of disability and expensive and frequently unfruitful treatment. Any treatment, to be of great value, must therefore produce reasonably prompt results. The average patient cannot afford the money or the time for daily treatments over a period of months, and he usually prefers having his diseased leg replaced with a wooden one so that he can return promptly to work.

It is well to attempt comparison of results that follow the use of intermittent suction and pressure with those that follow other types of treatment. Increases in surface temperature can be accomplished by the artificial induction of fever, by immersion of the hands in warm water, and by the ingestion of alcohol, theobromine and mechohim. All these methods are simpler than treatment with alternate suction and pressure. One may reason, logically, that unusual benefit will ensue from treatment with alternate suction and pressure only if the increase in circulation is permanent, since similar increases can be induced temporarily by simpler methods.

Permanent relief of rest pain, if effected, is a distinct attribute of the method. Barker, however, reported that as a result of treatment of thrombo-angitis obliterans with typhoid vaccine there was a complete or almost complete relief in 86 per cent of twenty-eight cases in which rest pain was present but in which there were no trophic changes, and in 73 per cent of fifty cases in which rest pain was associated with trophic ulcers. In 65 per cent of forty-six cases of gangrene limited to digits, and in 25 per cent of cases of massive gangrene pain was likewise relieved by typhoid vaccine. Permanent relief of pain by section of peripheral nerves has been reported by Laskey and Silbert.¹¹

The good results reported in sudden arterial occlusion are encouraging, but Denk¹² reported almost equally good results from intravenous injection of a papaverine substitute. In one case observed by Allen and MacLean,¹³ papaverine was injected intravenously with good results. It is well known that about one half of patients with sudden arterial occlusion recover when very simple methods of treatment are used. The report of Herrmann and Reid that all ten patients recovered when the alternate suction and pressure method was used indicates a distinct advance. Two of our three cases cannot be considered fair tests, as occlusion had taken place too long before treatment was begun. The relief of intermittent claudication is also of great interest. Careful investigation of many patients with this symptom has indicated that the patient's statement is commonly unreliable. Accurate tests should be carried out. We determine the distance at which claudication occurs by walking patients at a standard pace of 120 steps each minute. The distance at which claudication causes the patient to stop is frequently found to exceed by many times that which the patient states. Even under these carefully controlled conditions, Barker, Brown and Roth¹⁴ have found that tissue extracts influence claudication beneficially. Barker has also shown that repeated injections of typhoid vaccine cause improvement in this symptom in about 53 per cent of cases of thrombo-angitis obliterans, however, the results were not checked by the standard test.

In our experience with about 2 000 cases of thrombo-angitis obliterans and thrombo-arteriosclerosis obliterans, healing of indolent ulcers has been observed very commonly without the benefit of passive vascular exercise. These good results have partly been the

result of repeatedly induced vasodilatation, partly the result of rest. The latter is a very important factor. The trauma to feet during ordinary activity is enormous, and no method of treatment can be evaluated truly unless some measuring stick for the beneficial effect of rest is used or unless the patients are ambulatory. Worthy of mention is Samuel's¹⁵ report of twelve cases of gangrene or ulceration in thrombo-angitis obliterans in which healing and relief of pain followed a regimen of rest in bed, cessation of smoking, the intravenous injection of salt solutions, and surgically attained cleanliness. Barker¹⁶ reported excellent to slow healing of ulcers in 86 per cent of cases of thrombo-angitis obliterans, apparently as a result of treatment with artificial induction of fever. The common denominator of many types of treatment is rest in bed, and it is our opinion that this is the most important phase of all successful therapeutic procedures.

Even successful amputation of toes, or of the foot, has been observed on occasions, and the fact that such procedures are successful following passive vascular exercise is not proof of cause and effect unless the percentage of successes is greater than can ordinarily be expected. Such evidence is as yet not available.

The term "collateral circulation" is frequently used in considering chronic occlusive arterial disease. One gains the impression that the term refers to circulation that occurs through newly developed arteries. One of us¹⁷ has reviewed evidence elsewhere that these are not new arteries in an anatomic sense but only in the physiologic sense. In other words, development of collateral circulation is not a process of initiating new arteries to grow in situ but of causing arteries already present to function at a higher physiologic level. Experimental work has indicated that control of the level of function of collateral arteries is largely if not entirely under control of the sympathetic nervous system. An increase in the temperature of the skin is commonly accepted as the best evidence of an increase in the collateral circulation. Sympathectomy remains, then, the best method of increasing circulation through collateral arteries. When sympathectomy is performed, it increases the blood flow to an extremity to an exceptional degree, a result superior to that following any other procedure if degree and permanence are considered together. However, sympathetic neurectomy is inadvisable when gangrene or large ulcers are present.

COMMENT

Evaluation of the results of treatment in medicine is usually difficult, and it is too optimistic to expect any remarkable unanimity of opinion regarding any therapeutic procedure. One thing appears quite certain: the alternate suction and pressure method of treatment has not produced any results that have not been observed repeatedly as a result of simpler methods. Do good results follow passive vascular exercise more frequently than other methods of treatment? We have no answer to this question, and no conclusions can be drawn from reports in medical literature. Do good results follow treatment with intermittent negative and positive pressure in cases in which good results have not or could not reasonably be expected to follow other

11 Laskey A F and Silbert Samuel. Thrombo-Angitis Obliterans. Relief of Pain by Peripheral Nerve Section. *Ann Surg* 98: 55-69 (July) 1933.

12 Denk Wolfgang. Zur Behandlung der arteriellen Embolie. *Munchen med Wchnschr* 81: 437-439 (March 23) 1934.

13 Allen E V and MacLean A R. Treatment of Sudden Arterial Occlusion with Papaverine Hydrochloride. Report of Case. *Proc Staff Meet Mayo Clin* 10: 216-220 (April 3) 1935.

14 Barker N W, Brown G E, and Roth Grace M. Effect of Tissue Extracts on Muscle Pains of Ischemic Origin (Intermittent Claudication). *Am J Med Sci* 180: 16-44 (Jan) 1935.

15 Samuel S S. Gangrene Due to Thrombo-Angitis Obliterans. Further Experiences with Treatment. *J A M A* 102: 436-442 (Feb 10) 1934.

16 Barker N W. Results of Treatment of Thrombo-Angitis Obliterans by Foreign Protein. *J A M A* 97: 841-843 (Sept 19) 1931.

17 Allen, E V. How Arteries Compensate for Occlusion. An Arteriographic Study of Collateral Circulation. *Arch Int Med* to be published.

methods of treatment? Again no definite answer can be given and none is available in medical literature. Our own opinion is that good results ordinarily follow changing environmental pressure treatment in cases in which good results could be expected from other measures, and that when good results do not follow other measures, passive vascular exercise is usually valueless.

The results of treatment of thrombo-angitis obliterans chiefly by intravenous injection of typhoid vaccine, as reported by Barker, are so excellent that one wonders whether the results of any other single type of treatment can be favorably compared with them. The important question arises: Were the cases of the same general type as those which we have presented in this paper and those which other authors have presented elsewhere? There can be no reliable answer, as the stages and degrees of vascular disease are widely variable. After data have been presented in as extensive a form as advisable, the final resort must be to opinion. Our opinion, based on observation of results of various types of treatment in a large number of cases of occlusive arterial disease, is that the alternate suction and pressure method has been some contribution to the program of treatment. To be sure, this treatment does certain things in peripheral vascular disease, it increases skin temperature and may relieve pain and induce healing of ulcers, but these results follow other methods as well. Evidence is still lacking that passive vascular exercise produces anything other than temporary increases in the circulation. The greatest benefit we have observed from this treatment is in the relief of the pain of ischemic neuritis.

The greatest therapeutic need is a satisfactory method of treating older patients who have occlusive arterial lesions as a result of arteriosclerosis. Such patients do not tolerate well repeated intravenous injections of typhoid vaccine, and the increased risk of sympathectomy, because of their age, ordinarily makes that procedure inadvisable. Moreover, the circulation tends to be diminished progressively, whereas in thrombo-angitis obliterans remissions are not uncommon. It is for such patients that a new procedure is urgently needed. We cannot state as yet that passive vascular exercise is a significant advance in this direction. Objections may reasonably be offered to our results on the basis that patients did not have sufficiently long periods of treatment. We feel, however, that the periods reported are sufficiently long to allow some evaluation of the method.

Our opinion regarding passive vascular exercise is not necessarily final. A revision of this opinion, however, must follow recognition of greater benefit than is available at present. There is need for more specific information regarding the value of the method, and this may be expected as the passage of time allows more extensive observations.

SUMMARY AND CONCLUSIONS

The intermittent suction and pressure treatment of chronic occlusive arterial diseases increases the skin temperature temporarily, may relieve the pain of ischemic neuritis and trophic changes, and may induce healing of ulcers. It is not clear that these results are superior to those following other methods of treatment. However, it is our impression that the pain of ischemic neuritis is relieved to a greater degree than is ordinarily observed. As a result of our experiences we believe that passive vascular exercise constitutes some, but as yet poorly defined, contribution to the treatment of vascular disease.

DIURETIC ACTION OF INTRAVENOUS SODIUM DEHYDROCHOLATE

FRANKLIN A. WEIGAND, M.D.

PHILADELPHIA

Diuresis is obtained in therapeutics by the use of various substances acting through different mechanisms and belonging to different groups. According to their chemical structure and their pharmacologic action, diuretics may be classified as follows: water, the saline diuretics, the xanthines (caffeine, theobromine and theophylline), the digitalis group, mercurial diuretics and finally liver and bile acids.

In the healthy individual with normal water balance, water acts as a diuretic when it is ingested without sodium chloride. Therapeutically this finds use in the restriction of salt intake in the presence of edema, so that water and sodium chloride are eliminated.

The saline diuretics potassium and ammonium salts and urea induce diuresis probably through their osmotic effect. Ingested by mouth, they are most frequently used in conjunction with digitalis or to dilute the urine and decrease its acidity in genito-urinary irritations. Used in large quantities to produce marked diuresis, they cause gastro-intestinal irritation. Urea and the ammonium salts are contraindicated in nitrogen retention.

In the xanthine group, theobromine with sodium salicylate is preferred over caffeine or theophylline. Producing little or no effect on the central nervous system in contrast to caffeine, it is not as irritating to the gastro-intestinal tract as is theophylline. These diuretics are indicated in all cases of edema whether of cardiac, hepatic or renal origin. After prolonged use a certain degree of tolerance is acquired, and in some instances there is discomfort and loss of appetite. They are of most value in nephritis, since these drugs apparently do not injure the kidney even when administered in large doses and for prolonged periods.

The diuresis produced by the digitalis group is due not to direct action on the kidney but indirectly to changes in the circulation. For this reason this group is particularly indicated in cardiac edema and ascites. Squill and digitalis are used together when large accumulations of fluid must be removed. Gastric disturbance and portal congestion interfere with absorption, lessening the efficiency of this group of diuretics. Used in conjunction with the salines or with the theobromine group excellent results are obtained, particularly when the patient is at home where facilities for the use of intravenous diuretics are not readily available.

The diuretic effect of calomel has long been recognized by clinicians,¹ being utilized especially by the combination of calomel with squill and digitalis in a very effective pill used in dropsy of cardiac origin. Parenteral administration of mercury for diuresis is available through the intravenous use of merbaphen and salyrgan. These preparations are particularly indicated in those cases in which absorption through the digestive tract is poor and in which rapid reduction of edema and ascites is desired. Keith, Barner and

Read before the Section on Pharmacology and Therapeutics at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.
¹ Cushny, A. R. A Textbook of Pharmacology and Therapeutics, revised by C. W. Edmunds and J. A. Gunn. Philadelphia: Lea & Febiger, 1928.

Whelan² suggested that their effect may be increased by the oral administration of ammonium chloride. They are contraindicated in the presence of glomerulonephritis, malignant nephrosclerosis, uremia and pre-uremic states, active pulmonary tuberculosis and cachexia.

Since the introduction of liver and liver extract in the treatment of pernicious anemia, the diuretic effect of liver has been reported by numerous observers. In an experimental study of the action of bile, Landau and Held³ noted that diuresis increased when bile was used in cases of renal edema. In their cases (eight of glomerulonephritis and nephrosis, three of cardiac origin) bile was administered orally in the form of cachets or capsules in the dosage of 1 grain (0.06 Gm.) four times daily. Very refractory cases frequently responded with complete disappearance of edema.

SODIUM DEHYDROCHOLATE

The diuretic action of sodium dehydrocholate (sodium decholin) was mentioned by Neubauer⁴ in his original report on the relative nontoxicity of dehydrocholic acid. This bile salt and its acid are not present in either animal or human bile, being formed by oxidizing cholic acid. Comparing the sodium salts of desoxycholic, cholic and dehydrocholic acids, Neubauer found that sodium dehydrocholate had so little hemolytic effect as to be practically nonhemolytic. He found further that dehydrocholic acid was one twenty-fifth as toxic as desoxycholic acid in studies on the isolated frog's heart, and to be tolerated in large doses by the body as a whole, the maximum nonfatal dose being eleven times that of sodium taurocholate and almost a hundred times that of desoxycholic acid. In concluding that dehydrocholic acid and sodium dehydrocholate were strong, safe cholagogues, Neubauer noted the diuretic effect of the sodium salt, commenting on its variability in appearance and its mildness. These preparations were introduced into therapeutics primarily as a cholagogue and cholagogue in 1925 by Adlersberg and Neubauer.

The diuretic effect following intravenous administration of sodium dehydrocholate clinically has been reported by numerous observers⁵. During their study on blood pressure, blood cholesterol and diuresis following ingestion of bile acids, Adlersberg and Taubenhaus⁶ observed an increased urinary output following intravenous injection of sodium dehydrocholate in eight of thirteen cases in their series. Normal individuals as

well as patients with renal or cardiac lesions were present in both groups—those showing diuresis and those failing to show it. These authors concluded that diuresis cannot be predicted in any type of case and that there was no interrelationship between the effect of the drug on blood pressure, blood cholesterol and diuresis. In his studies Semler⁷ found the most marked diuretic effect of this drug in patients with heart disease and a markedly congested liver. Rahmlow and Ritterband⁸ and Lebermann⁹ concurred with this observation, while Bix⁶ made the additional observation that diuresis followed the use of sodium dehydrocholate intravenously in nephrosclerotic edema. Koniger⁵ found the drug to be especially effective as a diuretic in Laënnec's cirrhosis and also reported diuresis after its use in a case of inoperable mesenteric tumor which interfered mechanically with venous return. In one of her cases with marked ascites, sodium dehydrocholate failed to produce diuresis until after the abdomen had been tapped, whereupon a marked diuresis (from 3,600 to 6,000 cc in twenty-four hours) ensued for six days following one injection of sodium dehydrocholate. Variability in the diuretic action of this drug has been noted by all observers.

Combined with Salyrgan—Semler⁵ reported that a brief diuresis from salyrgan could be lengthened by injection of sodium dehydrocholate on the following day. Injecting sodium dehydrocholate one day previously to administering salyrgan, Bix⁶ was able markedly to increase diuresis from the latter. On the basis of these observations Bix was led to attempt administration of salyrgan and sodium dehydrocholate in the same syringe. Diuresis resulting from the injection of 10 cc of 20 per cent sodium dehydrocholate and 1 cc of salyrgan (4,500 cc) was almost twice that from 2 cc of salyrgan alone (2,500 cc). Prohaska⁵ likewise was able to increase diuresis from salyrgan by giving sodium dehydrocholate in the same syringe. Fleckseder,⁷ by adding 20 cc of 33 per cent dextrose to the salyrgan-sodium dehydrocholate mixture, induced daily outputs of 5,000, 6,000, 7,000 and, in one case, 13,500 cc. This combination was just as variable in its diuretic effect as decholin or salyrgan alone. In some of his cases Fleckseder was able to increase the output by the simultaneous oral administration of ammonium chloride.

MODE OF ACTION

Two possible explanations for the diuretic action of sodium dehydrocholate have been advanced. Rahmlow and Ritterband⁸ believe that it may be due to renal irritation, basing their assumption on the observation that jaundice leads to inflammatory changes and that this derivative of a bile acid may act in a similar fashion. Cantarow and Stewart¹⁰ have recently reported a toxic effect on the renal tubular epithelium resembling that of mercury and other tubular poisons in certain animals. Kauftheil and Neubauer⁵ observed an increase in kidney volume lasting as long as the diuresis in the experimental animals being studied. Their oncometric studies revealed a similar enlargement in cases in which the administration of deep narcosis or posterior pituitary lobe extract prevented

² Keith N. M., Barrier C. W. and Whelan Mary. Diuretic Action of Ammonium Chloride and Novasurol in Cases of Nephritis with Edema. *J. A. M. A.* 85:799 (Sept. 12) 1925.

³ Landau A., and Held J. Sur l'action diurétique de la bile. *Presse méd.* 70:333 (March 14) 1925.

⁴ Neubauer E. Dehydrocholsäure. Ein wirksames praktisch ungiftiges Glied der Gallensäuregruppe. *Klin. Wchnschr.* 2:1065 (June 4) 1925.

⁵ Articles on diuretic effect following intravenous administration of sodium dehydrocholate.

Adlersberg D. Zur Rolle der Leber im Wasserhaushalt. *Wien Arch. f. inn. Med.* 25:269-401 1934.

Adlersberg D. and Neubauer E. Ueber die Beeinflussung von Galle Blut und Harn durch Zufuhr von Dehydrocholsäure. *Ztschr. f. d. ges. exper. Med.* 48:291 1926.

Adlersberg D. and Taubenhaus M. Blutdruck, Blutcholesterin und Diurese nach Zufuhr von Gallensäuren. *Biochem. Ztschr.* 177:400 1926.

Bix H. Decholin als Diuretikum. *Wien klin. Wchnschr.* 40:321 (March 10) 1927.

Kauftheil L. and Neubauer E. Ueber Natrium Dehydrocholatdiurese. *Arch. f. exper. Path. u. Pharmacol.* 100:675-692 1932.

Koniger F. Decholin als Diuretikum. *Therap. d. Gegenw.* 32:540 (Oct.) 1930.

Lebermann F. Ueber die diuretische Wirkung der Gallensäuren. *Deutsche med. Wchnschr.* 53:2020 (Nov. 25) 1927.

Prohaska A. Decholin als Diuretikum. *Therap. d. Gegenw.* 32:382 (Aug.) 1930.

Rahmlow H. and Ritterband H. Dehydrocholsäure und Diurese, *Deutsche med. Wchnschr.* 52:1992 (Nov. 19) 1926.

Semler R. Zur diuretischen Wirkung der Gallensäuren. *Med. Klin.* 23:891 (June 4) 1926.

⁶ Bix H. Beitrag zur Diuresetherapie. *Wien klin. Wchnschr.* 41:1080 (July 26) 1928.

⁷ Fleckseder R. Steigerung der entwässernden Wirkungen des Salyrgans zu Hochleistungen. *Wien klin. Wchnschr.* 43:136 (Jan. 30) 1930.

⁸ Cantarow A. and Stewart H. L. Certain Effects of Sodium Dehydrocholate upon the Liver and Kidneys of Cats with Biliary Stasis read before the Section on Medicine, College of Physicians Philadelphia, March 25 1935.

the appearance of diuresis after the injection of sodium dehydrocholate. They accordingly concluded that sodium dehydrocholate, despite its marked renal effect, is not the direct diuretic that it seems to be.

THE RÔLE OF THE LIVER

The majority of investigators of the diuretic action of this drug believe that its effect is due to its influence on the liver. Schwiegk,⁹ in experimental studies on dogs, noted a marked increase in the blood supply of the hepatic artery following intravenous administration of sodium dehydrocholate, while the portal vein showed only a small increase. The mixed blood bathing the liver cells accordingly has a greater content of arterial blood and thus the supply of oxygen to the hepatic parenchyma is improved. Schwiegk feels that this arterial hyperemia of the liver is responsible for the influence of sodium dehydrocholate on various functions of the liver, including its influence on diuresis.

MECHANICAL INFLUENCE

The rôle of the liver in water metabolism has been thoroughly expounded by Adlersberg¹⁰ and Villaret.¹¹ These authors are in agreement in assigning a mechanical role in regulating the water economy to the liver. The circulating blood forms but a fraction of the total mass of blood, the remainder being in a stage of relative stagnation as reserves in the different organs and capillary systems. The liver parenchyma is able to store about 1,300 cc of liquid, according to Monneret.¹² Villaret found that injection of colored gelatin into the portal vein of a dog killed by exsanguination was followed in a short time by the appearance of the injected material in the center of the lobule, especially about the central vein. Injection under like conditions into the subhepatic vein results in the appearance of the colored mass in the periphery of the lobule. He states that this phenomenon, disappearing about six hours following death of the animal, is caused by contraction of living parenchyma and illustrates one phase of the mechanical influence of the liver on water metabolism.

In addition to this storage ability, the liver controls the return to the major circulation of all the blood of digestive origin. Mautner and Pick,¹³ while considering the conception of a damlike or barrierlike action in the liver, suggest an autonomic sphincter system about the subhepatic veins. They hold that vagal irritation closes and sympathetic irritation opens this "subhepatic venous dam." The absorption and release of water, according to this conception, is influenced by alterations in the pressure of the hepatic veins. Contraction of the veins increases pressure in the capillaries, water is pressed into the lymph spaces and eventually reaches the thoracic duct. By means of this "overflow pipe" mechanism the liver can supervise the inflow and outflow of water within the blood and tissue circulation. Villaret showed, in dogs, that the introduction of a great mass of water (from two to three times that of the blood) directly into the general circulation was blocked by the energetic action of this barrier.

Adlersberg has studied this mechanism through comparison of the effects of chronic histamine and

chronic phosphorus poisoning experimentally produced in dogs. Led to this procedure by noting the disturbance in water metabolism in certain liver disorders, phosphorus was chosen, since by regulating its dosage hepatic injury can be achieved without cardiac, capillary or renal damage. In the early stages of the poisoning, Adlersberg found increased diuresis following administration of water in contrast to decreased diuresis in the later stages. This resemblance between the changes in chronic histamine and chronic phosphorus poisoning and their analogy with similar changes in certain involvements of the hepatic parenchyma led him to conclude that the same mechanism operates throughout. In the early stages the increased output is possibly connected with the subhepatic venous barrier, under the assumption that this is open, the water would more rapidly flow through the liver. In the later stages, with liver damage, one may assume closure of this barrier mechanism and consequent interference with the flow of water. Villaret likewise emphasizes a vagosympathetic control of the subhepatic venous dam. This has a twofold purpose: (1) an automatic protection for the right side of the heart against irregularities in delivery of return circulation after abnormal increase of the circulatory mass and (2) a protective barrier against heterogeneous proteins.

HORMONIC INFLUENCE

Villaret mentions also the difference between excretion of water injected into the general circulation and that ingested by mouth. Rowntree¹⁴ refers to the observation that the administration of distilled water intravenously is not at once followed by diuresis but that polyuria usually appears in a few hours after the ingestion of water by mouth in excess of from 10 to 15 cc for each kilogram. In attempting to explain the difference in diuresis following water given parenterally and orally, Cow¹⁵ has suggested that in the latter case an enzyme from the alimentary tract comes into play. Glaubach and Molitor,¹⁶ in studying the diuretic action of bile extracts, assign this suggested hormonal role of water regulation on the part of the alimentary tract to the liver. Adlersberg in his exposition of the rôle of the liver in water metabolism stresses this "hormonic" action. In his experiments he found that only when parenterally administered water is infused into a mesenteric vein is its diuretic effect equal to that of swallowed water. He subscribes to the hypothesis that this action may be due to a hormone mixing with the water as it passes through the liver, so affecting it that when it reaches the kidney it is more rapidly excreted.

The explanation of the diuretic effect of sodium dehydrocholate advanced by Adlersberg is based on the belief that it induces a hyperemia of the liver cells, as shown by Schwiegk,⁹ thereby causing more water to be brought under the mechanical and hormonal supervision of the liver. No explanation has been advanced as to why the diuretic effect of this substance is manifested in man only on its use in patients with cardiac decompensation.

The increased diuresis resulting after simultaneous intravenous injection of sodium dehydrocholate and salyrgan in certain cases has been closely studied by Fleckseder.¹⁷ At first he advanced the belief that this

9 Schwiegk H. The Importance of the Blood Supply of the Liver to Liver Therapy. Naunyn-Schmiedeberg Arch f exper Path u Pharmacol 168:693 (1932)

10 Adlersberg D. Leber und Wasserhaushalt. Klin Wchnschr 13:393 (March 17) 1934

11 Villaret M. L'intervention physiologique et pathologique du foie dans la diurèse. Presse med 42:1529 (Oct 3) 1934

12 Monneret cited by Villaret.¹¹

13 Mautner and Pick, cited by Adlersberg and by Villaret.¹¹

14 Rowntree L. G. Water Balance of the Body. Physiol Rev 2:116-169 (Jan.) 1922

15 Cow D. Diuresis, J. Physiol 48:1 1914 cited by Rowntree.¹⁴

16 Glaubach S. and Molitor H. Untersuchungen über die hormonalen diureseerregende Tätigkeit der Leber. Arch f exper Path u Pharmacol 132:31-49 1928

17 Fleckseder R. Ueber Anwendungen und Wirkungsweise der komplexen Quecksilberdiuretika, Ztschr f Urol 28:32-35 1934

effect may be due to the possible action of sodium dehydrocholate preventing the separation of mercury in the hepatic parenchyma and its subsequent excretion in the bile so that it is returned to the general circulation. More recently he has advanced the belief that there is a special compound formed when sodium dehydrocholate and salyrgan are administered in the same syringe and that this is responsible for the increased diuresis following such administration.

UNTOWARD EFFECTS

Neubauer⁴ and others⁵ have reported the nontoxicity of sodium dehydrocholate. Sterner, Bartle and Lyon¹⁸ observed a temporary hypotension in 50 per cent of their cases, no appreciable change in pulse rate and the occurrence in many cases of a bitter taste a few seconds after the injection was begun. They "believe sodium dehydrocholate can be considered a nontoxic bile salt that can be administered intravenously with reasonable safety." Their views are concurred in by Ziegler,¹⁹ who compared sodium dehydrocholate with other bile salts and concluded that "sodium dehydrocholate is the least toxic of the bile salts and is practically non-hemolytic, being at least 120 times less hemolytic than sodium taurocholate and glycocholate." Rahmlow and Rutterband⁵ in their studies on the diuretic effect of sodium dehydrocholate in man observed no ill effects in the urine after doses as high as 2 Gm. three times a day. All the cases in the series here presented showed more or less albuminuria, which was either uninfluenced or noticeably decreased during treatment.

Sodium dehydrocholate intravenously is contraindicated in mechanical obstruction of the bile passages, acute hepatitis and acute yellow atrophy.

REPORT OF CASES²⁰

CASE 1—A white woman, aged 46, had hypertensive cardiovascular disease, mitral insufficiency with hepatic congestion and edema of the legs. The urine showed a faint trace of albumin, while other laboratory examinations were within normal limits. The daily urinary output was from 500 to 600 cc. before treatment was instituted. Intravenous administration of 10 cc. of 20 per cent sodium dehydrocholate (1 ampule) on three successive days failed to increase the urinary output or reduce the edema. This decreased markedly after the use of Southey's tubes but gradually returned again, the patient leaving the hospital unimproved before further treatment could be instituted.

CASE 2—A white woman, aged 46, had rheumatic heart disease and cardiac decompensation with edema of the ankles. The urine showed a very faint trace of albumin, and other laboratory observations were within normal limits. The daily urinary output varied from 500 to 1,000 cc. Three daily intravenous injections of sodium dehydrocholate resulted in no appreciable difference in the urinary output and the patient left the hospital, unimproved, before further treatment could be instituted.

CASE 3—A white woman, aged 60, complained chiefly of abdominal enlargement on admission. Two months before she had been operated on at another hospital, when a diagnosis of Laennec's cirrhosis was made and omentopexy performed. A faint trace of albumin was found in the urine, no other outstanding laboratory changes being noted. Administration of 10 cc. of 20 per cent sodium dehydrocholate intravenously had no influence on the average daily output of 850 cc. Injection of 0.5 cc. of salyrgan with 10 cc. of 20 per cent sodium dehydrocholate caused an output of 1,850 cc. on the day of

injection and 2,500 cc. on the following day. Repetition of this procedure after the output had fallen to its former level, resulted in a diuresis of 3,500 cc. Two subsequent injections of one ampule of sodium dehydrocholate (10 cc. of 20 per cent solution) and 1 cc. of salyrgan produced no notable increase in diuresis. When discharged, the patient was slightly improved and had lost 5 pounds (2.2 Kg.).

CASE 4—A white man, aged 45, had decompensated rheumatic pancarditis, mitral stenosis, edema and ascites. The heart was uniformly enlarged, with a rough presystolic and systolic murmur over the mitral area, the abdomen showed shifting dullness, the liver border being 5 cm. below the costal margin, there was pitting edema of the sacrum and lower extremities. Laboratory examinations, other than a trace to a very faint trace of albumin in the urine, were not remarkable. The average daily output of urine was from 400 to 600 cc. Three successive daily injections of 10 cc. of 20 per cent sodium dehydrocholate caused no increase in output. Injection of 0.25 cc. of salyrgan produced an output of 1,175 cc., injection of 0.5 cc. of salyrgan with 10 cc. of 20 per cent sodium dehydrocholate resulted in a diuresis of 5,250 cc., while injection of 0.25 cc. of salyrgan with the same amount of sodium dehydrocholate produced an output of 4,050 cc. on one occasion and 1,750 cc. on another.

On discharge this patient had lost 39 pounds (17.7 Kg.) and was markedly improved.

CASE 5—A white woman, aged 54, had arteriosclerotic heart disease with edema and ascites, and diabetes mellitus. The heart was slightly enlarged to the left, the abdomen showed shifting dullness, the liver edge was 6 cm. below the costal margin and pitting edema of both arms and legs was present. While the patient was in the hospital the urine improved from a trace to a faint trace of albumin. Other laboratory observations, with the exception of the hyperglycemia, were not significant. The daily urinary output while the patient was on digitalis and ammonium chloride averaged 600 cc. Three successive injections of 10 cc. of 20 per cent sodium dehydrocholate produced a maximum diuresis of 1,100 cc. On the day following the third injection of sodium dehydrocholate, one injection of 1 cc. of salyrgan was followed by an output of 4,200 cc. Subsequent injections of 1 cc. of salyrgan and 10 cc. of sodium dehydrocholate (20 per cent) resulted in increased diuresis, the maximum result being 2,700 cc. Edema and ascites disappeared, the patient lost 25 pounds (11.3 Kg.) and was markedly improved on discharge.

CASE 6—A man, aged 46, had myocardial degeneration with edema and ascites, hypertension, and acute infectious arthritis. The urine at times showed a very faint trace of albumin, other laboratory observations were not remarkable. The daily urinary output varied from 225 to 800 cc. Intravenous administration of 0.5 cc. of merbaphen was followed by a diuresis during the ensuing five days of 7,570 cc., the highest daily output being 2,350 cc. on the fourth day after injection. The output fell to 250 cc. and subsequent injection, on three successive days, of 10 cc. of 20 per cent sodium dehydrocholate resulted in an output of 11,615 cc. for five days, the highest daily output of 3,250 cc., which occurred on the fifth day, two days after the third injection of the drug. In this case the output of 11,615 cc. following the use of the relatively nontoxic sodium dehydrocholate compares favorably with that of 7,570 cc. after the use of merbaphen. On discharge this patient was markedly improved and had lost 41 pounds (18.6 Kg.).

CASE 7—A white man, aged 46, had chronic glomerulonephritis, myocarditis with edema and ascites. The heart was moderately enlarged, a definite fluid wave was determined in the abdomen (the liver margin was not felt) and there was marked edema of the lower extremities. Other than a lessening of albuminuria from a dark cloud to a cloud and a phenol-sulfonphthalein output of 40 per cent, laboratory observations were not significant. The daily urinary output of 450 cc. was raised to 1,225 by administration of digitalis and ammonium chloride. Intravenous injection of 10 cc. of 20 per cent sodium dehydrocholate resulted in the output of 2,300 and 1,800 cc., on the first and second days following injection. A second injection of this drug resulted in an output for two days of 1,675 and 2,475 cc. Later injections of sodium dehydrocholate resulted in increased output, the greatest being 3,275 cc.

¹⁸ Sterner R F, Bartle H J and Lyon B B V. The Chologogue Effect of the Intravenous Injection of Sodium Dehydrocholate with a Resume of Literature on Bile Salt Metabolism. *Am J M Sc.* 182: 822 (Dec.) 1931.

¹⁹ Ziegler E. E. Sodium Dehydrocholate—Its Specific Effect on Pneumococci. *J Lab & Clin Med* 18: 868 (June) 1931.

²⁰ These cases were seen in the ward service of Dr. Edward L. Bortz at Lankenau Hospital.

On discharge this patient was markedly improved, the edema had subsided and he had lost 27 pounds (12 Kg.)

CASE 8—A Negro man, aged 47, had syphilitic myocarditis, decompensation with edema and ascites. Noteworthy on physical examination was the presence of pitting edema of the legs, with involvement of the penis and scrotum, the abdomen was distended, with a fluid wave and shifting dullness, the liver being enlarged to the umbilicus. The heart sounds were of poor quality. The Wassermann and Kahn reactions were four plus; the urine showed variable amounts of albumin and other examinations were not unusual. The daily urinary output averaged 500 cc. Injection of 10 cc. of 20 per cent sodium dehydrocholate raised this to 1,100 cc., repetition of this dose with 0.5 cc. of salyrgan gave a maximum output of 2,650 cc. on the day following injection, the daily average being above

TABLE 1—Maximum Output and Weight Before and After Treatment and Total Number of Injections

| Case | Diagnosis | Maxi- mum Output Before (in Cc.) | Maxi- mum Output After | Weight Before (Lbs.) | Weight After | Total Num- ber of Injections |
|------|---|--|---------------------------------|----------------------------|-----------------|------------------------------------|
| 1 | Cardiovascular disease hypertension mitral in- sufficiency with edema | 600 | 600 | 134½ | 130 | 3D |
| 2 | Decompensated rheumatic heart disease edema and ascites | 1 000 | 1 050 | 117½ | 117 | 3D |
| 3 | Laënnec's cirrhosis | 850 | 3 500 DS½* | 133 | 128 | 1D DS½ 2DS½ |
| 4 | Decompensated rheumatic pancarditis mitral ste- nosis edema and ascites | 600 | 5 200 DS½ | 207 | 169 | 3D 18½ 3DS½ 2DS½ |
| 5 | Arteriosclerotic heart dis- ease edema and ascites diabetes mellitus | 600 | 4,200 S1 | 140 | 115 | 3D 18½ 5DS1 |
| 6 | Myocardial degeneration with edema and ascites hypertension acute in- fectious arthritis | 800 | 3 250 D | 220 | 184 | 3D 1N½ |
| 7 | Chronic glomerulonephri- tis myocarditis with edema and ascites | 820 | 3,275 | 159 | 132 | 6D |
| 8 | Decompensated syphilitic myocarditis with edema and ascites | 1 150 | 2 650 DS½ | 108 | 141½ | 1D 1DS½ |
| 9 | Decompensated arterio- sclerotic heart disease with edema and ascites | 500 | 7 200 DS1 | 151 | 134 | 2D 18½ 1DS½ 2DS1 |
| 10 | Decompensated rheumatic myocarditis with edema and ascites mitral stenosis | 1 100 | 7 275 DS½ | 280 | 162 | 11D 18½ 18½ 1DS½ 5DS½ 4DS1 |
| 11 | Decompensated rheumatic pancarditis with edema | 900 | 2 905 S2 | 154½ | 119 | 3D 48½ 3S1 48½ 2DS2 |
| 12 | Hypertensive arterioscle- rotic cardiovascular disease with edema and ascites | 500 | 2,575 | 182 | 157 | 3DS½ |

D = 10 cc. of 20% sodium dehydrocholate N½ = 0.5 cc. of mer-
baphen S½ ½ 1 = 0.25, 0.5 cc. of salyrgan

* Dosage causing maximum output

1,500 cc. for the ensuing five days. At the end of this time the edema and ascites were gone and the patient had lost 26½ pounds (12 Kg.)

CASE 9—A white woman, aged 67, had decompensated arteriosclerotic heart disease with edema and ascites. Positive physical changes were slight cardiac enlargement, a palpable liver border, fluid wave in the abdomen, and pitting edema of the lower extremities. Albumin was present in the urine, varying from a trace on admission to a very faint trace on discharge. Other laboratory observations being not remarkable. Ten cubic centimeters of 20 per cent sodium dehydrocholate and 1 cc. of salyrgan administered simultaneously resulted in an output of 7,200 and 2,150 cc. on the two days following administration. Injection of sodium dehydrocholate alone, on two separate occasions, resulted in an output of 1,750 cc. and 1,235 cc. respectively, compared with the daily average output of from 300 to 500 cc. before treatment was instituted. The edema having subsided subsequent injections of sodium dehydrocholate and salyrgan in combination and of salyrgan alone, produced no diuresis. On discharge the patient had lost 17 pounds (7.7 Kg.) had no edema and was markedly improved.

CASE 10—A white man, aged 61, had decompensated rheumatic myocarditis, mitral stenosis, edema and ascites. On physical examination there was marked cardiac enlargement, a mitral systolic murmur, marked enlargement of the liver, shifting dullness with fluid in the abdomen, and marked edema of the lower extremities. The daily urinary output averaged from 350 to 500 cc. There was a variable albuminuria (faint to a very faint trace) throughout treatment, and other laboratory observations were not remarkable. Numerous injections of sodium dehydrocholate and salyrgan, alone and in various combinations, were given. Of the eleven injections of sodium dehydrocholate alone (10 cc. of 20 per cent solution) five injections produced no increased diuresis. The highest output from this drug occurring one day after the injection was 2,925 cc. The greatest output from salyrgan alone followed injection of 2 cc., a total output of 7,700 cc. (2,125 and 5,575) ensuing on the two following days. The greatest diuresis of the entire series of this patient's injections, 7,275 cc. on the day of injection and 3,175 cc. on the following day, a total of 10,450, followed injection of 0.5 cc. of salyrgan and 10 cc. of 20 per cent sodium dehydrocholate. The patient's weight was reduced 98 pounds (44.5 Kg.), the ascites was eliminated and the edema was markedly reduced. The inevitable tendency to recurrence of the edema necessitates effective diuresis every six or seven days.

CASE 11—A white woman, aged 35, had decompensated rheumatic pancarditis with edema, auricular fibrillation and asthma. The patient entered the hospital in collapse. The heart and liver were both markedly enlarged, numerous asthmatic and moist rales were heard throughout the chest and the lower extremities were markedly edematous. Albuminuria improved from a cloud to a very faint trace during her stay in the hospital. Other laboratory observations were not remarkable. The daily urinary output averaged 500 cc. Three daily injections of 10 cc. of 20 per cent sodium dehydrocholate produced a maximum output of 1,050 cc., 0.5 cc. of salyrgan administered on two successive days resulted in an output of 1,025 and 1,775 cc., 2 cc. of salyrgan at one time produced an output of 1,030 and 1,135 cc., on another occasion the same amount caused an output of 1,000 and 2,955. Injection of 10 cc. of 20 per cent sodium dehydrocholate and 2 cc. of salyrgan together was followed by an output of 1,500 and 1,900 cc. on one occasion and on another by output of 1,225 and 2,190 cc. Weight had decreased 35½ pounds (16 Kg.), the edema had disappeared and the patient was markedly improved on her discharge.

CASE 12—A white man, aged 60, had hypertensive arteriosclerotic cardiovascular disease with edema and ascites. There was a moderately enlarged heart, fluid wave and shifting dullness in the abdomen, and marked edema of the lower extremities. Urinalysis showed a faint to a very faint trace of albumin during treatment, while other laboratory observations were not remarkable. The daily output was 500 cc. Injection of 10 cc. of 20 per cent sodium dehydrocholate and 0.5 cc. of salyrgan resulted in an output of 2,575, 1,875 and 1,230 cc. on three successive days, the output falling to 500 cc. thereafter. A second injection of the same dosage of both drugs was followed by an output of 2,475 cc. two days after the injection, a third injection resulted in an output of 1,525 and 2,500 cc. on the following days. The patient lost 25 pounds (11.3 Kg.), edema and ascites disappeared, and on discharge from the hospital he was markedly improved.

SUMMARY

Cases 1 to 4 showed no increase in diuresis following intravenous administration of sodium dehydrocholate alone. Cases 3, 4 and 5 responded variously to subsequent administration of different amounts of salyrgan in combination with 10 cc. of 20 per cent sodium dehydrocholate, the markedly increased diuresis obtained in case 4 suggesting that the dose of salyrgan can be markedly reduced by this combination.

Marked diuresis followed intravenous injection of sodium dehydrocholate in cases 6 and 7.

Fair diuresis followed the use of sodium dehydrocholate in cases 8 to 11 inclusive. Combination of

varying amounts of salyrgan with 10 cc of 20 per cent sodium dehydrocholate resulted in marked diuresis in cases 8 to 12, results in cases 9, 10 and 12 again suggesting that the dose of salyrgan can be markedly decreased by combination with sodium dehydrocholate.

Table 1 summarizes salient data on the twelve cases here presented. Typical variability in response to sodium dehydrocholate and salyrgan, alone and in combination, is shown in table 2.

COMMENT

With the exception of one case (Laënnec's cirrhosis) all cases in this series presented edema or edema and ascites accompanying myocardial disease and hepatic congestion. It is for this type of case that the diuretic action of sodium dehydrocholate has been especially suggested.

In four of the eleven cases in which sodium dehydrocholate alone was used, no increased diuresis was observed (cases 1 to 4). Cases 5 to 11 inclusive showed an increased diuresis after sodium dehydrocholate intravenously, cases 6 and 7 being particularly marked. Results in eight cases (3, 4, 5, 8, 9, 10, 11 and 12) showed the most effective diuresis after simultaneous injection of varying amounts of salyrgan.

TABLE 2—Variability in Diuretic Response

| Case | | First 24 Hours Cc | Second 24 Hours Cc | Total 48 Hours Cc |
|------|--------------------|-------------------------|--------------------------|-------------------------|
| 4 | 0.25 cc S | 1 175 | 0.0 | 1 175 |
| | 10 cc. D | 6.0 | 57.0 | 1 222 |
| | 0.25 cc S 10 cc. D | 1 750 | 1 12.0 | 2 875 |
| | 0.25 cc S 10 cc. D | 4 000 | 1 0.0 | 5 100 |
| | 0.5 cc S 10 cc. D | 4 550 | 700 | 5 250 |
| 10 | 10 cc. D | 0.0 | 1 550 | 2 450 |
| | 10 cc. D | 2 02.0 | 1 500 | 4 42.0 |
| | 10 cc. D | 825 | 625 | 1 550 |
| | 1 cc S | 1 875 | 5 775 | 7 650 |
| | 2 cc. S | 2 12.0 | 5 576 | 7 700 |
| | 0.5 cc S 10 cc. D | 7 275 | 8 175 | 10 450 |
| | 1 cc. S 10 cc. D | 1 300 | 6 7.6 | 7 075 |

S = salyrgan D = sodium dehydrocholate

with 10 cc of 20 per cent sodium dehydrocholate. In six of these cases (3, 4, 8, 9, 10 and 12) the maximum output followed administration of 1 cc or less of salyrgan in combination with sodium dehydrocholate, a result comparing very favorably with that reported by Fleckseder,¹⁷ Bir,⁵ and others, when 1 cc or more of salyrgan was used in this combination.

In the three cases in which ammonium chloride was used, no marked increase in diuresis was observed. It was impossible to predict just how any given case would respond to any of the doses and combinations used, the variability in diuresis following intravenous injection of sodium dehydrocholate observed by Adlersberg and Taubenhaus,⁶ Koniger⁸ and others being confirmed by our observations.

CONCLUSIONS

1 A series of twelve patients were given 10 cc of sodium dehydrocholate intravenously, alone and in combination with salyrgan, in order to determine the resultant diuretic effect.

2 Three patients showing no diuretic effect from the bile salt and five more showing moderate diuresis from its action all experienced marked diuresis when given this bile salt combined with salyrgan.

3 Four other patients were not given this combination but the bile salt alone. Two of them showed a good response and two failed to respond at all.

4 This small series suggests that, while sodium dehydrocholate has some diuretic effect, it becomes a

satisfactory diuretic in most cases only when combined with salyrgan. The effective dosage of the mercurial diuretic salyrgan seemed to be considerably lower when used in this combination.

Sixteenth and Jefferson streets

ABSTRACT OF DISCUSSION

DR. B. B. VINCENT LYON, Philadelphia. After six years of experimental work with sodium dehydrocholate in Germany and France, and after the bibliography of published papers had exceeded 100, it was introduced into America. In 1929 Wakefield, Powelson and McVicar of the Mayo Clinic studied and reported favorably on its choleretic action. In 1931 Sterner, Bartle and I studied and reported favorably on its cholegogic action. In 1932 Jenkelson and Altman used it to enhance the value of cholecystography. In 1934 Swalm, Bartle, Sterner and I published a report of a two year clinical study of its therapeutic effectiveness in sixty cases of various diseases and disorders of the liver and concluded that its exhibition alone or preferably combined with other measures might be considered helpful. Since then I have used it extensively in the tablet form (dehydrocholic acid) and to lesser extent by vein (sodium dehydrocholate) in a large number of disorders of the liver, and I feel that it has helped the patients beyond question, although the extent of its benefits is somewhat variable. Its effectiveness is increased when given by vein and I no longer have fear of using 10 cc of the 20 per cent solution. I have had no experience with it in the dropsy of cardiovascular-renal diseases, except when the liver has been enlarged by chronic passive congestion or when there was associated hepatic ascites. Although not invariably successful it has usually helped me, and I have as yet seen no harmful results from its use. Cantarow and Stewart have recently noted a toxic effect on the kidneys of certain experimental animals following the use of this drug. Last spring Shay, Fitzhugh and Raydin, before the Philadelphia College of Physicians gave a preliminary report on their favorable impressions from its use in biliary migraine and several forms of so-called allergic diseases. I am satisfied that it has helped the majority of my cases classified as biliary migraine, but I have had no personal experience with it in allergic diseases. In our clinical study of sixty cases of disorders of the liver in which the drug was given chiefly by mouth in tablet form, we were able to note a diuretic effect of slight degree in only five cases. On the other hand, there was a marked increase in the amount of bile flow from the liver to the intestine, which helped to combat constipation and in some cases produced a definite bile irritation diarrhea. When one is confronted with a single drug that seems to act favorably in such a wide variety of diseases and disorders, one necessarily becomes cautiously skeptical. Nevertheless I feel that this particular bile salt acid is a useful and safe drug.

DR. ABRAHAM CANTAROW, Philadelphia. In our studies of the biliary tract of cats, Stewart and I have observed the effects of the intravenous injection of sodium dehydrocholate. Observations were made on thirty cats with ligation of the common duct and on twenty normal adult cats. From one to sixteen daily injections were given, the amount administered being 0.2 cc. of a 20 per cent solution. The animals were killed by bleeding under light ether anesthesia twenty-four hours after the last injection. Striking changes were noted in the renal tubular epithelium in every case, being as marked in the normal animals as in those with biliary stasis. The cells of both convoluted and Henle's tubules showed all stages of epithelial degeneration and necrosis from simple hydropic swelling to complete denudation of the basement membrane. Active regeneration occurred rapidly with the production of an atypical, flattened type of epithelium described by MacNider, Oliver and others, in animals receiving various nephrotoxic substances. This type of epithelial change was present to some degree after a single injection but was most conspicuous after from two to six injections. As the number of injections increased, the lining cells of the tubules increased in height, becoming cuboidal and later columnar in type. The impression was obtained that the atypical, flattened cells, regarded by most observers as highly resistant to subsequent injury gradually developed into the

cuboidal and columnar cells. These, too, were apparently more resistant to injury than the normal cells. Mitotic figures were seen at all stages, being particularly numerous after from three to seven injections. Similar changes were noted in animals in which a single injection was made into the portal vein. Non-protein nitrogen values as high as 148 mg per hundred cubic centimeters of blood were obtained after a single injection, the highest figure obtained subsequently being 67 mg per hundred cubic centimeters. On the basis of these observations it appears that sodium dehydrocholate is highly nephrotoxic for the cat. Other species may differ, but the characteristic localization of the lesion suggests that it may bear some causal relation to the diuretic action of this substance. The fact that diuresis occurs almost exclusively in patients with liver functional impairment may be dependent on diversion of the excretion of this substance from the liver to the kidneys under such circumstances.

DR. FRANKLIN A. WEIGAND, Philadelphia. It is rather odd that Kaufheil and Neubauer did not complete the observation made when they noted gross changes in the kidney, by studying it microscopically. However, Rahmlow and Ritterband have studied the effect of sodium dehydrocholate on the kidney and have found no ill effects in the urine after using as much as 2 Gm. of the drug three times a day. In my cases either those that presented albuminuria showed no increase in albuminuria or it was definitely decreased during the course of treatment.

THE INTRADERMAL REACTION FOR CHANCROIDS WITH CHAN- CROIDAL BUBO PUS

H. N. COLE, MD

AND

E. A. LEVIN, MD

CLEVELAND

In 1913 Ito, working with Carl Bruck at Neisser's clinic, devised a specific intradermal test for chancroid—Ducrey bacillus infection. The diagnostic value of this test was later confirmed by Reenstierna, working with a serum containing antibodies of the Ducrey bacillus. Today this test is spoken of as the Ito-Reenstierna reaction.

Ito, for his cultures, used 24 hours old streptobacillus colonies from two Besançon blood agar tubes. The bacilli are suspended in physiologic solution of sodium chloride with the addition of 0.5 per cent phenol and heated at 60 C for two hours. Reenstierna employed unheated material in the presence of phenol for fourteen days in the icebox. Frei¹ in his survey of the entire subject up to 1927 says that he employed the water of condensation. He also states that it makes little difference what method of preparation is employed.

The antigen is employed as an intradermal test, readings being made in forty-eight hours, the same as in the tuberculin reaction. The reaction will generally show positivity within from eight to twelve days after the infection,² being dependent on the virulence of the organism, on the length of the infection and on the course of the disease. In a recent study Lippert³ states his belief that uncomplicated chancroidal infections will give a negative reaction unless there is extensive destruc-

tion. With beginning bubo the test may be negative. If ulcers are old, even with no bubo, the test may be positive, and with extensive broken down bubo it is practically always positive. The reaction is more likely to be positive after the lymph nodes are involved. The reaction is specific with less than 1 per cent nonspecific reactions⁴ and persists at least for twenty-five to forty years, even fifty years in a case of Reenstierna.¹ In the recent symposium of the French Dermatologic Society on chancroid, held at Strasbourg, there was a surprising unanimity of opinion as to the specificity of the test. In European clinics an antigen, dmecos vaccine, elaborated according to the method of Nicolle and Durand, is quite generally employed. This preparation is a mixture of the killed streptobacillus in suspension and of an antibody containing serum elaborated according to the technic of Reenstierna. It is used not only for diagnostic purposes but also for therapy, either intramuscularly or intravenously in rapidly ascending doses. Generally a few doses suffice to check the disease.

In the United States it is impossible to procure this agent because of certain public health regulations. Moreover, despite numerous attempts to prepare our own antigen, it has been found most difficult to grow the streptobacillus of Ducrey. Thus the need for a simple diagnostic test for this disease is obvious.

As long ago as 1923 Bordin and Turpin⁵ distinguished between what they spoke of as "septic" and "aseptic" pus—i.e., sterilized and nonsterilized pus—and mentioned their use in veterinary medicine. They felt that it had some resemblance to protein therapy. Fay and Gaal⁶ treated a series of cases of chancroid by simply withdrawing 1 cc of pus from a chancroidal bubo and injecting it, without sterilization, subcutaneously into the buttock. It was termed "pyotherapie." Injections were given every four to five days. Later they employed doses of 0.25 cc up to 1 cc, increasing 0.25 cc at a time. There was no infection and the results were very good. Cruveilhier,⁷ also in 1922 after subcutaneous injections of autogenous pus (heated at 57 C for one-half hour) had noted good and rapid effects on soft chancre infection, and in 1926 Vigne, Fournier and Acquaviva⁸ used boiled milk injections for treating chancroidal bubo and also "pyotherapie." They employed 1 cc of pus plus 20 cc of saline solution put up in 1 cc capsules and sterilized at 56 C for one hour. They injected the material in ascending doses, 0.25, 0.5, 0.75 up to 1 cc, intramuscularly every two to three days. Thirty cases were treated. It was noted that after the first injection pain disappeared. The edema of the lymph node went down and hospitalization was shortened. In two cases there was no response. Frei was not sure whether this was a vaccine treatment or a special form of protein therapy. He suggested that this might be settled by using chancroidal pus for intracutaneous tests as in lymphogranuloma inguinale. Annuzzi⁹ compared tests made with this specific bubonic pus with the Nicolle and Durand vaccine and found the results to be comparable, though perhaps weaker and more transitory after intradermal injections of sterilized pus. Nicolas, Lebeuf and Weigert¹⁰ confirmed the comparable character of the two antigens, and Bizzo-

From the Department of Dermatology and Syphilology of the Western Reserve University School of Medicine and of the Cleveland City Hospital. Read before the Section on Dermatology and Syphilology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.

¹ Frei, Wilhelm. *Ulcus molle*. Handb. f. Haut u. Geschlechtskr. 21: 1, 1927.

² Grütz, Otto. In: *Arzt, Leopold and Zieler, Karl*. Die Haut und Geschlechtskrankheiten. Berlin: Urban & Schwarzenberg, 1934, p. 458.

³ Lippert, F. Ueber Cutreaktion bei *Ulcus molle*. Ihre Anwendung zu diagnostischen Zwecken. Hamburg: Univ. Klin. u. Poliklin. f. Haut u. Geschlechtskr., Diss. 1933, abstr. Zentralbl. f. Haut u. Geschlechtskr. 47: 273, 1934.

⁴ Venturi, T. *Gior. ital. di dermat. e sif.* 69: 958, 1928, abstr. Zentralbl. f. Haut u. Geschlechtskr. 29: 216, 1929.

⁵ Bordin, L. and Turpin, R. *Bull. Med. Paris* 37: 8, 199, 1923.

⁶ Fay, A. and Gaal, A. K. *Dermat. Ztschr.* 42: 285 (Dec.), 1923.

⁷ Cruveilhier, L. *Compt. rend. Soc. de biol.* 86: 421, 1922.

⁸ Vigne, P., Fournier, A. and Acquaviva, R. *Ann. d. mal. ven.* 21: 1 (Jan.), 1926.

⁹ Annuzzi, G. *Bull. Ist. sieroter. Milan* 7: 511, 1928, abstr. Zentralbl. f. Haut u. Geschlechtskr. 30: 523, 1928.

¹⁰ Nicolas, J., Lebeuf, F. and Weigert, H. *Bull. Soc. franç. dermat. et syph.* 38: 106 (Jan.), 1931.

zero, in discussion, said that in one case inoculated with this specific sterilized pus a bulla formed, the serum from which, inoculated in the same patient, caused the appearance of a characteristic papular intracutaneous reaction. Nicolas and Lacassagne¹¹ went still further and took a group of patients and infected them with the bacillus of Ducrey. They then did a series of intradermal tests with the chancroidal sterilized pus, making tests every two days. In eight cases they found positive tests after from six to eight days. Bratzlavsky and Marenus¹² tested out ninety-nine cases, using the pus antigen according to the technic described by Frei. There were thirty-three cases of uncomplicated chancroid and nine with buboes. There were five cases with histories of previous soft chancres and fifty-two other control cases but with no history of chancroids. In 81 per cent of the chancroidal cases there were positive reactions. Among the fifty-two controls the reactions were negative except in two cases presenting indefinite histories and primary syphilis. Franchi¹³ employed the sterilized serum aspirated from the surface of soft chancres as an intradermal antigen. It likewise gave specific reactions. Jersild¹⁴ has also studied the problem and confirmed the fact that, whether sterilized or unsterilized pus from a chancroidal bubo was used as an intradermal antigen, it would give positive reactions in chancroidal cases.

INVESTIGATIONS

Stimulated by these facts and because of the great need of further diagnostic help in certain moot cases of Ducrey bacillus infection, it was decided to investigate this problem further. Also, we were aware of the frequent suspected cases in which it was impossible to find the bacillus of Ducrey either in the original ulcers or in the auto-inoculations so much employed in the European clinics¹⁵ because of greater ease in finding the Ducrey organisms in the fresh secondary lesions.

PREPARATION OF ANTIGEN AND DESCRIPTION OF TEST

The antigen for the intracutaneous chancroidal test is prepared from a proved chancroidal bubo, i. e., one in which the bacillus of Ducrey can be demonstrated either in the primary lesion or in the pus present in the bubo. The patient from whom the material is obtained must have a negative Frei reaction and the antigen prepared must react negatively in patients with proved lymphogranuloma inguinale.

The pus aspirated from a suppurating unruptured node is diluted with five parts of physiologic solution of sodium chloride and then heated at 60 cc for two hours and repeated for one hour the following day. The material is then tested for sterility.

The test itself is simple to perform and is similar to the tuberculin or Frei test. One-tenth cubic centimeter of antigen is inoculated intracutaneously and the results are read in forty-eight hours as negative to four plus, depending on the degree and severity of the reaction. A positive test presents itself as an infiltrated, rounded papule with a base from 0.5 to 1 cc in diameter. When the reaction is marked, the induration is much larger and may even go on to necrosis.

NUMBER OF TESTS PERFORMED AND RESULTS

From Nov. 10, 1934, to March 19, 1935, 433 intracutaneous chancroidal tests were performed on different subjects, all patients in the Cleveland City Hospital. In fifty-two cases the test was found to be definitely positive and in 272 negative. The remaining 109 were repeat tests, either negative or positive. The fifty-two positive cases can be conveniently divided into four groups.

Group A. Patients studied during the active manifestations of the disease.

Group B. Patients with old known previous chancroidal infection.

Group C. Patients with histories of previous venereal ulcerations and suppurating buboes.

Group D. Patients without active infection or history of such in the past.

Group A is composed of twenty-two patients, twenty-one male and one female. In fourteen of these the bacillus of Ducrey was demonstrated in the primary lesions. The remaining eight cases were diagnosed by the typical chancroidal ulceration and at times bubo formation plus a positive intracutaneous test.

Group B consists of five patients in whom a previous hospital record showed the clinical diagnosis substantiated by the presence of the bacillus of Ducrey. The test was found positive three years after the infection in two of these patients and six months after the infection in the remaining three.

In group C there are twenty patients in whom the test was positive without any active manifestation of the disease. All were males and had a history either of previous genital ulceration or of previous suppurating bubo. The lapse of time between infection and positive reaction in seven of these twenty cases was from three to nine years. Nine patients gave a history of infection for from ten to twenty-four years and four a duration of from thirty to thirty-four years. It is interesting to observe that in this entire group of twenty patients fifteen, or 75 per cent, had a recent or old syphilis. In addition seven, or 35 per cent, had a positive Frei test. Of these seven, one was an active case of lymphogranuloma inguinale and the other six either had a history of bubo in the past or inguinal scars were noted.

Group D consists of five patients. These will be considered under possible "false positive tests."

CONTROL CASES

In relation to other venereal diseases the test was found negative in ten cases of lymphogranuloma inguinale, twenty-two primary syphilitic lesions, twenty-seven active secondary syphilitic cases, thirty-seven presenting latent or central nervous system syphilis, nine cases of acute gonorrhea and two presenting granuloma inguinale. In the remaining negative tests there were fifty cases of pulmonary tuberculosis, twenty-six in all stages of pregnancy, thirty-five presenting various skin diseases, including mycotic infections, and a miscellaneous group of fifty-four, chiefly from the medical wards.

DURATION OF ULCERATION AND RUBO IN RELATION TO TEST

In patients in whom the test was negative on entry and gradually became positive, the increased positivity could readily be followed by repeated weekly tests. Nine patients in group A showed a negative intracutaneous test on admission and subsequently became positive. The interval from the onset of the primary lesion to the first positive test varied from five to nine weeks, with an average of seven weeks.

¹¹ Nicolas J. and Lacassagne J. Bull. Soc. franç. de dermat. et syph. 35: 753 (July) 1928.

¹² Bratzlavsky and Marenus. Russk. Dermat. 7: 243 1929. abstr. Zentralbl. f. Haut u. Geschlechtskr. 31: 147 1929.

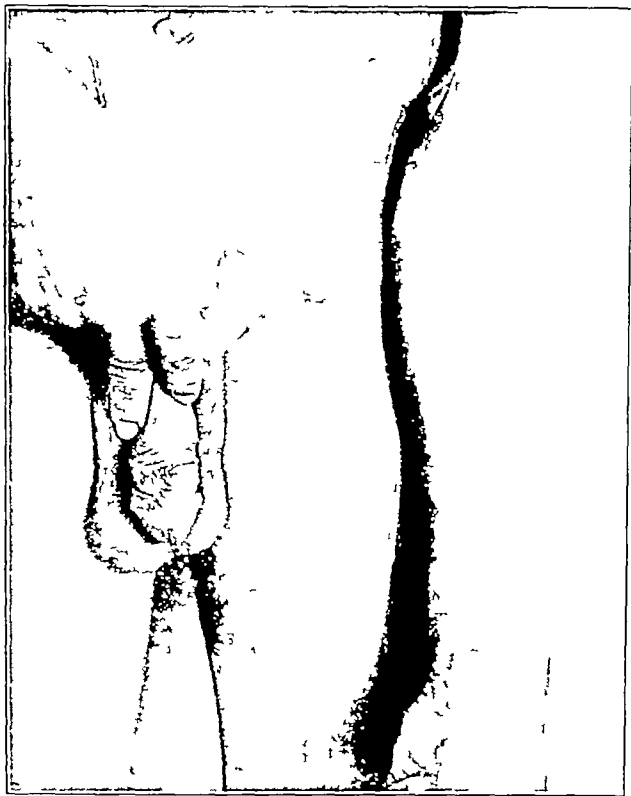
¹³ Franchi F. Bull. Sez. region. Soc. ital. Derm. 5: 315 1931. abstr. Zentralbl. f. Haut u. Geschlechtskr. 40: 417 1932.

¹⁴ Jersild O. Hospitalstid. 74: 883 (Sept. 3) 1931. abstr. Zentralbl. f. Haut u. Geschlechtskr. 33: 841 1935.

¹⁵ Ravaut, P., and Rabreau H. Bull. Soc. franç. de dermat. et syph. 37: 593 1910.

Of these nine patients, four had involvement of the inguinal nodes. The interval from the onset of the bubo to the first positive test varied from four to five weeks. In the remaining thirteen patients of group A the test was positive on admission. The duration of the latent period from the development of positivity could not, of course, be observed. The primary lesion had been present (based entirely on the history of the patient and not on hospital observation) from one to seven weeks, with an average of four weeks. In nine of these the lymph node involvement had been present from two to five weeks, with an average of three weeks.

Considering, then, the entire group of twenty-two patients (one female, twenty-one male) the average latent period from the presence of the primary ulcer to the first positive test was five weeks and from the appearance of the bubo three weeks.



Chancroidal ulcer of Frenulum. Bubo and positive intradermal tests on forearm with three different antigens

In two patients, one male and one female, with proved active chancroidal infection without bubo formation, the test remained negative six weeks and seven weeks, respectively, after the lesion appeared. Further follow-up tests could not be obtained. Since in two cases of group A with active chancroidal infection the test did not become positive until after eight and nine weeks, these two patients giving negative tests can be considered only as not being followed sufficiently long.

RELATION OF TEST TO BACILLUS OF DUCREY, ULCER AND BUBO

At first glance there seemed to be no close relationship between the degree of the reaction in the intradermal test and (1) the presence or absence of the bacillus of Ducrey and (2) the extent and type of primary lesion.

Thus in the eight patients in whom the bacillus of Ducrey could not be demonstrated in the ulcers after careful search, the skin reaction in seven was strongly

positive and in the remaining case only weakly so. In the fourteen patients with positive smears the test was strongly positive in eight and only moderately or weakly positive in six. While this is not a large series, it would, however, tend to show only moderate relationship between the abundance of organisms and the degree of positivity of the test.

It would seem that the greater the tissue involvement the stronger the reaction to the test. An analysis of the material failed to bring this out. In eight patients in whom the skin involvement was minimal, i. e., one or two lesions with a total area of about 1 sq cm or less, the reaction was mild in three, moderate in two and strong in three. In seven cases in which the skin involvement was between 1 and 2 sq cm the reaction was mild in three, moderate in three and strong in one. In the remaining six patients in whom the skin involvement was extensive the test was noted as mild in three, moderate in two and strong in only one. In the only female in this group suffering from an adenitis but with no primary lesion, the test was strongly positive.

It might be stated here that patients in groups B and C, in whom the reaction was positive without active disease, with only a past history, similarly gave varying degrees of positivity to the test. Eleven were noted as strongly positive, while the remaining fourteen were only moderately so.

As to the effect of bubo formation on the skin allergy, it was found that in thirteen patients of group A with buboes the test was strongly positive in twelve and only weakly positive in one. Bubo formation tends to induce a strong allergy. Of the remaining nine patients without lymph node involvement, three gave a strong reaction and six reacted only moderately.

Three patients had negative intracutaneous tests on the day on which pus was aspirated, but the pus made an active antigen. All three subsequently, from eight to ten days later, gave a positive skin test. Another patient, while yielding pus with strongly antigenic properties, reacted weakly to other potent antigens. Auto-inoculation in one with a weakly positive test did not appear to raise the allergic reaction to the test.

In using normal patients as controls, no instance has been observed in which the specific allergy of the skin has been raised by the intracutaneous test, despite the fact that repeated tests have been made on the same patients.

POSSIBLE FALSE POSITIVE TESTS

There were five patients in group D, three males and two females, who gave a positive intradermal test yet had no active lesions and gave no history of previous venereal ulceration or of suppurating bubo. Of the females, one had a history of gonorrhea nine years before and the other had a positive blood Wassermann reaction. One of the men had an active lymphogranuloma inguinale, one a positive blood Wassermann reaction, and the other a history of gonorrheal urethritis in the past. The diagnosis is given in each case to emphasize the fact that venereal disease was common to this group, and a chancroidal infection in the past would not be unusual for these patients, even though denied by the history. Consequently we are inclined to accept the intradermal reaction as evidence of old submerged chancroidal infection.

COMPARISON OF DMELCOS AND PUS ANTIGEN

In the last few weeks of this investigation a small amount of dmelcos vaccine was obtained.¹⁶ A number

¹⁶ We are indebted to Dr. Marion B. Sulzberger of New York for the supply of dmelcos vaccine.

of tests were done simultaneously with the other tests, the diluted chancroidal pus being used. In no instance was there any discrepancy noted, i. e., a positive dmelcos vaccine always gave a positive test with the chancroidal antigen, similarly, a negative chancroidal antigen test gave a negative dmelcos test. It was noted, however, that the dmelcos antigen gave a more clear-cut and stronger reaction.

COMMENT

This study seems to confirm the observations of previous workers as to the specificity of an antigen prepared from the pus of chancroidal buboes and used as an intradermal diagnostic test. This test, like the Frei test, is probably to be attributed to the presence in the pus of the causative factor of the disease, perhaps specific antibodies in the pus may also play a role. At any rate, the reaction to dmelcos vaccine would point to these two probabilities. The test, in our experience, is quite specific and in the hands of careful workers, with plenty of material, will undoubtedly be of great value in diagnosing certain suspected chancroidal infections in which organisms cannot be found. Apparently the allergic powers in the human body caused by a chancroidal infection, once they are developed, persist to a certain extent throughout life. Naturally, in performing the test, antigen prepared from a certain patient's chancroidal bubo should not be used for diagnostic purposes on that patient.

SUMMARY

1 The use of an intradermal diagnostic test, with sterilized pus from chancroidal buboes, confirms the specificity of the test in cases of Ducrey bacillus infection and corroborates the observations of earlier workers.

2 The interval from the presence of the ulceration to the production of a positive test was on the average five weeks.

3 The presence of a chancroidal bubo seems to increase the rapidity and the intensity of the intracutaneous test.

4 The allergic properties raised in a patient by a chancroidal infection persist for years, in our experience at least from thirty to thirty-four years.

1352 Hanna Building

ABSTRACT OF DISCUSSION

DR. EUGENE F. TRAUB, New York. In the past the dermatologist had but few laboratory tests to help him to differentiate between the skin lesions of two or more diseases that might often closely approximate one another. Cutaneous tests are now commonly employed in tuberculosis, dermatophytosis, inguinal lymphogranuloma and chancroids. Because of the larger number of persons who have at some time been infected with tuberculosis or tinea, the skin tests in these diseases must be carefully weighed before they are given any diagnostic significance. In the case of inguinal lymphogranuloma the Frei test is specific and diagnostic. Drs. Cole and Levin have now reported definite confirmation of the observations of previous workers as to the specificity of the intradermal test for chancroids, using chancroidal bubo pus as an antigen. The use of this method raises several pertinent points in view of the fact that the dmelcos antigen has been found uniformly satisfactory, however, it cannot be obtained legally in the United States. The only reason for searching for another test is the difficulty in obtaining the dmelcos vaccine and the difficulty in growing the Ducrey bacillus. I should like to ask the authors why we have this difficulty in growing the organism, because recently at an academy meeting some men believed that the organism could be grown rather easily and others maintained that it could not. Human pus was originally used in the Frei test. It was impossible in this way to get a preparation that could be standardized.

This was all rectified when Levaditi, Pavant and Schoen in 1932 showed that the brains of mice could be infected, and thus opened a source of antigen, Grace and Suskind, of a measured and graded amount of uniform potency and quality. Such a supply is unlimited. Does it not seem logical, therefore, that in the chancroidal test we shall eventually strive to get away from the use of human pus? In the meantime, the test under consideration offers a valuable temporary aid. Both tests, the dmelcos and the present one, parallel each other in the period of time at which the tests become positive, the length of time the patient reacts positively, from 25 to 40 years, and so on. But the dmelcos vaccine gives a sharper and more clean-cut reaction. It is interesting that only a moderate relationship existed between the abundance of organisms and the degree of positivity of the test. In the work in which I engaged with trichophyton, the culturing of an organism from the skin or nails was not even necessarily accompanied by a positive skin test. When extensive or acute "ids" were present, the majority of the cases gave generally moderately strong positive reactions, but the strong allergy produced by bubo formation was not so evident in cases of dermatophytosis with "ids."

DR. DAVID BLOOM, New York. Until now this method of identifying Ducrey infection was not used much in this country by others or myself at the Dermatology Department of Dr. Fox. The reason was that we were concerned particularly in distinguishing between buboes due to lymphogranuloma infection virus and ulcer molle buboes. We were concerned in convincing others and also ourselves of the existence of inguinal lymphogranuloma buboes. In this we could succeed only by using the Frei antigen, which consists of sterilized pus from those gland tumors which looked clinically like inguinal lymphogranuloma, or a test substance which represents with certainty Ducrey infection, and this is the dmelcos vaccine, a suspension of streptobacilli. This dmelcos vaccine is not manufactured here and for some reason is not permitted to be brought into this country. In the near future, however, this vaccine will be manufactured here and we shall not have to embarrass our Canadian friends by asking them to supply us with the vaccine. Now that we are convinced of the existence of inguinal lymphogranuloma buboes and are able in the great majority of cases to make the diagnosis clinically, the method of testing reported by Drs. Cole and Levin will be of great additional value, of lower value, however, than the streptobacillus vaccine itself. In the same way will the Frei antigen, as prepared until now, lose in value, should we succeed in the future in isolating the lymphogranuloma infection virus itself.

DR. JAMES L. PIPKIN, San Antonio, Texas. During the last five years I have done 1,200 Frei tests, obtaining about sixty positive reactions. I felt that there was an overlapping in these adenitis cases which were giving positive reactions with the prepared antigen. After some difficulty I was able to obtain some dmelcos vaccine from Dr. Williamson in Canada. I rechecked a number of the positively reacting patients who had given conflicting readings. I want to speak for the specificity of dmelcos vaccine and the sterile chancroidal pus. I was able to get positive reactions in the questionable cases by using the chancroidal-test materials, and negative readings in known cases of lymphopathia venerea. It was apparently very specific in the limited number of cases tested. It also is a very valuable help in diagnosing large extragenital chancroidal lesions in which the organism cannot be demonstrated.

DR. HAROLD N. COLE, Cleveland. In a way we should make an excuse for a report on a study of this sort using material such as sterilized pus when there is a vaccine on the market, but it is impossible, because of our laws, to get it in this country. It may be that some can grow the Ducrey bacillus with ease, unfortunately, that is not our experience in Cleveland. It is a most difficult procedure. We have been trying it for quite a few years. Of course, with the dmelcos vaccine one has a standardized test as against a more or less crude test in which the pus is used. Nevertheless, one gets excellent results using this sterilized chancroidal pus as a test and as a therapeutic procedure. In several cases of resistant chancroidal infection the therapeutic results from the use of this material injected subcutaneously were striking. Moreover there is a place for a test of this sort, because one encounters certain

cases in which it is exceedingly difficult to differentiate between chancroidal infection and inguinal lymphogranuloma infection. They do not always run true to form and, too, one may even get a case in which there is a double infection and, naturally, if under this condition it can be proved with specific measures instituted, the patient will respond much more rapidly. Therefore I feel that, until there is a dmelcos vaccine in this country, there is a place for the employment of a chancroidal pus vaccine of this type. What this material consists of it is difficult to say. It undoubtedly consists of a certain number of killed, macerated organisms in the pus and it probably also contains a certain amount of antibodies that have been produced by the body against this infection.

ETHER-OIL RECTAL ANALGESIA IN OBSTETRICS

MODIFIED TECHNIC

JAMES T GWATHMEY, MD

NEW YORK
AND

C O McCORMICK, MD

INDIANAPOLIS

The experimental work on which the clinical use of ether-oil rectal anesthesia is based was conducted in 1913 in the Pharmacological Laboratory of what was then the New York University and Bellevue Hospital Medical College, by Prof. George B. Wallace,¹ and in the Chemical Laboratory of the College of the City of New York, by the late Prof. Charles Baskerville.²

Twenty-four experiments on dogs were made by Wallace to determine its practicability. Typical tracings of heart and lungs of a dog under ether-oil anesthesia showed the respiration and carotid blood pressure to be evenly and fully sustained. Baskerville proved by experiments that the rate of evaporation of ether from all oils kept at body temperature in a water bath was constant, despite the changing ratio of ether.

The clinical application of these observations was reported in 1913 at the seventeenth International Medical Congress, in London.³ Clinical experience proves that ether evaporates in the human body when given with oil by rectum at the rate of about 1¼ drachms (4.5 cc) every five minutes and that it is impossible for it to leave the oil in any other ratio. In clinical experiments made in 1913 it was noted that 2½ ounces (75 cc) of ether by rectum never produced sleep in the average adult but that analgesia quite often resulted.

The application of these experimental and clinical observations in obstetric practice was made ten years later, in 1923, at the Lying-In Hospital in New York, under the supervision of Dr. Asa B. Davis, chief of staff of the hospital.⁴ At that time more than 300 confinements occurred in this hospital each month.

Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

Gwathmey J. T. Oil Ether Colonic Anesthesia. Clinical Experience with More Than Five Thousand Cases. *J. A. M. A.* 93: 447-452 (Aug. 10) 1929.

2 Baskerville Charles. On the Rate of Evaporation of Ether from Oils and Its Application in Ether Oil Colonic Anesthesia. *Am. J. Surg. (Anesthesia Supp.)* 30: 20-23, 1916. discussion pp. 24-25.

3 Gwathmey J. T. Oil Ether Anesthesia. An Attempt to Abolish Inhalation Anesthesia. Seventeenth International Congress of Medicine, London 1913. Subsection VII (b) part II pp. 163-166, 1914.

4 (a) Davis A. B. Amelioration of Labor Pains by Morphine-Magnesium Sulfate Injections and Colonic Ether Installations. Directions for Administration by Method Evolved at the Lying-In Hospital of the City of New York. *Surg. Gynec. & Obst.* 40: 868-874 (June) 1925.

(b) Davis A. B. in discussion at Dec. 9, 1924 meeting of the New York Obstetrical Society. *Am. J. Obst. & Gynec.* 9: 405-406, 1925.

(c) Gwathmey J. T., McKenzie K. A. and Hudson F. J. Painless Childbirth by Synergistic Methods (Second Paper). *Am. J. Obst. & Gynec.* 8: 154-163 (Aug.) 1924. discussion 238-240. (d) Gwathmey J. T. Obstetrical Analgesia. A Further Study Based on More Than Twenty Thousand Cases. *Surg. Gynec. & Obst.* 61: 190-195 (Aug.) 1930.

The agreement between Davis and Gwathmey governing the principles to be observed in developing the method was (1) to employ only drugs in common use, (2) to devise a method requiring neither specialized technic nor unusually equipped or trained personnel, and so simple that it could be used in the home or the hospital by any physician, (3) to modify or stop the administration if either the mother or the child appeared to be in danger at any time, (4) to publish the results, whether favorable or not.

After many drugs and various combinations were used^{5a} a standard formula and technic were evolved. The technic, as developed at the Lying-In Hospital, has been used in more than 15,000 cases in that hospital alone, and the method is now used in all civilized countries. A comparison of the records of three different house surgeons at the Lying-In Hospital for the month of March of three successive years (1927-1929) shows that the method has been standardized. Ninety per cent of all cases were successful with this method. Davis said before the New York Obstetrical Society in 1924, after observing the method in many cases, that he had yet to know of a case wherein either mother or child was in any way injured by this method.^{4b} In 1925 Davis^{4a} stated that the "ether practically never stops the contractions of the uterus when given at the time directed." In the second stage, the patient bears down in the usual way. Even if the drugs should prolong or stop labor, no harm is done and at any rate the patient does not suffer.

The work of Meltzer⁵ and Hooper⁶ in the laboratory, and clinical experience⁷ have proved the synergistic action of magnesium sulfate, with both ether and morphine.⁸ However, in obstetrics unpleasant results sometimes follow the hypodermic injection of magnesium sulfate. This is sufficient reason for omitting the magnesium sulfate and substituting a drug that is effective in expert hands and harmless in the inexperienced. Tuberculosis, heart and kidney diseases, and threatened eclampsia do not contraindicate the administration of ether by rectum. By substituting pentobarbital sodium by mouth for magnesium sulfate by hypodermic injection, the possibility of an occasional abscess is avoided. The technic as presented here is simplified, and made safer.

DRUGS USED IN MODIFIED TECHNIC

*Pentobarbital Sodium*⁹—Bernard Fantus¹⁰ states that "the fatal dose of the barbiturates is from fifteen to thirty times the therapeutic dose." Gillespie¹¹ reviewing all the literature regarding the barbiturates since 1904, says "No clear-cut case has yet been reported where a barbiturate in therapeutic dosage has produced death in the absence of complicating factors." Recovery is reported in several instances after more than 15 Gm (225 grains of barbital) and after 5 Gm (75 grains of phenobarbital). Recovery is reported¹² of a patient having taken 11 Gm (172 grains) of sodium

5 Meltzer S. J. and Auer J. Combined Action of Magnesium and Ether. Evidence of a Central Effect of Magnesium. *Proc. Soc. Exper. Biol. & Med.* 10: 159-161, 1913.

6 Gwathmey J. T. and Hooper C. W. Synergistic Analgesia and Anesthesia with Special Reference to Magnesium Sulfate, Ether, Morphine and Novocain. *J. Lab. & Clin. Med.* 10: 641-659 (May) 1925.

7 Gwathmey J. T. Synergism of Magnesium Sulfate and Morphine and Magnesium Sulfate and Ether. *J. A. M. A.* 85: 1482-1485 (Nov. 7) 1925.

8 Gwathmey J. T. Synergism of Magnesium Sulfate and Morphine. *J. A. M. A.* 91: 1774-1776 (Dec. 8) 1928.

9 Lucke R. Personal communication to Dr. Gwathmey from Dr. Lucke of the Abbott Laboratories, North Chicago, Ill.

10 Fantus Bernard. The Therapy of the Cook County Hospital Barbiturate Poisoning. *J. A. M. A.* 103: 749-750 (Sept. 8) 1934.

11 Gillespie R. D. On the Alleged Dangers of the Barbiturates. *Lancet* 1: 337-345 (Feb. 17) 1934.

12 Gwathmey J. T. The Barbiturates a Safe Preliminary Medication for Surgical Operations. *J. A. M. A.* 103: 1536-1537 (Nov. 17) 1934.

ipral, the salt of ethylisopropylbarbituric acid. A thorough examination by her physician, one year after this occurrence, showed no pathologic changes, and, to all outward appearances, she is in perfect health. Pentobarbital sodium acts more quickly, is less productive of delirium, and affords a deeper amnesia and a less pro-

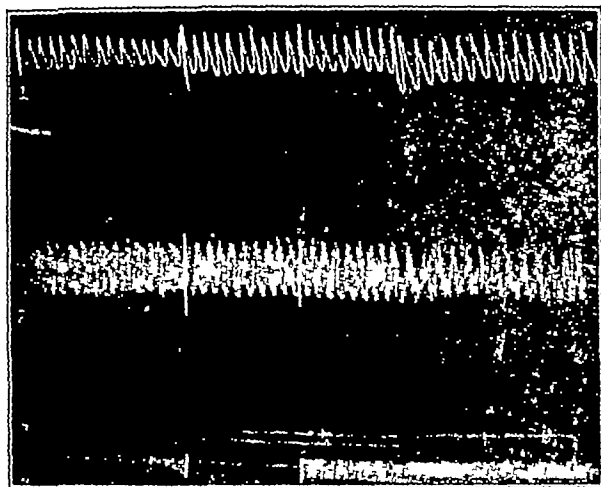


Fig 1—Tracings from dog under oil ether anesthesia. The records from above downward are (1) respiration (2) carotid blood pressure (3) base line at zero and (4) time in half seconds. The anesthesia was begun at 11:30.

tracted hypnosis than any other barbiturate tried by us.¹² The accompanying table illustrates the relatively low toxicity of pentobarbital sodium.⁹

Paraldehyde—Sollmann¹⁴ states: "The sleep is normal and, with ordinary doses, without after-effects. Its acute toxicity is low, so that 100 Gm produced only very prolonged sleep." Bastedo¹⁵ says: "Ordinarily paraldehyde is a very safe hypnotic, its tendency being to stimulate the heart and respiratory tract." By mistake, a nurse added 2 ounces (60 cc) of paraldehyde instead of 2 drachms (8 cc) to the usual oil-ether-surgical mixture which prolonged the sleep, but the recovery was uneventful, without treatment of any kind. Another nurse added 4 ounces (120 cc) instead of

Relative Toxicity of Drugs

| | Minimum Effective Dose | Minimum Fatal Dose | Ratio |
|----------------------|------------------------|--------------------|-------|
| Pentobarbital sodium | 40 | 110 | 2.7 |
| Barbital | 225 | 310 | 1.37 |
| Amital | 72 | 180 | 2.5 |

4 drachms (15 cc) of paraldehyde to the usual ether-oil surgical mixture. The patient to whom this was administered slept from Saturday morning until Monday morning. Artificial respiration, transfusion, and the like resulted in an uneventful recovery. Two drachms is the amount used in the present obstetric mixture. This amount has been given thousands of times with the ether-oil mixture in surgery, with only favorable results. Paraldehyde adds nothing to the analgesia but makes the whole technic smoother and safer.

¹² McCormick, C. O. Popularizing Ether Oil Rectal Analgesia in Obstetrics. J. Indiana State M. A. 23:454-456 (Oct.) 1932. Anesth. & Analg. 11:166-173, 1932.

¹⁴ Sollmann, Torald. A Manual of Pharmacology and Its Applications to Therapeutics and Toxicology, ed. 4. Philadelphia: W. B. Saunders Company, 1932, especially p. 780.

¹⁵ Bastedo, W. A. Materia Medica. Pharmacology, Therapeutics. Prescription Writing for Students and Practitioners, ed. J. Philadelphia: W. B. Saunders Company, 1932, especially p. 433.

Ether—Ether is the most nearly universal anesthetic. The nausea and vomiting that usually follow inhalation anesthesia without preliminary medication are practically eliminated by giving the ether by rectum and using a barbiturate as a preliminary. In suitable dosage and with proper technic, ether rectally may be a sedative, an analgesic, or an anesthetic. Equal parts of ether and olive oil of each 2 drachms (8 cc) placed in the rectum will act as a sedative in whooping cough and effectively prevent a coughing spasm in young children. In larger dosage up to 2½ ounces (75 cc) with half the amount of oil, by rectum, it acts as an analgesic only. With increased volume, but in the same proportion (4 to 6 ounces [120 to 180 cc] of ether), it acts by rectum as a powerful anesthetic. It is promptly excreted by the lungs of both the mother and the new-born infant. Tuberculosis is no contraindication to ether given by rectum. As it boils at 96° F., it passes in and out of the fetus without any cumulative effect.

Ether given by rectum affects the sensory nerves to a far greater extent than when given by inhalation. Frequently patients under ether-oil analgesia may be conversed with while being operated on. The fact that the upper portion of the brain is but little affected is most important in obstetrics. The patient, even when seemingly unconscious, will "bear down" when told to do so. The 2½ ounces of ether by rectum will never produce surgical anesthesia. It is therefore unnecessary for the obstetrician to be present when this is given. This amount may be considered standard for the average adult (130 to 170 pounds [59 to 77 Kg]), but may be increased to 3 or decreased to 2 ounces for those overweight or underweight. The experienced obstetrician will individualize, with both the ether and the pentobarbital sodium.

Quinine—Quinine¹⁶ stimulates and continues the contractions of the uterus when labor pains start. In the dosage used, it is ineffective in initiating or producing premature labor. It will intensify weak labor.

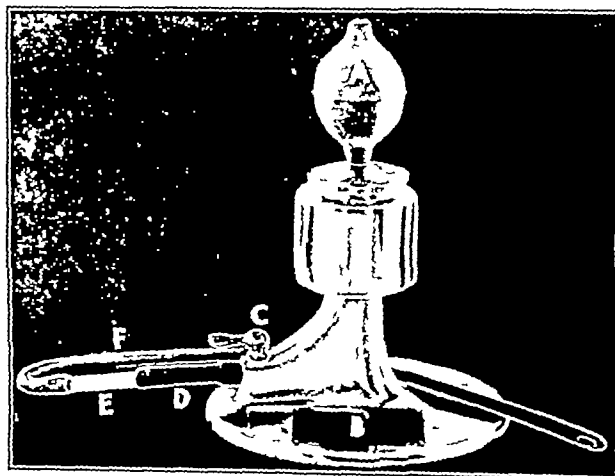


Fig 2—Apparatus for McCormick rectal analgesia.

pains. It is more persistent than solution of posterior pituitary and safer, since it never produces uterine spasm. In the isolated virgin guinea-pig uterus, Lieb¹⁷ found that a 1:100,000 solution brought an immediate increase in the rate and strength of the contractions. At the Lying-In Hospital, when quinine was omitted from

¹⁶ Sollmann, Torald. A Manual of Pharmacology and Its Applications to Therapeutics and Toxicology, especially p. 590.

¹⁷ Lieb, C. C. Pharmacologic Action of Ecboic Drugs. Am. J. Obst. 69:132, 1914 (especially p. 21 on quinine).

the solution labor was delayed and uncertain in several hundreds of cases, with its reintroduction, labor was progressive and uneventful. Qualitative tests for quinine excreted in the urine in 100 cases gave ninety-two positive and eight negative results. An erythema develops once in about 500 cases and may be disregarded. The fatal dose is 8 Gm (128 grains), but

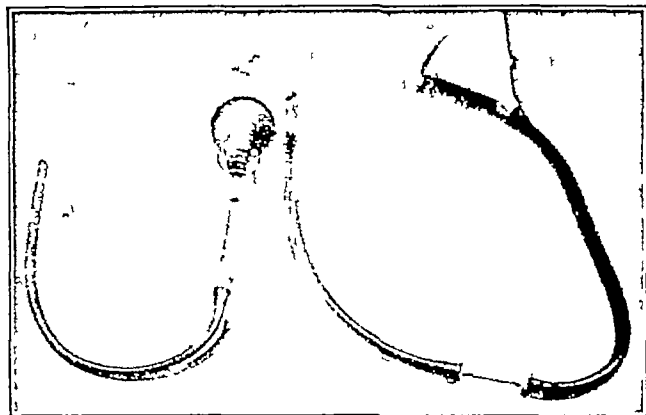


Fig 3—A aseptic syringe equipped with a 22 French catheter B 5 ounce funnel equipped for gravity instillation

recovery has followed a dose of 30 Gm (480 grains). The amount used at one time with this method is 1.25 Gm (20 grains). Clinical experience proves that it is practically harmless in the dosage used, but if omitted labor is delayed.

TECHNIC WITH NEW MODIFICATIONS

Changes in the obstetric technic have been made by McCormick¹⁹ and his associates in the obstetric department of Indiana University School of Medicine. Briefly, these modifications involve the following:

1 The omission of magnesium sulfate by hypodermic injection, and the substitution of pentobarbital sodium (nembutal) by mouth. For the nurse, this is easier to give, for the patient, it is safer and easier to take.

2 The substitution of the degree of the patient's suffering for the amount of cervical dilatation as a time criterion for the administration of the sedatives and the rectal instillations. Experience has demonstrated that the distress of the patient is a more practical guide than cervical dilatation.

3 The explanation, to the patient, of the steps to be taken for her convenience and safety.

4 The instillation of the rectal mixture with the McCormick apparatus (fig 2), which is completed readily within thirty seconds, falling within any pain interval, instead of with the funnel method, requiring from ten to fifteen minutes. No assistant is required, and the instillation is higher and better retained.¹⁸

5 The substitution of a 5 to 10 per cent (a heaping tablespoonful in 1 quart of water) solution of sodium bicarbonate enema for the usual soapsuds enema. If the pentobarbital sodium is not given within eight hours after the initial enema, the enema is repeated. It should not be given just before the rectal instillation. If this is unavoidable, any remaining water is siphoned back before the rectal instillation.

As with all other forms of analgesia and anesthesia, experience gives added success.

18 The McCormick apparatus is not essential. With an assistant the funnel method or an aseptic syringe equipped with a catheter has proved quite practical (fig 3).

ETHER-OIL MIXTURE

The formula for the rectal mixture, as now used, is ether, 2½ ounces (75 cc), quinine alkaloid 20 grains (1.3 Gm), alcohol 45 minims (3 cc), paraldehyde 2 drachms (8 cc) and liquid petrolatum or olive oil enough to make 4 ounces (120 cc).

These agents are mixed in the following order: (1) quinine and alcohol, (2) paraldehyde, (3) ether, (4) oil. The mixture is then stirred, strained through cotton, bottled and corked.

PRELIMINARY PROCEDURE

The patient, having had a cleansing enema and a bath, and having been placed in bed, is addressed by the obstetrician as follows: "We are desirous of making your labor as painless as possible. Therefore, when your pains become uncomfortably severe, let the nurse know and she will give you a couple of capsules¹⁹ to relieve you. When the pains again become uncomfortable notify her as before and she will give you another capsule¹⁹ and perhaps a hypodermic²⁰. Later when this medicine begins to lose its effect, she will inject a solution into your rectum."²¹

The following routine is then employed. Instead of the first two intramuscular injections of magnesium sulfate the patient is given orally 3 grains and 1½ grains (0.2 and 0.1 Gm) respectively of pentobarbital sodium. One-sixth or one-fourth grain of morphine is usually given hypodermically with the second instead of with the first dose of pentobarbital if the patient is a primipara and labor is active. On the other hand, if the labor is not uncomfortably active, or if it is of the prolonged type, the second dose of pentobarbital may be repeated once or oftener before the morphine is given (not more than 10 to 12 grains [0.6 to 0.7 Gm] in twenty-four hours). When the effects of the morphine begin to wear off, the ether-oil-quinine solution is administered by rectum and repeated as often as required, except that the quinine is omitted after the second instillation. Usually one instillation suffices. Morphine is omitted if delivery is anticipated within four hours and is rarely

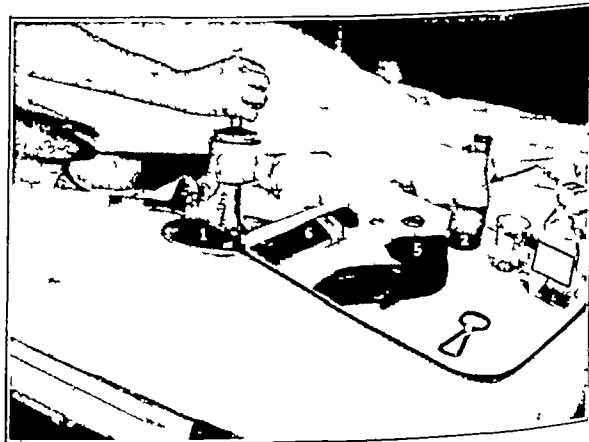


Fig 4—Analgesia tray and patient in position for instillation.

necessary if the patient is a multipara. If delivery is anticipated within four hours, the oral administration of pentobarbital and the rectal ether-oil instillation are promptly given, simultaneously. After the pentobarbital is given, the patient should be kept quiet. She is

19 Pentobarbital sodium 1½ grains (0.1 Gm) repeated if necessary.
20 Generally speaking, if the patient is a primipara and delivery is not expected within twenty-four hours one-sixth or one-fourth grain (0.016 or 0.016 Gm) of morphine is given.
21 Ether-oil-quinine—McCormick.²²

given only the necessary attention. The environment should be such as to favor her falling asleep. If she is in a ward, the bed is screened, if in a room, the shades are lowered and the light is excluded, the door is closed. The patient must be watched while asleep, as she may turn from side to side during contractions and fall out of bed.

RECTAL INSTILLATION

The patient is placed on her left side, with the buttocks at the side of the bed. Seaweed or tragacanth lubricating jelly (not petrolatum) is liberally applied about the anus. A well lubricated 22 F catheter is inserted from 6 to 8 inches into the rectum. It is important that the catheter pass the presenting part. It is held in place with the left hand. With the right hand the bulb is compressed at the conclusion of a pain not more than twenty or thirty times a minute (fig 4). The mixture may be poured in a funnel (fig 2B). During the administration of ether mixture the patient is told to breathe deeply with her mouth open, and to draw up with the anal sphincter, as if she were trying to avoid expelling gas, this will induce reverse peristalsis and permit the fluid to run in more rapidly. After all the ether mixture is passed out of the catheter, the catheter is clamped to prevent air being drawn into the return. The catheter is then gently withdrawn. Pressure is made with a towel over the anus during three or four contractions after the catheter is withdrawn. The patient may now be on her back or whatever position is most comfortable. The quiet appearance of the patient should not be misleading, she may be having strong contractions and should be watched carefully. The rectal instillation may be given at intervals of two and one-half hours if necessary. At actual delivery, ethylene, nitrous oxide or ether is given by inhalation, but not chloroform. When the baby is born, if a gas-oxygen apparatus is used, all anesthetic is cut off, and 5 per cent carbon dioxide and oxygen, under pressure, is given before the cord is cut.

SUMMARY

After ten years' experience with the original and other methods and many modifications, the advantages of this modified method and the reasons for its popularity are summed up by numerous authorities and listed by one of us (McCormick) as follows:²²

- 1 It is the safest of all satisfactory analgesias used to date. Several series of many thousands of cases have been reported, no maternal or infant mortality being attributed to its use. The largest of the series is a group of 20,000 cases, reported in 1930.¹⁴
- 2 There are no major physical contraindications. It may be given with impunity to patients presenting cardiac disease, tuberculosis, pneumonia, acute bronchitis, nephritis, eclampsia, placenta praevia, and pelvic disproportion. In the event of a pathologic condition of the rectum, it is no more irritating than the soapuds enema formerly used. It is used with equal facility in the home and in the hospital.
- 3 It serves as a satisfactory analgesic in 85 to 95 per cent of cases. Most failures are due to faulty technique.
- 4 It requires but little equipment and experience and is readily administered by the general practitioner.
- 5 It can be started early in the first stage and administered any time during labor.
- 6 The patient is much more cooperative than in "twilight sleep" or sodium amytal analgesia.

7 In addition to analgesia, it affords a most gratifying amnesia, the patient rarely having more than a vague recollection of the labor.

8 The physician does not have to be in constant attendance, the average instillation being effective for from two to six hours.

9 It is not likely to prolong labor and not infrequently the second stage is shortened.

10 The baby suffers no ill effects.

11 It incurs no complications of labor or postpartum pathologic condition.

12 Forceps deliveries are decreased in number, and lacerations are no more frequent than with other methods of delivery.

13 Mental and physical shock are lessened. Normal appetite is restored within a few hours following delivery.

14 It is relatively inexpensive, especially compared with nitrous oxide and ethylene gas. At wholesale cost the ingredients of the ether-oil mixture total only a few cents.

15 It dovetails excellently with gas and inhalation ether as adjuvants during the perineal stage and instrumentation, only 50 per cent or less of the usual amount of ether being necessary. Chloroform should never be used in conjunction with the method.

17 In performing a cesarean section under local anesthesia, it affords an excellent preliminary.

18 This form of analgesia is available to practically every woman in labor.

133 East Fifty-Eighth Street—504 Medical Arts Building

VINYL ETHER OBSTETRIC ANESTHESIA FOR GENERAL PRACTICE

WESLEY BOURNE, M.D., F.R.C.P. (CANADA)
MONTREAL

Although the usefulness of vinyl ether in obstetrics has already been described,¹ this drug may be dealt with again on account of the continuation of its employment at the Royal Victoria Montreal Maternity Hospital, from which increased confidence has been gained concerning its relative safety. It is therefore proposed to recount some of its effects, particularly those on the liver, to add new information of its action on the organ and to point out that vinyl ether seems to be especially suitable for obstetric anesthesia in general practice.

The original report of the use of vinyl ether in obstetrics gave an account of its administration to 152 parturient women and a detailed analysis of the first fifty cases. The condition of the patients as well as the procedure of delivery varied considerably. Several of the women were "toxic" and the deliveries varied from spontaneity to high forceps and low cesarean section. The vinyl ether was administered either by dropping it on a small "open" mask or with oxygen in a closed system having a carbon dioxide absorption attachment (Foregger). The latter method is much more desirable, as it not only precludes asphyxia and waste of material but affords a means of mixing vinyl ether vapor with any of the anesthetic gases. Whenever it seemed advisable, a preliminary period of intermittent evanes-

²² McCormick C O. Rectal Ether Analgesia in Labor. *Am Med J* 135:160 (April) 1933.

From the Royal Victoria Montreal Maternity Hospital.
Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Sixth Annual Session of the American Medical Association Atlantic City, N. J., June 14, 1935.
¹ Bourne Wesley. *Lancet* 1:566 (March 17) 1934.

cent anesthesia (it is almost impossible to produce analgesia with vinyl ether) was produced for each earlier severe labor pain

Among the first fifty patients, the bromsulfalein dye test² for liver function was carried out on four, including a very "toxic" woman of the renal type. A striking comparison was afforded by these liver function tests, and those after chloroform administered under similar conditions. The data showed that after vinyl ether very little dye was retained in the blood, that is, there was practically no liver damage, while the administration of chloroform was followed by marked dye retention indicating definite liver impairment. Leake, Knoefel and Guedel³ have reported no gross pathologic changes in the liver, heart, lungs, kidneys and other tissues of dogs, Goldschmidt, Ravdin, Lucke, Muller, Johnston and Ruigh⁴ found liver necrosis in dogs only after vinyl ether had been given for three hours, and none in monkeys. Although fully appreciating the value of these observations, Raginsky and I⁵ thought it worth while to study more thoroughly the actions of vinyl ether on the liver. Accordingly, it was administered to normal dogs, to dogs with chloroform-damaged livers, and to partially starved dogs, and the liver function was measured by the previously mentioned dye test. The following is quoted from the results:

1 Vinyl ether anesthesia in normal dogs does not alter the liver function appreciably. In those cases in which cyanosis is a feature of the anesthesia, moderate liver damage occurs which is not due directly to the drug but to the associated anoxemia.

2 Vinyl ether anesthesia does not enhance the liver function damage produced previously by the inhalation of chloroform, nor does it delay the period of recovery from this damage.

3 The effect of vinyl ether anesthesia on the liver function in partially starved dogs is not appreciably different from that produced in normal animals.

The problem of the effects of anesthetics on the liver has been approached in another manner by Dr. Hans Molitor⁶ of the Laboratories for Pure Research, Merck & Co. He inserts cannulas in the bile duct and in the duodenum of rabbits, then he collects measures and weighs the bile and reinjects it into the duodenum. The bile passes a drop recorder before being collected, so that the slightest change in the bile secretion may be recorded. In a control animal the bile flow over a period of four hours shows a pronounced decrease during the first hour and a very slow and gradual increase during the following two hours. When chloroform is administered to such an animal, he records an immediate decrease in bile secretion, which continues after the anesthetic has been withdrawn. When ethyl ether is used, he finds a very slight initial decrease and a subsequent increase in the flow of bile, not unlike that of the control animal. When such an experiment is done with vinyl ether, whether the material is pure or impure, there is no change in the usual flow of bile, even though the administration lasts for two hours and the anesthesia is profound. Dr. Molitor has gone on to show the powerful effects of anoxemia in this regard. He applies a mixture of 95 per cent nitrous oxide and

5 per cent oxygen and obtains a prompt drop in the flow of bile, in fact, the secretion comes almost to a stop. At this point he changes to a mixture of 80 per cent nitrous oxide and 20 per cent oxygen, along with a sufficient amount of vinyl ether to produce very deep anesthesia, and in spite of the vinyl ether the bile starts to flow again, reaching its normal rate within five minutes.

Seemingly antithetical to these five sets of favorable observations concerning the actions of vinyl ether on the liver, there is a brief account in a footnote of one of the fore-mentioned papers⁴ of two cases presenting "evidence of central lobular necrosis of the liver." These cases were reported through the kindness of Dr. Dean Lewis of the Johns Hopkins Hospital. I have obtained permission from Professor Lewis to publish the following more extended details of these two fatalities:

Mrs. H. G. White, aged 23, admitted to the accident room at 10 p. m., July 11, 1933, complained of abdominal pain of two days' duration. The patient was obese, weighing 76 Kg, had a sallow complexion and was obviously sick. The abdomen was pendulous and full, with definite tenderness on deep pressure in the right lower quadrant. There was nothing striking in the rest of the physical examination. The throat was clear, the lungs appeared normal and the heart was of normal size with an apical blowing systolic murmur. There was no peripheral edema. The blood pressure was 110 systolic, 65 diastolic. The white blood cells numbered 19,200. The diagnosis was appendicitis.

An exploratory laparotomy with appendectomy was performed July 12, 1933, under divinyl ether anesthesia. The induction period was eight minutes. The patient was mildly hysterical and noncooperative prior to anesthesia, but induction was smooth and rapid and there was no anoxemia. Complete relaxation was easily obtained, but an amount in excess of the usual dosage of divinyl ether was required. The operation was completed in one hour and thirty-five minutes, and 275 cc. of the agent was used. The patient was fully conscious six minutes after cessation of anesthesia.

The immediate postoperative course was uneventful, with the exception of slight nausea and vomiting on the second day. On the fourth and fifth days the patient complained of heart burn pain in the chest and headache. The physical examination was negative with the abdomen soft. Early on the sixth day the pulse rose to 160 with respirations to 35 or 40 and the patient became unresponsive, the arms were spastic and the pupils dilated but reacted to light. The white blood cells numbered 30,000. The respirations gradually slowed and the patient died in midafternoon in apparent respiratory failure. The impression was cerebral vascular accident, involving the basal nuclei or multiple fat emboli. The autopsy showed a slight fat embolism with midzonal necrosis of the liver, an acute splenic tumor, chronic cystitis which was slight, a small ulceration of the vaginal mucosa, a wide foramen ovale, and hematoma and necrosis of the subcutaneous tissue around the operative wound.

J. H. R., a white man, aged 54, admitted to the hospital July 18, 1933, complained of epigastric discomfort after meals and loss of from 15 to 20 pounds (6.8 to 9 kg). Physical examination was negative except for the loss of weight, the ventral hernia and bilateral inguinal hernia, and very slight tenderness on deep pressure in the epigastrium. The liver was not enlarged. The blood pressure was 165 systolic, 90 diastolic. Hemoglobin was 42 per cent. The white blood cells numbered 8,400. The urine showed albumin one plus. Transfusion of 500 cc. of citrated blood increased the hemoglobin to 62 per cent. The operation was performed July 25. A resection of the stomach with gastro-enterostomy was done under divinyl ether anesthesia, 350 cc. The duration of the operation was two hours and forty minutes. The operation revealed a large carcinoma of the stomach posteriorly with several suspicious pinpoint white spots in the liver. The patient left the table in good condition and was fully conscious ten minutes after completion of the operation. The induction was rapid

² Rosenthal S. M. and White E. C. Clinical Application of the Bromsulfalein Test for Hepatic Function. J. A. M. A. 84: 1112 (April 11) 1925.

³ Leake C. D., Knoefel P. K. and Guedel A. E. J. Pharmacol. & Exper. Therap. 47: 5 (Jan.) 1933.

⁴ Goldschmidt, Samuel, Ravdin, I. S., Lucke, Baldwin, Muller, G. P., Johnston, C. G. and Ruigh, W. L. Divinyl Ether. J. A. M. A. 102: 21 (Jan. 6) 1934.

⁵ Bourne Wesley and Raginsky B. B. Brit. J. Anaesth. 12: 62 (Jan.) 1935.

⁶ Molitor, Hans. Personal communication to the author.

and smooth, with no cyanosis. Maintenance anesthesia was light throughout, and the patient was satisfactorily relaxed for the surgeon. The physical condition was excellent the evening of the operation with the temperature 100 F, pulse 98 and respiratory rate 20. There was no nausea or vomiting. On the second postoperative day the temperature was 101, pulse from 110 to 130, and respiratory rate 24. The patient was drowsy but quite comfortable. He voided 125 cc of bloody urine. On the fourth postoperative day at 2:30 a.m. the patient died suddenly in apparently normal sleep with no previous changes in temperature, pulse or respiratory rate. The impression was sudden massive hemorrhage. The autopsy report was localized peritonitis, central and midzonal necrosis of the liver, pulmonary edema, adenoma of the prostate, pyelitis cystica, extreme mononuclear infiltration of papillae and pyramids of the kidney, solitary calcified tuberculous nodule in the left upper lobe.

In each case the divinyl ether was administered by the open drop method, a chloroform mask with eight thicknesses of gauze being used. No oxygen was used and there was no anemia at any time in either case.

Although it is true that the first case showed midzonal necrosis, it is pointed out that when liver necrosis does follow anesthesia it usually occurs at the center of the lobule, and whereas in the second case there was central as well as midzonal necrosis of the liver, this man was very wasted, very anemic, had a large carcinoma of the stomach with suspicion of metastases in the liver, and was subjected to an operation that lasted two hours and forty minutes. In fairness it must be conceded that his was a hazardous outlook and that the liver necrosis may not be attributed too seriously to the vinyl ether.

Since the previously mentioned 152 vinyl ether anesthetics there have been 500 more in this clinic, making a total of 652 administrations of vinyl ether to parturient women of all kinds and conditions. Among all these there was only one case which was followed by untoward results.

A primipara, aged 23, due March 19 1935, was admitted to the hospital February 27 in indifferent labor. Pregnancy had been apparently normal throughout. Labor progressed normally and the patient was delivered spontaneously of a living child. Vinyl ether was given for forty minutes. Some thirty hours later a jaundice developed, which increased daily. Analyses of the blood showed rapidly increasing urea, uric acid, nonprotein nitrogen and the van den Bergh reaction indirect. Urinary output dropped to practically zero, the patient became first restless and then comatose, the jaundice deepened, blood transfusions and injections of salines and dextrose intravenously seemed to do no more than prolong life. After five days of illness she died. The last figures of chemical analyses of the blood were urea 175, urea nitrogen 140, uric acid 21.4, creatinine 11.0, amino acids 181. The van den Bergh indirect reaction was 30 units. Postmortem examination was refused, but a small piece of liver was obtained through an abdominal incision. Prof. T. R. Waugh of the Pathological Institute of McGill University gave the following report: The specimen consisted of two pieces of liver the size of lima beans, yellowish green with red punctate markings. Section showed a hemorrhagic necrosis of the parenchyma, which started about the periportal spaces and invaded a zone of the lobule, varying from 3 to 6 cells deep in this area. The remaining parenchyma showed some fatty metamorphosis. The picture agreed with that encountered in eclampsia.

The anatomic summary was periportal hemorrhagic necrosis (eclampsia).

Having now obtained more exact knowledge of the pathologic changes concerning the two deaths at the Johns Hopkins Hospital just mentioned, and with Professor Waugh's report before me, I feel justified in the belief that vinyl ether was not the cause of the liver damage in any of these three cases. Although I

do admit that it probably did enhance liver impairment in the first two anesthetics, which were unusually long, it is very likely that the results would have been the same had ethyl ether been the anesthetic. This opinion is expressed because it has already been clearly shown from repeated experiments that vinyl ether does not effect any more impairment of hepatic function than does ethyl ether. In these experiments there were no complicating factors and the conditions were under absolute control. Who can say with any sense of assurance that the livers in these three clinical cases were not diseased before the administration of vinyl ether?

Another argument in favor of vinyl ether has recently come from the Pharmacological Laboratory of the University of California Medical School. Peoples and Phatak⁷ made a comparative study of the effects of ethyl ether, ethylene and vinyl ether on rabbit intestine. They found that whereas ethyl ether always caused an immediate and marked loss of tone and inhibition of movement of the intestinal muscle and ethylene caused a slight and transitory loss of tone with an occasional increase in the amplitude of contraction, vinyl ether uniformly increased the tonicity of the intestine. They conclude that their observations on the action of vinyl ether on isolated intestinal muscle indicate that in this respect, as in other phases of its pharmacologic action, it has properties resembling ethylene more than ethyl ether. Indeed, since it definitely increases intestinal muscle tonus, it may be expected to be followed by even less postoperative stasis when used clinically than ethylene, which is reputedly so much better in this desideratum than ethyl ether. This would seem to be a point in favor of the use of vinyl ether in operative obstetrics, especially cesarean section, as against ethyl ether.

In verification of this work of Peoples and Phatak, Molitor⁸ has shown me a tracing of intestinal action recorded by the method of Straub,⁹ which shows that vinyl ether does not interfere with the automatic movements of the intestine, whereas ethyl ether will stop these movements. Molitor has done similar experiments on the uterus, he finds that, like ethyl ether, vinyl ether does not affect uterine contractions, which supports the impressions received in this clinic.

Since the more extended employment of vinyl ether in this clinic, with the exception of the case of eclampsia already described, there has been no question of untoward effects, its entire suitability for use in obstetrics has become very convincing, and although those patients who have had it by the "open" method have done well enough, there can be no doubt that it is better to administer vinyl ether with oxygen, if for no other reason than that every anesthetist knows something of the benefits of adding oxygen to anesthetic vapors. Ravdin⁹ states that "there is no doubt that the increase of necrosis in the experimental animal is markedly reduced when a plentiful supply of oxygen is at hand." The extreme volatility of vinyl ether is such that it is very wasteful to give it by the "open" method. It is therefore preferable to employ a closed-system apparatus, fitted for supplying oxygen and for absorbing carbon dioxide, so that a very small quantity of anesthetic will suffice for the longest case, in other words, the longer the anesthesia the smaller will be the

⁷ Peoples, S. A. and Phatak, N. M. *Proc. Soc. Exper. Biol. & Med.* 32: 378 (Nov.) 1934.

⁸ Straub, W. and Viaud, P. *Arch. f. exper. Path. u. Pharmacol.* 100: 1 1932.

⁹ Ravdin, I. S. Personal communication to the author.

quantity used per unit of time. Such an apparatus should be cheap and should in a short time more than pay for itself by precluding waste of material.

SUMMARY

1 When vinyl ether is used to produce anesthesia sufficient for obstetric procedures, it apparently does not cause liver damage nor does it interfere with muscular activity in the intestine and in the uterus.

2 Vinyl ether seems to be particularly suitable for obstetric anesthesia in general practice on account of its safety for mother and child, its ease of administration, the rapidity of its action, the satisfactory maintenance of any desired degree of narcosis, and the early uneventful recovery.

3 Although vinyl ether may be given with relative safety by the "open drop" method, it is preferable to administer it in a "closed" manner with oxygen.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRs GWATHMEY AND MCCORMICK
AND DR BOURNE

DR R A GAUHAN, Hazelton, Pa. I will confine my discussion to the rectal ether anesthesia as worked out by Dr Gwathmey. For the past twelve years in our hospital we have been using the rectal oil anesthesia in obstetrics. We transferred it to the surgical department, so that in conjunction with Dr Gwathmey we worked out a technic of rectal anesthesia plus the use of morphine and magnesium sulfate which has been very successful. We use this type of anesthesia in all our thyroid work. Our technic is as follows: Preceding the operation the patient is given two soapsuds enemas, one at 9 o'clock the night before, the other at 5 a. m. One hour before the operation the patient is given three ampules each 2 cc. representing morphine sulfate one-eighth grain (0.008 Gm.) and solution of magnesium sulfate 50 per cent, intramuscularly at fifteen-minute intervals. Following the injection of the last dose, 1½ ounces (45 cc.) of ether with 2 ounces (60 cc.) of olive oil, thoroughly mixed, is slowly injected into the bowel and retained. If the patient is very light in weight we use 1 ounce (30 cc.), for those a little heavier we use an ounce and a half. We seldom go any higher than an ounce of ether by bowel. The patient is then moved to the operating room. At the beginning of the operation approximately 3 cc. of a 1 per cent solution of procaine hydrochloride is injected into the skin. Immediately after operation a colonic irrigation of tepid water is given until the return is clear. Following this 10 ounces (300 cc.) of dextrose solvent 5 per cent with 1 drachm of aqueous solution of iodine (Lugol's solution) is given by bowel every six hours for four doses. Fowler's position, physiologic solution of sodium chloride by hypodermoclysis, digitalin and morphine sulfate are given as a routine. Liquids are given by mouth as desired. We have not had one death from this anesthesia in 1,500 operative cases in the past ten years in the City Hospital. There is no effect on the respiratory center or the heart. The blood pressure remains constant. The patient comes to the operating room calm, a big help in toxic goiter cases. There is perfect anociassociation. The patient is able to talk during the operation and never loses consciousness. This is a big factor in operating on thyroids as the danger of injuring recurrent laryngeal nerves is markedly lessened. There is less hemorrhage in this type of anesthesia. Breathing is regular, and there is no collection of mucus in the throat or coughing. The patient is longer without pain. When seen in the ward in the evening the patients will say that they haven't any pain. There is much less nausea and vomiting. I am indeed indebted to Dr Gwathmey for his help in developing our technic of synergistic analgesia.

DR LYLE G MCNEILE, Los Angeles. While for a normal delivery or a cesarean section the agent need only be capable of maintaining its effect in the upper level of third stage anesthesia, for a breech extraction anesthesia must be pushed to the second level, while version and vaginal hysterotomy require that the patient be brought down to the third level of third stage anesthesia. Again in obstetrics there exist as constant factors a

rise in the basal metabolic rate during labor, pain and emotional excitement, each of these directly influencing the physiologic effects of nearly all the anesthetic agents. Finally, in obstetric anesthesia one must consider not only the effect of the particular anesthetic agent used on the individual to whom it is given but also the immediate and remote effects on the child. In my opinion these varying demands, the physiologic factors influencing the action of the various anesthetic agents used in obstetrics and the limitations of these same agents are responsible for the wide variations of opinion regarding the choice of anesthesia. My associates and I have used rectal ether and oil, or some modification, since its introduction by Gwathmey and Davis. It is used in both the outdoor and indoor services. First given according to the original technic described, we soon discontinued the use of magnesium sulfate as having no noticeable effect. Later we substituted dial-Ciba for the morphine, with increasingly satisfactory results. More recently we have been using pentobarbital sodium and scopolamine instead of the original morphine and magnesium sulfate. Amnesia has been greatly increased. I regard the method after many years of trial under varying and often adverse conditions as entirely safe and one to be highly recommended for general use.

DR JOSEPH B DE LEE, Chicago. It seems to me that it is much more sensible to anesthetize that portion of the patient on which one is going to operate than to desensitize the whole patient. The two elements in successful anesthesia are the mind and the body. In topical anesthesia the anesthetizer and the anesthetic are one, and this one should compose both the mind and the body of the patient. Mind treatment is essential in all anesthesia. I might say that Dr McNeile would get better results with his local cesarean sections if he used mind treatment, in fact, that is a large part. If completely painless labor is the goal, every woman must be delivered under ether or gas by cesarean section or possibly by local anesthesia after her mind is treated. If the woman is to be delivered from below the labor must have been present long enough to be thoroughly established, so that the anesthetics will not stop the process of delivery. Is there any anesthetic that will allow all pain to be safely abolished from this point? No there is not. The barbiturates, morphine, dilaudid, chloroform, scopolamine, cyclopropane, tribrom-ethanol, all increase the mortality and morbidity of labor for mother and baby. They prolong the first stage, they increase the necessity for operative intervention, and the deep anesthetics under which nearly all babies are delivered nowadays cause asphyxia, postpartum hemorrhage and bronchitis, which may lead to local infections or pneumonia or to something worse. But I hasten to add that analgesics and anesthetics given properly actually reduce the dangers of labor. First, they help the mind, and labor is not such a deep psychic insult on impressionable persons, secondly, they prevent premature and harmful intervention by the doctor. He is therefore not affected by the cries of the woman and the importunities of her relatives. He allows the labor to take a more natural course. A high head comes down into the pelvis, the cervix is permitted to dilate fully, and the doctor is not precipitated into action. I believe that physicians should not aim at a completely painless delivery but should administer analgesics and anesthetics freely in the first stage, and, in the second stage, effect a delivery under ethylene gas or preferably local anesthesia. Throughout, and beginning during pregnancy, the mind should be brought into a psychologically normal condition.

DR CARROL J FAIRO, Cincinnati. I should like to ask just two questions of Drs Gwathmey and McCormick. What has been their experience with proctitis after rectal ether instillation? Secondly, I notice that otologists are now very suspicious of large doses of quinine having some effect on the hearing apparatus of the new-born child. I should like to ask what their reaction is to this complaint of the otologists.

DR H F BECKMAN, Indianapolis. I think that the picture portrays the results obtained by rectal ether analgesia better than words can relate. Its safety is a great factor. The dose of ether used, 2½ ounces (75 cc.), I do not think any one would challenge as a toxic dose, and it will not be repeated until again demanded or required. I believe that using the patient as the index for the degree of suffering is certainly appropriate and practical. No one in this presentation has considered the child. There is no specified time to direct the physician or to explain

what is depressed breathing or delayed breathing in the newborn child. There is a certain amount of depression in all births for the child. This manifests itself either as asphyxia or as shock. I have recently had reviewed about 870 cases for this principle. The criterion of asphyxia and depressed respiration was not clearly analyzed, but out of this number it was decided that morphine and scopolamine were the greater depressants manifesting themselves on the child in about 30 per cent of the cases. I think that Shute and Drury of the Chicago Lying-in Hospital showed that the greatest effect of morphine manifests itself on the child during the third hour. Hence in administering these drugs it is wise to observe this time limit. With ether, however, this depressing effect was not observed. This was present in only perhaps 8 per cent of the cases. Hence I like the result obtained by this method and feel that it can be recommended as regards its safety for both mother and child.

DR MABEL H. OTIS, Moline, Ill. The biggest problem in obstetrics was defined by Dr DeLee when he said it is the mental treatment. It is the fear with which this supreme effort is approached. If that could be relieved, the anesthetic would not be a matter of utmost importance.

DR. WESLEY BOURNE, MONTREAL. Vinyl ether would seem to be more useful to general practitioners than to those obstetricians who have the facilities for indulging in the better anesthesia which a large clinic should afford. Vinyl ether would seem to offer an opportunity for replacing the much more dangerous chloroform. It is equally rapid in its action, or rather more so, one or two inhalations of vinyl ether vapor are sufficient to relieve the pains of labor. Almost any one can give vinyl ether with much greater safety than when chloroform is given even with special care. Chloroform should be banished and relegated to a historical position.

DR. C. O. McCORMICK, Indianapolis. I recommend the use of rectal ether as a basic analgesic before cesarean section, especially if the section is done under local anesthesia. If inhalation anesthesia is employed, whether ether or one of the gas anesthetics, approximately only half the usual amount is necessary. Because of the narrow margin of safety, chloroform should never be used in conjunction with rectal ether. While formerly there was an occasional rectal irritation following rectal ether, since substituting a 5 to 10 per cent (1 heaping tablespoonful to 1 quart of water) sodium bicarbonate enema for the soapsuds enema, its occurrence has been greatly minimized. As to the auditory effect of the quinine on the infant, I cannot cite figures to bear one way or the other. I know of one authority who reports 1,000 cases in which he uses 30 grains (2 Gm.) of quinine per instillation, repeating as indicated. That the risk is quite light is evidenced by absence of increased deafness in the South, although countless malaria-infected expectant mothers partake freely of large quantities of quinine. No case of auditory injury in the child has come to our attention. By carrying the patient far into active labor under the influence of pentobarbital sodium, quinine can be wholly omitted without disadvantage.

DR. JAMES T. GWATHMEY, New York. Ether by inhalation is absolutely contraindicated for tuberculous patients. I have given ether by rectum, 2½ ounces (75 cc.) three times a week for six months to a tuberculous patient with the idea that ether given in that way might affect the tubercle bacillus. It had no effect, either good or bad, so I discarded it although the patient seemed to think it did her lots of good. Her chart showed no change whatever. I have given it by rectum to patients with heart disease with no bad effects. Lundy of the Mayo Clinic has stated that, if the patient has one good kidney, he doesn't hesitate to give ether by rectum. Two and one half ounces of ether by rectum cannot be considered an anesthetic, it is an analgesic. The patient is never carried to the stage that an anesthetist is required. Even in a patient weighing 100 pounds (45 Kg.) it is an analgesic pure and simple. For that reason I think that it is perfectly safe.

Syphilis—Aortic aneurysm is the most frequent mediastinal tumor and may have no signs whatever. It is the part of wisdom to consider every patient known to have syphilis as a potential case of cardiovascular syphilis.—W. D. Reid quoted by Fisher, Alexander. *Aphorisms in Clinical Medicine* *Canad J Med & Surg* 77 166 (June) 1935.

THE USE OF BENZEDRINE FOR THE TREATMENT OF NARCOLEPSY

MYRON PRINZMETAL, M.D.

LOS ANGELES

AND

WILFRED BLOOMBERG, M.D.

BOSTON

Benzedrine (β -phenylisopropylamine) is a sympathomimetic compound closely related to ephedrine and epinephrine (fig. 1). Pharmacologic studies indicated that this compound has a more stimulating effect on the higher centers of the central nervous system than ephedrine, as manifested by its ability to awaken experimental animals from intraperitoneal barbituric anesthesia and by its insomnia-producing effect in human beings.¹ For this reason it was thought that it would be of interest to try this compound in clinical conditions in which this type of action would be desirable. Moreover, the compound seemed particularly suited for such application because of its low toxicity, its small cost and its prolonged action, as well as because of the fact that its side effects, such as stimulation of the peripheral sympathetic system, are not marked.²

Narcolepsy was chosen as the condition to be studied because the stimulation of the central nervous system induced by ephedrine has been found to be of therapeutic value in this disease.³ The effect of benzedrine in other neurologic conditions, especially certain forms of asthenia, is now being studied.⁴

Nine patients with typical histories of narcolepsy were selected for study. In all instances the disease was well established and the patients fell asleep at least three times a day. In seven instances cataplexy and other conditions associated with narcolepsy were present. Seven of the patients had been taking ephedrine in the usual therapeutic doses for a considerable period of time, but only one obtained complete relief from the symptoms. Five noticed some improvement, and one, no improvement.

Of the nine patients treated, four were hospitalized for more accurate control. Throughout the period of the experiment on these patients they were kept in ignorance of the medicine they were receiving and of the changes in the dosage, in order to rule out any psychic effect. Since both benzedrine and ephedrine, in aqueous solution, have a salty taste the patients were given physiologic solution of sodium chloride by mouth at the regular medication time when they were not taking either of the effective drugs. Careful record was kept, with the assistance and cooperation of the

Dr. Prinzmetal is National Research Council Fellow in Medicine. Benzedrine is the name in New and Nonofficial Remedies for an ephedrine like compound described as racemic desoxy nor-ephedrine or as racemic benzylmethyl carbinamine. It has been supplied under the names phenylisopropylamine and β -phenylisopropylamine.

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard) Boston City Hospital and the Department of Medicine Harvard Medical School and the Neurological Service Boston City Hospital the Department of Neurology, Harvard Medical School Boston, and the Department of Internal Medicine Washington University School of Medicine St. Louis.

1. Alles, G. A. and Prinzmetal Myron. Unpublished data.
2. Alles, G. A. The Comparative Physiological Actions of the di β Phenylisopropylamines I. Pressor Effect, *J. Pharmacol. & Exper. Therap.* 47: 339-354 (March) 1933. Alles, G. A. and Prinzmetal Myron. The Comparative Physiological Actions of the di β Phenylisopropylamines II. Bronchial Effect *ibid.* 48: 161-173 (June) 1933.

3. Jonata O. Symptomatische Behandlung der pathologischen Schlafsucht, besonders der Narcolepsie. *Med. Klin.* 27: 278 (1931). Doyle J. B. and Daniels L. E. Symptomatic Treatment for Narcolepsy. *J. A. M. A.* 90: 1370 (April 25) 1931. Narcolepsy. Results of Treatment with Ephedrine Sulphate *ibid.* 98: 542 (Feb. 13) 1932. Daniels L. E. *Narcolepsy* *Medicine* 12: 1 (Feb.) 1934.

4. Solomon P. and Prinzmetal Myron. Use of Phenylisopropylamine for the Treatment of Certain Forms of Asthenia and Related Conditions, to be published.

patient, of the number and duration of sleep attacks each day, as well as of attacks of cataplexy. At the start of each experiment, to establish a level and for a control, the patient was given physiologic solution of sodium chloride for a period of from three to seven days. Then for several days, varying doses of benzedrine (phenylisopropylamine hydrochloride)⁵ were administered, followed by equivalent doses of

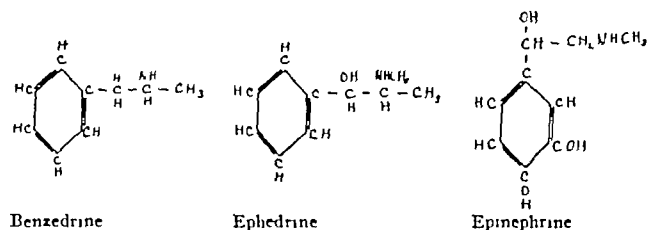


Fig 1—Comparison of chemical structure of benzedrine ephedrine and epinephrine

ephedrine sulfate⁶ for several days. Then, for a final period, benzedrine was again given.

The dosage of benzedrine varied from 10 mg once daily to 40 mg three times a day, depending on the age of the patient and the severity of the disease. The five ambulatory patients could not be so carefully controlled, but with them also benzedrine and ephedrine were alternated, without their knowledge of the change.

RESULTS

In all instances complete relief from the attacks of sleep, and practically complete relief from cataplexy, resulted when suitable doses of benzedrine were given (as shown in the table and in figure 2). On an average, this compound was approximately three times as effective as ephedrine. In four instances huge single doses of ephedrine, as high as from 80 to 150 mg, failed to give relief, while moderate doses of benzedrine, such as 30 mg, afforded complete relief from symptoms. In only one instance (case 8) did ephedrine prove as effective as benzedrine, in no instance did it prove more effective. No diminution in the effectiveness of benzedrine has been observed as a result of its use over comparatively long periods of time. Patient 2 has been taking this compound for fourteen months and still obtains complete relief from symptoms.⁷

UNTOWARD SYMPTOMS

In several instances the patients complained that, although they did not fall asleep during the day, they also could not sleep at night. This was remedied by giving a smaller or no evening dose. Patients 7 and 9 complained of hyperexcitability and marked restlessness and showed evidence of overstimulation of the central nervous system, as manifested by dilated pupils and inability to relax. Reduction of the dosage resulted in disappearance of these troublesome symptoms but still gave complete relief from the narcolepsy.

There appears to be some individual variation in response to benzedrine. In order to avoid untoward symptoms, therefore, it is best to start with small doses of 10 mg and gradually increase the amount until the optimal effect is obtained.

5 The benzedrine was kindly furnished by Dr Gordon Alles of Los Angeles and the Smith Kline and French Laboratories of Philadelphia, to whom we are indebted for their cooperation.

6 Ephedrine sulfate 1.25 mg is equivalent to benzedrine (phenyl isopropylamine hydrochloride 1 mg).

7 Dr William L. Long of Philadelphia has kindly informed us of a patient of his with narcolepsy who has received benzedrine with relief of symptoms. We have ourselves had four additional cases, not so carefully controlled or long enough followed to warrant inclusion in this study in which complete relief from narcolepsy has been obtained by the use of benzedrine.

CONCLUSIONS

1 Benzedrine has a profound stimulating action on the higher centers of the central nervous system.

2 In nine cases of narcolepsy complete relief of attacks of sleep, and practically complete relief of cataplexy, was obtained when suitable doses of benzedrine were given.

3 Comparative studies indicate that benzedrine is approximately three times as effective as ephedrine in preventing attacks of sleep in narcolepsy, and that in some cases it gives complete relief from symptoms that are not relieved by huge doses of ephedrine.

REPORT OF CASES

CASE 1—J S, a 26 year old Negro male student, had sleep attacks for one year. These occurred whenever he was quiet. There had been at least three sleep attacks daily. He had noticed occasional momentary spells of 'drawing up' of his leg muscles and had had occasional headaches. In 1918 he had influenza and probably encephalitis. In the past two years he had grown extremely rapidly. Physical examination showed obesity with female fat distribution. Otherwise the examination was essentially negative. The basal metabolic rate was -19 per cent and -22 per cent. The diagnosis was narcolepsy with cataplexy, ? postencephalitic. Previous treatment with thyroid extract had given only slight relief. Ephedrine, 25 mg three times a day, had given complete relief.

Experimentally, he was given benzedrine 10 mg three times daily, with complete relief. He stayed awake without any attacks of drowsiness or sleep, except on a few rare occasions when he neglected to take his medicine. Once, without his knowledge he was given a placebo instead of the benzedrine, and all his symptoms returned.

CASE 2—W L, a 21 year old white male student, had frequent sleep attacks for the past six years, so that his school work and athletic activities suffered. He had gained 30 pounds (136 Kg) in a relatively short time and had an insatiable appetite. He was well developed and slightly obese and had a stupid expression, which faded when he was stimulated by interest. The skin and hair were delicate, and there was absence of body hair. The neurologic examination was essentially negative. A roentgenogram of the skull, centered over the sella turcica, was negative. The basal metabolic rate was -23 per cent. The sugar tolerance curve was normal. The diagnosis was narcolepsy. Previous treatment with 250 mg

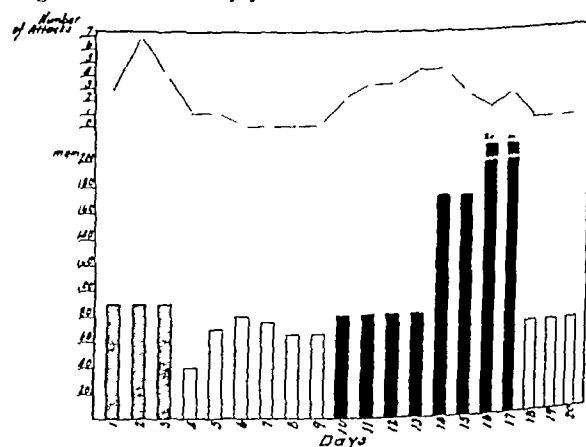


Fig 2—Comparative effect on number of narcoleptic attacks of benzedrine and ephedrine in case 9. Upper block shows number of daily attacks of sleep, lower block shows medication used and dosage. Shaded columns: physiologic solution of sodium chloride; white columns: benzedrine; black columns: ephedrine.

of thyroid extract daily gave only slight relief from symptoms. Ephedrine 25 mg every six hours during the day relieved him at first almost completely but after three months was only slightly effective.

Experimentally, benzedrine 20 mg daily gave complete relief from all symptoms. After fourteen months the same dose continued to be fully effective.

CASE 3—G McD, a 19 year old white male student, received a blow on the head in a football game three years before. That night he had an attack of momentary weakness of the legs and fell down. This was followed by attacks of drowsiness and sleep of gradually increasing frequency, until he was having about six attacks daily. He had also momentary generalized weakness whenever he laughed. He had had difficulty with his school work because of these symptoms. Physical examination and neurologic examination were essentially negative. Laboratory studies were negative. The diagnosis was narcolepsy with cataplexy, post-traumatic. Before he was seen by us the patient had taken ephedrine with moderate relief for a short time, followed by rapid diminution in its effectiveness until no relief was obtained.

During this study, he was given 75 mg of benzedrine daily, with complete relief from his sleep attacks and practically complete relief from his cataplectic attacks. He states that he

seven sleep attacks daily. On 90 mg of benzedrine daily for five days she fell asleep on only one occasion. For a period of eleven days she was then given ephedrine in gradually increasing doses up to 242 mg daily, and she fell asleep at least once every day. In a final four day period on 90 mg of benzedrine she fell asleep only once. Complete relief from cataplexy also resulted.

She has been seen since leaving the hospital and six months after beginning benzedrine treatment. She reports complete relief from both sleep attacks and cataplexy.

CASE 5—H M, an 11 year old white schoolboy, had sleep attacks for two years. He had slept all the time he was not actively occupied, also. He had failed his school work because, his teacher said, he could not keep awake. There had been no cataplectic attacks. Physical examination and neurologic examination were essentially negative. Blood and urine examinations were negative. The diagnosis was narcolepsy. Pre-

Comparison of Effectiveness of Benzedrine and Ephedrine in Entire Series of Nine Cases

| Case | Age | Sex | Duration of Disease | Cataplexy | During Experimental Period | | Effectiveness of Benzedrine | Time Followed | Estimated Ratio of Effectiveness of Benzedrine to Ephedrine | Comment |
|------|-----|-----|---------------------|-----------|----------------------------|----------------------------|---|---------------|---|--|
| | | | | | Sleep Attacks Daily | Daily Dose of Ephedrine Mg | | | | |
| 1 | 16 | ♂ | 1 yr | Yes | 3-6 | 92 | Complete relief | 1 month | ? | postencephalitic |
| 2 | 21 | ♂ | 6 yrs | No | 2-4 | 92 | Complete relief for one month then gradual decline, end of 3 months slight relief | 14 months | 4.5:1 | |
| 3 | 19 | ♂ | 3 yrs | Yes | 3-4 | 187 | Complete relief of sleep attacks, nearly complete of cataplexy | 4 months | 2.5:1 | Post traumatic, previously had taken ephedrine with moderate relief for short period followed by no effect |
| 4 | 24 | ♀ | 10 yrs | Yes | 3-6 | 244 | At least one sleep attack daily | 4 months | 2.5:1 | Had ephedrine before beginning this study at first with complete relief but soon began to fall asleep |
| 5 | 11 | ♂ | 9 yrs | No | 3-5 | 48 | At least one sleep attack daily | 4 months | 2:1 | |
| 6 | 34 | ♂ | 10 yrs | Yes | 2-5 | 187 | Only rarely a full day without an attack | 4 months | At least 5:1 | |
| 7 | 18 | ♂ | 3 yrs | Yes | 6-10 | | | 2 months | | Usual dose prevented night sleep and made him extremely irritable and anorexic |
| 8 | 14 | ♀ | 3 yrs | Yes | 3-6 | 92 | Rare attack | 4 months | 1:1 | The two compounds apparently equally effective |
| 9 | 21 | ♀ | 4 yrs | Yes | 3-6 | 244 | At least one attack daily | 2 months | 3.5:1 | Benzedrine at first caused irritability which later disappeared took ephedrine before experimental study at first found 65 mg effective but within a few months found 240 mg of ephedrine not completely effective and had to leave school |

can concentrate on his school work, which he is now successfully completing. He was given ephedrine experimentally, without his knowledge of the change. Single doses of 187 mg of ephedrine were necessary to keep him awake, smaller doses being unsuccessful.

CASE 4—R K, a 24 year old white female houseworker had sleep attacks for ten years occurring from three to six times daily. She also had generalized momentary weakness when she laughed. She had had to give up school because of her symptoms and was doing housework in a friend's home. Physical examination and neurologic examination were essentially negative. Blood, urine and roentgen studies were all negative. The basal metabolic rate had been —14 per cent, —18 per cent, —27 per cent and —25 per cent on different occasions. The diagnosis was narcolepsy with cataplexy. Previous treatment with thyroid extract made her feel better when awake but did not influence the number of sleep attacks. Solution of pituitary was also given, without effect. Ephedrine 100 mg daily, gave some relief but she still slept at least once every day, ephedrine relieved the cataplectic attacks completely.

The patient was hospitalized for study. During a control period on physiologic solution of sodium chloride she averaged

vious treatment with thyroid, 120 mg daily for three weeks, had no effect on his attacks. Sedatives did not relieve his symptoms.

For a control period he was given physiologic solution of sodium chloride and he slept from three to four times daily. He was then given benzedrine, 36 mg and later 24 mg daily, with complete relief from symptoms. When the dose was reduced to 12 mg daily for three days, he fell asleep once a day. On the following two days, during a vacation, he neglected to take any medicine and reported that he "slept all day." During the next eighteen days taking 24 mg of benzedrine daily, he did not sleep except on two occasions when he vomited his dose of medicine immediately after taking it. In the following five days he was given 30 mg of ephedrine daily and slept at least twice each day. For the next nine days he took 48 mg of ephedrine daily and slept at least once each day. Finally, in a period of two weeks on 24 mg of benzedrine, he slept only on two occasions when he neglected to take his dose on time. Eight months after starting treatment he reports that he has fallen asleep only when he has neglected to take his medicine. His teacher reports that he now stays awake in school and will be promoted this year.

CASE 6—H G B, a white man, aged 34, an office worker, had sleep attacks from two to five times daily for the past ten years. He had also had frequent spells of generalized momentary weakness. These attacks of sleep so interfered with his work that he had to give it up. He was unable to concentrate and thought that his memory was failing. An embryoma of the testicle was removed three years before, but there had been no evidence of recurrence or metastasis. Physical examination was essentially negative except for the absence of one testicle. Neurologic examination showed slightly irregular pupils but was otherwise negative. The basal metabolic rate was -17 per cent and -16 per cent. The sugar tolerance curve was normal. Lumbar puncture and skull roentgenograms were negative. The diagnosis was narcolepsy with cataplexy. Ergotamine and caffeine had both been tried experimentally, with no effect. He was given ephedrine 150 mg daily but this was not completely effective since only rarely did he go a whole day without a sleep attack.

Experimentally he was given benzedrine 10 mg daily. He reports that he has had complete relief from all symptoms.

CASE 7—B A, an 18 year old white male student, had from six to ten sleep attacks daily for three years. He also had frequent spells of generalized momentary weakness when he laughed. He had stammered badly since the age of 6, when his handedness was changed from left to right. One sister had epilepsy, one brother stammered. Physical examination was essentially negative. Neurologic examination was negative except for stammering. Diagnosis was made of narcolepsy with cataplexy and strephosymbolic stammering. Atropine and pilocarpine were given with no effect on the narcolepsy.

The patient was hospitalized for study. When he was given 105 mg of benzedrine daily, his daytime sleep attacks were abolished but his night sleep was also interfered with. He became irritable and irascible and there was loss of appetite. On 40 mg of benzedrine daily these untoward symptoms disappeared and he had complete relief from sleep attacks and almost complete relief from cataplexy. He was seen four months after beginning treatment and reported complete relief except when he neglected to take his medicine.

CASE 8—E B, a 14 year old white female student, had a mild head injury three years before. Since then, she had from three to six sleep attacks daily. Whenever she laughed she suffered from momentary generalized weakness. On physical examination there was evidence of mitral stenosis. Neurologic examination was essentially negative. The red blood count was 3,000,000. Lumbar puncture was negative. The diagnosis was narcolepsy with cataplexy, ? post-traumatic, rheumatic heart disease, with mitral stenosis, hypochromic anemia.

The patient was hospitalized for study. During a control period, while taking physiologic solution of sodium chloride she averaged three sleep attacks daily. She was given benzedrine, 80 mg daily, and in a period of several days had only one sleep attack. Again on physiologic solution of sodium chloride she slept twice daily. She was then given ephedrine 115 mg daily, and in a period of a few days had one sleep attack. When again given benzedrine she had no daytime sleep attacks. There was also complete relief from cataplexy.

CASE 9—J C W, a 21 year old white female student, had had sleep attacks from three to six times daily for four years. She had also had momentary generalized spells of weakness associated with laughing. She had been forced to leave college in two successive years because she could not avoid falling asleep in class. Physical examination was essentially negative. Neurologic examination was negative except for ptosis of the right eyelid, which was congenital and familial. Laboratory examinations were negative. The diagnosis was narcolepsy with cataplexy, idiopathic ptosis. Previously, with ephedrine, she got fair relief, though she still fell asleep and had to leave school. She found at first that 65 mg of ephedrine daily was effective, but within three months she had to increase the dose and when first seen was taking from 195 to 250 mg daily and was still falling asleep at least once each day.

Figure 2 is a graphic record of the experiment in this case. The patient was hospitalized for study. During the control period, on physiologic solution of sodium chloride, she averaged four sleep attacks daily. She was given 65 mg of benzedrine daily and had no sleep attacks. She did, however, become

nervous and irritable, but this condition disappeared after two days. Then she was given gradually increasing doses of ephedrine, ranging from 82 to 242 mg daily, and she fell asleep at least once each day. During the final period, on 70 mg of benzedrine daily, she had no sleep attacks. She was seen five months after discharge from the hospital, and she reported that she was not having any sleep attacks at all. She very occasionally had an attack of cataplexy. She felt ready to try going back to college.

Clinical Notes, Suggestions and New Instruments

PAROXYSMAL VENTRICULAR FIBRILLATION

W LAWRENCE CAHALL M D GERMANTOWN PHILADELPHIA

Since ventricular fibrillation is practically always a terminal event, occurring just before clinical death, this case is of interest because of (1) the frequent attacks followed by recovery, (2) the effect of therapy and (3) an unusual electrocardiogram, which recorded one attack that lasted 120 seconds.

T C, a white man, aged 68, admitted to the Germantown Hospital, May 20, 1935, complained of repeated attacks of



Fig 1—A lead 1. Complete heart block with ventricular premature contractions. B lead 2. A short series of ventricular tachycardia. C lead 3. Frequent ventricular premature contractions with a longer run of ventricular tachycardia terminated in D.

unconsciousness. These had begun only three days before, although he had had occasional vertigo and increasing dyspnea for the past year. The past medical history was negative. Physical examination was negative except for moderate gen-

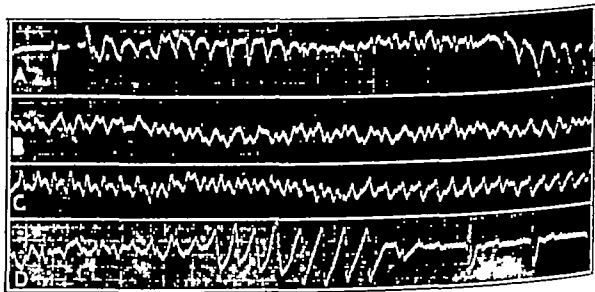


Fig 2—A the first QRS complex seen is followed by the onset of ventricular fibrillation. A continuous strip of lead 2 was taken. B is cut from a section twenty seconds later. C at sixty seconds and D at the termination of the attack passing from fibrillation to ventricular tachycardia and return to the dominant rhythm complete heart block. The entire episode measured 120 seconds.

eralized arteriosclerosis. Cardiac examination showed slight enlargement to the left. The heart sounds indicated poor muscular quality. A soft systolic murmur was heard at the apex. The blood pressure was 190-200 systolic, 100 diastolic. The heart rate was from 34 to 40 with frequent premature contractions. There were no signs of congestive failure. Ur-

analysis revealed a specific gravity of 1.022, a trace of albumin and numerous white blood cells. A blood count revealed slight polymorphonuclear leukocytosis. The Wassermann reaction was negative. Blood sugar and urea nitrogen were normal. Roentgenograms showed old fibrosis of the lung fields and slight cardiac enlargement.

During the first twenty-four hours he had eighteen attacks of ventricular fibrillation ranging from twenty to forty seconds. He would become ashen, his eyes would take on a fixed, glassy stare, respirations would cease, the pulse would disappear, no heart sounds could be heard over the precordium reflexes would be absent and there would be a loss in sphincter control. Then feeble rapid heart action could be detected becoming stronger, respirations commence and consciousness return and the heart would slow down to the usual rate of 32 to 36 per minute.

Figure 1 shows complete heart block with frequent ventricular tachycardia. Sedatives had no effect on lessening the frequency of the attacks, so on May 22, 5 minims (0.3 cc.) of epinephrine was given intramuscularly third hour. There was a prompt obliteration of the premature contractions that always preceded a paroxysm of ventricular fibrillation and cessation of further attacks. May 24, 2 grains (0.12 Gm.) of quinidine sulfate was given the fourth hour and May 25 and 26, 4 grains (0.24 Gm.) four times a day. Premature contractions reappeared and the paroxysms of ventricular fibrillation recurred, becoming more frequent and longer in duration. One attack was observed on the 26th, during which no heart action could be detected for over three minutes. Another was recorded as shown in figure 2.

The quinidine was stopped and 5 minims of epinephrine was again given every third hour, with prompt cessation of attacks after the first dose and were not repeated. Epinephrine was stopped June 1 and he was entirely free until his discharge from the hospital, June 8, in good condition. Further electrocardiograms showed no appreciable change in the complete heart block and only a rare premature contraction. He continued to do well at home, was stronger, had less dyspnea and no return of attacks until six weeks later, when he was found dead presumably in a final paroxysm. Autopsy was not obtainable.

COMMENT

There is a divergence of opinion in regard to the use of epinephrine, quinidine and digitalis in paroxysmal ventricular fibrillation.

Davis and Sprague¹ believe that a circus movement in the ventricles is responsible for the arrhythmia. When there is complete auriculoventricular dissociation, the slow rate of complete heart block is initiated by the idioventricular node. If frequent ectopic ventricular premature contractions are present, ventricular fibrillation may supervene. Both quinidine and digitalis depress intraventricular conduction time in the branch bundles and Purkinje fibers so the administration of these drugs increases the hazard in complete heart block.

Dock² reports a case which was initiated by epinephrine and controlled by quinidine. Kerr and Bender³ feel that quinidine was the causative factor in their case.

Other observers⁴ have been successful in controlling paroxysms of ventricular fibrillation by intramuscular injection of epinephrine. Levine and Matton⁵ report a case in which recovery followed the intracardiac injection of epinephrine.

On the other hand, Schwartz and Jezer⁶ believe that epinephrine is distinctly contraindicated since it enhances the

irritability of the ventricles and stimulates the idioventricular pacemaker. However, in their experiments no premature contractions were noted during the use of epinephrine. In the case here reported, each paroxysm was preceded by an increasing number of premature contractions.

Obviously no conclusions can be drawn from single cases, but from the clinical observations in this case epinephrine would seem to be indicated to abolish these ectopic beats and quinidine contraindicated if complete heart block is present.

Alden Park Manor

Special Article

FOOD, DRUG, THERAPEUTIC DEVICE AND COSMETIC LEGISLATION PENDING IN CONGRESS

A CRITICAL ANALYSIS OF THE PROVISIONS OF THE COPELAND BILL¹ RELATING TO DRUGS AND PROPHYLACTIC AND THERAPEUTIC DEVICES

By THE BUREAU OF LEGAL MEDICINE AND LEGISLATION, AMERICAN MEDICAL ASSOCIATION CHICAGO

The Federal Food and Drugs Act of 1906 was enacted nearly thirty years ago. Inherent weaknesses were recognized in it at that time, but there had been a long hard battle for even such legislation as was then in prospect and its proponents accepted the new act as the best they could get. Amendatory legislation, they hoped, would strengthen and supplement it. Some such legislation has been enacted in the long period that has elapsed since that time, but at the end of thirty years the act is recognized as an ineffective remedy for the evils that it was intended to cure and for others that have grown up.

Today a situation confronts us similar to that which confronted the proponents of federal food and drug legislation thirty years ago. The country is engaged in a struggle to procure the enactment of federal legislation adequate, when taken into consideration with the numerous other federal food and drug laws, to protect the people against fraud and against danger to health, inherent in the inadequately supervised and controlled manufacture and sale of foods and drugs, prophylactic and therapeutic devices, and cosmetics, so far as it lies within the power of the federal government to enact such legislation. Emulating the proponents of earlier legislation, the proponents of the legislation now pending, in their eagerness to procure its enactment, have made so many concessions to commercial interests, as distinguished from the interests of the consumer, that the prospect of effective legislation has been greatly diminished. There is grave danger of the enactment of an inadequate law—one that will not protect the consumer adequately, that will require expensive and prolonged litigation before it can be effectively enforced, and that may for another quarter century or more exclude from the statute books an effective law. The situation must be met now, by adequate amendments of the Copeland bill, or by the preparation of a new bill.

1 Seventy Fourth Congress S. 5 'An Act To prevent the adulteration, misbranding and false advertising of food, drugs, devices and cosmetics in interstate foreign and other commerce, subject to the dictation of the United States for the purposes of safeguarding the public health, preventing deceit upon the purchasing public and for other purposes.

1 Davis, David and Sprague, H. B. Ventricular Fibrillation Its Relation to Heart Block. *Am. Heart J.* 4: 559 (June) 1929.

2 Dock, William. Transitory Ventricular Fibrillation as a Cause of Syncope and Its Prevention by Quinidine Sulfate. *Am. Heart J.* 4: 709 (Aug.) 1929.

3 Kerr, W. J. and Bender, W. L. Paroxysmal Ventricular Fibrillation with Cardiac Recovery in a Case of Auricular Fibrillation and Complete Heart Block While Under Quinidine Sulfate Therapy. *Heart* 9: 269 (Dec.) 1922.

4 Phear, A. G. and Parkinson, J. Adrenalin in the Stokes Adams Syndrome. *Lancet* 1: 933 (May 13) 1922. Feil, Harold. The Use of Epinephrine in the Stokes Adams Syndrome. *J. A. M. A.* 80: 26 (Jan. 6) 1923. Parkinson, J. and Bain, C. W. C. The Adrenalin Treatment of Stokes Adams Disease. *Lancet* 2: 311 (Aug. 16) 1924.

5 Levine, S. A. and Matton, Marcel. Observations on a Case of Adams Stokes Syndrome Showing Ventricular Fibrillation and Asystole Lasting Five Minutes with Recovery Following the Intracardiac Injection of Adrenalin. *Heart* 12: 271 (March) 1926.

6 Schwartz, S. P. and Jezer, Abraham. The Action of Adrenalin on Patients with Complete Heart Block and Stokes Adams Seizures. *Am. Heart J.* 7: 632 (June) 1932.

Circumstances prevent an analysis of each of the nine bills now pending in Congress for the better regulation of the manufacture and sale of foods, drugs, devices and cosmetics. The outstanding bill is S 5, commonly referred to as the Copeland bill, it is sponsored by a senator who is a physician, it has passed the Senate, and it has been made the principal topic of discussion in the hearings held under the auspices of a subcommittee of the Committee on Interstate and Foreign Commerce of the House of Representatives. Because of its length and breadth, however, and its wealth of detail, it is impossible to give here a critical analysis even of that one measure in its entirety. This analysis will be limited, therefore, to the provisions of the Copeland bill that relate primarily to drugs and prophylactic and therapeutic devices. These are the provisions that are of primary import to the medical profession and unfortunately are probably the weakest in the bill.

Adequate standards of purity, wholesomeness and potency of foods, drugs, prophylactic and therapeutic devices, and cosmetics constitute the foundation of legislation to protect the people from fraud and from danger to health in the purchase and use of such merchandise. Adequate standards of frankness and truthfulness in labeling and advertising are likewise important. Without standards, compliance by the honest manufacturer, distributor and dealer is difficult, evasion by the dishonest is easy, administrative officers and the courts are embarrassed in their efforts to enforce the law, the cost of enforcement is increased, and the consumer suffers. So far as relates to drugs and prophylactic and therapeutic devices, the Copeland bill proposes no adequate standards.

SCOPE OF COPELAND BILL

The Copeland bill defines interstate and foreign commerce so as to make it cover not only interstate and foreign commerce, properly so called, but also commerce in the District of Columbia and the territories. The bill covers four classes of merchandise whenever and wherever they enter such commerce, namely, (1) foods, (2) drugs, (3) devices and (4) cosmetics. It proposes standards of purity and safety for foods, drugs and cosmetics, and regulations to govern the labeling and advertising of them and of devices. For foods, the Secretary of Agriculture is to be authorized to set up additional standards. For drugs, three private organizations are to have similar authority, namely, the United States Pharmacopoeial Convention, Inc., the American Institute of Homeopathy, and the American Pharmaceutical Association.

STANDARDS FOR DRUGS AND DEVICES

The Copeland bill proposes to set up certain standards of purity and potency for drugs. It proposes no standards for the soundness and potency for what the bill dominates as "devices." The labeling and advertising requirements with respect to both of these classes of merchandise are identical, so far as they are applicable to one or to the other or to both. Drugs and devices, therefore, may be considered together.

"Drugs" and "Devices" Defined—For the purposes of the bill, the term "drug" and the term "device" are defined as follows:

Section 201 As used in this Act, unless the context otherwise indicates

(b) The term "drug," for the purposes of this Act and not for the regulation of the legalized practice of the healing art includes (1) all substances and preparations recognized in the

United States Pharmacopoeia, *Homoeopathic Pharmacopoeia of the United States*, or National Formulary, or any supplement to any of them, and (2) all substances and preparations intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in man or other animals, and (3) all substances, and preparations, other than food and cosmetics, intended to affect the structure or any function of the body. [2 3-19]

(c) The term "device," for the purposes of this Act and not for the regulation of the legalized practice of the healing art, includes all devices intended (1) for the use in diagnosis, cure, mitigation, treatment, or prevention of disease in man or other animals, and (2) to affect the structure or any function of the body. [2 20-25]

The foregoing definitions, it will be observed, are only "for the purposes of this Act," and "not for the regulation of the legalized practice of the healing art."

The phrase "not for the regulation of the legalized practice of the healing art" is used, according to the Senate Committee on Commerce,² "to make it clear that the bill is not a medical practices act and will not interfere with the practice of the healing art by chiropractors and others in the States where they are licensed by law to engage in such practice." Its full import is best understood when it is remembered that in certain states some practitioners are licensed on condition that they shall not use drugs and in some states chiropractors are limited in their practice to palpation and adjustments of the vertebrae and possibly of other tissues by hand only. If any practitioner holding such a limited license uses drugs or any chiropractor licensed to use only manual palpation and adjustment uses mechanical devices of any kind, he is guilty of violating the medical practice act and may be punished accordingly. The apparent purpose of the limiting phrase "and not for the regulation of the legalized practice of the healing art" is to prevent the law enforcement officers of any state from introducing in evidence the proposed federal definitions of "drug" and of "device" to show that a substance administered or prescribed by a supposedly drugless practitioner is in fact a drug, or to show that a device used by a chiropractor who is authorized to use only his hands is in fact a device and not a negligible incident to manual diagnosis and treatment. The limiting clause will therefore apparently tend to facilitate the fraudulent practice of drugless healing, favoring particularly chiropractic.

"Misbranding" and "False Advertisement" Defined and Prohibited—The Copeland bill proposes to penalize misbranded drugs and devices in interstate commerce and the dissemination of false advertisements of drugs and devices in interstate commerce and in the mail. The adequacy of these prohibitions depends on the meaning of the words "misbranded" and "false" as used in them.

"Misbranded" is defined by the bill as follows:

Sec 402 A drug or device shall be deemed to be misbranded—

(a) If its labeling is false or misleading in any particular. Any representation concerning any effect of a drug or device shall be deemed to be false under this paragraph if such representation is not supported by demonstrable scientific facts or substantial and reliable medical or scientific opinion.

Under the heading "False Advertisement," the bill says:

Section 601 (a) An advertisement of a food, drug, device, or cosmetic shall be deemed to be false if it is false or misleading in any particular relevant to the purposes of this Act regarding such food, drug, or cosmetic. Any representation concerning any effect of a drug or device shall be deemed to be false under

this paragraph if such representation is not supported by demonstrable scientific facts or substantial and reliable medical or scientific opinion

The limiting sentences in both of the foregoing definitions, it will be noted, have reference solely to representations concerning the effects of drugs or devices, as the case may be. Seemingly they are intended to limit the activities of the manufacturers and venders of unworthy and unfit drugs, notably the manufacturers and venders of quack medicines. As a matter of fact, however, when interpreted in the light of the bizarre definitions of the terms "medical opinion" and "scientific opinion" embodied in the act, and as construed by the Senate Committee on Commerce, they open the door wide for fraud and danger. When it is proposed that a representation concerning the effect of a drug or device shall be deemed to be false if it is not supported by demonstrable scientific facts or substantial and reliable medical or scientific opinion, it is clearly implied that such a representation is not to be deemed false but is to be deemed true if it is so supported. And the language of the bill is such that such a representation need be supported only by (1) demonstrable scientific facts or (2) substantial and reliable scientific opinion, or (3) substantial and reliable medical opinion. In other words, even though representations concerning the effect of a drug or device are not "supported by demonstrable scientific facts," and even though they may be disproved by such facts, they are, for the purposes of this bill, to be accepted as true if they are supported by "substantial and reliable scientific or medical opinion" as that term is defined by the bill, a matter that will be discussed later. In the end, a lay jury will in contested cases judge the weight of the evidence and determine whether any of the medical or scientific opinions offered in evidence are "substantial and reliable." Obviously, the results will be uncertain.

Moreover, the bill seems to throw the burden of proof on the government, for the defendant is entitled to the presumption of innocence and before he can be convicted it must be shown beyond a reasonable doubt that a representation that he has made concerning the effect of a drug or device and that the prosecution alleges is false is not supported by demonstrable scientific facts or by substantial and reliable scientific or medical opinion. The difficulty and expense of successful prosecutions under such conditions can easily be seen. The proof of a negative is notoriously difficult, it may easily be impossible in cases arising under the foregoing provisions of the Copeland bill, if the construction placed on them by the Senate Committee on Commerce is accepted, for as construed by the committee any such representation supported by the opinion of any "numerically significant group of competent and reliable practitioners or qualified scientists, including recognized experts in the field in question," is not to be deemed false.³ How numerous a group must be before it becomes "numerically significant," the committee has not said. Presumably, however, there may be numerous "numerically significant groups" in any state, territory or other jurisdiction.

The difficulty of obtaining a proper judgment under this bill as to the truth or falsity of any representation concerning the effect of a drug or device is increased by the attempts made in the bill to define arbitrarily the terms "scientific opinion" and "medical opinion."

"Scientific Opinion" Defined—For the purposes of the bill, "scientific opinion" is limited to "the opinion, within their respective fields, of competent pharmacologists, physiologists, or toxicologists." The opinions of biologists, chemists, physicists and psychologists, and of experts in all branches of these sciences and arts, are to go for naught as "scientific opinion" unless the witness whose evidence is proffered dubs himself or is dubbed by others as a "pharmacologist," a "physiologist" or a "toxicologist."

'Medical Opinion' Defined—In contradistinction to the foregoing narrow definition of "scientific opinion," the definition of the term "medical opinion" opens a wide field.

The term "medical opinion" means the opinion within their respective fields of the practitioners of any branch of the medical profession the practice of which is licensed by law in the State or Territory where any drug or device, to which such opinion relates is held, sold, or distributed.

The meaning of this definition is hidden in the bill's arbitrary definition of the seemingly simple term "medical profession," for the bill provides

The term "medical profession" means the legalized professions of the healing art.

Unfortunately, the bill leaves us in the dark as to what it means by the phrase "the legalized professions of the healing art." According to the Senate Committee on Commerce—

The definitions of "medical profession" and "medical opinion" in paragraph (k) [sic] are intended to effect a definite recognition of all branches and divisions of the healing art which are licensed by law in the various States and Territories, and to provide that statements concerning the effect of drugs and devices shall be judged on the basis of the opinion of the branch of the healing art in accordance with the teachings of which they are offered. It is further intended that the laws governing medical practice of the State or Territory in which the drug is to be distributed shall prevail in determining whether the opinion of any particular branch of the healing art may be resorted to in the trial of issues arising under this act. The definition as so drawn recognizes fully the right of the States to determine for themselves, through their control of medical practice, the character of representations made for drugs and devices coming from interstate commerce for distribution within their own borders.⁴

The term "medical opinion" seems to mean, then, wherever it appears in the Copeland bill, the opinions not only of doctors of medicine and of dentists, pharmacists and registered nurses but the opinions also of chiropractors, osteopaths, naturopaths, optometrists, chiropodists and midwives, and in some states of other practitioners according as one or another class is licensed by the laws of the state. Just how the court is to determine whether any particular drug or device is or is not within the field of any one group, or in the fields of two or more of them, and how the jury is to determine what constitutes substantial and reliable "medical opinion" when a drug or device may be within the fields of two or more such groups, are problems that the bill leaves to the courts, to solve as best they can.

The situation with respect to the misbranding of drugs and devices and the false advertising of drugs and devices may be summed up as follows. A drug or device is to be deemed misbranded if its labeling is false or misleading in any particular, and an advertise-

³ Seventy Fourth Congress S Rep 646 p 6

⁴ Seventy Fourth Congress S Rep 646 p 2

ment of a drug or device is to be deemed false if it is false or misleading in any particular relevant to the purposes of the act regarding such drug or device, except that no representation concerning any effect of a drug or device is to be deemed false if it is supported by demonstrable scientific facts, or substantial and reliable scientific opinion, or substantial and reliable medical opinion. A representation that finds support from any one of these sources is not to be deemed false, no matter how thoroughly it may be discredited by evidence from the two other sources named in the bill. Scientific opinion is to be limited to the opinions of pharmacologists, physiologists and toxicologists. Medical opinion is to include the opinions not only of doctors of medicine and of dentistry, pharmacists, and nurses and licensed chiropractors but also of osteopaths, chiropractors, naturopaths, optometrists, midwives and possibly others concerning any drug or device that lies within the field of practice that the witness is authorized by law to pursue. The scientific opinion and the medical opinion sufficient to support any representation and save it from being legally false is not the preponderance of scientific opinion or medical opinion throughout the United States or even within any one state but is, in any state or territory nothing more than the opinion of any "numerically significant group" within that particular state or territory.

Tracing our way back, then, through the maze of definition and subdefinition embodied in the Copeland bill, we find that no matter how effectively a representation concerning the effect of a drug or device is disproved by scientific facts and opinions such disproof will not prevent the use of that representation in advertising and labeling, for the exploitation of that drug or device when it is sold in interstate and foreign commerce in any state, the District of Columbia or any territory, in which the misrepresentation is supported by the opinions of any "numerically significant group" of "practitioners of any branch of the medical profession," be they doctors of medicine, dentists, pharmacists, midwives, physiotherapists, optometrists or osteopaths, within their respective fields of licensed activity. So-called medical opinion, as it varies from time to time and from place to place in our fifty-four states, territories and other primary jurisdictions, is to determine what constitutes "misrepresentation", and the manufacturer, distributor, dealer and consumer, and even the prescribing physician, must discover what that opinion is from day to day as best he can, at his own peril. But so long as a drug or device has the approval of any proper numerically significant group in a jurisdiction, it can lawfully be sold in that jurisdiction, in interstate commerce, no matter what the opinions of other equally or even more significant groups in the same community and throughout the world may think.

Misbranding That Injures or Kills Only by Delaying Treatment Is to Be Tolerated—The insufficiency of the standards proposed by the Copeland bill with respect to the labeling and advertising of drugs and devices is aggravated by the following provision in the bill

Sec 402 A drug or device shall be deemed to be misbranded—

(b) If it is dangerous to health under the conditions of use prescribed in the labeling or advertising thereof

It must be rare, indeed, that a manufacturer, distributor or vender of quack medicines and devices cannot phrase the directions for use that he inserts in his

labeling and advertisements so as to prevent his nostrum or device from being directly and positively "dangerous to health under the conditions of use prescribed in the labeling or advertising." With negative danger, as we shall see, injuring and killing by delaying proper treatment, the foregoing provisions of the Copeland bill are apparently not concerned.

Some protection is afforded by the requirement that, if a medicine contain any one or more of certain named habit forming drugs, the label shall declare that the medicine "May be habit forming." As an additional safeguard the bill proposes to require that the name of each active ingredient of a medicine, although not the proportions of each of the ingredients, be stated on the label. It proposes to require also that the labeling of any drug or device contain complete and adequate directions for use and adequate warnings against (1) use in particular conditions, (2) use by children, and (3) excessive or prolonged use and unsafe methods or dosage. But no such warning and information need be embodied in any advertisement.

On the other hand, the bill proposes to forbid the incorporation, in any advertisement of any drug or device, of representations as to its therapeutic effect in the treatment of Bright's disease, cancer, tuberculosis, infantile paralysis, venereal diseases, and heart and vascular diseases, but apparently representations of such therapeutic claims may be freely made in the labeling, if supported in the manner already described. Even the prohibition of the publication of therapeutic claims in advertisements does not apply in the case of the retail dealer who disseminates "in good faith" any advertisement, no matter how false it may be, offering for sale at his place of business any article that he does not distribute or sell in interstate commerce.

The language of the Copeland bill, set forth in the foregoing, has been given a most unhappy, unfortunate and unexpected meaning by the Senate Committee on Commerce. Unfortunately, the construction that the committee placed on the bill was made in such a way as to render it possible for it to be consulted and relied on by the courts, if doubt is thrown on the intent of Congress with respect to these particular provisions of the bill. The bill proposes, as has been pointed out, penalties for the introduction into interstate commerce of any misbranded drug or device, for the misbranding of any such drug or device in interstate commerce and for the receipt in interstate commerce of any drug or device so misbranded, and it provides for the seizure of any such misbranded drug or device. According to the Senate Committee on Commerce, however, these provisions of the bill are not to be construed to prevent such misbranding of drugs and devices as are calculated to injure and kill only by causing delay in the adoption of rational methods of treatment. Neither the bill nor the report of the Senate Committee on Commerce that accompanied it, May 22, 1935,⁵ gave any clue of this limitation on the meaning of the language quoted. On May 28, 1935, however, the chairman of the Committee on Commerce, Senator Copeland, asked and obtained the unanimous consent of the Senate to amend the report of the committee as previously filed and printed, by inserting the following

Much criticism has been launched at this provision on the ground that it applies to innocuous drugs for which extravagant therapeutic claims are made and which thus indirectly impair the patient's chance of recovery through his postponement of

*proper methods of treatment The language does not relate to such products It applies only to potent drugs which are per se harmful unless properly administered*⁶

In order that there might be no possibility of misunderstanding regarding the matter, the report of the committee was at the same time amended by striking from the following paragraph in the original committee report the language reproduced in italics

It is intended that the Government shall have authority to proceed with multiple seizures against any adulterated product. It is likewise intended that the Government may make multiple seizures of any misbranded product, whether it is per se poisonous or not, if it is misbranded in such a fashion that imminent danger to the health of the consumer is involved. *Such danger might result from improper or insufficient directions for use of a potent drug, it may also follow the misbranding of an innocuous drug with false claims for a serious disease, which induce the patient to delay effective treatment until too late. In the latter example, the product of itself, if honestly sold, would not in any way endanger health but even though it is innocuous, it may very definitely endanger health through misrepresentations made for it*

The amending of the report of the Senate Committee on Commerce in the manner stated, with the full knowledge of the Senate itself, may not unreasonably be construed by the courts as indicating an intent on the part of the Senate that, except so far as the bill proposes to forbid advertisements for the treatment of certain named diseases, it shall not interfere with the labeling and advertising of "patent" and proprietary medicines and devices that are misleading as to the effects of such medicines and devices, so long as they do not harm directly but aggravate disease and injury and hasten death only by leading the patient to refrain too long from seeking proper treatment. In other words, labeling and advertising that recommends the use of a drug or device not inherently dangerous, for the relief of cough, with lassitude and diminishing weight, is not to be forbidden, even though its use may delay diagnosis and rational treatment and end in death from tuberculosis. A drug, not in itself inherently dangerous, may, under the provisions of this bill as construed by the Senate committee, be lawfully labeled and advertised for the scattering of "lumps in the breast," although by its use diagnosis and rational treatment are delayed and the patient dies of cancer when an early operation would have saved her life.

Pharmacopoeial and Formulary Standards Optional and of Doubtful Validity—If the provisions of the Copeland bill are unsatisfactory so far as they relate to drugs and devices generally, those that relate specifically to drugs of what may be termed official types, such as those covered by the United States Pharmacopoeia and the National Formulary, are no better. Those provisions are based primarily on the proposed statutory definition of the term "official compendium." The bill defines that term as follows:

Section 201 As used in this Act, unless the context otherwise indicates

(m) The term "official compendium" means the United States Pharmacopoeia, Homeopathic Pharmacopoeia of the United States, National Formulary, or any supplement to any of them, official at the time any drug to which the provisions thereof relate is introduced into interstate commerce.

This proposed definition, if adopted, will introduce two standards for drugs not now recognized by law, namely, (1) the Homeopathic Pharmacopoeia of the United States and (2) "supplements" to the United States

Pharmacopoeia, the Homeopathic Pharmacopoeia of the United States and the National Formulary

So far as is known, the fact that the Food and Drugs Act of 1906, for the past thirty years, has not officially recognized the Homeopathic Pharmacopoeia has caused no trouble. No edition of that pharmacopoeia has been published since 1914. What motivates the proposed recognition now of such an archaic volume it is impossible to understand. The situation is not improved by the provision that an agency, not named in the bill, but easily identified as the American Institute of Homeopathy, is to be authorized to publish from time to time "supplements" to this pharmacopoeia.

After having defined the term "official compendium," the bill proceeds to establish standards for official drugs.

Section 401 A drug shall be deemed to be adulterated

(b) If its name is recognized in an official compendium, or if it purports to be a drug the name of which is so recognized and it differs from the standard of strength, quality, or purity as determined by the tests or methods of assay set forth therein, except that whenever tests or methods of assay have not been prescribed therein, or such tests or methods of assay as are prescribed are insufficient, for determining whether or not such drug complies with such standard, the Secretary is hereby authorized to bring such fact to the attention of the *appropriate body charged with the revision of such compendium* and if such body fails within a reasonable time to prescribe tests or methods of assay which are sufficient, then the Secretary may prescribe for the purposes of this Act such tests or methods of assay by regulations as provided by sections 701 and 703. *No drug shall be deemed to be adulterated under this paragraph because it differs from the standards of strength, quality, or purity therefor set forth in an official compendium, if its standard or [sic] strength, quality, and purity be plainly stated on its label*

This attempt at the establishment of drug standards gives rise to two questions. 1. Has Congress the right to delegate to unnamed publishers of the volumes that it designates as "official compendiums," and to unnamed publishers of "supplements" to such volumes, the right to fix legal standards for drugs, binding on every one throughout the United States? 2. Of what legal effect are the standards proposed by the bill, since every one is to be at liberty to adopt any standards of strength, quality and purity for any drug named in the pharmacopoeia or formulary, provided only that he states his private standards on the label?

Attempted Delegation of Legislative Authority—Has Congress the right to delegate to unnamed publishers of the volumes that it designates as "official compendiums," and to unnamed publishers of "supplements" of such volumes, the right to fix legal standards for drugs, binding on every one throughout the United States? One of the so-called compendiums the standards of which, present and future, it is proposed to adopt as legal standards, is the United States Pharmacopoeia. It is published by a private corporation, the United States Pharmacopoeial Convention, Inc. Another, the Homeopathic Pharmacopoeia of the United States, is published by another private organization, the American Institute of Homeopathy. The third, the National Formulary, is published by a private organization, the American Pharmaceutical Association. Nowhere in the bill does the name of any of these organizations appear. They are referred to severally only as "the appropriate body charged with the revision of such compendium," but the bill nowhere charges anybody with any such duty. The bill imposes no limit on the right of the publishers of these compendiums to make and alter standards at pleasure, except that the Secretary of Agriculture may prescribe tests or methods of assay and packaging, if

after due notice the publishers fail to correct what he believes are defects in the tests or methods of assay and packaging previously prescribed by them. The bill lays down no lines of separation between the jurisdictions of these three organizations. It imposes on none of them any obligation to give notice of the proposed establishment of standards or of changes in existing standards, or to give hearings, or to publish in any prescribed manner or at all the standards prescribed.

The legal aspects of such an attempted delegation of ill defined legislative authority to unidentified agencies can hardly be discussed here, but such a delegation is believed to be clearly unconstitutional. The fact that the Food and Drugs Act of June 30, 1906, as amended, contains a similar provision, does not justify its incorporation in the Copeland bill. So far as is known, no serious attack on the standards in the present law has ever been made, but where attacks have been made on similar provisions in state food and drug acts, the courts have held, except in one instance, that the standards proposed in the state act in question were only those previously prescribed in the United States Pharmacopeia or the National Formulary and official at the time the act was passed. That a legislative body can lawfully incorporate in law standards in existence when the law is enacted is clear but that it cannot distribute among three unnamed private agencies an unrestricted authority to fix future standards, without the necessity of notice of hearing, or even publication, seems equally clear.

Of what legal effect are the standards proposed by the bill, since every one is to be at liberty to adopt any standard of strength, quality and purity for any drug named in the pharmacopeia or formulary, provided only that he states his private standards on the label? Possibly for the purpose of preventing a legal attack on the constitutionality of the privately made standards for drugs, proposed by the Copeland bill, the bill specifically provides that no body need comply with them, saying

No drug shall be deemed to be adulterated under this paragraph because it differs from the standards of strength, quality, or purity therefor set forth in an official compendium, if its standard or [sic] strength, quality, and purity be plainly stated on its label.

The foregoing provision, authorizing all manner of variations from what at first glance appear to be official standards, is intended, it has been suggested, to preserve the constitutionality of the attempted delegation of legislative authority. If it seems to accomplish that end, it probably does so only because it makes it worth no one's while to test the issue in court. Probably the existence of a similar exempting clause in the Food and Drugs Act of 1906 is a reason why the constitutionality of the delegation of legislative authority attempted in that act has never been tested in court.

It has been urged that too rigid standards for drugs would retard progress and that an exempting clause such as is here proposed is necessary to permit advances to be made. This argument seems to lose sight of the fact that, if the provisions of this bill are valid, there will always be three organizations that can give immediate effect to any improvement in drugs, without any formality whatever, by the simple process of issuing a "supplement" to any one of the so-called official compendiums. As the bill is written, it proposes to make every pharmacist in the United States, wholesale and retail, the sole judge, so far as his own products are concerned, of what constitutes an improvement or advance in pharmacologic and therapeutic technique. Finally, although the drug standards in this bill, relating

to such drugs as are covered by the pharmacopeias and formulary, will probably be declared unconstitutional as soon as the issue is raised, the bill makes no provision whatever whereby adequate standards may be set up by some duly constituted authority if such a situation should arise.

Labeling Requirements for Drugs Illogical and Inadequate—While the Copeland bill proposes no adequate standards for purity and potency of drugs, it prescribes requirements for labeling that in some cases are unnecessary and in others may do harm rather than good. The Food and Drugs Act of 1906 provides that drugs shall be deemed misbranded if the package fails to bear a statement on the label of the quantity or proportion of any alcohol, morphine, opium, cocaine, heroine, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate, or acetanilid, or any derivative or preparation of any of them (section 8, subsection "In case of drugs," paragraph second). The Copeland bill requires no such disclosure. It provides that if a drug is fabricated from two or more ingredients, the name of each active ingredient, including alcohol, shall appear on the label, unless the Secretary of Agriculture deems it impracticable, but it does not require that the quantity or proportion of the several drugs be stated. Obviously, the listing of the name of a potent, dangerous drug along with the name or names of one or more relatively innocuous drugs would give the purchaser no idea of the potency of the mixture. Innocuous drugs, under this bill, would probably be introduced into quack medicines for the sole purpose of using their names on the label to obscure the presence and effect of really potent drugs, like acetanilid or the barbituric acid compounds. The bill does contain a lengthy list of drugs the presence of which makes necessary a statement on the label that the drug or mixture "May be habit forming" but acetanilid and alcohol are not among the drugs so listed.

The general labeling requirements for drugs make no exception in favor of physicians' prescriptions, except that they authorize the omission of the warning phrase "May be habit forming." Even though adequate directions for use appear on the label, a physician's prescription, if it calls for a drug not designated solely by a name recognized in a so-called official compendium must be labeled so as to show the common or usual name of the drug, if there is any, and, unless the Secretary of Agriculture by special dispensation otherwise provides, if the prescription calls for two or more ingredients, the label must show the name of each active ingredient, including any alcohol it may contain. A container in which a pharmacist has dispensed a physician's prescription or any other drug whatever—even so innocent a drug as sodium bicarbonate—must be labeled so as to give "warnings in such manner and form as may be adequate against use in such pathological conditions or by children where its use may be dangerous to health, or against unsafe dosage or methods or duration of administration or application" and, unless the secretary deems directions for use unnecessary for the protection of the public health, the label must contain also complete and adequate directions for use. Whether the required directions for use are to be "complete and adequate" for the purposes of the immediate purchaser of the drug, or "complete and adequate" for all purposes for which the drug may possibly be put, the bill does not say. Apparently, if the Copeland bill should be enacted in its present form, a new and elaborate system of labeling all manner of

PROMULGATION OF REGULATIONS

The Food and Drugs Act of 1906 provides for the promulgation of regulations by a board consisting of the Secretary of the Treasury, the Secretary of Commerce and the Secretary of Agriculture (section 3). These three officers, through the resources of their respective departments, have access to all information necessary for the framing of such regulations as the act requires. The Secretary of the Treasury, through the Bureau of Public Health Service, is in touch with matters relating to public health, and the Bureau of Customs keeps him in touch with foreign trade. The Secretary of Commerce, through the Bureau of Standards, has access to the best and latest scientific information regarding standards and methods of assay, and the Bureau of Fisheries serve to keep him in touch with problems relating to manufacture and industry and with one aspect of food production. The Secretary of Agriculture has in his jurisdiction the Bureau of Animal Industry, the Bureau of Dairy Industry, the Food and Drug Administration and other agencies concerned with production and distribution of food and drugs.

The Copeland bill, however, proposes to break down this admirably organized board for the promulgation of regulations by eliminating from it the Secretary of the Treasury and the Secretary of Commerce. The bill proposes to set up, it is true, a committee on food standards and a committee on public health, appointed by the President, to assist in the promulgation of regulations. Without questioning the advisability of setting up a committee on food standards, it may well be pointed out that such a committee can cooperate just as effectively with such a board as now exists for the promulgation of regulations as it can with the Secretary of Agriculture alone. It must be frankly stated, however, that there seems to be no reasonable good to be obtained by the establishment of the proposed committee on public health, in the Department of Agriculture, independent of the recognized public health agency of the country, the United States Public Health Service, particularly at a time when the President has only recently felt called on to appoint a committee for the purpose of better coordinating and making more effective the health agencies that now exist.

ENFORCEMENT OF LAW

If the standards for drugs and the provisions with respect to the labeling and advertising of drugs and devices, laid down in the Copeland bill, are weak, that weakness is not likely to be offset by severity in the enforcement provisions of the bill. Probably in no other statute authorizing and providing for the punishment of crime has there ever been incorporated a provision specifically leaving to the discretion of the enforcing officer the determination whether he will or will not enforce the penalties that it provides without any reference even to any "offer in compromise" or other quasipunitive adjustment. The Copeland bill, however, says that—

Nothing in this Act shall be construed as requiring the Secretary to report for prosecution or for the institution of libel injunction proceedings, or civil penalty action minor violations of this Act whenever he believes that the purposes of the Act can best be accomplished by a suitable written notice or warning.

The standards by which the secretary is to determine whether a violation of the act is a "minor" or a "major" violation are not stated nor is the secretary required to state them in regulations. Whether he will or will

not institute prosecution in any case is left to his discretion in that very case, and he need give to no one his reasons for not prosecuting or make any record of those reasons. As the matter of instituting prosecutions or refraining from instituting them will not be passed on primarily by the Secretary of Agriculture himself but by subordinate officers in the Department of Agriculture, the danger of this provision is apparent.

The secretary must go through a long process, too, before venturing to initiate proceedings against any offender, except as relates to certain seizures that he is authorized to make. He must first serve or cause to be served on the supposed offender an appropriate notice and give to him an opportunity to be heard, and hearings must be conducted by the secretary of an officer or employee designated by him. Even after such a hearing and a tentative decision based on it, the secretary, before proceeding to prosecute, must report his tentative decision to the supposed offender and give him an opportunity to show cause why he should have a second hearing. Until after all this has been done, and until after a second hearing has been given, if the secretary believes that a second hearing is necessary, prosecution cannot be instituted.

The bill places a premium on a dealer's ignorance, when it provides that no dealer shall be liable to the fine and imprisonment prescribed by it, for having received in interstate commerce any article of food, drug, device or cosmetic and having "in good faith" sold it as received, unless he refuses to furnish on request the name and address of the person from whom he purchased or received such article and the documents pertaining to the delivery of the article to him. The dealer who remains ignorant of the quality of the goods that he sells and concerning the labeling and advertising of them can sell them "in good faith," even though they are in fact adulterated, misbranded and falsely advertised, and then avoid punishment by the simple expedient of furnishing, on request, the name of the person from whom he obtained such goods and the documents pertaining to their delivery. If a dealer takes the trouble to inform himself concerning the merchandise he handles, he will not be able lawfully to sell it. Furthermore, a dealer who is engaged in a retail business cannot lawfully be even prosecuted under this bill for the dissemination, "in good faith," of an advertisement offering for sale at his place of business any article which he does not distribute or sell in interstate commerce, although it is unlawful to disseminate similar advertisements in the mail, or in interstate commerce, by radio broadcast or otherwise, or by any means, for the purpose of inducing directly or indirectly the purchase of food, drugs, devices or cosmetics in interstate commerce.

Finally, it may be questioned whether the Copeland bill does not unduly restrict the dissemination of information by the Secretary of Agriculture concerning food, drugs, devices and cosmetics. The secretary must, it is true, cause to be published reports summarizing all judgments, decrees and court orders that have been rendered. Moreover, there is nothing to prevent the secretary from collecting, reporting and illustrating the results of investigations by the Department of Agriculture. The bill provides, however, that

The Secretary may also cause to be disseminated information regarding food, drugs, devices, or cosmetics in cases involving imminent danger to health or gross deception of the consumer.

Clearly, this implies that the secretary may not cause information to be disseminated regarding food, drugs,

devices or cosmetics, except so far as that information is derived from investigations by the Department of Agriculture, unless the danger to the health of the consumer is imminent or the deception of the consumer gross

On the whole, the Copeland food, drugs, devices and cosmetics bill is disappointing in its weakness. It has much in it to be commended, but the medical profession should lend its influence to bring about a rewriting of at least so much of the bill as relates to drugs and prophylactic and therapeutic devices, and possibly of other features. It is important that this be done not only because of the immediate effect of the enactment of the Copeland bill but also because that bill, if enacted, is likely to be adopted as a pattern for state legislation within the next few years, both its weaknesses and its strength. It is hoped, therefore, that through the efforts of the profession and of other agencies interested primarily in the welfare of the consumer, the hands of the Secretary of Agriculture will be strengthened and the health and pocketbooks of the people will be protected by an adequate reenforcement of the pending measure.

Therapeutics

THE THERAPEUTICS OF THE COOK COUNTY HOSPITAL

EDITED BY BERNARD FANTUS, M.D.
CHICAGO

NOTE.—In their elaboration, these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics, Dr. Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. The articles will be continued from time to time in these columns. When completed, the series will be published in book form.—ED

THE CAUSAL THERAPY OF CONTACT DERMATITIS

IN COLLABORATION WITH DR. THEODORE CORNBLEET

Eruptions due to chemicals may be the result of the internal administration of drugs, a condition known as medicinal dermatosis, or of direct application of the irritant to the skin, a condition also known as dermatitis venenata and which we shall speak of as contact dermatitis.

DISCOVERY OF THE IRRITANT

A contact dermatitis may be merely the usual reaction to a generally harmful agent, one capable of damaging any skin, or it may be due to an allergen, in the unusual reaction to which the altered reactivity (allergy) of the organism is of prime importance.

While it is usually not difficult to recognize the causal nexus between a generally harmful chemical agent and a resulting dermatitis, it is often hard to discover the allergen responsible for an allergic dermatitis, and obviously this is the most important step in the therapy.

The following method of study of a case is helpful in establishing a diagnosis of contact dermatitis and in detecting the agent responsible for it.

(a) *Distribution of the Lesions*—An eruption on those exposed parts which have the greatest opportunity for contact with an irritant speaks in favor of a contact

dermatitis. Nevertheless, covered parts may be involved, as when there is hypersensitiveness to articles of clothing or to cleansing agents remaining in the clothing, or when transference or dissemination of the irritant occurs. An example of such transference is to be seen in the localization of poison ivy dermatitis on the genitalia. Eruptions produced by internal causes are usually bilateral and often symmetrical.

(b) *The Morphology of the Lesions*—This may help in differentiation between a contact dermatitis and a medicinal dermatosis, in that the former is a simple dermatitis, often of vesicular nature, while the latter takes nearly every possible form except that of simple dermatitis.

(c) *The History*—To find the irritant or irritants responsible for the patient's dermatitis, a clear history of the patient's work, activities and environment is most important. The frequency with which the causal irritant is brought to light depends largely on the diligence and insight of the inquirer. A knowledge of the common irritants used in the various trades and vocations is of material aid. A list of probable or possible skin irritants that the patient is exposed to should be drawn up and the patient tested with these.

(d) *Materials for Reaction*—Almost anything at all may cause a contact dermatitis. Certain substances, however, are more prone than others to produce it. Such agents are most likely to be found among substances having a marked chemical affinity for the skin, thus, keratolytics and detergents and chemicals that have a great affinity for the horny layer of the skin, such as trinitrophenol (picric acid) or paraphenylene diamine (the black dye used for dyeing furs and shoes) or certain metallic salts, as the mercurials, and bodies that are more soluble in fat than in water, such as plant oils and certain alkaloids.

In addition to poison ivy there are many instances of summer dermatitis caused by contact with the leaf or wind borne pollen of other plants, particularly members of the ragweed family. These individuals are apparently sensitive to the lipid fraction of the plant and not to the protein portion. They usually do not have hay fever. In the literature there are several comprehensive lists of common irritants. The safest procedure is to take a careful history and ascertain those things to be suspected which are present in the patient's environment. These materials should first be tested and then others which are known commonly to produce sensitization may be added to them. It takes experience with the method to ferret out the less obvious irritants. But diligence here has its rewards. If the hypersensitivity is monovalent, the discovery of the irritant and its withdrawal will almost always give dramatic results. The dermatitis will improve promptly and spontaneously.

(e) *The Patch Test*—Squares of linen or cotton material about the size of a postage stamp, dipped in or moistened with the test substance in as nearly possible the concentration with which the patient comes in contact with it, are placed on the skin. If the substance is a solid, it should be dissolved in its suitable solvent, water, oil or alcohol. If the test material is an insoluble powder, it is moistened and placed on the skin and covered with the squares of linen. Leaves of plants should be as fresh as possible. A piece of impermeable material, such as cellophane, about four times as large, is put over the test squares and a

"frame" of adhesive plaster anchors all this to the skin. The transparent material is purposely made so much larger to permit differentiation, as nearly as possible, from irritation due to the adhesive plaster. If a few materials are under test, the flexor surface of the arms and forearms may be used. If a large number of substances must be tested, the back is a more convenient site. By arranging the patches in rows, as many as twenty tests may be made here at one time. The patches are left in place for twenty-four hours and then removed, unless the reaction due to their presence is so great and so uncomfortable that they must be removed sooner. Reactions are looked for at the time when the patches are removed and after forty-eight and seventy-two hours from the time of initial contact. Sometimes reactions may be delayed even for several days. Obviously a control patch should always be employed. If the patient is allergic to adhesive plaster, collodion may have to be employed to fasten the patch to the skin.

Interpretation—A positive reaction is denoted by the appearance on the tested area of an eczematous reaction. In other words, the reaction should resemble in appearance the dermatitis clinically present. Care should be taken not to confuse true reactions with pseudo-reactions such as those from adhesive plaster.

False Negative Reaction—If a positive reaction of the type clinically present should appear whenever a certain substance is used in a test, interpretations would indeed be easy. Unfortunately, reactions do not always appear, even if the patient is sensitized to the test substance. A negative reaction may result because the patient is temporarily desensitized by an acute reaction he has just had or because he has remained away from the excitant for some prolonged period of time. The sensitization may be localized, i. e., present in isolated areas, such as on the eyelids or even one eyelid—to eyelash dyes, while other skin areas may be insensitive to this eyelash dye and thus fail to react to it. The V of the neck may be a suitable area for patch tests with substances irritating the face. Sometimes a reaction depends on multiple influences that individually may not suffice to set up a dermatitis. An example of this is seen in the type of dermatitis that may follow exposure to the sun's rays after contact with certain grasses and shrubs.

In some cases, apparently, it is the interplay of heat and sweat, in addition to a specific sensitizing substance, that produces the dermatitis. At times it may be necessary to traumatize the skin somewhat, as by slight multiple scratches on the epidermis, in order to get the proper base for a positive reaction. Failure to appreciate these multiple factors may result in overlooking the cause. The reaction to a specific substance may depend on some other underlying sensitizing state. If this primary condition is removed, it will prevent the test substance from giving the positive reaction it should. An example of this is the dermatitis from leather or other substances when an eczematoid ringworm is present at the same time. When the eczematoid ringworm is cleared up, the individual fails to react to the leather or other substances. With the recurrence of the eczematoid ringworm, the subject again reacts to these excitants and they will then give a positive patch test.

The patch test is not of practical use in chronic lichenified eczema or disseminated neurodermitis, sebor-

rhic dermatitis, urticaria, angioneurotic edema or drug eruptions not of an eczematous character. In recent years dermatologists have come to recognize the complex character of the skin's immunity reactions. It is now known that the skin does not act as a unit throughout its thickness in responding to irritants, but rather through its several components. Each of these has the capacity to react independently with only indirect changes occurring in the rest of the skin. External irritants generally, but not always, affect the outer or epithelial portion, while constitutional or circulating materials in the blood or lymph usually act on the blood vessels, the corium or the subcutaneous layers. An allergic reaction takes place only when an allergen comes in contact with the sensitized tissue. If the deeper parts of the skin are sensitized as in urticaria (q v) the material under test must be injected into the skin or be introduced by scratching away the overlying epithelium, or even ingested to produce the reaction. On the other hand, if the epithelium itself is sensitized, injecting the material under test into the skin or by scratching the epithelium is apt to give a false negative reaction. As, on the other hand, the patch test may give a positive reaction also, with material, e. g., quinine to which the patient is hypersensitive on ingestion, the patch test should be the first one to be performed in the study of allergic dermatoses.

In noneczematous, presumably allergic, dermatoses, this test, if negative, should be followed by endermic and/or ingestion tests (see Urticaria).

False Positive Reaction—A positive patch test does not always mean that the material used to obtain it is the cause of the patient's dermatitis. The dermatitis that the patch test produces should be similar to that present clinically. The material used for the test should be shown to be present as a possibility in the patient's work or surroundings. There must then be an opportunity for contact, as brought out in the history. An individual that becomes sensitive to one substance often develops a sensitivity to others. These may be numerous. The positive patch test therefore may bring to light one of the substances the patient is sensitive to, but not necessarily the one responsible for the clinical condition present. To check up on this, the dermatitis clinically present must be shown to disappear after the material used for the positive patch test is withdrawn from the patient's work or surroundings. It may be necessary for the patient to come in repeated contact with the substance to develop a dermatitis from it. A negative patch test from a single application may in such a case yield a false result. For all these various reasons and others it takes exceeding care and watchfulness to evaluate properly the results of the patch test. It is, of course, necessary that in testing for skin allergy normally harmless concentrations of the test material be employed. Thus, soap will give a positive patch test on the skin of a normal person. For testing, an emulsion of soap must be made that is sufficiently dilute not to irritate normal skin.

PREVENTION OF EXPOSURE TO THE IRRITANT

Elimination of the substance or the substances that give positive skin tests helps in the cure of the skin disease and prevents its recurrence.

In occupational contact dermatitis it is not always necessary for the patient to give up his employment. The use of rubber gloves, for instance, may protect him

sufficiently. The accompanying formula is offered (James, 1934) as a protective film for persons susceptible to paints or varnishes with which they must work. This produces an invisible covering, soluble in water, nonirritating to the normal skin. The only difficulty with the preparation is that its water solubility makes it impossible to keep it on the skin when the skin perspires during hot weather.

In cases of obvious or suspected contact dermatitis in which the irritant cannot be discovered, removing the patient from his home and work may lead to a prompt recovery. If the condition reappears on return to the patient's accustomed surroundings, a painstaking analysis of the materials to which he is exposed and the

Protective Film

| | Per Cent |
|--------------------------|----------|
| Ivory soap flakes | 7.48 |
| Glycerin chemically pure | 26.40 |
| Sodium silicate | 24.20 |
| Tragacanth | 0.21 |
| Oil of lemon | 0.16 |
| Water | 41.60 |

patch test may lead to the ultimate discovery of the etiologic agent. Indeed, this "climatotherapeutic test" is useful for the discovery not only of a chemical but also of psychic as well as physical pathogens in a patient's accustomed surroundings.

REMOVAL OF PREDISPOSING CAUSE

Removal of the predisposing cause is chiefly a matter of lessening excessive perspiration and mechanical irritation. Persons who perspire freely are more apt to develop sensitization to external irritants. Excessive sweating is usually an evidence of weakness and it often has a background of overwork and exhaustion. These patients require some form of rest cure, mental, physical or both. If the patient is worn out by lack of sleep, he may need his insomnia (q v) taken care of. Obesity or anemia favor excessive perspiration and the treatment (q v) of these becomes of importance in this connection.

DESENSITIZATION

Desensitization is generally unsuccessful in contact dermatitis for the reason that simple chemical irritants, even when they become allergens, do not produce circulating antibodies. This is in marked contradistinction to such complex antibodies as food proteins and bacteria, which are capable of acting as antigens, producing antibodies. In general antigens are chemically akin to the assimilable foods.

In cases in which an antigen *i. e.*, a substance capable of producing the development of antibodies, is a cause of contact dermatitis, an attempt may be made at desensitization by injecting, for the purpose of immunization, ascending doses of the antigen secured in as pure a form as possible and prepared in the form of sterile highly dilute solution. An example of this method is found in the therapy of ivy poisoning (q v). Desensitization treatment in the case of other types of plant dermatitis has been frequently successful.

SYMPTOMATIC TREATMENT

Whether the cause of a dermatitis can be discovered or not, symptomatic relief is demanded. The details of this are given in connection with the therapy of eczema (q v).

As individuals may be allergic even to the ointment bases employed in treatment, the patch test should be employed to discover such hypersensitiveness when its possibility is suspected.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE.

HOWARD A. CARTER, Secretary

RADIOTHERAPY

(ROENTGEN RAYS, RADIUM)

ARTHUR U. DESJARDINS, M.D.
ROCHESTER, MINN.

BIOLOGIC CONSIDERATIONS

Each variety of cell in the body is specifically sensitive to roentgen rays or radium. Certain varieties of cells are extremely sensitive and are destroyed or injured by small doses, other varieties are resistant and can tolerate large doses with apparent impunity. This does not imply that a given dose of roentgen rays will destroy all cells of a given variety in the irradiated territory, because the sensitiveness of any kind of cell varies somewhat from cell to cell. It would be more accurate to say, therefore, that each variety of cell has a specific range of sensitiveness.

When cells of a given kind are exposed to a certain dose of radiation, some are destroyed, some are injured but regenerate later, and some do not show any deleterious effect. Such variation in the susceptibility of different cells of the same kind is probably due to the metabolic stage of the cells and perhaps to other unknown factors. Whatever the main reason for variation in the radiosensitiveness of different cells of the same variety may be, this does not affect the fundamental law of the specific sensitiveness of different varieties of cells, a law based on innumerable experiments on animals and substantiated by extensive clinical observation.

According to present knowledge, cells may be classified, in the order of the degree of their sensitiveness, as follows:

Lymphoid cells (lymphocytes in the spleen, lymph nodes, intestinal lymph follicles, circulating blood, bone marrow, thymus tonsil, and other structures in which such cells may be present).

Polymorphonuclear leukocytes and eosinophils in the blood or tissues.

Epithelial cells (1) basal epithelium of certain secretory glands, especially the salivary glands, (2) basal epithelium (spermatogonial cells) of the testis and follicular epithelium of the ovary, (3) basal epithelium of the skin, mucous membranes and certain organs, such as the stomach and small intestine, (4) alveolar epithelium of the lungs and epithelium of bile ducts (liver) and (5) epithelium of tubules of the kidneys.

Endothelial cells of blood vessels, pleura and peritoneum.

Connective tissue cells

Muscle cells

Bone cells

Fat cells

Nerve cells

Although the difference in susceptibility between the most sensitive and the least sensitive varieties of cells is considerable, no cell in the body is wholly invulnerable to radiation, all cells, whatever their variety, may be destroyed or injured if exposed to a sufficiently large dose of rays, especially if doses within the therapeutic range are disregarded. It is possible that the apparent difference in radiosensitiveness between certain kinds

of cells, such as between the epithelium of the skin and that lining the bile ducts of the liver, may be chiefly due to the distance between them and the focus of the tube, but the mere factor of distance from the source of radiation (roentgen tube) does not appear sufficient to explain such differences. How, for instance, could the relatively greater sensitiveness of the epithelium of the small than of the large intestine be accounted for? Such difference can be explained only by histophysiologic factors within each structure. Bergonie, Tribondeau and others have shown conclusively that the younger and the more active the cell, from an metabolic point of view, the more susceptible it is to the influence of the rays. Cells that naturally undergo rapid mitotic division and the life cycle of which, therefore, is comparatively short are most radiosensitive. But the relation of the age of the cell to its relative sensitiveness is less important than the specific vulnerability of the different varieties of cells.

LYMPHOID CELLS

The exceptional sensitiveness of lymphocytes was established by the early experiments of Heineke and has since been fully confirmed by Warthin, Krause and Ziegler, Fromme, Jolly, Tsuzuki, Priepborn and many others. When the entire body of an animal is exposed to roentgen rays, the spleen, the mesenteric and other lymph nodes, the intestinal lymph follicles, the blood and bone marrow, the thymus in young animals, and other collections of lymphoid tissue show a more or less marked destruction of lymphocytes, and the degree of such destruction is in proportion to the dose of rays and to the interval between irradiation and death. As the number of intact lymphocytes in the spleen and lymph nodes diminishes, the stroma becomes more prominent, and this feature may become so pronounced that the malpighian corpuscles or lymphoid follicles may largely disappear and be recognizable only by the blood vessels and the concentric arrangement of the corpuscular or follicular stroma. Heineke found destruction of lymphocytes two hours after irradiation, but Warthin, who examined the lymphoid structures sooner after exposure to the rays, found unmistakable evidence of lymphocytic disintegration within fifteen minutes after irradiation.

The destruction of these cells is characterized by disorganization and fragmentation of the nuclear chromatin and by scattering of the fragments of chromatin between the remaining intact cells and in the spaces of the reticular stroma, where the fragments gather into clumps or balls. The extent and the duration of this destructive phase depend on the intensity of irradiation, may continue from one to several days, and are accompanied by a progressive reduction in volume or atrophy of the affected lymphoid structures. Then the clumps or balls of degenerate chromatin are gradually taken up by some of the reticular cells, which assume a phagocytic property and swell as the amount of ingested chromatin debris increases. Such phagocytic disposal of chromatin material from the destroyed cells may continue until the lymphocytes are largely destroyed, but a certain proportion of the cells appear to resist the action of the rays. Some hours later, the phagocytic reticular cells themselves begin to disappear, the chromatin debris ingested by the phagocytes apparently undergoes intracellular digestion, because the number and size of the ingested fragments diminish

steadily. From seven days to three weeks after irradiation, more or less regeneration of lymphoid tissue may be observed.

POLYMORPHONUCLEAR AND EOSINOPHIL LEUKOCYTES

Next to the lymphocytes in sensitiveness to roentgen rays are the polymorphonuclear and eosinophil leukocytes in the circulating blood or in the tissue spaces of different organs. Two or three days after irradiation, degenerative changes in these cells also may occur, but their disintegration is less marked than that of the lymphocytes and is often preceded by a sharp increase in the number of polymorphonuclear cells in the circulation. It is not clear whether such polymorphonuclear leukocytosis is to be regarded as a compensatory or defense reaction or merely as a mobilization of cells to counteract the effect of the rays. In any event the increase in the polymorphonuclear cells, often observed during the first twenty-four hours after irradiation, is but a transient phase and is invariably followed by a varying degree of polynuclear and eosinophilic leukopenia. The extent of cellular destruction, the time at which these cells begin to regenerate, and the rate of regeneration are a measure of the dose of roentgen rays and of the cubic area of body exposed.

THYMUS GLAND

The essential character of the small round cells of the thymus gland has long been the subject of controversy. The extensive investigations of Hammar have led him to conclude that these cells are lymphocytes, and this conclusion is strongly supported by the reaction of these cells to irradiation. Rudberg, Aubertin, and Bordet, Arella, and especially Regaud and Cremieu have shown that the small round cells of the thymus react at the same rate and undergo the same changes as the lymphocytes of the spleen, lymph nodes, intestinal lymph follicles, bone marrow and circulating blood. When the thymic region of a young animal, such as a guinea-pig or a rabbit, is exposed to roentgen rays, the lobules of the thymus exhibit, within twenty-four hours, destruction of small round cells characterized by fragmentation of the chromatin of the nucleus and scattering of the fragments among the remaining intact cells. The degree of cellular disintegration varies with the dose of roentgen rays and may be so extensive as to give the lobules a depopulated appearance, the stroma and blood vessels of the lobules stand out prominently.

As the destruction of small round cells proceeds, some of the reticular cells ingest the scattered fragments of nuclear chromatin and swell in proportion to the amount of the material which they take up. The reticular phagocytes then migrate toward the corpuscles of Hassall and appose themselves to the peripheral cellular layer of the corpuscles. The degenerate chromatin residue from the destroyed lymphocytes then passes from the reticular phagocytes through the successive layers of cells of the corpuscles of Hassall and finally reaches the central clear space of the corpuscle, where the partly digested nuclear debris accumulates as an amorphous mass. As the number of reticular phagocytes accumulating around the periphery of the corpuscles increases, the corpuscles swell to many times their normal size. After all the nuclear debris has passed from the phagocytes to the cells of the corpuscles proper and has reached the central clear space, the corpuscles gradually diminish in size, some recover

their normal dimensions, but many become abnormally small and some disappear completely.

If the gland has been irradiated only once, some of the small round cells are not destroyed, although their mitotic activity is inhibited. After one or two weeks, such cells recover and appear to serve as a nucleus for regeneration, which proceeds more or less rapidly until the number of small round cells in the thymic lobules again approximates the normal. The phase of cellular destruction is accompanied by a corresponding decrease in size and weight of the gland, which recovers its normal dimensions and weight as the cells regenerate. Repeated irradiation, however, may cause destruction of all the lymphocytes, and this is accompanied by marked atrophy of the gland. In this event regeneration does not occur.

EPITHELIUM OF THE SALIVARY GLANDS

Next to the leukocytes in point of radiosensitivity are the basal epithelial cells of the salivary glands. Actually these cells are more sensitive to radiation than the polymorphonuclear and eosinophilic leukocytes, as evidenced by the fact that, whereas microscopically perceptible changes in the last two varieties of cells can seldom be found within the first six hours after exposure to the rays, clinical signs of salivary reaction can usually be observed in from three to six hours after irradiation. These signs consist of swelling, redness and tenderness in the region of the irradiated glands and, when bilateral, may simulate the salivary phase of mumps. If all the glands on both sides have been exposed to the rays, the foregoing clinical signs may be rapidly followed by a decrease in salivary secretion, often leading to dryness of the mouth lasting from a few days to two or more weeks. Microscopically, this reaction of the salivary glands is characterized by mucinous degeneration of the basal epithelium. The amount of mucus in the secretion increases, and the cells may swell to such an extent that the meatus of the excretory ducts becomes occluded, hence the swelling and tenderness of the glands and the dryness of the mouth. After a single irradiation, such salivary reaction is always transient, after a time usually from twenty-four to forty-eight hours the acute phase of the reaction subsides and the clinical signs gradually abate. After repeated irradiation, however, the secretory function of the glands may cease and the dryness of the mouth may persist in some degree for a long time.

It must be clearly understood that these effects can occur only when all the salivary glands on both sides are exposed to the direct action of the rays. Such reaction does not occur when other parts of the body are irradiated, and exposure of the salivary glands on one side causes a reaction on that side only. When the reaction is unilateral, dryness of the mouth is seldom noticed, undoubtedly because the glands on the opposite side furnish sufficient saliva to lubricate the oral mucosa.

EPITHELIUM OF TESTIS AND OVARY

The Testis—It has long been known that the testis is peculiarly sensitive to irradiation. It is not as sensitive, it is true, as some of the leukocytes or as the salivary glands, but, with the exception of these, it is the most sensitive structure in the body. Such susceptibility has been established by numerous experiments on animals as well as by the cessation of seminal function in radiologists and other persons exposed to roentgen rays over a long period of time. The cells of Sertoli

are relatively resistant to irradiation, and this fact tends to support the view that they supply nourishment to the basal layer of true seminal cells, the spermatogonia. The radiosensitivity of the testis is due to susceptibility of the spermatogonial cells, which are affected deleteriously even by a moderate dose of roentgen rays. The spermatocytes of the first and second order, as well as the spermatids and mature spermatozoa, are distinctly less sensitive than the spermatogonia and are affected only by larger doses. Even then much of the cellular degeneration noted is probably secondary to the direct action of the rays on the basal cells.

Microscopic examination of the seminal tubules some days after irradiation may disclose vacuolization and degeneration of some or all of the spermatogonia, depending on the dose of roentgen rays to which the organ has been exposed. After a sufficiently large dose, the degeneration of the spermatogonia proceeds to complete disintegration. This is accompanied by failure of the cells to evolve into spermatocytes and then to mature spermatozoa, and the final result may be a permanent azoospermia. After a dose insufficient to cause permanent azoospermia, a certain proportion of the spermatogonia may be able to survive and serve as a nucleus for histologic regeneration and functional restoration. Repeated large doses at comparatively short intervals are almost certain to induce permanent roentgen castration. The interstitial tissue, on the other hand, is much more resistant and is not perceptibly influenced by ordinary therapeutic irradiation. Needless to say, however, even the interstitial tissue could be irreparably injured by excessive irradiation beyond the therapeutic range.

The Ovary—The radiosensitivity of the ovary is essentially the same as that of the testis, and the cells to which the specific susceptibility of the gland is due are the ova and the epithelial cells of the follicles. The sensitivity of different follicles varies according to the stage of their development, and the effect of irradiation may be the disintegration and disappearance of a certain proportion of the follicles or complete and permanent destruction of every follicular structure, depending on the dose of rays to which the ovary has been exposed or on the number of times a given dose has been repeated. Moreover, the steps in the reaction of the follicles are analogous to those of spontaneous physiologic atresia.

The follicular reaction appears from three to six hours after exposure and is particularly marked in the mature follicles. In the primary follicles the rays act on the ovum sooner than on the follicular epithelium and such action is featured by pyknosis of the germinal vesicle, condensation of the protoplasm and finally chromatolysis and fragmentation of the cell. The cellular fragments then undergo phagocytosis by the follicular epithelial cells, which themselves degenerate as soon as the phagocytic disposal of the fragmented ova is complete. These different steps require three or four days, but, since all the follicles do not begin to react at the same time, a week or more may elapse before all the affected follicles have disappeared. A single irradiation within the range of therapeutic doses may not destroy all the follicles.

The same cycle of changes occurs in the more mature follicles with several layers of epithelium, but in these the follicular epithelium is much more sensitive and its cells undergo rapid autolysis. Moreover, the connective

tissue cells of the theca interna degenerate as rapidly as the epithelial cells. In the still more mature follicles, in which the ovum is large and separated from the follicular epithelium by a membrana pellucida, the epithelial cells first penetrate this membrane by diapedesis, dispose of the degenerate ova by phagocytosis, and in turn degenerate and disappear. Such migration of the epithelial cells begins about the third day, and the degenerative process continues for two or three weeks. Usually all such follicles are destroyed by irradiation, but on account of the large size of the ova the autolytic process may require considerable time.

In fully developed follicles the epithelial cells are still more radiosensitive, most of the parietal epithelium of the follicular cavity being destroyed by irradiation, whereas the epithelial cells which surround the ovum are slightly less sensitive. Sometimes irradiation may be followed by an accelerated maturation of the ovum, followed by degeneration. Thus the radiosensitivity of the ovarian follicles increases in proportion to their development. Follicles in process of maturation are readily destroyed by exposure to roentgen rays, but a certain proportion of the primordial follicles may escape if the dose has been small.

The interstitial cells of the ovary do not appear to be influenced directly by the rays but gradually and slowly disappear, probably because the destruction and disappearance of the follicles prevents the interstitial cells from being renewed. The follicular degeneration that follows irradiation is accompanied by a corresponding atrophy and reduction in weight of the ovary.

EPITHELIUM OF THE SKIN AND MUCOUS MEMBRANES

The Skin—The skin can tolerate with impunity a considerable single dose of roentgen rays, but when its limit of tolerance is exceeded it may undergo a series of reactive changes.

Early Effects In the case of the scalp the first clinical manifestation of excessive irradiation from a physiologic but not from a therapeutic standpoint, is a readiness of the hair to fall out in the exposed territory. The hair can be plucked with unusual ease or may fall spontaneously. Such epilation occurs two or three weeks after irradiation and continues for a short time. After relatively small doses epilation is only temporary, but after sufficiently large doses the alopecia is permanent. In the case of the skin of the body as a whole (other than that of the scalp), following a single dose of roentgen rays or radium, erythema may occur without epilation, or epilation and erythema may occur more or less simultaneously. After a still larger dose not only does epilation occur but varying degrees of reactive inflammation of the skin may take place. Dermatitis may appear as a mere erythema lasting a few days followed by slight pigmentation corresponding to the exposed area, as more pronounced, bright red erythema, with a sensation of heat followed by the formation of vesicles and later by itching, exfoliation of the epidermis and deep pigmentation, or, in extreme cases, as intense, painful erythema, with or without fever, and followed by more or less extensive ulceration of the entire thickness of the skin. The mild grade of radiodermatitis usually does not leave permanent marks beyond slight atrophy of the irradiated area of skin, provided the inflammatory reaction resulted from a single exposure and was not preceded or followed by

other exposures. If such a reaction should appear after the same area of skin has been exposed several times, it is likely to be followed, from one to three years later by telangiectasis. Needless to say, the sudoriferous and sebaceous glands of the irradiated skin also undergo degenerative changes.

Radiodermatitis accompanied by the formation of vesicles is soon followed by more extensive desquamation or by the actual formation of small rounded or larger, irregular cutaneous scars. When radiodermatitis is sufficiently severe to lead to ulceration, the ulcers are noted for their slow healing. This is due partly to the peculiar character of the cellular injury produced by irradiation and partly to the secondary infection which so commonly complicates the ulceration. The severe grades of radiodermatitis generally result from inexperience, from a miscalculation of some of the dosage factors, or from the accidental omission of a certain filter with a dose based on the use of filtered rays.

The rays act on the epithelium of the hair follicles. This explains the loosening or falling of the hair. As is well known, the elective sensitiveness of the hair follicles is made use of in the treatment of skin diseases such as ringworm, in which the dose of roentgen rays is adjusted so as to cause temporary epilation. The success of the treatment rests on the ability of the radiologist to regulate the dose within narrow limits, any uncertainty in this respect may result in permanent alopecia or worse. When the dose is sufficient to cause distinct erythema, the microscopic changes include an irritative disturbance of the basal layer of cells accompanied by hyperemia and edema, and later by degeneration and desquamation of the epidermis. After still larger single doses, these cellular and circulatory alterations may be quite marked and may extend to all the layers of the skin.

The rays also act on the endothelium of the blood vessels, causing these cells, and sometimes the entire intima, to swell and to undergo hyperplasia and later connective tissue proliferation, which may lead to reduction in the caliber or actual obliteration of the vessels. This serves to explain in some measure the slow healing of radiodermatitic ulcers, an explanation further substantiated by the fact that a dose several times greater may be given to a very small area of skin (from 1.5 to 2 cm. or less) without causing ulceration.

Late Effects Besides the foregoing acute effects of irradiation and their sequelae, there exist two varieties of late effects. One variety is featured by late necrosis in a region of the skin subjected, several months or even several years before, to repeated irradiation to the point of inducing early lesions, such as have been described. Such necrosis commonly follows slight trauma but may occur without any apparent, immediate cause. It begins with redness, pain, swelling and a sensation of heat, and a short time later a progressive ulceration similar to that which typifies early radiodermatitis of the third degree. It is probable that the chief determining cause of such late ulceration is infection of the connective tissue, the natural resistance of which has diminished as a result of obliterative changes in the blood vessels and other chronic changes in the connective tissue itself.

The second variety of late radiodermatitis is encountered in cases of physicians or others who may have been exposed to roentgen rays or radium at frequent intervals for a long period of time. It affects usually the hands and sometimes the face. The lesions appear

only after years of daily exposure and consist of a thickening of the skin, with redness and sensitiveness, and often also of a dryness and brittleness of the nails. In fact, changes in the nails often precede other evidences of injury. The skin becomes harsh and tends to crack easily, and areas of keratosis develop, which later may undergo epitheliomatous transformation. Many of the pioneers in roentgenology have had the misfortune to pay for their ignorance of the danger or for their carelessness, with the loss of fingers, hands or entire extremities, and a number have lost their lives.

MUCOUS MEMBRANES

The sensitiveness of the epithelium of mucous membranes is much the same as that of the skin. Excessive single irradiation causes first anesthesia, then dryness, redness from hyperemia, and edema. Depending on the doses, these clinical manifestations may abate and disappear or may be followed by ulceration. Excessive repeated exposure causes a hyperplastic thickening of the epithelium, and this may be followed by necrosis.

SPECIALIZED MUCOUS MEMBRANES

The Stomach and Intestine—The radiosensitiveness of specialized mucous membranes, such as the mucosa of the stomach and intestine, varies with each structure. Irradiation of the stomach causes temporary reduction in the secretion of gastric juice, and this affects the production of hydrochloric acid and pepsin. If the stomach is exposed repeatedly at relatively short intervals, the gastric acidity and pepsin fall lower and lower. Such an effect may continue for several weeks or several months. If the exposures should be repeated indefinitely it is conceivable, if not indeed probable, that the secretory activity of the gastric mucosa would be completely and permanently destroyed. The susceptibility of the intestine varies in its different parts. The mucosa of the colon is relatively insensitive to the action of the rays, at least, it is much less sensitive than that of the small intestine. The most radiosensitive portion of the mucosa of the digestive tract is that of the duodenum and jejunum, in which irritative reactions may occur after doses insufficient to cause any disturbance in the overlying skin. When the upper half of the abdomen is exposed to a therapeutic dose of roentgen rays, anorexia, nausea and vomiting often follow within a few hours, and diarrhea may appear several days later. Exposure to excessive doses, such as have been employed in many experiments on animals, causes mucinous degeneration of the intestinal epithelium, hyperemia, and edema of the mucosa and submucosa, and such changes may be sufficiently marked to be followed by desquamation of the epithelium. According to the severity of the reaction, the epithelium may regenerate or the breach in the mucosa may be repaired by connective tissue.

EPITHELIUM OF THE LUNGS AND LIVER

The lungs are comparatively resistant to the action of roentgen rays, but if the overlying skin is exposed to a grossly excessive dose, especially if the thoracic wall is thin and if such a dose is repeated several times, reactive pneumonitis is likely to follow. This may subside spontaneously without any after-effects or may be followed by fibrous repair and more or less impairment of respiratory function.

As a whole, the liver is still less radiosensitive than the lungs. Most of the pathologic changes in the liver

that have been found after experimental irradiation of animals have not been direct effects of the rays but an indirect effect of cellular changes in other more sensitive structures. The epithelium of the biliary ducts, however, appears to be slightly more sensitive than the hepatic cells themselves, but it is not clear whether the alterations that have been observed resulted from the direct action of the rays or whether they also were secondary to the circulation of toxic products of cellular degeneration in remote organs.

EPITHELIUM OF THE KIDNEYS

The kidneys can hardly be regarded as radiosensitive organs, as far as therapeutic doses of roentgen rays are concerned. Yet excessive irradiation may cause slight, moderate or severe nephritis. The cells first affected are the epithelial cells of the convoluted tubules. Nephritis should never occur in radiotherapy as applied to human beings. Its appearance must immediately suggest either gross overdosage or excessive elimination of toxic products of cellular degeneration in other more sensitive structures or tissues. Certain animal experiments have shown that, if therapeutic doses are disregarded and if the kidney is exposed to several times an ordinary therapeutic dose, the organ may undergo reactive inflammation leading to chronic nephritis, with increase in blood pressure and the usual reverberations associated with that condition. Such an effect merely shows that the kidney, like all other organs and tissues, is not wholly insensitive to radiation but may be injured more or less severely and permanently if its limit of tolerance is exceeded. But it must not be inferred that ordinary therapeutic irradiation of the kidneys is dangerous.

ENDOTHELIUM

The radiosensitiveness of the endothelium of the blood vessels, pleura and peritoneum is approximately the same as that of the skin. In other words, a dose of roentgen rays insufficient to irritate the skin is not likely to have an appreciable effect on the endothelial cells. When the tolerance of the skin is exceeded, however, the endothelium is likely to suffer temporary or permanent injury. The effect of a grossly excessive dose on the blood vessels is swelling of the endothelial cells, some or all of which in the irradiated area may degenerate and desquamate into the lumen of the vessel. The media also may swell more or less. As the acute phase subsides, the destroyed endothelial cells are replaced by hyperplasia of adjacent cells which may have suffered less, and the intima or the entire vessel wall thickens by hyperplasia of connective tissue. The result is a slow narrowing of the lumen of the affected vessels, which may or may not proceed to the point of complete obliteration. Similar changes occur in the pleura and peritoneum. Naturally the effect of excessive irradiation may not be confined to these structures but may extend to the underlying parenchyma of the lung or to the wall of the intestine or other tissues underlying the peritoneal endothelium. The endothelial degeneration is usually accompanied by hyperemia and serous exudation and terminates by chronic adhesive pleuritis or peritonitis. If the dose of roentgen rays has been sufficiently intense, the injury to the underlying tissues may outweigh the effect on the endothelium and may have serious consequences. It is important, therefore, to keep the dose within safe therapeutic limits.

CONNECTIVE TISSUE CELLS

Young, freshly formed connective tissue cells are more radiosensitive, and mature connective tissue cells are less sensitive to irradiation, than the epithelium of the skin. Young connective tissue, in a healing traumatic or surgical wound, for example, is peculiarly sensitive to roentgen rays and, even after moderate therapeutic exposure, becomes more porous and more brittle. Moreover, moderate therapeutic irradiation of such connective tissue diminishes its formation or tends to hasten the granulation process. This effect appears to be due more to the action of the rays on the leukocytes infiltrating the area and the connective tissue changes, therefore, are partly secondary or indirect, but a direct effect on the connective tissue cells also occurs. This is evidenced by the influence of roentgen rays on keloids, for which radiotherapy is the most effective treatment. Mature connective tissue cells, on the other hand, are distinctly more resistant than the epithelium of the skin, but, if a dose beyond the limit of tolerance of the skin is given, the connective tissue cells in the exposed territory may also be affected. Some may be destroyed and fresh connective tissue may be formed. This probably has given rise to the assumption that the formation of such tissue may be stimulated by irradiation. Such stimulation is never a direct result of exposure to the rays but is an indirect result and always implies an antecedent destruction of cells of the same or of some other variety.

MUSCLE CELLS

The cells that typify voluntary or involuntary muscles also may be injured or destroyed by exposure to roentgen rays beyond therapeutic limits, but this involves still greater injury or destruction of the overlying tissues or the convergence on the muscle of several beams of rays directed toward it through as many separate fields. Muscle cells are comparatively resistant to the action of the rays and, if not excessive, therapeutic doses should not have a deleterious influence on them. Pathologic changes, such as fatty degeneration, sometimes observed in muscle cells after exposure to roentgen rays, usually result from the circulation of toxic products of cellular degeneration in other more sensitive tissues or structures.

BONE CELLS

Bone has long been thought to be impervious to the influence of roentgen rays. It possesses a relatively high degree of resistance, it is true, but sufficiently intense irradiation, in either single or repeated exposures, may cause the bone cells to degenerate. The degree of effect varies with the dose and with the age of the irradiated animal or person. In early life the growth of bone can readily be retarded or permanently stopped by therapeutic irradiation especially if the exposures are repeated. Adult bone, however, is able to tolerate rather large doses of roentgen rays without any apparent effect. Irradiation beyond the therapeutic range of dosage may cause the bone cells to degenerate and the bone to become devitalized. In the absence of infection devitalized bone is slowly replaced by ingrowing new bone especially if the affected bone is used for weight bearing. When on the contrary, mechanical function is prevented by fracture or otherwise, the devitalized bone separates as a sequestrum,

which is slowly absorbed. Secondary infection of bone devitalized by irradiation leads to sequestrum formation, regardless of function.

NERVE CELLS

As far as experimental evidence shows, the neurons of the central nervous system possess the highest degree of resistance to roentgen rays. The brain and spinal cord can tolerate maximal therapeutic doses and even more with apparent impunity. But this must not be taken to mean that the specific cells of the nervous system are entirely invulnerable to the rays. Nevertheless, in many experiments on animals, in which doses several times greater than those used in the treatment of human beings were administered to the brain or spinal cord, the nerve cells did not show any perceptible evidence of a direct action of the rays. Such cellular changes as have been found after irradiation have appeared to be secondary to the action of the rays on the cerebral vessels, the endothelial lining of which is more sensitive than the nerve cells themselves.

STIMULATING EFFECT OF IRRADIATION

For years the legend that roentgen rays, under certain conditions of dosage, may increase the growth and metabolism of cells has gained wide circulation. This notion has arisen from the attempt to apply to roentgen and radium rays the so-called Arndt-Schulz law, according to which small doses stimulate, and large doses depress, cellular metabolism. Based on pharmacologic grounds, this doctrine has not been generally accepted, even by the pharmacologists. The attempt to apply it to the action of roentgen rays is unwarranted, because the experimental evidence on which it is based is extremely meager and apparently invalid. That a measure of acceleration in cellular metabolism may occur under certain conditions has been shown repeatedly both in animals and in plants, but such unusual acceleration is but a transient phase of the reaction to irradiation and is invariably followed by more or less pronounced inhibition of function and cellular degeneration.

Another factor in the propagation of this notion of a stimulating action of the rays has been the commonly observed regression of pathologic lesions after exposure to small doses of roentgen rays. Such regression is best explained by the exceptional radiosensitiveness of cells, as will be shown in the third section of this chapter.

As the result of a primary degenerative effect on certain cells, a secondary and indirect stimulation may sometimes be observed. Such is the increase in connective tissue cells in certain tissues and organs after repeated irradiation, the connective tissue is laid down to replace other cells which the rays have caused to undergo degeneration. Any primary or direct acceleration of cellular metabolism must be regarded as an effort of the cell to counteract or compensate for the noxious influence of the rays, in other words, it is purely a defense reaction.

Continued acceleration of metabolism cannot be produced by exposure to any dose of roentgen rays or radium, which always cause degenerative changes or have no effect whatever. Repeated irradiation of certain tissues, such as the skin, over a long period of time may cause hyperplasia of the epithelium, and this in turn may lead to malignant transformation. This is

not stimulation in the sense here employed, but the alteration of a normal to an aberrant function due to chronic irritation

CLINICAL RADIOTHERAPY

RADIUM OR ROENTGEN RAYS

Too much stress on radium or on roentgen rays has been laid by certain writers who, not possessing both agents, have naturally tended to stress the agent which they happened to possess. The question is not one of radium versus roentgen rays but of the relative advantages and disadvantages of each agent. A thorough knowledge of these advantages and disadvantages should govern the indications and contraindications for each. In certain conditions, or in certain phases of the same condition, radium may be preferable to roentgen rays, and vice versa. Sometimes the two agents may be combined to advantage, and some conditions may be treated as effectively with one agent as with the other, the relative advantage then being a matter of time, availability, convenience and cost. Technical considerations may also enter into the decision to use radium or roentgen rays, or both, in a given case.

In a general way radium is preferable when the lesion is well defined, of limited size, and situated at the surface or readily accessible from the surface. Thus a nevus or small keloid may preferably be treated with radium, but it may also be treated with roentgen rays. A large keloid is best treated with roentgen rays, unless a large quantity of radium is available, even then the relative cost makes treatment with roentgen rays preferable. Whenever the lesions cover an area of considerable size, roentgen rays usually are to be preferred, because the affected territory can thus be irradiated more uniformly in less time and at smaller cost. In connection with tumors, sometimes either agent may be used with equal effectiveness, and sometimes the best results are obtained by suitably combining them. In carcinoma of the uterine cervix, for example, the indications for radium treatment are almost ideal, because the cervico-uterine canal permits the introduction of radium into the very center of the malignant process. Moreover, the vaginal cavity makes it possible to apply additional radium to the cervix itself. But the best results are obtained when, besides direct local irradiation with radium, supplementary irradiation with roentgen rays or with a large quantity of radium is directed to the pelvic structures from without.

In the case of a sarcoma of the shoulder, a carcinoma of the lung, a lymphoblastomatous process of the mediastinum or abdomen, an embryoma of the kidney, or a tumor of the testis with metastasis to the para-aortic (retroperitoneal) lymph nodes, adequate irradiation can usually best be done with roentgen rays. Such lesions can be treated with radium only in a few institutions where a quantity of radium large enough to permit external irradiation under satisfactory conditions is available.

In carcinoma of the breast, radium or radon can sometimes be implanted throughout and around the primary growth, but this and the tributary lymphatics should also be irradiated from the outside, either with roentgen rays or with radium. The aim throughout should be to concentrate in and around any malignant process the largest total dose of rays compatible with the integrity of the surrounding normal tissues.

INTERNAL ADMINISTRATION OF RADIUM

Some years ago the internal use of solutions of radium for arthritis, gout, high blood pressure, neuralgia, leukemia and other conditions was advocated and was practiced to a considerable extent, but the results have not been satisfactory and the method has largely been given up, except by the charlatans.

Much has been made also of the therapeutic virtues of the water of certain springs, and claims have often been based on the radioactive content of such water. The quantity of radioactive energy present in the water of most natural springs is quite small—too small to have any perceptible therapeutic effect. Any virtues such water may possess are almost certainly not due to radioactivity. It is probable that the benefit of a stay at such springs results mainly from the regimen in general and not from any radioactive effect of the water.

INFLAMMATORY DISEASES

General Considerations—So much has been written about radiotherapy for malignant tumors that many physicians are not aware that many forms of acute or chronic inflammation also are amenable to treatment with roentgen rays. Other physicians who, to some extent, may be familiar with the therapeutic possibilities of roentgen irradiation for various inflammatory processes hesitate nevertheless to make use of the method because they fear either the deleterious effects of excessive irradiation on the skin, not infrequently encountered after the treatment of tumors with maximal doses, or the systemic reaction with which such treatment is often associated. As far as inflammatory lesions are concerned, provided the treatment is administered by a radiologist who has had substantial experience with the treatment of inflammations, such fears are unfounded.

For the benefit of those who may not be familiar with the subject, it must be emphasized that radiotherapy for inflammatory conditions is an entirely separate field from the treatment of malignant neoplasms. In the latter the aim must be to deliver to every part of a tumor the largest total dose of rays compatible with the integrity of the overlying and surrounding tissues, while, in the former, comparatively small or moderate doses are employed. Large doses that might jeopardize the integrity of the skin are not only unnecessary but should be carefully avoided as less effective and sometimes as actually dangerous. The risk of complicating the inflammation already present by inducing inflammatory reaction to an excessive dose of rays may lead to spread rather than resolution of the primary inflammation.

Acute—Many forms of acute inflammation yield quite rapidly to a single, small dose of rays. In some cases in order to cause complete resolution of the pathologic process, it may be advisable to repeat irradiation after an interval of from six to ten days. By a small dose of rays is meant a dose representing less than one-half the tolerance dose of the skin, a dose as small as one-fourth the so-called erythema dose is often sufficient, but the exact dose must vary somewhat according to the character of the lesion in each case. A significant point is that, other things being equal, the more acute the lesion, the smaller the dose of rays required. Another significant point is that the results are most striking and prompt when the lesions are irradiated early, during the stage of leukocytic infiltration and before suppuration has set in. Irradiation later

may still be useful, in that suppuration is favored and the process may thus be shortened to an extent which varies with the stage of the lesion at the time of irradiation. Another advantage of the method, especially for early lesions, is prompt relief from pain, although sometimes relief may be preceded by actual increase in pain for a brief period.

As examples of inflammatory lesions notably amenable to roentgen irradiation may be mentioned furuncle, carbuncle, acute simple adenitis, acute parotitis complicating operations on the colon and other abdominal structures, abscess and cellulitis of soft tissues, onychia and paronychia, mastitis, sinusitis and mastoiditis in selected cases, and delayed resolution of lobar pneumonia.

The favorable influence of irradiation on furuncle and carbuncle, especially when treated early, has been demonstrated by Coyle, Dunham, Ross, Richards, Lewis and many others. Prompt and marked benefit is derived in a large proportion of cases. Indeed, when treated early, relief from pain within a few hours and rapid resolution are the rule. When treated late, suppuration tends to be hastened, and surgical drainage may have to be instituted earlier than would be the case if the lesion had not been irradiated. As already mentioned, the treatment is most effective during the early stage when other methods of treatment are least effective, it is painless and inexpensive and does not interfere with the patient's activities, it often relieves pain in a short time, makes hot or other dressings unnecessary or shortens the period during which they must be applied, it often avoids an operation, and it usually yields a better cosmetic result. The dose of rays is so small that reaction of the skin or of the gastro-intestinal tract does not occur. Consequently, the treatment may be given to weak and febrile patients without danger.

Ocular Lesions—Certain inflammatory conditions of the eye can be treated effectively with radium or with roentgen rays. In dealing with such lesions the advantage usually lies in roentgen irradiation, because the small doses required can be given in a much shorter time and without the difficulty and discomfort incidental to the application of radium to a mobile and sometimes acutely inflamed structure. The dose of rays must never exceed 80 per cent of an erythema dose, otherwise, early conjunctivitis or late degeneration of the crystalline lens may follow. This is especially prone to occur in children.

Parotitis, Acute—Certain operations, notably on the colon, are complicated by acute parotitis, and a high mortality rate is attached to this complication. In such cases early exposure of the parotid regions to a small dose of roentgen rays or radium has been found effective in controlling and in arresting this variety of inflammation, and the mortality rate has thus been notably reduced. When the patient's condition allows him to be moved to a nearby treatment room, irradiation with roentgen rays is simpler and requires less time than that with radium. But if the patient's condition is such that any movement is to be avoided, treatment with radium is preferable because it can be administered without disturbing the patient.

Not all acute inflammatory lesions respond favorably, but a large percentage may be counted on to do so. Moreover, if the pathologic process is not favorably influenced, its evolution is not perceptibly altered.

(To be continued)

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
PAUL NICHOLAS LEECH Secretary

BACILLUS ACIDOPHILUS CULTURE (B A CULTURE) OMITTED FROM N N R

Bacillus Acidophilus Culture (B A Culture), manufactured by the B B Culture Laboratory, Inc., was accepted for inclusion in New and Nonofficial Remedies in 1926. The product is a concentrated culture or suspension of *B. acidophilus* stated to contain not less than 100 million organisms (*Bacillus acidophilus*) per cubic centimeter at the date of issue.

At the expiration of the last three year period of acceptance in 1932, the product was reaccepted for one year only, on account of the fact that the Council is reconsidering the whole status of bacillus acidophilus therapy. At that time certain revisions of the firm's label and circular were required. For the Council's reconsideration in 1934, the firm submitted proof of label and circular revised to meet these objections. These revisions were found acceptable except for the use of the initials "B A." In its reconsideration, the Council found two objections to the continued acceptance of this concentrated culture or suspension of *B. acidophilus*.

The first, a general objection, is that there appear to be available no published reports satisfactorily proving that broth cultures, whey cultures and concentrates of *B. acidophilus* are therapeutically useful. One of the Council's consultants, who is thoroughly familiar with this field, has written in answer to a question concerning the therapeutic value of this type of product: "I know of no references good or bad on clinical studies dealing with the therapeutic value of acidophilus cultures and concentrates." The facts are that all thorough clinical studies have been made with *B. acidophilus* milk and the information derived from them has been transferred to the cultures and concentrates. In its submitted advertising the B B Culture Laboratory, Inc., claims: "In the conditions mentioned above, where the implantation of *B. acidophilus* is indicated, *Bacillus Acidophilus* Culture (B A Culture) will be found effective, convenient and economical." The Council must regard this claim as being unwarranted until the firm submits convincing evidence to support it.

The second objection relates to the instability of these cultures and concentrates. It has been known for a long time that *Bacillus acidophilus* loses viability rapidly in these preparations. Bacteriologic analyses made for the Council by a competent investigator in this field show this clearly for several preparations of this sort, among which were two samples of this *Bacillus Acidophilus* culture. The results of these tests were as follows:

Two samples of the *Bacillus Acidophilus* Culture of the B B Culture Laboratory, Inc. were obtained in New York at 8 p. m. on May 28, 1934. The date of manufacture was stated on the label to be May 25, 1934. The expiration date was July 20, 1934. Counts of *Bacillus acidophilus* were as follows:

| | No. of Viable <i>B. Acidophilus</i> Organisms | |
|---------------------------|---|--------------------------------|
| | At Date of Purchase, 5/29/34 | At Date of Expiration, 7/20/34 |
| Medium | | |
| Tomato juice agar pH 6.6 | | |
| (a) in 10% carbon dioxide | 655 million | 1 million |
| (b) in air | 670 million | 1 million |
| Casew digest agar pH 7.1 | | |
| (a) in 10% carbon dioxide | 656 million | 1 million |
| (b) in air | 659 million | 1 million |

These counts show that the product deteriorated greatly in storage at 10-18 C during fifty-two days which was four days less than the eight weeks expiration period. The firm's label guarantees "not less than 100 million viable *B. acidophilus* at the expiration date." This claim is obviously unwarranted in view of these observations.

The general article Lactic Acid-Producing Organisms and Preparations in N N R. contains the statement (New and Nonofficial Remedies 1935, p 263) that the expiration date for B acidophilus milk preparations will "usually be one week, and probably less than two weeks, after the date of manufacture" Since some of the milk preparations appear to be quite stable, the Council has extended their expiration date to three weeks during a trial period The cultures and concentrates should have expiration periods shorter than those of the milk products Certainly the period of eight weeks used by this firm was much too long It is doubtful whether these cultures and concentrates can be satisfactorily marketed within the brief expiration period, probably less than one week, during which the viability of B acidophilus organisms in them can be maintained.

The type of culture in this preparation was found to be an intermediate rough form It is not certain that this preparation represents the true intestinal type of B acidophilus suitable for implantation.

The Council voted to omit Bacillus Acidophilus Culture (B A Culture) of the B B Culture Laboratory, Inc, from New and Nonofficial Remedies because there is insufficient evidence supporting claims for its therapeutic value and because, like other cultures and concentrates, it is subject to great deterioration

The foregoing statement of the Council's consideration was transmitted to the B B Culture Laboratory, Inc. The firm replied, raising objections and asking for postponement of the publication of the Council's statement Publication was withheld pending the results of a reinvestigation of some of the problems involved

The firm objected to the classification of its product as a culture concentrate. Since the product has always been described in New and Nonofficial Remedies as a "pure aqueous suspension of Bacillus acidophilus," and since the firm has never objected to this description, there is little basis for such objection The firm now states that "This culture is a natural 24-hour growth in a medium developed by us and is not a concentrate." As there are more serious objections to the product, the Council's only concern here is to make sure that the preparation is accurately described in this statement The firm has indicated that the product is a culture which has not been concentrated by artificial means

The firm objected to the requirement that the initials "B A" be removed from the name, but expressed willingness to consider any specific objections to the use of these letters The letters are now in conflict with the Council's rule 8 and would have to be deleted if the product should be reaccepted.

In answer to the objection that there is no evidence for the therapeutic value of this product, the firm submitted three references to published papers and stated "The best evidence of success following this treatment is after all the testimony of physicians which comes to us Unfortunately, perhaps, this evidence was not given us for publication." The Council has considered the papers of Coleman, Gompertz and Vorhaus, and Albee, which were referred to by the firm

Coleman (THE JOURNAL, Aug 4, 1917, p 329) does not claim that B acidophilus therapy had any specific value in typhoid fever, but that it did reduce diarrhea and tympanites All the patients treated by him received a high calory diet and were kept in good nutritional condition He emphasizes, as do others, the importance of the general nutritional state of these patients There is little or nothing in his reports to show that patients treated with the B acidophilus culture prepared by Torrey were better off than those given lactose and good care without the culture. It may be concluded from his paper, however, that diarrhea and tympanites were probably reduced by the B acidophilus therapy The organisms were administered in cultures prepared especially by Dr Torrey and the patients were not treated with a commercial preparation These results cannot be transferred to the use of 'B A Culture' without confirmation by actual test

The article by Gompertz and Vorhaus (THE JOURNAL, Jan. 13 1923 p 90) gives no information on the type and source of the culture used Implantation of B acidophilus was appar-

ently obtained by these investigators, though the bacteriologic studies, limited largely to examination of stained specimens, are deficient

The Council does not deny that implantation of B acidophilus can be secured by the oral administration of suitable broth cultures It is, however, not impressed with the work done thus far in the therapeutic use of broth cultures, suspensions or concentrates, it believes that convincing evidence is needed to show that the commercial preparations of this type are therapeutically effective.

The paper by Albee (*Am J Surg* 23 70 [Jan] 1934) does not give any analyzable or convincing evidence. The title of the paper is "Myofascitis," a term coined by Dr Albee to designate vague muscle and joint pains, lumbosacral troubles and a number of ill defined conditions He used manipulation, massage and colonic irrigation along with cultures of B acidophilus in the treatment of his patients The Council recognizes the fact that the element of psychotherapy in the treatment of patients of this type together with the effect of general dietary and hygienic regulation may have great influence on the results obtained. There are no bacteriologic data in Dr Albee's paper

In view of the firm's reference to the "testimony of physicians not given us for publication," the Council again points out that the usual testimonial letter of a physician does not constitute scientific evidence The Council could not regard as convincing letters of that sort which may be in the firm's file

At present the Council knows no reason to change its opinion (a) that there is no satisfactory evidence that culture-preparations of this type are therapeutically effective and (b) that there is no satisfactory evidence to support the claim advanced by the firm in the sentence "In the conditions mentioned above, where the implantation of B acidophilus is indicated, Bacillus Acidophilus (B A Culture) will be found effective"

The firm was requested in January 1935 to submit evidence in the form of reports of carefully controlled studies of (1) the implantation of B acidophilus in the intestine of man by the administration of "B A Culture" and (2) therapeutic effects from the use of this culture or other culture preparations, exclusive of B acidophilus milk¹

The firm criticized the bacteriologic report reproduced in the Council's statement previously transmitted to the firm and presented the results of routine analyses made by Dr Kopeloff and by the firm as evidence that the Council's statement was not accurate. After correspondence with the firm there was received a supply of the firm's own special medium. Samples of the firm's product were purchased on the New York market and arrangements were made for a bacteriologic examination to be made by a competent worker under the supervision of the Council's referee Every care was taken to follow the directions specified by the firm in the plate count procedures, the care and handling of specimens and in all other details. The results of this analysis are as follows

I Tests of viability of B acidophilus in the B A Culture under conditions recommended by the firm to the user Bottles opened were returned to the refrigerator at 50 F after each sample was withdrawn. The firm advised in its letter of Jan 26 1935 Tests of viability after opening bottles should not be made more than ten days after bottle is opened

Two samples were examined in this way under the referee's supervision The results according to two methods were as follows

Sample 1 Produced Jan 23 1935 Expires March 11 1935
Purchased Feb 4 1935 Examination begun Feb 8 1935
Bacillus acidophilus counts (maximum of any dilution)

| Days After Opening Bottle | B B Labora- tory Medium | Tomato Agar Under Carbon Dioxide |
|------------------------------|----------------------------|--|
| 0 | 540 000 000 | 600 000 000 |
| 2 | 150 000 000 | 370 000 000 |
| 4 | 40 000 000 | 30 000 000 |
| 6 | 10 000 000 | 9 000 000 |
| 8 | 20 000 000 | 10 000 000 |
| 10 | 7,000 000 | 3 000 000 |

This shows that viability of the organisms was lost rapidly The product was below the minimal Council standard six days after the bottle had been opened

1 At the time this addition to the original statement was formulated the firm had not furnished any new evidence on these points

Sample 2 "Produced Feb 4 1935 Expires March 20 1935"
Purchased Feb 6 1935 Examination begun Feb 8 1935
Bacillus acidophilus counts (maximum of any dilution)

| Days After Opening Bottle | B B Labora- tory Medium | Tomato Agar Under Carbon Dioxide |
|------------------------------|----------------------------|--|
| 0 | 770 000 000 | 720 000 000 |
| 2 | 710 000 000 | 670 000 000 |
| 4 | 710 000 000 | 630 000 000 |
| 6 | 670 000 000 | 660 000 000 |
| 8 | 230 000 000 | 400 000 000 |
| 10 | 30 000 000 | 30 000 000 |

The deterioration in sample 2 was less rapid than in sample 1 but it was below the minimal Council standard by the tenth day after the opening of the bottle. It is to be noted that this was a fresher sample than sample 1. Sample 1 was sixteen days old when the examination was started while sample 2 was examined four days after the date of production.

If Tests of viability of B acidophilus in the B A Culture product under conditions of storage at intervals during the expiration period of approximately fifty days as indicated by the firm.

The ten unopened samples were stored in a dark refrigerator at 50 F. Each bottle was used only once. It was opened for the withdrawal of a specimen and then discarded. This procedure was adopted in compliance with the firm's directions in its letter of Jan 26 1935. The results were as follows:

| Sam- ple | Date of Produce- tion | Date of Expira- tion | Date Ex- amined | Stor- age Days After | B Acidophilus Counts (Averages) | | |
|-------------|-----------------------------|----------------------------|--------------------|-------------------------------|------------------------------------|-------------------------------|--|
| | | | | | Pro- duc- tion | B B Labo- ratory Medium | Tomato Agar Under Carbon Dioxide |
| 9 | 2/11/35 | 3/28/35 | 2/27/35 | 16 | 49 000 000 | 55,500 000 | |
| 10 | 2/11/35 | 3/28/35 | 2/27/35 | 16 | 67 600 000 | 69,500 000 | |
| 11 | 2/11/35 | 3/28/35 | 3/ 3/35 | 20 | 85 000 000 | 85 000 000 | |
| 12 | 2/11/35 | 3/28/35 | 3/ 3/35 | 20 | 67 000 000 | 74 000 000 | |
| 6 | 2/ 6/35 | 3/20/35 | 3/ 8/35 | 30 | 4 000 000 | 3 000 000 | |
| 7 | 2/ 6/35 | 3/20/35 | 3/ 8/35 | 30 | 12 000 000 | 9 000 000 | |
| 8 | 2/ 4/35 | 3/20/35 | 3/16/35 | 40 | 500 000 | 1 500 000 | |
| 8 | 2/ 6/35 | 3/20/35 | 3/16/35 | 40 | 600 000 | 820 000 | |
| 4 | 1/ 2/35 | 3/21/35 | 2/21/35 | 50 | 1 000 000 | 1 000 000 | |
| 5 | 1/ 2/35 | 3/21/35 | 2/21/35 | 50 | 3,000 000 | 1 000 000 | |

These tests show that with one exception (sample 1) none of the purchased specimens examined contained 100 000 000 viable B acidophilus organisms at ten day periods within sixteen to fifty days after the dates of manufacture. The tests of samples 1 and 2 and other counts made by the firm and by examiners for the Council have shown that at about the date of manufacture this product contains approximately 600 to 700 million viable acidophilus organisms per cubic centimeter. The loss of viability that occurs, even under conditions specified by the B B Culture Laboratory, Inc., is perfectly evident from these figures.

The opinion that the product is unstable and subject to great deterioration is thus confirmed.

Attention is called to the fact that the firm's own special medium was used in accordance with directions received from the firm and was no better than tomato agar for these counts.

The colonies of B acidophilus were larger in the B B medium. They were surrounded by an opaque zone, giving the impression that there is some acid-precipitable material, possibly a protein in the B B Laboratory medium.

The type of colony from the B A Culture in B B medium was round very compact, with well defined edges and occasional filamentous projections. In general, they appeared to be of the so-called intermediate type, as were also colonies of the same culture in tomato agar. They resembled the colonies of lactobacilli from grain more than the colonies of a typical rough strain known to be derived from the intestinal tract of man. The typical X strain did not produce a precipitate in the B B Laboratory medium.

The Council on Pharmacy and Chemistry reaffirmed its decision to omit from New and Nonofficial Remedies the Bacillus Acidophilus Culture (B A Culture) product of the B B Culture Laboratory, Inc., because the product is unstable and is subject to rapid deterioration, and, further because there is insufficient evidence to support the therapeutic claims made for the product by the B B Culture Laboratory, Inc.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS

RAYMOND HERTWIG, Secretary

WITHDRAWAL OF ACCEPTANCE

COCOMALT

Manufacturer—R B Davis Company, Hoboken, N J

Description—Mixture of sucrose, skim milk, cocoa, malt extract, vanilla flavoring and added vitamin D (irradiated ergosterol) 81 U S P units per ounce.

Withdrawal of Acceptance—Under date of November 6 the manufacturer requested withdrawal of acceptance from Cocomalt which has been accepted since March 1932 (THE JOURNAL, June 4, 1932, p 1991). Reasons for requesting withdrawal were not stated.

Submission of Cocomalt for acceptance was entirely voluntary on the part of the manufacturer. The product was accepted with the understanding that both the product and its advertising would be maintained in complete accord with published Rules and Regulations and General Decisions of the Committee. Manufacturers of accepted foods assume no other obligations with respect to the Committee or the American Medical Association. There are no charges accompanying the initial acceptance of foods nor subsequently.

In accordance with the request, Cocomalt will no longer be listed as an accepted food nor the company privileged to display the Committee seal on the package label or in advertising.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.



RAYMOND HERTWIG, Secretary

ADVERTISING BOOKLET "THE HAWAIIAN ISLANDS AND THE STORY OF PINEAPPLE"

Sponsor—American Can Company, New York.

Description—Popular booklet descriptive of the Hawaiian Islands, circumstances surrounding early discovery of the pineapple, development of the pineapple industry, and modern methods of cultivation, harvesting and packing the fruit. A brief statement of the food value of canned pineapple and suggestions and recipes for its use in cookery are included.

DIXIE BRAND SANDWICH BREAD DIXIE BRAND TWIST BREAD

Manufacturer—Malbis Bakery Company, Mobile, Ala.

Description—Prepared from flour, water, sugar, whole milk, lard, skim milk, salt yeast, malt extract, and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate (method described in THE JOURNAL, March 5, 1932, p 817).

LADY CLARE BRAND EVAPORATED MILK

Distributor—M Muskal Chicago

Manufacturer—The Oatman Condensed Milk Company, Dundee, Ill.

Description—Canned, unsweetened evaporated milk. The same as Oatman's Brand Evaporated Milk (THE JOURNAL, April 16, 1932 p 1376).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO, ILL.

Cable Address

Medic, Chicago'

Subscription price

Seven dollars per annum in advance

Please send in promptly notice of change of address giving both old and new always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, DECEMBER 21, 1935

THE ELEVENTH REVISION OF THE PHARMACOPEIA OF THE UNITED STATES OF AMERICA

One hundred and twenty years has passed since Dr Lyman Spalding, a physician, issued a call for "gentlemen, willing to act and men distinguished for their ability and learning" to formulate a pharmacopeia. Their object was to "select from among substances which possess medicinal power, those, the utility of which is most fully established and best understood, and to form from them preparations and compositions in which their powers may be exerted to the greatest advantage." These articles were to be distinguished by "convenient and definite names."

During its early history the Pharmacopeia was decidedly an undertaking by physicians. Gradually the necessity for pharmaceutical advice developed, and the revisions of the last three editions have been dominated largely by those representing pharmacy rather than medicine. In the 1920 revision there was a fortunate agreement whereby the scope of the pharmacopeia was left entirely to the medical members of the Revision Committee even though they composed only one third of the group, the pharmaceutical interests were responsible for questions of pharmacy. Before the issuance of a new Pharmacopeia, pharmaceutical schools, medical schools, societies, certain government agencies and other organizations send delegates to the Pharmacopeial Convention. In 1930, at Washington, pharmaceutical interests, with certain manufacturing interests, gave little heed to those representing scientific and progressive medicine. Fortunately, Dr E. Fullerton Cook who had successfully revised the previous edition of the Pharmacopeia, was appointed chairman of the Revision Committee.

The new Pharmacopeia is now at hand. While this Pharmacopeia has lacked the able judgment of some of the most valuable leaders in pharmacology and medicine, owing to the 1930 political manipulations,¹ the book is to be commended. Evidently under the successful guidance of Dr Cook the members have

given serious consideration to the admonitions of the medical profession. The new Pharmacopeia follows the old one in style and general method of presentation. The progress of the revision may be measured in part by the deletions.² The committee reports that 119 products have been deleted either because they had been superseded by better products pharmaceutically or medically or because their period of usefulness had expired in view of more modern methods of treatment.

The new additions to the Pharmacopeia, of which there are fifty-eight, include Calcium Gluconate, Carbon Dioxide, Chiniofon Powder, Ephedrine and the Hydrochloride and Sulfate, Ethylene, Histamine Phosphate, Iodophthalein Soluble (Tetraiodophenolphthalein Sodium), Merbaphen, Mercuric Succinimide, Mild Tincture of Iodine, Neocinchophen and Parathyroid Solution. Thirty-nine of the new additions are already familiar to physicians in New and Nonofficial Remedies, sixteen are so well established that they appear in Useful Drugs. Of course there are a number of drugs without which the physician cannot practice successfully which are not included in the Pharmacopeia. This is in accord with the recognized policy of the Pharmacopeia that monopolized substances are not admissible, thus, as long as there is a patent for insulin it cannot be admitted. There are also other drugs, such as certain mercurials, arsenic preparations and antiseptics, for which the physician will continue to rely on New and Nonofficial Remedies for his guidance. It would seem well, if an interim revision is issued, that a shorter acting barbiturate be included. For instance, pentobarbital sodium is a nonproprietary drug having the necessary short-acting attributes.

It will be well for physicians to notice that the forthcoming edition of the Pharmacopeia has made one radical change in the matter of percentage. In the introduction it is stated that the percentage shall be "weight in volume" unless otherwise indicated. This means that in each prescription containing such heavy substances as glycerin the total amount of the other

2 Aconitine Crude Tetanus Antitoxin Water Benzaldehyde Buchu Calcium Glycerophosphate Calumba Lime Chlorinated Lime Gamboge Wood Charcoal Cimicifuga Cinchonidine Sulphate Cinchophen Colchicum Corm Colocynth Cotarnine Chloride Cubeb Elaterin Capsicum Plaster Lead Oleate Plaster Eucalyptus Extract of Colchicum Extract of Colocynth Compound Extract of Colocynth Saccharated Ferrous Carbonate Ferric Chloride Soluble Ferric Phosphate Encapsulated Ferrous Sulphate Granulated Ferrous Sulphate Fluidextracts of Bella donna Leaves Buchu Cimicifuga Cinchona Colchicum Eucalyptus Pomegranate Hydrastis Hyoscyamus Rhubarb Rhus Glabra Rose Squill Senega and Uva Ursi Gambur Glycinate of Phenol Pomegranate Guaiacol Carbonate Red Mercuric Iodide Hydrastis Hyoscyamine Hydrobromide Infusion of Digitalis Ipomea Jalap Krameria Lime Liniment Solutions of Arsenous and Mercuric Iodide Iron and Ammonium Acetate Lead Subacetate Potassium Citrate, Potassium Hydroxide Chlorinated Soda Sodium Hydroxide and Zinc Chloride Lobelia Malt Manna Honey of Rose Morphine Hydrochloride Oil of Capsicum Oil of Capuput Oil of Caraway Croton Oil Paracetamol Compound Pills of Mild Mercurous Chloride Pills of Phenol formaldehyde Peppermint Phosphorus Pilocarpine Hydrochloride Pills of Phenol Asafoetida Compound Pills of Mild Mercurous Chloride Compound Powder of Rhubarb Quassia Quinine Hydrochloride Quinine Hydrobromide Quinine Tannate Resin of Ipomea Resin of Jalap Rhus Glabra Rose Salicin Senega Sodium Indigotindisulphonate Strontium Sulphate Straphanthus Sulphoamethane Syrup of Rhubarb Compound Syrup of Squill Syrup of Senega Syrup of Ginger Tinctures of Asafoetida, Calumba Cardamom and Cinchona Compound Tincture of Gambur Tinctures of Krameria Lobelia Rhubarb and Straphanthus Ammoniated Tincture of Valerian Tincture of Ginger Troches of Tannic Acid Troches of Ammonium Chloride Elm Iodoform Ointment Ointment of Lead Oleate and Uva Ursi

1 A discussion of the 1930 convention appears in THE JOURNAL May 24 1930 p 1707

ingredient(s) will have a different value than if the usual weight/weight method of expression were employed in terms of percentages

Within the last two years the Committee on Revision in cooperation with the Board of Trustees of the U S Pharmacopeial Convention has initiated a practice of issuing an "interim revision" This has now become an established policy It has the advantages of early correction of serious mistakes and the necessity of making products conform with new manufacturing processes However, it has the decided drawback of requiring the physician to keep constantly in mind any possible changes which the committee may issue affecting prescription practice and may easily become a hardship on manufacturers It is hoped, therefore, that these revisions will be issued most conservatively

The nomenclature used in certain instances in the new Pharmacopeia is unfortunate For instance, physicians are asked to prescribe "Theophylline with Ethylene Diamine," a most difficult term to write in prescriptions, when there was already available to the Pharmacopeia the nonproprietary name Aminophylline At the last moment the Pharmacopeia has included the name Aminophylline as a synonym It has also used the cumbersome term of the British Pharmacopeial Commission, "Solution of Irradiated Ergosterol," when the nonproprietary name "Vioosterol in Oil" would have been simpler In the interest of the medical profession THE JOURNAL will continue to use the terms Aminophylline and Vioosterol in Oil There are, of course, many changes in spelling, such as the ph in sulphur changed to f As has so often been said, common usage establishes a name Seldom did one use the word "Gluside" in prescribing saccharin, so the Pharmacopeia has reverted to the old term "Saccharin" Names and standards for the ten newly admitted biologicals (a Typhoid, a Typhoid-Paratyphoid and Rabies Vaccines, Scarlet Fever Streptococcus Toxin and the Antitoxin, Diphtheria Toxin and the Toxin for Schick Test, Antipneumococcic (Type I) and Antimeningococcic Serums, and Old Tuberculin) were provided by the National Institute of Health A subcommittee on vitamins, responsible for the Interim Revision of Cod Liver Oil, will oversee standards on this vitamin A and D containing substance The International Units of vitamins A and D and digitals have become the official U S P units, with some modifications It is interesting to note the description of liver and stomach preparations Here no standards are given, but the Pharmacopeia endeavors to control these products with the following statement "This Board will indicate liver and stomach preparations which are of Pharmacopeial quality—as indicated by submitted clinical data" There have been some who have questioned the constitutionality of the Pharmacopeia since, in effect, it confers on an individual (corporation) legal prerogatives that are possessed only by the government Some have taken issue on each side of this question In view

of the recent decisions of the Supreme Court on the NRA, reference to an advisory committee of the determination of the acceptability of liver preparations is doubtful from a legal point of view

Of course many of the drugs that were in the Pharmacopeia have been transferred to the National Formulary, long a repository of discarded drugs An interesting conflict arises, however The new National Formulary,³ also now available, has made official certain ampule dosage forms, for instance, ampules of dextrose are now described By interpretation, ampules of other dosage forms of Pharmacopeial drugs may be looked on as nonofficial preparations The National Formulary states that ampules of dextrose "contain a sterile solution of approximately 50 Gm of anhydrous dextrose," yet anhydrous dextrose is not official in the Pharmacopeia or the National Formulary If a physician should prescribe a solution of dextrose, but not in ampule form, there would be dispensed the hydrous dextrose of the Pharmacopeia This alone would lead to an error of 5 Gm in 100 cc of a 50 per cent solution

For the most part the latest edition of the Pharmacopeia is indeed a credit to the Revision Committee THE JOURNAL and the Council on Pharmacy and Chemistry have consistently urged that physicians prescribe official preparations whenever possible⁴

LEGISLATION PENDING IN CONGRESS CONCERNING FOOD, DRUGS, COS- METICS AND THERA- PEUTIC DEVICES

Since Senator Copeland first introduced the so-called Tugwell food, drug, therapeutic device and cosmetic bill¹ in the Senate, in the Seventy-Third Congress, numerous other bills of similar purpose have been offered in both the Senate and the House of Representatives Those introduced in the Seventy-Third Congress died when that congress expired, Jan 3, 1935 Such bills² as have been introduced in the Seventy-Fourth Congress are still pending Outstanding among these is S 5, introduced by Senator Copeland and commonly called the Copeland bill It is officially entitled "An Act To prevent the adulteration, misbranding, and false advertising of food, drugs, devices, and cosmetics in interstate, foreign, and other commerce subject to the jurisdiction of the United States, for the purposes of safeguarding the public health, preventing deceit upon the purchasing public, and for other purposes"

The Copeland bill, after many amendments and in a form much different from that in which it was introduced, was passed by the Senate, May 28, 1935 It then went to the House of Representatives, where it was referred to the Committee on Interstate and

³ Comment on the National Formulary VI will appear in next week's issue of THE JOURNAL

⁴ In following this policy the Council on Pharmacy and Chemistry has in course of preparation an Epitome of the U S Pharmacopeia and the National Formulary revised in accordance with the new additions

¹ Seventy Third Congress S 1944

² Seventy Fourth Congress S 5 S 580 H R 3972 H R 6145, H R 6688 H R 6906 H R 8744 H R 8805 H R 8941

Foreign Commerce, which in turn referred it to a subcommittee, along with other bills of similar purport. The subcommittee has given extensive hearings on these bills and now has them under consideration. It may be expected to report to the full committee shortly after Congress convenes next January. The committee, after considering the subcommittee's report, will then report a bill to the House of Representatives. This bill may be either the Copeland bill in the identical form in which it passed the Senate, or the Copeland bill with amendments, or an entirely new bill possibly composed of the good features of all pending legislation. The bill reported by the committee will then take its place on the House calendar and, depending on parliamentary procedure, come before the House for debate and action. If it passes, it will in the ordinary course of events be returned to the Senate. The differences in the bill as passed by the two bodies will be adjusted through conference committees before the bill is eventually sent to the President for action.

If such a bill is passed and approved by the President, it will become a law on the day the President signs it unless some other day is named in the bill. In bills of this character it is customary to provide that the bill, in whole or in part, shall not become effective until some date considerably after the date of approval, so that business may adjust itself to the requirements newly imposed on it. The Copeland bill provides a waiting period of twelve months after its approval before its penal provisions become effective.

Every one interested in the enactment of federal food and drug legislation better than that which now prevails and in the extension of such legislation to protect the public against fraud and danger in cosmetics and prophylactic and therapeutic devices must recognize that the present Copeland bill is the result of many compromises. On its face, the bill may appear to be materially more rigid in its requirements than the Food and Drugs Act of 1906. It does cover cosmetics and therapeutic devices, which existing law does not cover at all. It is more rigorous in its requirements on the labeling of foods and drugs and in covering advertising as well as labeling. A careful study, however, discloses loopholes and evidences of weakness in its administrative provisions, particularly with reference to drugs, including "patent" and proprietary medicines, and prophylactic and therapeutic devices. These should be corrected before the bill is enacted.

A critical analysis of the Copeland bill now pending before the subcommittee of the Committee on Interstate and Foreign Commerce of the House of Representatives, by the Bureau of Legal Medicine and Legislation of the American Medical Association, appears elsewhere in this issue.³ The subcommittee, it is hoped, will develop a bill free from such defects as are pointed out in this analysis. Legislation should be enacted in a form better designed for the protection of the consumer

than is the present bill. The Association and its several constituent state associations and component county societies, and Fellows and members of the Association individually should do what they can to bring about that result.

Current Comment

ANTHRAX IN IMPORTED HAIR

Anthrax is unique in many ways in the history of bacteriology. Robert Koch's demonstration in 1876 of the anthrax bacillus as the cause of this disease was in fact the beginning of modern bacteriology. Davaine in 1863, however, had produced experimental infections with blood containing anthrax bacilli and suggested an etiologic relation. Anthrax is primarily a disease of herbivorous animals, especially sheep, cattle, goats, hogs and horses. In some European and Asiatic countries, thousands of animals succumb to this infection each year. In America the disease occurs infrequently in man. The Bureau of the Census reports that nine deaths from anthrax occurred in the United States in 1934, eleven in 1933 and twelve in 1932. Now comes a record of the occurrence of ten cases in the last two years in Delaware County, Pa. A mill that imports goat hair from China and India for the manufacture of inner lining had been in operation more than twenty years without ever having a case of anthrax until March 1933. Gold¹ reports ten cases, seven of which occurred in persons working in the mill and two in children living in the village surrounding the mill, the remaining case occurred at a distance, the infection having been carried from the mill either by shipping cases or by hair bobbins. The diagnosis in each case was confirmed by bacteriologic cultures. The first case developed in a youth, aged 18, who scratched his face while working in the carding room. A typical anthrax lesion developed, together with edema over an area 3 inches in diameter. The patient was treated by the local administration of antianthrax serum into the affected area, as well as by intravenous injections. However, the disease spread and the patient died in about five days from the time his face was scratched. It was thought that the local administration of the antianthrax serum possibly encouraged the spread of the infection in this case by the mechanical separation of the tissues. Serum was not administered locally in any of the other nine cases, and all the patients recovered. Following the optimal dose of antianthrax serum administered either intramuscularly or intravenously, definite results promptly occurred, the temperature and pulse rate dropped and the edema disappeared in a short time. However, neither the adenopathy nor the anthrax bacilli were so promptly affected, and in some cases anthrax bacilli were recovered from the lesions late in the course of the disease, when the patients seemed to be practically well. Fortunately, antianthrax serum did not produce in these cases any severe reactions, even though enormous doses were given. As much as 1,000 cc of serum as the initial dose was given, followed later by one or more injections of 100 cc each.

¹ Gold, Herman. Studies in Anthrax. Clinical Report of Ten Human Cases, *J. Lab. & Clin. Med.* 21:134 (Nov.) 1935.

into the muscles. While other patients received smaller initial doses, the average total amount given to the patients who recovered was 943.3 cc. Neoarsphenamine in addition to the antianthrax serum was used in some of the earlier cases but was discontinued, as it did not seem to be of benefit. The facts brought out in the investigation show that this strain of anthrax bacilli was especially virulent. Two cases occurred one year after the last previous case developed, and yet during that time there had been no change in the raw material used at the mill or in its processing. Were the last two cases a recurrence of the previous infection or was a new shipment of hair, which had just arrived from the Orient, responsible for the fresh outbreak? Bacteriologic tests on the new bales of hair showed that anthrax bacilli were present in the center of a bale as well as in sweepings of the storeroom floor. These ten cases indicate that it is possible for products infected with virulent anthrax organisms to be shipped into the United States without detection, even though quarantine regulations to prevent such disasters are operating.

Medical Economics

DISTRIBUTION OF PHYSICIANS UNDER INSURANCE

An oft repeated indictment against the system of private practice of medicine in the United States is that it leads to an inequitable distribution of medical facilities. The advocates of compulsory sickness insurance and 'socialized' medicine cite the fact (unaccompanied by an analysis of population charac-

Distribution of Physicians in Prussia

| District | 1932 Physicians | 1933 Population per Physician |
|--------------|--------------------|-------------------------------------|
| Königsberg | 621 | 1,542 |
| Gumbinnen | 206 | 2,651 |
| Allenstein | 184 | 3,003 |
| Westpreussen | 128 | 2,167 |
| Potsdam | 894 | 1,582 |
| Frankfurt | 662 | 1,980 |
| Berlin | 6,791 | 625 |
| Stettin | 780 | 1,584 |
| Köslin | 278 | 2,466 |
| Grenzmark | 152 | 2,181 |
| Breslau | 1,513 | 1,285 |
| Liegnitz | 756 | 1,666 |
| Oppeln | 657 | 2,257 |
| Magdeburg | 942 | 1,384 |
| Merseburg | 869 | 1,710 |
| Erfurt | 384 | 1,590 |
| Schleswig | 1,157 | 1,374 |
| Hannover | 751 | 1,204 |
| Hildesheim | 466 | 1,275 |
| Lüneburg | 356 | 1,748 |
| Stade | 235 | 1,993 |
| Osnabrück | 230 | 2,030 |
| Aurich | 164 | 1,899 |
| Münster | 879 | 1,776 |
| Minden | 549 | 1,588 |
| Arnsberg | 1,693 | 1,539 |
| Kassel | 843 | 1,363 |
| Wiesbaden | 1,625 | 884 |
| Köln | 472 | 1,616 |
| Düsseldorf | 3,069 | 1,328 |
| Cologne | 1,475 | 1,047 |
| Trier | 204 | 2,439 |
| Aachen | 450 | 1,662 |
| Sigmaringen | 33 | 2,212 |
| Total | 30,468 | 1,311† |

* Outside Saar

† Average for all Prussia

teristics) that in 1931 there were 614 persons per physician in New York and 1,400 in South Carolina as evidence of the need to introduce insurance or some similar scheme as a means of distributing physicians more closely in relation to population. Prussia has had compulsory sickness insurance for more than half a century. The accompanying table is the result of a recent study of the distribution of physicians in Prussia¹

¹ Humboldt H. Medical Care in Prussia in the Years 1824 and 1932. *Deutsches Arzteblatt* 66: 854 (Sept. 7) 1935.

Although Prussia is smaller than most American states and there is a much more uniform distribution of population than in the United States as a whole, the differences in the distribution of physicians reach the extreme of 625 and 884 persons per physician in two provinces with the most physicians, to 3,003 and 2,651 in those with the least number of physicians in proportion to population.

Medical facilities, like all other facilities, in a competitive society, follow purchasing power, and purchasing power is not increased by any system of distribution through insurance, or otherwise.

Association News

RADIO BROADCASTS

The American Medical Association broadcasts over the Blue network and certain additional stations of the National Broadcasting Company at 5 p. m. eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time) each Tuesday, presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers a toast "Ladies and gentlemen, your health!" The theme of the program is repeated each week in the opening announcement which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

The next three programs are as follows:

December 24 No broadcast
December 31 No broadcast
January 7 Winter Ills Morris Fishbein, M.D.

This program is broadcast also on the short waves through KDKA, Pittsburgh, over station W8XK, 11,870 and 12,210 kilocycles.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Annual Registration Due January 1—Every licensee of the Arkansas Eclectic Medical Examining Board must register annually with the secretary of the board between January 1 and the last day in February and pay a fee of \$2, if a resident of Arkansas, and of \$4, if a nonresident. The failure of a licensee to pay the required fee by March 1 automatically suspends his right to practice while delinquent. If he fails for three successive years to pay the required fee, his license is to be canceled and thereafter will be reinstated only on such a showing to the board of moral character and professional qualifications as would entitle the applicant to the issuance of an original license and on the payment of the same fees as are required for the issuance of an original license.

CONNECTICUT

Society News—At a meeting of the Windham County Medical Society recently, speakers included Drs. Erwin C. Miller, Worcester, Mass., and Cecil R. Garcin, Danielson, on pneumonia and cancer, respectively.—Dr. Bret Ratner, New York, addressed the Hartford Medical Society at Hartford, November 18, on allergy in childhood.

Personal—Dr. Ross G. Harrison, Sterling professor of biology at Yale University School of Medicine, New Haven, received an honorary degree from the University of Budapest at the tercentenary celebration of the university.—Dr. Clifford D. Moore, formerly chief executive officer, Boston Psychopathic Hospital, has been appointed superintendent of the Fairfield State Hospital, Newton, succeeding Dr. Roy L. Leak.

DISTRICT OF COLUMBIA

University News—Dr Siegfried Thannhauser, formerly director of the medical clinic and professor of internal medicine at the University of Freiburg-i-Br, Germany, and now of Boston, gave the second lecture in the Smith-Reed-Russell series at George Washington University School of Medicine, November 26, his subject was "Cholesterol Its Chemical, Physiological and Clinical Aspects"

Society News—The Medical Society of the District of Columbia was addressed, November 22, by Drs J Tate Mason, Seattle, and James S McLester, Birmingham, Ala., President-Elect and President of the American Medical Association, respectively, they spoke on "Etiology and Treatment of Peptic Ulcer" and "Influence of Food in Digestive Disorders" Among others, Dr Edward A Cafritz addressed the society, December 11, on "Nondrainage Appendiceal Peritonitis"

ILLINOIS

Society News—Dr Anton J Carlson, Chicago, discussed "Advance in Medicine Through Animal Research" before the Fulton County Medical Society in Canton, November 25—At a meeting of the Sangamon County Medical Society in Springfield, December 5, Dr Paul B Magnuson, Chicago, spoke on "Surgery of Arthritis"—Dr Jack L Diamond Alton, addressed the Alton Medical Society, November 14 on "Value of Malaria Therapy in the Treatment of Paresis"

Chicago

Dr Houssay to Address Institute of Medicine—Dr Bernardo A Houssay, professor of physiology, National University of Buenos Aires, Argentina, will deliver an illustrated lecture before the Institute of Medicine of Chicago January 3, on "Interactions Between the Parathyroid Glands and the Hypophysis and Pancreas"

University News—Construction will soon begin on a three story addition to the Surgical Institute for Crippled Children at the University of Illinois College of Medicine The building is to cost about \$150,000 and will provide forty additional beds—A symposium on poliomyelitis was presented before the Volini Medical Society at Loyola University School of Medicine in November by Drs Archibald L Hoyne and Victor E Gonda The Volini Medical Society is an honorary society, its membership limited to those members of the junior and senior classes who have maintained honor grades in medicine

Conference on Mental Hygiene—The Illinois Society for Mental Hygiene sponsored a one day conference, December 6, to discuss the modern concepts and practice of mental hygiene Speakers included

William E Blatz, Ph D associate professor of psychology University of Toronto Mental Hygiene Concepts in Present Day Thought
Marion Faber assistant director in charge psychiatric nursing service Cook County School of Nursing Psychiatric Nursing
Dr Franz G Alexander director Institute for Psychoanalysis Psychoanalysis

Dr Samuel H Kraines associate in neuropsychiatry University of Illinois College of Medicine Psychobiological Aspects

Dr William Malamud professor of psychiatry State University of Iowa College of Medicine Iowa City Psychotherapeutic Techniques in Personality Adjustments

Speakers at the dinner meeting included Dr Ralph C Hamill who presided Helen L Myrick, general director of the Illinois Society for Mental Hygiene, and Dr Clarence M Hincks, director, National Committee for Mental Hygiene, New York.

INDIANA

Society News—A symposium on syphilis was presented before the Indianapolis Medical Society, December 17, by Drs John R Thrasher, John R Brayton, Robert G Thayer and Russell L Arbuckle.—The Noble County Medical Society was addressed in Kendallville, December 3, by Dr Marshall B Catlett, Fort Wayne, on "Surgical Treatment of Female Pelvic Disease"—At a meeting of the Fort Wayne Medical Society, December 3, Dr Louis J Hirschman, Detroit, discussed "Extracolonic Factors in the Etiology of So-Called Colitis"—Dr Oscar O Miller, Louisville, addressed the Jefferson County Medical Society in Madison November 26, on "Modern Treatment of Pulmonary Tuberculosis"—At a meeting of the Vigo County Medical Society in Terre Haute, November 12, Dr Walter E Stewart, Terre Haute, spoke on sinusitis.—The Vanderburgh County Medical Society was addressed in Evansville November 12, by Dr Julius R Yung, Terre Haute, on "Toxic Diffuse Goiter—Its Diagnosis and Treatment."

IOWA

Personal—Dr Ralph H Heeren has been appointed associate professor of hygiene, preventive medicine and bacteriology at the State University of Iowa College of Medicine, Iowa City, succeeding Dr Albert V Hardy, who, it is reported, has gone to Johns Hopkins University, Baltimore.

Examination in Basic Sciences—The Iowa Board of Examiners in the Basic Sciences will conduct a written examination at the state capitol, Des Moines, January 14, at 9 a. m. Those wishing to take the examination must first obtain an application blank from the secretary, fill it out and return it, together with the fee of \$10, so as to reach the secretary not later than Monday, December 30 Edward A. Benbrook D V M, Iowa State College, Ames, is secretary of the Iowa Basic Science Board.

Society News—Dr Julian D Boyd, Iowa City, discussed tuberculosis in childhood before the Johnson County Medical Society at the Oakdale Sanatorium, November 6—Speakers before the Scott County Medical Society in Davenport recently included Dr William P Murphy, Boston, on "Modern Treatment of Anemia"—At a meeting of the Woodbury County Medical Society in Sioux City recently Drs William E Ash, Council Bluffs, spoke on "Relationship of Psychiatry to General Medicine", Eugene B Floersch, Council Bluffs, "Coronary Thrombosis," and Lloyd G Howard, Council Bluffs, "Head Surgery"—Dr Lonnie A Coffin, Farmington, was chosen president of the Southeastern Iowa Medical Society recently, speakers at the meeting included Dr Arnold S. Jackson, Madison, Wis, on "Diseases of the Thyroid Gland."—Dr Walter L. Bierring, Des Moines, among others, addressed the Wright County Medical Society, November 25 on the prevention of disease and the responsibility of the state health department—Dr Albert M Snell, Rochester, Minn., will speak before the Linn County Medical Society, January 9 in Cedar Rapids, on "Differential Diagnosis of Conditions Associated with Jaundice"

MINNESOTA

Personal—Dr Fred G Carter, superintendent of Ancker Hospital, St Paul has resigned to accept a position at Christ Hospital, Cincinnati, he will be succeeded by Dr Seymour R. Lee, who formerly was on the staff of the hospital but recently has been at the state hospital at Willmar Dr Carter has been associated with Ancker Hospital for fifteen years—Dr Milburn W Kemp of the Fergus Falls State Hospital has been appointed superintendent of the state hospital at Anoka to succeed the late Dr Arthur C Came—Dr Thomas H Dickson Jr has been appointed medical director of the Minnesota Mutual Life Insurance Company to succeed Dr Charles N McCloud—Dr Magnus C Petersen, assistant superintendent of the St. Peter state hospital since Jan 1, 1928, has been named superintendent of the Willmar State Asylum by the Minnesota Board of Control

MISSOURI

Medical Information Bureau—In accordance with a decision by its house of delegates, the Missouri State Medical Association has established a medical information bureau in its office in St Louis to facilitate the dissemination of authentic information on public health matters to the public, the press, and charitable organizations and association members, to expose and suppress quackery and to promote a better understanding between the public and organized medicine The bureau maintains a card index file on proprietary medicines, physicians and institutions One hundred members of the society were appointed as advisers to be consulted in answering inquiries not of a routine nature or which deal with a special field of medicine or medical problems Dr Edward J Goodwin secretary of the state association, is in charge of the bureau.

NEBRASKA

Survey of Cancer in Nebraska—The official report of a survey of the cancer problem in Nebraska, made in 1934 by Dr Frank L Rector, field representative of the American Society for the Control of Cancer, at the request of the Nebraska State Medical Association, was published in the *Nebraska State Medical Journal* in November The death rate from cancer in Nebraska was found to have increased from 75.4 per hundred thousand in 1920 to 102.5 in 1932, an increase comparable to that for the U S registration area as a whole In the decade 1920-1930 the population 30 years of age and over increased only 37 per cent, while the cancer death rate increased 38.3 per cent Cancer caused 11 per cent of all Nebraska deaths in 1932 and, of the 1,424 deaths, 57.2 per cent

were from cancer of the digestive tract and peritoneum. At the time of this survey seventy-five counties in Nebraska, containing 52 per cent of the population and nearly 42 per cent of the physicians of the state, were without hospitals of twenty-five beds or more. Twenty-eight hospitals located in fourteen counties furnished information concerning cancer patients cared for in 1933 and facilities for diagnosis and treatment. There were 1,355 cancer patients hospitalized in 1933, of these 184 died and eighty-two came to necropsy. Only 12.9 per cent of all cancer deaths in the state took place in hospitals. All general hospitals take cancer patients. Nine are equipped with x-ray apparatus of 200,000 volts capacity, the Lincoln General Hospital has equipment of 800,000 volts capacity. Three hospitals own a total of 256 mg of radium, and private physicians as far as could be ascertained, own 835 mg. Eleven of the hospitals have no facilities for laboratory examination of tissues, but four of these send tissues to pathologists of recognized standing. Six hospitals reported no necropsies although they reported 164 deaths from all causes. Seven other hospitals reported a total of 438 deaths, of which only forty-two cases came to necropsy. Two tumor clinics were in operation in Omaha and one was being organized in Lincoln at the time of the survey. Dr. Rector outlined detailed activities that could be undertaken by the state medical association, the state department of health and the state committee of the American Society for the Control of Cancer.

NEW JERSEY

Fined for Recording Blood Pressure on Boardwalk.—Harry Forman, who operated a stand on the boardwalk at Atlantic City where he made blood pressure readings was arraigned in district court, October 23, before Judge W. Lindley Jeffers, who fined him \$200 but suspended the fine. Forman was investigated by the state medical board and the Atlantic County Medical Society after protests were received from about 175 physicians who visited Atlantic City at the annual session of the American Medical Association last June. It was said. Forman contended that he was not practicing medicine but that his machine was similar to a weight machine. The *New York State Journal of Medicine* printed in its November 15 issue a letter from the president of the Taylor Instrument Companies, Rochester, N. Y. deploring misuse of instruments produced solely for the medical profession. The letter requested that the company be given any information concerning the way these instruments are procured for unethical purposes so that steps may be taken to prevent continuance of the practice.

NEW YORK

Personal.—Dr. Louis C. Kress, director of the New York state division of cancer control has been appointed chairman of the state cancer committee of the American Society for the Control of Cancer, succeeding Dr. Burton T. Simpson. At the recent meeting of the New York State Association of Public Health Laboratories, a medal was presented to Mary B. Kirkbride, Sc.D., associate director of laboratories of the state department of health, in appreciation of her services as secretary of the association during the past fifteen years. A portrait of Dr. Leroy W. Hubbard, Mount Vernon, N. Y. was presented to the Georgia Warm Springs Foundation Warm Springs, Ga. Thanksgiving Day, by former patients. Dr. Hubbard was the first physician to be connected with the foundation serving as surgeon-in-chief from 1926 to 1931 when he resigned to do extension work for the institution. He was succeeded at Warm Springs by Dr. Michael Hoke. Prior to this appointment, Dr. Hubbard had been orthopedic surgeon with the New York State Health Department for nine years.

New York City

Analysis of Poliomyelitis Outbreak.—The New York City Department of Health has published a preliminary report on the poliomyelitis epidemic of last summer which reached the highest number of cases since 1931. About 1,900 cases had been reported up to October 1 compared with 4,138 in 1931 and 9,023 in 1916. The peak of the outbreak was reached August 24. Comparison with earlier outbreaks shows that there has been a definite shifting of incidence to higher ages. 86.6 per cent of the cases in 1907 were in children under 5 years old, while in 1935 only 32.8 per cent occurred in this group with 41.9 per cent in the group 5 to 9 years old. The virulence has varied in the four principal epidemics. In 1907 the case fatality rate was estimated at 5 per cent, in 1916 it was 27.3 in 1931 it was 12.18 and in 1935 it was 4 per cent. After deliberation, it was decided to open the city schools at

the regular time, and it is believed that this policy was proved sound by the fact that no increase in prevalence followed the opening of schools.

Municipal Health Building Opened.—New York's \$4,550,000 ten story building for the departments of health, hospitals and sanitation, which has been under construction for four years, was dedicated November 26. Speakers included Mayor La Guardia, Dr. John L. Rice, commissioner of health, Dr. Sigismund S. Goldwater, commissioner of hospitals, Thomas W. Hammond, commissioner of sanitation, Dr. John A. Hartwell, director of the New York Academy of Medicine, and Dr. Thomas A. Gonzales, acting medical examiner. The design of the building was described as "conservatively classic" harmonizing with other civic units in the area. The main entrance is on Worth Street and the other sides face Center, Lafayette and Leonard streets. On the façades are carved names of prominent public health figures from Moses to Dr. Hermann M. Biggs. The names are Moses, Jenner, Ramazzini, Hippocrates, Paracelsus, Pinel, Lind, Koch, Behring, Pasteur, Leeuwenhoek, Ehrlich, Billings, Harvey, Farr, Howard Lister, Nightingale, Shattuck, Morton, Marion Sims, Bard, Semmelweis, Welch, Stephen Smith, E. B. Dalton, Biggs, Walter Reed and Gorgas. Fifty years ago the department of health was at 300 Mulberry Street, in 1889 the offices were moved to the criminal courts building, later to a building at Fifty-Fourth Street and Sixth Avenue, and then to the Excelsior Building in Center Street. From 1919 till the new building was begun the headquarters were at 505 Pearl Street and during the past four years they were at 139 Center Street.

NORTH CAROLINA

Health Bulletin Fifty Years Old.—With its December issue the *Health Bulletin* of the North Carolina State Board of Health completed fifty years of publication. It was founded by Dr. Thomas Fanning Wood, the state's first health officer who was a practicing physician of Wilmington. Dr. George M. Cooper, assistant state health officer and director of the division of preventive medicine of the state board of health, Raleigh, has been editor since 1923.

Graduate Course in Gastro-Intestinal Diseases.—A graduate course in gastro-intestinal diseases was presented at Duke University School of Medicine, Durham, October 31-November 2. Speakers included Drs. James S. McLester, Birmingham, Ala., President, American Medical Association, Thomas R. Brown, Arthur M. Shipley, Dean Lewis and Harvey B. Stone, Baltimore, Walter C. Alvarez and Byrl R. Kirklin, Rochester, Minn., Hugh H. Trout, Roanoke, Va., William Weston and LeGrand Guerry, Columbia S. C., Walter B. Martin and Robert L. Payne, Norfolk, Va., Martin E. Rehfuess, Philadelphia, Thomas T. Mackie, New York, Fred W. Rankin, Lexington, Ky., Frank K. Boland, Atlanta, Ga., Anton J. Carlson, Chicago, and John Shelton Horsley, Richmond, Va.

OKLAHOMA

County Quarantined for Meningitis.—Kiowa County was placed under quarantine December 13 because of an outbreak of meningitis that caused at least one death and thirteen illnesses in the county, which has a population of 26,000. The quarantine was lifted from most of the area two days later after a conference between the state health commissioner, Dr. Charles M. Pearce, and county authorities, but it was enforced by the national guard in the communities of Snyder and Mountam Park. Dr. James L. Adams, Hobart, Kiowa County health officer, ascribed one death definitely to meningitis and said that nine other recent deaths may have been caused by the disease. Public assemblages were forbidden and grocery and drug stores were directed to serve only by delivery and then with extreme caution.

Society News.—Dr. Ian MacKenzie addressed the Tulsa County Medical Society, Tulsa, November 11, on "Congenital Deformities." Drs. Charles H. Eads and Anna Luvern Hays spoke November 25, on "Management of Syphilis in Pregnancy and Treatment of Congenital Syphilis," respectively. The Muskogee Academy of Medicine at an all day meeting in Muskogee December 4 had as guests Drs. Peter T. Bohan and Charles C. Denme, Kansas City, Mo., and John C. Burch, Nashville, Tenn. Drs. Anson L. Clark and Henry H. Turner, Oklahoma City, addressed the Osage County Medical Society, Pawhuska recently on "Fever Therapy, Its Possibilities and Limitations" and "Recent Advances in Endocrinology with Special Reference to the Sex Hormones, respectively." Drs. John L. Kleinhessel and Henry N. Tihen, Wichita, Kan., addressed the Woods-Alfalfa County Medical Society in Alva, November 26 on "Diabetes and Pregnancy," and Relation of Gastric and Duodenal Ulcer to Cancer."

respectively—Drs William P Neilson and Charles J Roberts, Enid, addressed the Garfield County Medical Society, Enid, recently, on "Effect of Abdominal Operations on Respiration" and "Medical Treatment of Peptic Ulcer," respectively—Speakers before the Kay County Medical Society, Tonkawa, recently, were Oklahoma City physicians Drs Ephraim Goldfain and Earl D McBride, on arthritis, and John H Robinson, significance of abdominal pains

PENNSYLVANIA

Prize Awarded—Dr Constantine P Faller, Harrisburg, received the 1935 award of the Seibert prize of \$500 for study in Europe, given by the Harrisburg Academy of Medicine. Dr Faller was honored in recognition of his work in initiating graduate medical assemblies in his community. The prize was presented at the academy's annual banquet, November 13

Society News—A conference of secretaries of county medical societies was held in Harrisburg, December 10, Dr Samuel R Haythorn, Pittsburgh, reported a survey of group hospitalization plans and Dr Rosco G Leland, director, Bureau of Medical Economics, American Medical Association, Chicago, spoke on economic problems—Dr Truman G Schnabel, Philadelphia, conducted a clinic on cardiac and renal cases at the meeting of the Cambria County Medical Society, Johnstown, December 12

Philadelphia

Society News—Dr Bret Ratner, New York, addressed the Philadelphia Pediatric Society, December 10, on "Pathogenesis and Management of Allergy in Childhood"—Speakers at a meeting of the Philadelphia Academy of Surgery, December 2, were Drs Harry E Knox, on "Pneumococcic Peritonitis," William J Ryan, "Hernia of the Vermiform Appendix," and Harold A K Mingle, "Experimental Studies in Peritonitis"—Drs Lewis C Scheffey and William J Thudium, among others, addressed the Obstetrical Society of Philadelphia, December 5, on "Further Results in the Treatment of Carcinoma of the Cervix"—Speakers at a meeting of the Philadelphia Urological Society, November 25, were Drs Paul M Butterfield, New York, on "Urological Conditions in Childhood," Joseph C Birdsall, Relationship of Hydronephrosis to Nephrophtosis, and John T Farrell Jr and Theodore R Fetter, "Irradiation of Carcinoma of the Bladder"

Pittsburgh

Society News—At a meeting of the Pittsburgh Pediatric Society, December 13, speakers were Drs Hyman A Slesinger, Windber Pa, on "Acute Epidemic Encephalitis," James LeRoy Foster, "Present Status of Certified Milk in Pittsburgh," and William W Briant Jr, Mount Lebanon, Pa, "Complete Heart Block in a Child of Three Years"—A symposium on peptic ulcer was presented before the Pittsburgh Academy of Medicine, December 10, by Drs Frank A Evans, Frederick B Utley and John P Griffith

TENNESSEE

Health at Nashville—Telegraphic reports to the U S Department of Commerce from eighty-six cities with a total population of 37 million for the week ended December 7 indicate that the highest mortality rate (208) appears for Nashville and that the rate for the group of cities was 12.2. The mortality rate for Nashville for the corresponding week of 1934 was 165 and for the group of cities, 11.7. The annual rate for the eighty-six cities for the forty-nine weeks of 1935 was 11.3, and the same rate appeared for the corresponding period of last year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have large Negro populations may tend to increase the death rate.

TEXAS

Personal—Dr Edmond H Sauvignat, Laredo, has been appointed health officer of Webb County, succeeding Dr Albert T Cook, who became health officer of the city of Laredo—Dr Laurence J Montague has been appointed superintendent of City-County Hospital, Edinburg, succeeding Dr Cleburne M Williamson, who resigned to devote himself to private practice

Graduate Assembly at Houston—The fourth annual Post Graduate Medical Assembly of South Texas was held in Houston, December 3-5, at the Rice Hotel. Sessions were held morning, afternoon and evening with informal luncheon meetings as well. Guest speakers were Drs Edward V L Brown,

Chicago, and Edward C Ellett, Memphis, Tenn., on ophthalmologic subjects, Thomas E Carmody, Denver, and Albert C Furstenberg, Ann Arbor, Mich., on otolaryngology, William C Danforth, Evanston, Ill obstetrics, Wilbur C Davison, Durham, N C, pediatrics, Walter A Fansler, Minneapolis, proctology, Louis J Karnosh, Cleveland, psychiatry, Frank H Lahey, Boston, surgery, Oswald S Lowsley, New York, urology, John S Lundy, Rochester, Minn, anesthesia, Emil Novak, Baltimore, gynecology, Paul A O'Leary, Rochester, Minn, dermatology, Leroy Sante St Louis, radiology, Cyrus C Sturgis, Ann Arbor, Mich, internal medicine, and Philip D Wilson, New York, orthopedics. The eye, ear, nose and throat section of the assembly met jointly with the Texas Ophthalmological and Otolaryngological Society with Drs Carmody, Brown, Furstenberg and Ellett as guests

GENERAL

Examinations in Ophthalmology—The American Board of Ophthalmology will conduct examinations in Kansas City, Mo, May 11, at the time of the annual session of the American Medical Association and in New York in October. Applications and case reports must be filed sixty days before the date of examination with Dr Thomas D Allen, assistant secretary, 122 South Michigan Avenue, Chicago

International Conference on Fever Therapy—The first International Conference on Fever Therapy will be held in New York in September 1936. Therapeutic, physiologic and pathologic phases of fever will be discussed. It is planned to translate abstracts of all the papers into French, English and German. In order to make printed copies of the transactions available for the conference, it is necessary that manuscripts and abstracts be sent in not later than June 1, 1936. Those interested in participating are requested to make early application. Dr William Bierman, 471 Park Avenue, New York, is secretary. The members of the American committee are Drs Arthur U Desjardins, Rochester, Minn, William Bierman, New York, Frank W Hartman, Detroit, Leland E Hinsie, New York, Clarence A Neymann, Chicago, Walter M Simpson, Dayton, Ohio, and Stafford L Warren, Rochester, N Y

Journal on Birth Control—A periodical known as the *Journal of Contraception* appeared in November. Published by the Birth Control Clinical Research Bureau, New York, it is to be devoted to the "biological and clinical aspects of human fertility and its control" and contains one original article, editorials, abstracts of current literature and news. The following medical advisory board is announced: Calvin Bridges, Ph D, Pasadena, Calif, Robert Chambers, Ph D, New York, Norman E Hines, Ph D, Hamilton, N Y, H M Parshley, Sc.D, Northampton, Mass, and Drs Morris N Baskin, Denver, Adelaide Brown, San Francisco, Herbert M Evans, Berkeley, Calif, Alan F Guttmacher, Baltimore, James S Klumpp, Huntington, W Va, Adolf Meyer, Baltimore, James Shirley Sweeney, Dallas, Texas, Fred J Taussig, St. Louis, Ira S Wile, New York, and Prentiss Willson, Washington, D C

Society News—The annual meeting of the American Society for the Study of Arthritis was held in New York at the Waldorf-Astoria, December 12-14. Among speakers were Drs Walter S Barnhart, Ottawa, Canada, on "Some Problems of Chronic Rheumatic Diseases", Raymond L Jeffery, Seattle, "Treatment of Arthritis with Complement Fixing Reactions", Conrad Berens, New York, "Lesions of the Eye Associated with Arthritis," and Donald Gordon, New York, "Traction and Resisted Movements in Arthritis." The program of the annual open meeting was noted in THE JOURNAL, December 14, page 1995—Dr George L Wright, Syracuse, N Y, was elected president of the International Association of Fire and Police Surgeons and Medical Directors of Civil Service Commissions at the annual session in New York, November 23. Dr Karl B Bretzfelder, New Haven, was made vice president and Dr Arthur Wildman, Brooklyn, secretary. Next year's convention will be in New Haven.

Prevalence of Communicable Disease—A decrease in poliomyelitis of about 1,500 cases occurred during the four weeks ended November 2 as compared with the preceding four weeks, according to *Public Health Reports*. The 1,039 cases for the country as a whole was about 50 per cent in excess of those for the corresponding periods in 1934 and 1933, but it was only about half of the number reported for this period in each of the years 1931 and 1930. The incidence was still considerably above that of recent years in regions along the Atlantic coast where the disease has been most prevalent, but all other sections reported fewer cases than last year. The number of cases of meningococcic meningitis rose from 240 for the pre-

ceding period to a total of 273 for the four weeks period ended November 2. The increase was somewhat unexpected, because this disease is usually at or near its lowest level at this season of the year. The sharpest rise occurred in the South Atlantic region, where practically every state reported an increase over the preceding four weeks and the fifty-nine cases reported was the highest for this period in the seven years for which data are available. The incidence of typhoid continued to decline. For the four weeks ended November 2 there were 1,600 cases, the lowest figure for this period in recent years. The usual seasonal increase of diphtheria continued, with 5,416 cases reported during the four weeks analyzed.

Mr Fosdick Appointed President of Rockefeller Foundation—The retirement of Max Mason, Ph.D. president of the Rockefeller Foundation since 1929, and the appointment of Raymond B. Fosdick, New York, as his successor, have been announced by the foundation effective July 1, 1936. Mr. Mason, who will devote his time to research in mathematics and mathematical physics, left Wisconsin in 1925 to become president of the University of Chicago from where he went to the foundation in 1928 as director of the division of natural sciences, and became president in 1929. In addition to becoming head of the foundation, Mr. Fosdick will assume the presidency of the General Education Board. In explanation of the combination of offices, it was announced that the General Education Board plans to expend increasing amounts of its principal funds over a period of years, possibly resulting in their complete exhaustion, meanwhile, to avoid any overlapping of the boards, it was deemed wise to have one administration for the two. Mr. Fosdick, an attorney, has been identified with Rockefeller interests for many years, being a trustee of the organizations he now heads and of the Rockefeller Institute for Medical Research. In 1913 he made a study of police organization in Europe as a representative of the Rockefeller Bureau of Social Hygiene. Among other public positions, Mr. Fosdick has been assistant corporation counsel of New York (1908-1910), commissioner of accounts in charge of investigations of city departments (1910-1913) and a member of the New York City board of education. During the World War he served as chairman of a commission on training camp activities of the War and Navy departments, as a special representative of the War Department in France as civilian aide to General Pershing in France and in 1919-1920 was attached to the League of Nations. He was awarded the Distinguished Service Medal.

Government Services

Hospitals and Physicians Eligible for Loans Under Federal Housing Administration

Hospitals and similar institutions, whether owned and operated by individuals or corporations, are eligible for loans for modernization, repair and equipment under the Modernization Credit Plan of the Federal Housing Administration.

Physicians and surgeons who maintain their offices in buildings removed from their homes, as well as those who have their offices in dwellings, may also take advantage of the plan to have the most modern establishment and equipment.

The distinction is that the hospital, diagnostic center, or the office of the physician when it is not located in a dwelling may obtain credit, anywhere from a few hundred dollars to as much as \$50,000, while the physician is limited to a loan of \$2,000 when his office is a part of a home.

The office in a business building where frequently a number of physicians have their individual consultation rooms but use a common diagnostic center and equipment, would be eligible for credit on the same basis as a hospital. The office in a home however, would be limited to the \$2,000 maximum for modernization and repair as provided for homes.

This means briefly that any reputable institution or physician may obtain on easy terms sufficient credit to put the structure in good condition and to purchase and install the most modern equipment for diagnosis and treatment.

The Federal Housing Administration lends no money. The loans are made by private banking and financial institutions under an arrangement by which the Housing Administration insures them against loss.

Under these conditions lending institutions are more than willing to make loans that are sound business risks.

The terms are that the charge may not be in excess of the equivalent of a 5% discount for each \$100 face value of a one-

year monthly instalment note. Payments are to be divided into equal monthly instalments and may be spread over a period of as long as five years.

Equipment that would be considered eligible for an insured credit is described in the regulations as follows:

It must be of permanent, utilitarian character and of such value as to justify the application of the principle of time payment thereto. It may not include furnishings, furniture, or small portable appliances. A hospital, for instance, could obtain an eligible loan covering x-ray machine, thermal cabinets, fluoroscopes and articles of like character, but such a loan could not include surgical instruments, beds and other furniture.

This should give an understanding of the types of equipment that may be installed. The list is an elaborate one. The main consideration is that the article should have a unit value sufficient to justify the application of time payments to its purchase and should be of a durable nature with a reasonable expectancy of useful life longer than the period of the loan.

The dealer in all such equipment is in all probability familiar with the eligibility rulings of the administrator and whether the article he sells comes within the regulations adopted. If he cannot supply the information the Federal Housing Administration, Washington, D. C. will make rulings on request.

In the same manner in which equipment has outgrown its usefulness the building itself may be in need of repairs and modernization. One of the greatest essentials in a hospital is proper light. Lighting installations are eligible.

The operating room may be completely done over, the walls redone, a modern heating plant installed and ventilating or air conditioning equipment put in. The structure may be in need of a new roof, floors, glass-enclosed porches, concrete driveways, fireproofing (most important in an institution of this kind) a built-in garage, or a separate garage. It may be advisable to make some additions. In short, any structural improvements that may be done to the ordinary business establishment would be eligible for the hospital.

Since funds are advanced by banks or other private lending agencies, they are expected to exercise ordinary business precaution. Naturally a lending institution could not be expected to make a large loan to some institution when the credit rating did not justify it.

The banks are required to satisfy themselves on the question of security and the ability to repay.

Assuming these conditions to be satisfactory, there should not be the slightest difficulty in obtaining credit promptly.

Here is an illustration from Hartford, Conn. Miss Anna M. Holmquist, owner of a convalescent home, obtained a modernization credit of \$1,500 and transformed the institution into an up-to-date maternity hospital. The loan was made available within five days from the date of application. This enabled the owner to put on a new roof, new porch, copper drains and new heating system, and to modernize the interior and the operating room.

It is amazing how much may be done with a comparatively small sum particularly in the modernization of the building and the purchase of equipment. It would be well for the physician who maintains his own hospital, clinic or diagnostic center, or the group of physicians or corporations, to make a survey of their needs and either consult their banker or the Federal Housing Administration.

Extent of Rural Health Service

Public Health Reports announces the establishment of full time health service in twenty-four units during the period Jan. 1-Dec. 31, 1934. The service was discontinued in fourteen units, leaving a net gain of ten. The greatest gains were in Tennessee and North Carolina, in each of which full time health service was established in five counties. Delaware and Maryland lead in the percentage of rural population with this service, all of their counties having been provided with full time local health organizations. Health units in Delaware are provided by the state, while those in Maryland are maintained by the local governments, with or without assistance from the state health department or other sources. Of the 540 counties, townships or districts with health service under full time health officers at the end of the present calendar year, 507, or 93.9 per cent were receiving financial assistance for the support of their health service from one or more of the following agencies: state board of health, U. S. Public Health Service, the Rockefeller Foundation, the American Red Cross, the American Women's Hospital Fund, the Rosenwald Fund, the Commonwealth Fund and the Milbank Memorial Fund.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov 23, 1935

Antivivisection Hospital Abandons Its Program

For many years there has been an active antivivisection party in this country, which carries on propaganda by means of a journal, public meetings and in other ways. One is the maintenance of the National Antivivisection Hospital at Battersea (in Southwest London). This is a general hospital with a proper staff of physicians, surgeons and specialists. According to its constitution no vivisectionist was permitted to be a member of the board of the hospital or of its medical, surgical, nursing or administrative staff. No remedies that were the result of any vivisection or experiments on animals might be used there. Every person on the staff was required before joining to give a pledge against vivisection. It has now proved impossible to carry on the hospital under these conditions. In 1929 there was a large surplus of income over expenditure, but since then there has been a deficiency, particularly in the income from legacies. The hospital has had to close three wards of 100 beds. An application was therefore made to obtain the sanction of the high court of justice for abandoning the antivivisection conditions of the foundation of the charity. An affidavit, made by the senior honorary surgeon, was read, to the effect that in view of the advances in general medical knowledge it was impossible to run the hospital on the present antivivisection lines. No other hospital in England was run on antivivisection lines. A scheme was submitted to the court for power to change the name of the hospital to the Battersea General Hospital and to declare that the observance of the principles and practice of antivivisection were no longer to bind the hospital. Mr. Justice Eve said that he must approve the scheme. Though personally he sympathized with the original objects and principles of the hospital, the time had come when they were no longer practicable. Possibly the diminution of the hospital's income was due to the fact that everybody had now to pay so much in taxation that little was left for charity.

An Expensive Dermatitis

The judicial committee of the privy council (the supreme court of appeal in England for the dominions) allowed the appeal of Dr. R. T. Grant of Adelaide, South Australia, from a judgment of the high court of Australia, which allowed by a majority the appeal of the Australian Knitting Mills Ltd. from a judgment of the Supreme Court of South Australia by which it was held that Dr. Grant should recover damages amounting to \$12,250 for dermatitis contracted from the underwear manufactured by the knitting mills. Dr. Grant's claim was that the disease was contracted by reason of the presence of free sulfite in the cuffs or ankle ends of the pants that he purchased and wore, and that the presence of this substance was due to the negligence of the manufacturers. He put on the pants June 28, 1931, in the morning and by the evening felt itching on the ankles, but objective symptoms did not occur until next day, when redness appeared on each ankle. The condition got worse and he was confined to bed from July 21 for seventeen weeks. The rash became generalized and very acute. In November he became convalescent and went to New Zealand to recuperate. He returned in February and was able to resume his practice but soon had a relapse, and by March his condition was so serious that he went to the hospital for three months. For the respondents it had been argued that the disease might have been contracted from some external irritant, which implied no imperfection in the garments and did harm

only because of the doctor's peculiar susceptibility. Thus the disease might have been initiated by the mechanical irritation of the wool itself, or, if it was due to some chemical ingredient in the garment, that might have been something in itself harmless, so that the mischief was attributable to the appellant's own physical defect. It was argued that the respondents could not be held responsible for anything in the garments that would not be harmful in normal use. However, the Australian chief justice held that the doctor's skin was normal. The respondent's secretary gave evidence that they had sold throughout Australia 4¾ millions of garments treated by a similar process and had had no complaints. Their lordships' judgment was that the facts showed negligence in manufacture. According to the evidence, the process of manufacture was correct. The danger of excess of sulfites being left was recognized and guarded against. If they were left, some one was at fault. The appellant was not required to show who this was. Their lordships allowed the appeal with costs in all the courts. This probably means more than doubling the \$12,250 damages. The retailers as well as the manufacturer were made liable.

The Eradication of Rabies from England

Rabies was eradicated from England about forty years ago by an order for the compulsory muzzling of dogs for a period. This prevented communication of the disease by any dog that happened to be in the incubation stage. The effect has been maintained by the quarantine of all imported dogs for a time which exceeds the incubation period. Though rabies is prevalent on the continent of Europe, these measures have kept England free from it, with one limited exception. In 1918 an outbreak occurred in Devon and Cornwall owing to an infected dog having been smuggled into the country. It took three years to weed out this outbreak. Since 1921 there has been no confirmed case of rabies among the dogs of this country though since 1919 twelve cases have occurred in imported dogs while undergoing quarantine. The vigilance that is exercised with regard to the importation of dogs is shown by the recent case of a woman traveling from Berlin and landing at Croydon airport carrying a very small dog known as a German pinscher. The dog was placed in quarantine, but she was fined \$10 because she had not obeyed the regulation which requires any person bringing a dog to obtain a landing license. The maximum penalty for the offense is \$250, and she was let off with the much smaller fine because the magistrate was satisfied that she did not break the law deliberately. She knew that the dog would have to be quarantined and thought that this was all that was necessary.

Damages for Shock

The extent to which damages can be claimed for shock are surprising. It has been decided in the law courts that illness resulting from nervous shock may be the immediate consequence of a wrongful act and that there may be cause of action against the person responsible although he never could have expected such a result. The following is an example. A woman was told, by way of a practical joke, that her husband, who had been to some races, had had an accident and broken both his legs. She was asked to fetch him home in a carriage and to take some pillows with her. The shock of this fabrication caused a serious illness and she was awarded \$500 damages. It has even been decided that a person can claim damages for shock because he was the spectator of an accident. A woman was awarded \$50 for shock to her nerves which prevented her from performing her household duties, so that she had to employ outside help. The shock was caused by seeing an omnibus mount the curb and slightly injure a man. A few years ago the court of appeal ordered a new trial of an action in which a jury gave a verdict against a plaintiff who claimed damages for

shock One of the judges remarked that the branch of the law relating to shock had developed considerably in recent years A similar development has taken place with regard to the compensation of workmen for injury arising in or out of their employment A man became ill in consequence of being stung by an insect on his way to work He was awarded compensation for this as an injury arising out of his employment

Modernization of Hospital for Nervous Diseases

The National Hospital for Nervous Diseases, Queen Square, London, may be described as both the birthplace and the home of British neurology It was there that its great men—Hughlings Jackson, Ferrier, Gowers and others—worked It has 186 beds and also maintains a convalescent home of thirty-two beds at East Finchley Its activities have been hampered for several years because of lack of accommodations The modernization of the hospital and the provision of new buildings and equipment would cost \$900,000 The Rockefeller Foundation has offered \$600,000 on the condition that the remainder required for the improvements is raised within two years A further \$300,000 would be given by the Rockefeller Foundation as an endowment for research work at the hospital, which is claimed to be the leading center of the world for neurology Probably more neurologists have been trained there than at any other similar institution Men from all parts of the world, and particularly from America, come there for training

PARIS

(From Our Regular Correspondent)

Nov 8, 1935

Results of Compulsory Antidiphtheria Vaccination

An interesting report has just been published by Reh in the *Revue d'immunologie* on the results of the vaccination of school children at Geneva with the Ramon anatoxin In a population of 160,000 there are about 25,000 children attending the public schools Reh cites an instructive example of the value of such a method Three children of the same family, aged respectively 6 months, 3 years and 4 years were admitted to a crèche The youngest was placed in a ward of nonvaccinated infants the two others in wards in upper stories of the crèche, containing children of about their own age In spite of a negative certificate of having any contagious disease the three children were diphtheria carriers An epidemic of diphtheria followed the admission of the 6 months old infant to the ward of nonvaccinated infants of the same age All the nonvaccinated nurses in this ward also were victims In the other two wards, to which the 3 and 4 year old children had been admitted, the children had been previously vaccinated In spite of being in constant contact with the two carriers, these vaccinated children did not acquire the disease

From February 1929 to December 1934 a total of 11,150 school children have been vaccinated, 8,953 were given three and 1,436 two injections of the Ramon anatoxin The former received 15 and the latter 20 antigen units Postvaccinal reactions of mild local character occurred in 123 and a febrile reaction in 294 cases The results of the compulsory vaccination of school children in the canton of Geneva is evident by a comparison of the number of cases of diphtheria in that canton with the total number in all of the cantons of Switzerland

| | |
|------|--|
| 1929 | 286 in Geneva versus 3,723 for all Switzerland |
| 1930 | 131 in Geneva versus 4,545 for all Switzerland |
| 1931 | 130 in Geneva versus 2,641 for all Switzerland |
| 1932 | 133 in Geneva versus 2,265 for all Switzerland |
| 1933 | 80 in Geneva versus 2,271 for all Switzerland |
| 1934 | 25 in Geneva versus 1,775 for all Switzerland |

The decreased morbidity is especially applicable to children of school age, who constitute the majority of vaccinated per-

sons Sixty-four cases of diphtheria were observed at the schools of Geneva in 1931 forty-five in 1932, twenty-five in 1933 and only thirteen in 1934

The influence of vaccination on the death rate from diphtheria is even more striking Since 1929 there has not been a single death among vaccinated children Among the 11,150 vaccinated children there were fifty-one cases of diphtheria It is necessary, however, to exclude fifty children with nondiphtheritic sore throat, who were carriers but were reported as having diphtheria In children with a negative Schick reaction it is impossible to distinguish in vaccinated children between a true diphtheria and an ordinary sore throat developing in carriers The investigations of Dopfer (*Bull Acad de med* 112 801 [Dec 18] 1934) have made it possible from both an immunologic as well as clinical standpoint to confirm the existence of nonspecific sore throat in children with a negative Schick reaction but who are diphtheria bacillus carriers

Included in these fifty cases occurring in vaccinated children are three of rhinitis with rapid recovery and forty-seven pharyngitis cases, of which forty-three were of benign appearance, four with false membranes and only one with severe general symptoms All the forty-seven children recovered Evidently there was inadequate immunization in spite of three anatoxin injections in the four cases of false membrane.

Cancer of the Cervix After Subtotal Hysterectomy

Mme Simone Laborde and two of her assistants at the Cancer Institute of Paris reported their observations on the frequency of cancer of the cervix following subtotal hysterectomy at the July 1 meeting of the Gynecologic and Obstetric Society They studied 1,508 cancers of the uterus from 1921 to 1935, including 1,165 of the cervix, fourteen of the body, one sarcoma, 101 vaginal recurrences following complete hysterectomy for cancer, forty-four pelvic recurrences of various kinds, and fifty-seven cancers of the cervix after subtotal hysterectomy The percentage of the latter to those of cancer of the cervix in general is 4.9 One should not speak of cancer of the cervical stump following subtotal hysterectomy in cases in which such a cancer is only a stage in the development of a uterine cancer In other words, a relatively long period must have elapsed between the subtotal hysterectomy and the appearance of the cervical neoplasm

It has been customary to state that, if cancer appears within a year after the subtotal hysterectomy, it already existed at the time the operation was performed It is impossible to know the real condition of the cervix in women who do not present themselves for examination when the first symptoms are noticed Furthermore, certain endocervical cancers develop in such a latent manner that many months may elapse before they give rise to symptoms Delayed appearance does not always signify a "healthy interval" In the fifty-seven cases of cervical cancer after subtotal hysterectomy observed by Laborde, eighteen appeared "early," four without any "healthy interval" and fourteen after an interval of from one to six months The "late" cases appeared after an interval of from one to twenty years as follows three after one year, five after three years, five after four years, one after five years one after six years, two after seven years five after eight years, one after ten years two after eleven years, two after twelve years, one after fourteen years, four after seventeen years and two after twenty years These last two intervals are the longest ever reported Only thirty-nine, or 3.36 per cent, of the fifty-seven cases ought to be considered as true cancers of the cervix developing late enough after the subtotal hysterectomy, i. e. to be independent of an overlooked cancer at the time of operation The majority of cancers developing in the cervical stump develop from the vaginal epithelial covering When a glandular type is found,

one must always suspect that the lesion termed "fibroma" for which the subtotal operation was done in reality was a cancer of the body with extension into the cervix. This is especially true of the cases in which the cervical cancer appears without any "healthy interval." In spite of this suspicion, Laborde has encountered three "late" cases of the glandular type in women who had been operated on for fibroids two, three and four years, respectively, before. In such instances there must have been an independent development of cancer from the endocervical glands.

The prognosis of cancer developing in a cervical stump is not as favorable as that of cancer developing in the normal cervix, because invasion of the bladder and pelvic cellular tissue occurs relatively early. The treatment that has generally been employed at the Cancer Institute is radium, associated or not with high voltage roentgen therapy. Radium is difficult to use, because the fornices of the vagina are obliterated and the cervical canal is too short as a rule. Twenty of the fifty-seven patients were given radium treatment alone and thirty-two both radium and high voltage roentgen therapy. One patient has been cured for eleven years, one for seven years, and one for five years. Two others are in good condition after two and one after one year. All the others died within a year after being first examined, hence the prognosis is much less favorable than in cases of cervical cancer in which there has been no subtotal hysterectomy. As to development of a cancer in the vaginal scar following complete hysterectomy for noncancerous lesions only nine, or 0.68 per cent, such cases were observed by Laborde, in a total of 1,305 cancers of the uterus (1,165 cervical and 140 of the body).

Prof. Gustave Roussy Promoted in Legion of Honor

In the recent list of promotions of the minister of national education appears the name of Prof. Gustave Roussy, dean of the Faculty of Medicine of Paris and director of the anti-cancer center of the Paris region. Professor Roussy has rendered distinguished service to medicine in France and amply merits his promotion to be a commander in the Legion of Honor.

BERLIN

(From Our Regular Correspondent)

Oct. 21, 1935

Fiftieth Anniversary of the German Gynecologic Society

In October the Deutsche Gesellschaft für Gynäkologie held a session in Munich to celebrate the fiftieth anniversary of its founding. After the society was founded in Strasbourg, which was then a German city, its first congress was held in Munich under the chairmanship of Professor von Winckel. The history of this society has been closely associated with the development of gynecology as a specialty. As Prof. A. Mayer of Tübingen, chairman of the society, in an article in the *Münchener medizinische Wochenschrift* wrote, the specialty of gynecology in Germany is an offshoot of "surgery," which was grafted on "obstetrics." This combination gave rise to certain difficulties in the development of the new specialty. Young obstetricians had to learn surgery, whereas in other countries experienced surgeons became gynecologists. The result was that "operative gynecology" in Germany was possibly inferior to that of some foreign countries, but this applies only to the first years of the new development. Gynecology therefore in its early years was characterized by a surgical trend. It sought to develop within the realm of so called greater gynecology. Soon "minor gynecology," so called, sprang up in opposition to greater or major gynecology. Minor gynecology became interested in the ills that affect woman and was not confined chiefly to the diseases of certain organs. After women ceased to con-

fine their activities to the home and the care of a family and had entered professional and industrial life, new problems arose for gynecology, and the connections with other closely related specialties became more numerous. The conception of gynecology as comprising the biology and pathology of womankind arose. From "frauenheilkunde," or the art and science of medicine as applied to women, there developed "frauenkunde," or the knowledge of womankind from a wide range of view. Thus, gynecology has developed from a specialty dealing chiefly with the diseases of the female organs into a specialty that embraces the whole personality of woman as an individual creation and a significant member of society.

Meeting of the German Lay Practitioners

The tendency under the present régime in Germany to promote the cause of the so-called *heilpraktiker*, or the nature cure practitioners, has been frequently mentioned in recent letters. The "Heilpraktikerbund Deutschlands, Reichsverband in München" held recently in Frankfurt-on-Main a session to which all the district leaders of the reich and the directors of the professional schools of the league were invited. About 200 representatives attended. This league was created in 1933 by the federal ministry of the interior and was assigned the task of cleansing the league, which consisted of twenty-three former associations of *heilpraktiker* and numbered 5,700 members, of all unsavory elements. The league is endeavoring to perform the task assigned to it and, it is asserted, has launched a bitter fight against quackery. From 1,500 to 2,000 former *heilpraktiker* have already been eliminated, and the management of the league has stated that about 1,500 more members will be removed. Those members thus eliminated are for the most part *heilpraktiker* who have refused to appear before a commission of the aforementioned league and submit to an examination as to their knowledge of the theory and practice of the principles of healing advocated by the league. To what extent these *heilpraktiker* differ from quacks, in a scientific and medical sense, is not clear. In any event, the opposition of licensed physicians to these lay practitioners is great. On the other hand, the *heilpraktiker* are endeavoring to do all in their power to prove to the government authorities, who are well disposed toward them, the serious nature of their activities. It is of interest that the director of the league, a government appointee, spoke at this meeting on "The Interests of the Heilpraktiker Profession," the director of the federal professional school of the league discussed the continuation courses to be given next winter, and the leader of the press and propaganda presented the aims and tasks of the propaganda of the league. It is evident that the *heilpraktiker* will exert themselves to the utmost to gain the same rank and prestige enjoyed by regularly licensed physicians.

The Value of Revaccination Against Smallpox

Dr. Breger of the federal bureau of health has given an opinion on the value of revaccination against smallpox, which was presented by the president of the federal bureau of health at the session of the international bureau of health, held in Paris in May 1935. This question has again come to the fore because the director of the vaccination service in the region of Rio de Janeiro recently expressed the view that a single vaccination confers a lifelong immunity against smallpox and that a reduction of immunity is so rare that it is of no practical importance, revaccination, he contended, has no value and is superfluous. He asserted further that the many good results from revaccination reported in German statistics are for the most part immunity reactions that have been erroneously considered as evidence of successful revaccination. In view of these facts, revaccination in Rio de Janeiro had been almost entirely given up and no untoward conditions had resulted.

Dr Breger stated that German experience over a long period of years went to show that a single vaccination in childhood does not suffice to protect a population against a smallpox epidemic. As an illustration he cited the fact that in Bavaria the vaccination of children was introduced in 1807 but did not eradicate smallpox from that region. However, after the federal vaccination law went into effect in 1874, which prescribed revaccination, deaths from smallpox (aside from the first few years after the law went into effect) have rarely occurred. Practical experience has therefore shown that the primary vaccination is not sufficient and that a renewal of immunity through revaccination is needed if an effective protection against the spread of smallpox epidemic is to be secured. This example can be confirmed by numerous observations during more recent years in Czechoslovakia, Hungary, Rumania, Poland, Latvia, Soviet Russia and other countries.

The duration of vaccination immunity has been placed by an English commission at from nine to ten years on an average. It was the opinion of this commission that vaccination immunity must be renewed from time to time in order to reach the highest degree of protection. The German vaccination commission reached the same conclusion, it also recommended a revaccination ten years after the first vaccination. The most convincing documentary evidence for the duration of vaccination immunity is furnished by the English smallpox statistics of the previous decade, because, owing to the peculiar nature of the English vaccination service, different groups of the population may be distinguished with respect to vaccination. In 1926, for example, younger persons, following a single vaccination, developed smallpox after twelve years at the earliest. In revaccinated persons it was found that in the 1-30 years group only one case of smallpox developed, and that was in a person aged 15. It appeared that after about ten years from the date of the first vaccination and after about twenty years from the revaccination a sure immunity was no longer present. It is evident, therefore, that a lifelong vaccination immunity does not exist. England's experience is in harmony with numerous observations made in Germany. Following an epidemic of smallpox in 1917, it was ascertained that 79 per cent of all deaths from smallpox concerned persons who had passed their fortieth year. Strictly speaking, a revaccination should therefore be applied every ten years. Since that is not feasible, emergency vaccinations are given in the event of a smallpox outbreak. In Germany the reaction following revaccination is termed positive if nodules or vesication appears at the site of the vaccinal incision, this is not however, solely an immunity reaction. On the basis of epidemiologic observations, it appears advisable to hold fast to revaccination as the backbone of smallpox vaccination.

Control in the Bandage Trade

Between the organization of the German pharmacists and of the manufacturers of bandage supplies an agreement has been reached that is designed to insure to pharmacies an adequate supply of suitable bandages needed by the *kranken-kassen* including the special packages intended for the use of puerperants. A special committee will test the products of the bandage manufacturers as to quality and priceworthiness. If the products of which samples are furnished to the testing commission meet the requirements, the manufacturer of bandage supplies is entitled to furnish to the pharmacies his products in an accepted package. Every package must bear the emblem of the *Deutsche Apothekerschaft* together with the mark of the federal guild of the manufacturers of bandage supplies, a stamp showing the contents (quality and weight) the key number of the dealer and finally, this "Notice. Tested as to quality and priceworthiness by the *Deutsche Apothekerschaft* and the *Reichsfachschaft der Verbandsmittelhersteller*

BELGIUM

(From Our Regular Correspondent)

Oct. 29, 1935

First International Congress of Gastro-Enterology

The first International Congress of Gastro Enterology was held in Brussels under the chairmanship of Dr Jean Schoemaeker of The Hague. Bringing together for the first time the internists, surgeons, radiologists and biochemists, whose researches dealt chiefly with the pathology of the digestive tract, it was a complete success. Twenty-three countries were represented. While the congress was in session, the officers of the congress, united in a general assembly with the delegates of twenty one nations, laid the foundations for an international society of gastro-enterology, which, after the manner of the International Society of Surgery, will constitute a closed group.

GASTRITIS

The etiology, symptoms, diagnosis, treatment, radiologic aspects and pathology of gastritis were discussed. Konjetzny pointed out that the question of the indications for the surgical treatment of gastritis is far from being solved. In acute gastroduodenitis, with or without erosion, internal treatment is indicated. At present the diagnosis may be established with certainty. In chronic gastritis the indications for gastric resection are partially established. The radical operation is necessary for (1) circumscribed hypertrophies of the areolar or polypous mucosa, in which the presence of cancer may be chemically suspected and (2) various forms of hypertrophic stenosis of the pylorus, a disorder that is, in most cases, the result of a chronic gastritis. It need occasion no surprise if the results of a gastric resection are unsatisfactory, owing to an acute or subacute gastroduodenitis.

ULCERATIVE COLITIS OF NONAMEBIC ORIGIN

Donati described the treatment to be followed in grave ulcerative colitis of nonamebic origin. The condition, while resistant to medical treatment, is susceptible of surgical intervention, if applied early. Surgical treatment is indicated also in the various complications and sequels of colitis. Two kinds of intervention are to be considered: (1) indirect for the eradication of foci assumed to be or shown to be the cause of the colitis, such foci may involve the mouth and the teeth, the stomach and the duodenum, the appendix, the colon, the rectum, the peritoneum, the gallbladder, the uterus and the adnexa, and the urinary organs, and (2) direct, on the colon itself. These interventions may take on different forms: (a) enterostomy, intestinal fistula to effect lavage of the colon, or artificial anus for the total exclusion of the diseased intestine and the withdrawal of fecal matter, (b) anastomosis and intestinal exclusion, ileosigmoidostomy, ileotransversotomy, typhlosigmoidostomy, and (c) resection of the colon (partial colectomy), total colectomy is inadmissible. The operative technic does not involve any special rules, the indications are the most important problem.

Training of African Natives as Medical Aids

The colonial administration of the Belgian Congo has undertaken to create schools in which the natives may be trained as aids to nurses, aids to midwives, "sanitary guards" and nurses.

The program as announced shows how much thought has been given to the organization of this work, and excellent results from these efforts may be anticipated. The program of instruction for the aids to nurses which requires the least preparation may be outlined as follows:

Points covered by the theoretical course: (1) moral responsibilities and duties of a nurse's aid, explanation of laws and regulations concerning medical service, (2) preparation of brief case reports based on cards and bulletins in current use in the

hospitals and dispensaries and in traveling services in vogue in Africa, (3) microscopy as applied to tropical pathology, (4) practical ideas on hygiene as applied to the ward services of a hospital, to dispensary services, and to centers of treatment, individual hygiene, hygiene of villages, work-camps and work-yards, ideas concerning contagion and prophylaxis, (5) care and use of the equipment of wards, dispensaries, centers of treatment and traveling services, ideas concerning cleanliness, asepsis and antiseptics, scales, weights and measures, and (6) ideas concerning the principal disorders treated in traveling services and on the more important tropical endemic diseases, preparation of solutions, and instruction in the use of specific drugs

Points covered by the practical course (1) rendering of aid in hospital services, in consultation centers, in the dispensary and in the centers of treatment, (2) microscopy, (3) transport of patients and wounded persons, first aid in emergency cases, management of stretcher service, (4) dressings, and (5) minor operations and interventions in hospital and in traveling services

Prof Léon Frédéricq

In the death of Prof Leon Frédéricq, whose career covered more than half a century in experimental physiology, Belgium has suffered a severe loss. Born in Ghent in 1851, Leon Frédéricq completed in that city his doctorate in the natural sciences and in medicine in 1871. After working in several laboratories in foreign countries, he served as an assistant in physiology and comparative anatomy at the University of Ghent. During this period he proved the existence of fibrinogen in the blood plasma. Later, when Schwann, eminent proponent of the cellular theory, was casting about for some one for the chair of physiology at the University of Liege, his choice was Leon Frédéricq, then 30 years old. From 1879 on, for forty years, Leon Frédéricq distinguished himself by his clear and concise presentation, which drew about him young collaborators who shared their teacher's enthusiasm for laboratory research. In this favorable atmosphere he founded what amounted to a school of biology, whereby he gave a transcendent impetus to the experimental sciences and became one of the leading physiologists of his time. His researches dealt chiefly with the physiology of the circulation, respiration and the nervous system. He demonstrated that the respiratory movements are dependent on a medullary center the action of which is conditioned by the carbon dioxide content of the human blood. In 1928 he was chosen president of the Academy of Medicine.

CZECHOSLOVAKIA

(From Our Regular Correspondent)

Nov 5, 1935

Intussusception in Infants

In a recent issue of *Rozhledy v chirurgii a gynaekologii* (1935, No 3, p 340) Polák made a report on fourteen cases in which the diagnosis of intestinal invagination was made. In twelve cases the diagnosis was confirmed. Surgical treatment was employed in eleven of these cases and one was cured without operation. Three patients who were operated on did not recover. The others did, and the condition did not recur. In two cases the diagnosis was not confirmed by the operation. Early diagnosis is necessary for the success of any therapy. Ombrédanne's law is valid for nearly all cases. Blood in the discharges as well as a palpable tumor occurs, however, only in advanced stages of the illness. The earliest and most frequent signs of intussusception are sudden abdominal pains of intermittent character with vomiting. This must always arouse suspicion of invagination, even if other symptoms are missing. As, however, diagnosis based merely on these symptoms can never be complete and justify surgical treatment, one should in these early stages make a roentgen examination immediately

and try medical treatment, operating only if this should fail. In cases in which hemorrhage has occurred and there is a tangible tumor, the diagnosis is usually clear and a roentgenogram is unnecessary, immediate operation being called for. Operation is done under ether anesthesia through a pararectus or by a middle abdominal incision above the navel. Spinal anesthesia also is recommended. Disinvagination is most frequently effected by expression of the intussusceptum, a careful pull on the invaginated bowel being sometimes necessary. To prevent recurrence, Ombrédanne's ileoceceopexy was used several times, but for cases that have a tendency to recur, the method of Coubine and Steimclenger is recommended, it consists in the suture of the serosa of part of the ileum to the cecum. Should disinvagination be too difficult, Brown's operative method is recommended, consisting in incision of the neck of the invagination, disinvagination and suture of the enterostomic wound. If gangrene has occurred, Maunsell's operation is preferred to resection of the invagination, which is too severe for infants.

Surgical Complications of Diabetes and Treatment

Siska (p 362) reports on the results of treatment of 105 cases of surgical diabetes. The death rate was 18.09 per cent. The author believes that surgical complications of diabetes occur less frequently in women than in men. Five of these patients suffered from furunculosis, thirty-eight from abscess and carbuncles, and twenty-nine from gangrene of the limbs. In thirty-four cases, diabetes complicated other diseases, such as acute and chronic appendicitis, incarcerated hernia, varices, hemorrhoids and fractures. Much stress is laid on preparation of the patient before the operation as well as on good nursing. Great importance is attached to the collaboration of the internist, on whose instructions the result of the operation often depends. Various modes of anesthesia are discussed. Intermittent anesthesia with ethyl chloride is regarded as most suitable, the acidity after the operation being thus considerably reduced, in addition, the patient is spared the psychic shock.

Operation for Pancreatic Cysts

In the same issue Rolak and Gjurić describe a case of pancreatic cyst, which developed after resection of the stomach according to the method of Pean and Rydiger, probably as a result of the ligation of a pancreatic duct during operation. After the marsupialization of the cyst a fistula developed, which resisted treatment for three years. The cyst contained all three pancreatic ferments. Comparison of the pancreatic secretion in the duodenum and in the fistula, and the effect of different food on the pancreatic secretion, showed that secretion was stimulated most by hydrocarbon, then came ether, fat and albumin. Milk had the least effect. As the fistula did not close, a pancreatogastrostomy was performed according to Jedlicka's technic. The literature describes various modifications of this treatment of pancreatic cysts used in about twelve cases with good results.

Professor Fiessinger's Lecture

Prof Dr Noel Fiessinger of Paris lectured in Prague November 4, on parenchymatosis during cirrhosis of the liver. If the liver, kidney or another organ is the site of a chronic inflammation, there first appear the destruction of the parenchyma and a sclerosis of the mesenchyme. Professor Fiessinger discussed the relation of mesenchymatosis and parenchymatosis during the illness. Clinically only the total aspect of their action is observed. The physician has to analyze the case to find what may be repairable and which symptoms result from the parenchymatous degeneration. The curing of a sclerotic organ does not mean the curing of the sclerotic tissue. Sclerosis is due to a scar and it cannot be cured. Besides the scar the physician has to keep in mind the reaction of the organ, or what Professor Fiessinger calls "secondaire."

Deaths

During the last two months, Czechoslovakian medicine has lost three leading personalities

Prof Dr Anthony Hanák, aged 46, chief of the physiologic institute of Carl's University in Prague, died September 12. Professor Hanak studied the hemodynamic effects of absorption and secretion of capillary walls, completely overthrowing the Pflüger dogma. For a year he studied hematology in Barcroft's laboratory in Cambridge. In 1925 he organized the physiologic institute in Bratislava, and since 1930 he had been chief of the physiologic institute in Prague.

October 1, Prof Dr Charles Vymola, chief of the laryngologic and otologic department of the policlinic in Prague, died at the age of 72.

On the eve of his fiftieth birthday, Dr Prochazka, professor of neurology and psychiatry of Masaryk's University in Brno, was shot by a former patient. He was very popular and was president of the Moravian Medical Chamber (Association).

RIO DE JANEIRO

(From Our Regular Correspondent)

Oct 15, 1935

Electrocardiographic Changes in Myocardial Infarct

Dr Jairo Ramos, in a lecture before the Associação Paulista de Medicina, discussed the electrocardiographic changes due to myocardial infarct. He reviewed the experiments of Smith, in which the electrocardiographic changes found in myocardial infarct were interpreted like those caused by ligation of the coronary branches. The diagnosis of myocardial infarct by the electrocardiogram was first made in 1918 by Pardee and was based on Smith's work. The speaker illustrated his lecture by showing a collection of electrocardiograms.

Serum Albumin and Blood Globulin in Liver Diseases

Dr João Manoel Rossi, in a lecture before the Associação Paulista de Medicina, discussed the role of the liver in the formation of blood proteins, especially serum albumin and globulin. Blood proteins, according to the speaker, are formed by the liver. Experiments proved that blood proteins are well regenerated in animals with normal liver functions, slowly regenerated in animals with a slight injury of the liver due to the administration of chloroform, and not regenerated at all after hepatectomy. The speaker wondered whether the determination of the serum albumin and globulins in the blood could be a test for liver insufficiency. From observations in 100 cases he reached the following conclusions: The content of serum albumin and globulin in the blood, alone, is not of diagnostic and prognostic value. The serum albumin-globulin ratio cannot be considered as a test for liver insufficiency. However, it is of great prognostic value for the general condition of the patient not only in liver diseases but in several other diseases. The progressive falling of the coefficient, on the one hand, indicates that the patient is near death. Its increase on the other, indicates an open improvement of the patient toward recovery.

Methylene Blue in the Treatment of Leprosy

Dr Renato Braga, in a lecture recently delivered before the Sociedade Paulista de Leprologia, claimed priority in the administration of methylene blue in the treatment of leprosy, which he used earlier than did Dr Feliz Guisard. He treated lepers, in the Asilo Colonia St. Angelo and in Taubate, with methylene blue, associated with chaulmoogra oil in 1916. He treated 122 lepers with methylene blue according to Montel's technique, that is, injections of increasing doses of from 10 to 45 cc of a 1 per cent solution of methylene blue in doubly distilled water. In some cases the results were better than those obtained by the chaulmoogra oil treatment. The speaker

advised the use of methylene blue in the diagnosis of leprosy, leprotic lesions, even when only slightly visible, are colored by the stain. He reported satisfactory results from the administration of methylene blue, associated with sodium salicylate, in the treatment of leprosy of the painful form and discussed the results of intra-arterial injections of methylene blue in leprosy of the atrophic and ulcerous form.

Pan-American Conference of Mental Hygiene

The first Pan-American Conference on Mental Hygiene will be held in the near future in Rio de Janeiro under the auspices of Brazil and with the collaboration of some other South American countries. It is hoped that all countries in North, Central and South America will send delegations. The following topics will be discussed: social and hospital care of neuropsychiatric patients, prevention of organic diseases of the nervous system, prevention of alcoholism, forensic psychopathology and psychology, prevention of delinquency, psychoanalysis, psychotechnic and mental hygiene in work, mental hygiene and education, sexology in mental hygiene, organization and propaganda of mental hygiene, eugenics.

MOSCOW

(From Our Regular Correspondent)

Oct 31, 1935

A Solarium at the Extreme North

The arctic department of the Leningrad Institute of Physical Therapy studied this year the influence of the arctic climate on man. On the Imandra shore of lake Imandra (latitude 67° 41') an aerosolarium was established, which provided more than 1,000 sun and air baths. Next year there will be built a special enclosed solarium for air baths. Preliminary studies indicate that aeroheliotherapy in extremely northern latitudes has great curative value because of the marked biologic activity of the northern air and sun. For this purpose the institute plans to build sanatoriums and health resorts in many districts of the Kola peninsula.

The Health Resort Conference

The seventh All-Union Conference of Health Resorts and Spas will be held in Moscow, December 25. The previous conference was called eight years ago. The subjects for discussion at the conference will be Health Resorts of the Soviet Union, Curative Gaseous Spas and Treatment of Children's Diseases at Health Resorts, a scientific exhibit will show the natural resources of Russian health resorts.

Ultra Short Wave Therapy

The All-Union Institute of Experimental Medicine is studying ultra short wave therapy. The greatest difficulties in this problem are the dosage of the waves and correct indications for their use. It is not accurately known what quantity of the energy produced is utilized by the organism under treatment. Ultra short waves produce a vasoconstriction. They are effective therefore only when the blood vessels have not lost their ability to contract because of organic changes such as those that cause gangrene. The ultra short waves have a bactericidal action and thus promote simultaneously the immune properties of the organism. They are effective in the treatment of furunculosis, carbuncles and other local and general inflammations. Even peritonitis of gynecologic origin, in its most acute stages, responds to this method of treatment.

The warmth effect of ultra short waves is used for the treatment of neuritis and neuralgia. The waves were found beneficial in chronic neurodermatitis with cutaneous itching, which ceased after irradiation of certain parts of the central nervous system and not of the itching part. However, it is too soon to use ultra short radio wave generators because possible

dangers must be studied in laboratories and scientific institutes, and the medical and technical staffs must be instructed in their use.

Prof Michael P Tuchnov

Prof Michael P Tuchnov died in Moscow, September 19, at the age of 56, from angina pectoris. As the result of his scientific work on immunology, he was elected professor of pathologic physiology at Kazan. In 1930 he went to Leningrad and Moscow, where he worked in the All-Union Agricultural Academy, in the Kremlin's Laboratories and in other scientific establishments. In his thirty-three years of scientific activity, Professor Tuchnov made investigations also in the fields of bacteriology and biology.

The Aspirant Groups

The increasing number of medical schools and the necessity for highly specialized scientists has led the People's Commissariat for Health to consider the question of organizing aspirant groups in medical institutes. Physicians up to 35 years of age can be enrolled in the aspirant group after they pass examinations in special medical courses, foreign languages and the natural sciences. This course of study is for a three-year period. The first year and a half is devoted to theoretical science related to the specialty taken at the institute. After examinations in practical and theoretical courses, the aspirants pass the second one and one-half years in clinical study. After his thesis has been accepted, the aspirant receives the degree of medical science candidate, if the Supreme Qualification Committee of the People's Commissariat of Health approves him. The Aspirant Institute must help to supplement deficiencies in highly qualified specialists. After graduation their number in the different medical specialties will be markedly increased.

New Ambulatorium in Moscow

In October a new polyclinic for workers in heavy industry was opened in Moscow. It is situated in a building specially reconstructed to serve 2,000 patients a day. The walls of the x-ray room are covered with lead packing. This polyclinic is one of the best Moscow ambulatoriums, and the most famous specialists receive patients there.

Marriages

JOHN C ADAMS, Surg. Lieut. Commander, U. S. Navy to Miss Lucene Prestwood, both of Pensacola, Fla., September 17.

HENRY TOMPKINS KIRBY-SMITH, Sewanee, Tenn., to Miss Mary Phillips Woolvorton of Birmingham, Ala., September 21.

HAROLD L. BRERETON, Emmetsburg, Iowa, to Miss Margaretta Williamson of Washington, D. C., in Chicago, October 16.

ORLANDO BENEDICT MAYER to Miss Nancy Phillips, both of Columbia, S. C., at Blowing Rock, N. C., September 11.

MAXWELL G. SIMPSON, Elizabeth, N. J., to Mrs. Lillian Haver Miller of Southern Pines, N. C., September 12.

CHARLES SUMMERS STEVENSON, Baltimore, to Miss Alice de Guildry Stevens of New Haven, Conn., September 21.

HENRIK MARINUS ROZENDAAL, Rochester, Minn., to Miss Katherine Scranton of Scranton, Pa., October 19.

PATRICK H. W. MURPHY, Jersey City, N. J., to Miss Marion B. Breen of Douglas, Ont., Canada, August 14.

CLARENCE LEE GUYTON JR., Monroe, N. C., to Miss Jennie Llewellyn Finlayson in Cheraw, October 26.

NICHOLAS GOTTEN, Philadelphia, to Miss Mary Meredith Whittaker of Memphis, Tenn., November 6.

HARRY P. BLABER JR., Toi Shan, China, to Miss Constance White of Naugatuck, Conn., November 27.

FRANK TRUMBO HARPER, Jamestown, N. C., to Miss Gladys Virginia Duval of Greenville, September 3.

JETHRO MERIVETHER HURT to Miss Margaret Virginia Bennett, both of Blackstone, Va., November 6.

RALPH JORDAN MITCHELL, San Francisco, to Miss Olga Verlaque of Lexington, Ky., in October.

GEORGE O. A. KELLOGG to Miss Emma D. Jensma, both of Nampa, Idaho, in Boise, September 27.

CLARENCE HUNT WHITE, Burnsville, N. C., to Miss Mary Young Hunt of Henderson, October 24.

WILLIAM A. DOWER, Windsor, Conn., to Miss Mary G. Church of West Hartford, October 14.

HILLIS LEDBETTER SEAY, Sanatorium, N. C., to Miss Margaret Vanstory of Lincolnton, September 2.

ERNEST H. DENGLE, Pottstown, Pa., to Miss Irma Arleen Greenawalt of Reading, November 2.

VACLAV GEORGE DVORAK, Chicago, to Dr. ELLA HELEN VALENTA of Cicero, Ill., October 30.

JOHN F. JUDGE to Miss Helen Englehart, both of Newark, N. J., in East Orange, November 8.

HARRY G. HUDNALL to Miss Elizabeth Beaufort Revercomb both of Covington, Va., October 5.

LEWIS W. CELLIO, Youngstown, Ohio, to Miss Dorothy Dowling of St. Louis, October 26.

RAYBURN NELSON JOYNER to Miss Olive Marie Rigdon, both of Jacksonville, Fla., November 7.

PAUL F. WILLWERTH to Miss Margaret Mathews, both of Binghamton, N. Y., September 5.

HAROLD A. FLETCHER, San Francisco, to Mrs. Virgil M. Hillyer at Baltimore, October 25.

EDWIN E. DAY to Miss Gertrude Douglas, both of Vancouver, B. C., Canada, October 5.

WILLIAM GROSSMANN JR., Richmond, Va., to Miss Virginia Cox of Lynchburg, November 3.

JOHN LINCOLN HOWETH, Jersey City, N. J., to Miss Edith Sloane Tompkins, September 28.

BOYD HARDEN, Pittsburgh, to Miss Ruth Elizabeth Holmes of McKeesport, Pa., October 26.

LOUTEN RHODES HEDGPETH, Lumberton, N. C., to Miss Louise Hogan of Hamlet, November 7.

FRANKLIN LEDGERWOOD GEIGER to Miss Beatrice Ott, both of Columbia, S. C., September 23.

GRACE M. JORDAN to Mr. Earl Scranton Duvall, both of Columbus, Ohio, November 9.

CECIL A. ROBINSON to Dr. LILA ROSE ROBERSON, both of Gladewater, Texas, October 6.

EDWARD O. GUERRANT, Winchester, Ky., to Miss Julia Bullard of Anniston, Ala., October 15.

PAUL R. MAULDEN, Kannapolis, N. C., to Miss Julia Watson of Greensboro, September 18.

CLAUDE MERRILL LEISTER to Miss Mary S. Butz, both of Allentown, Pa., November 9.

ROBERT H. CROW, Woodruff, S. C., to Miss Juanita Gregory of Spartanburg, November 4.

THOMAS STANLEY MEADE to Miss Mary Belle Long, both of Richmond, Va., November 7.

LOUIS EARL WHARTON to Miss Mabelle Lorenz, both of Akron, Ohio, November 2.

EDWARD DE WITT COOK, Buffalo, to Miss Emily Smith of Montclair, N. J., October 5.

WILLIAM E. ELKIN, Atlanta, Ga., to Miss Nell Osborne of Louisville, Ky., October 22.

WILLIAM E. E. TYSON to Mrs. Charles Franklin Patterson, both of Detroit, October 7.

PAUL JONES CHAMBERS to Miss Mary Ellen Watts, both of Charlotte, N. C., recently.

JOHN A. BOONE, Boston, to Miss Ellen Gleason of Bedford County, Va., October 19.

ALBERT S. HARDEN JR., Maplewood, N. J., to Miss Helen Baer Cox, October 12.

REUBEN J. GUEST, Fort Payne, Ala., to Miss Janie Chapman of Tuscaloosa, recently.

DAVID E. JONES, Indianapolis, to Miss Dorothea Barnett of Winamac, October 6.

DAVID MERRILL WEEKS to Miss Ruth Gould, both of New York, September 21.

CHARLES H. FARMER to Mrs. Eugenia Spivey, both of Macon, Ga., in September.

HOWARD CHARLES CLARK to Miss Vera May, both of Wichita, Kan., October 5.

JOSEPH CARL BAIER, Williamsport, Pa., to Miss Lois Winters, October 26.

Deaths

Charles Louis Mix, Americus, Ga., Harvard University Medical School, Boston, 1894, member of the House of Delegates of the American Medical Association, 1906-1907, past president of the Chicago Neurological Society, professor emeritus since 1929 and from 1920 to 1929 professor of medicine and head of the department, Loyola University School of Medicine Chicago, professor of anatomy, Northwestern University Woman's Medical School in 1899 and the dental school in 1901, assistant professor of anatomy, 1900-1903, professor of physical diagnosis, 1903 to 1914, and clinical professor of medicine from 1914 to 1920, Northwestern University Medical School, served during the World War, lieutenant colonel in the medical reserve corps from 1919 to 1929, for many years on the staff of the Mercy Hospital, Chicago, and consulting internist to the Illinois Central Railroad Company, was associated with Dr. John B. Murphy in editing *Surgical Clinics of North America* and was editor-in-chief of the *Practical Medical Series*, aged 65, died, November 21, of pneumonia.

John Leonard Eckel ♂ Buffalo, University of Buffalo School of Medicine, 1907, chairman of the Section on Nervous and Mental Diseases of the American Medical Association 1928-1929, associate professor of neurology and assistant professor of psychiatry at his alma mater, member of the American Neurological Association, the American Psychiatric Association, the Association for Research in Nervous and Mental Disease and the Central Neuropsychiatric Association, served on the medical advisory board during the World War, attending and consulting neurologist to the J. N. Adam Memorial Hospital, Perysburg, Buffalo General Hospital, Millard Fillmore Hospital, Memorial Hospital, Mercy Hospital, Our Lady of Victory Hospital, Sisters Hospital and the Providence Retreat, author of many articles on research published in medical journals, aged 55, died, November 26, of coronary occlusion and myocarditis.

Raymond J. Wenker, Milwaukee, Marquette University School of Medicine, Milwaukee, 1914, also a dentist, member of the Associated Anesthetists of the United States and Canada, formerly professor of dental anatomy and operative technique, professor of orthodontia and instructor of orthodontia technique, professor of oral surgery and temporary dean, Milwaukee Medical College Dental Department, professor of oral surgery, orthodontia, dental anatomy and operative technique and dean, College of Wisconsin Physicians and Surgeons Dental Department, assistant in nose and throat clinic at his alma mater and professor of orthodontia and associate professor of oral surgery at the Marquette University Dental Department, aged 67, died, October 24, of coronary thrombosis, arteriosclerosis and hypertension.

Herbert Francis Twitchell, Portland, Maine, Medical School of Maine, Portland, 1883, past president and member of the Maine Medical Association, past president of the Cumberland County Medical Society, at one time instructor in clinical surgery at his alma mater, fellow of the American College of Surgeons, consultant to the Maine Eye and Ear Infirmary, Maine General Hospital and the Children's Hospital Portland, the Webber Hospital Biddeford, and the Bath (Maine) City Hospital, aged 76, died, November 24, of cerebral hemorrhage and arteriosclerosis.

L. Rosa Hirschmann Gantt ♂ Spartanburg, S. C., Medical College of the State of South Carolina, Charleston, 1901, past president of the Medical Women's National Association, medical examiner of a draft board during the World War, member of the district advisory board, acting surgeon of the U. S. Public Health Service, at various times on the staff of St. Luke's Hospital, Trion and the Spartanburg General Hospital, aged 59, died, November 16, in a hospital at Philadelphia, of embolism following an abdominal operation.

Charles Daniel Fox, Ardmore, Pa., Hahnemann Medical College and Hospital of Philadelphia, 1903, Medico-Chirurgical College of Philadelphia, 1906, served during the World War, at one time demonstrator of neurohistology and neuropathology, instructor in neurology and pediatrics, Hahnemann Medical College and Hospital of Philadelphia, formerly on the staff of the Children's Homeopathic Hospital, aged 55, died, October 24, of carcinoma of the liver and lung.

Frederick Bush Willard, Buffalo, University of Buffalo School of Medicine, 1890, member of the Medical Society of the State of New York, at one time instructor in anatomy at his alma mater, served during the World War, formerly

medical sanitary inspector with the board of health, aged 72, died, November 7, in the Buffalo City Hospital, of cerebral arteriosclerosis, cerebral hemorrhage and bronchopneumonia.

Leonard Wheeler, Worcester, Mass., Harvard University Medical School, Boston, 1870, member and former vice president of the Massachusetts Medical Society, trustee, past president of the board and formerly on the staff of the Memorial Hospital at one time trustee of the State Hospital, Foxboro, at various times on the staffs of the City Hospital and St. Vincent Hospital, aged 90, died, October 2, of pneumonia.

Arthur Rowley Reynolds ♂ Chicago, Bellevue Hospital Medical College, New York, 1876, health commissioner of Chicago from 1893 to 1895 and again from 1897 to 1905, in 1911 named a lieutenant and in 1917 a captain in the medical reserve corps of the army, aged 81, died, November 14, in the Augustana Hospital, of injuries received when he was struck by an automobile.

Eugene Robert Van Meter, Springfield, Mo., Washington University School of Medicine, St. Louis, 1905, member of the Missouri State Medical Association, formerly assistant in clinical laryngology and rhinology at his alma mater, served during the World War, aged 52, died, September 30, in St. John's Hospital, of fat embolism, following a fracture of both legs.

William Francis Metcalf, Bayfield, Ont., Canada, University of Michigan Department of Medicine and Surgery, Ann Arbor 1888, fellow of the American College of Surgeons, formerly clinical professor of gynecology, Detroit College of Medicine, at one time on the staff of the Harper Hospital, Detroit, aged 71, died, October 17.

Olaf Severin Leedahl, Stanley, N. D., Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1907, member of the North Dakota State Medical Association, county coroner, formerly county health officer, aged 54, died, October 28, of carcinoma of the stomach.

August Angelo Cavagnaro, Stockton, Calif., Keokuk Medical College, College of Physicians and Surgeons, 1908, also a pharmacist, formerly city health officer and member of the state legislature, aged 59, died suddenly, October 15, of acute dilatation of the heart and chronic nephritis.

Hubert Schoonmaker ♂ Clifton Springs, N. Y., University of the City of New York Medical Department, 1891, fellow of the American College of Physicians, at one time superintendent of the Clifton Springs Sanitarium and Clinic, aged 72, died, October 21, of carcinoma of the lung.

George Collister, Boise, Idaho, Homeopathic Hospital College, Cleveland, 1880, member of the Idaho State Medical Association, on the staffs of St. Luke's and St. Alphonsus hospitals, formerly member of the city council, and city and county physician, aged 79, died, October 18.

Charles Edmund Fisher, Toledo, Ohio, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1895, fellow of the American College of Surgeons, for many years on the staff of St. Vincent's Hospital, aged 67, died, October 19, of coronary thrombosis.

Robert Hugh Campbell ♂ Vader, Wash., College of Physicians and Surgeons, Boston, 1906, past president of the Lewis County Medical Society, formerly member of the school board and bank president, aged 65, died, October 20, as the result of a cerebral hemorrhage.

Oscar E. Underwood, Roseboro, N. C., University College of Medicine, Richmond, 1909, member of the Medical Society of the State of North Carolina, aged 50, died, September 15, in the Highsmith Hospital, Fayetteville, of diabetes mellitus and carcinoma of the stomach.

James E. McGillicuddy ♂ Lansing, Mich., Detroit College of Medicine, 1898, past president of the Ingham County Medical Society, on the staffs of St. Lawrence Hospital and the Edward W. Sparrow Hospital, aged 63, died, October 17, of bronchopneumonia.

Joseph Herbert Ackerman, Asbury Park, N. J., Hahnemann Medical College and Hospital of Philadelphia, 1899, member of the Medical Society of New Jersey, on the staff of the Fitkin Memorial Hospital, Neptune, aged 65, died, November 2.

Roderic Stephen Elliott, Waupaca, Wis., Milwaukee Medical College, 1900, member of the State Medical Society of Wisconsin, served during the World War, aged 60, died suddenly, October 19, in Fort Francis, Ont., Canada, of heart disease.

James Jerome Parsons ♂ Monrovia, Calif., Syracuse University College of Medicine, 1913, member of the Associated

Anesthetists of the United States and Canada, served with the British army during the World War, aged 51, died in October

Paul Hardtmayer Walter, Bethlehem, Pa., Jefferson Medical College of Philadelphia, 1913, member of the Medical Society of the State of Pennsylvania, aged 48, was killed, November 16, when his automobile collided with a trolley car

Peter Lansing Wheeler, San Francisco College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1866, aged 91, died, October 2, in the Merritt Hospital, Oakland, of pneumonia, as the result of a fall

Benjamin W Brown ♂ Charlotte, N C, University of Virginia Department of Medicine, Charlottesville, 1886, senior surgeon in the U S Public Health Service, aged 74, died, October 25 of carcinoma of the prostate

Alice Hamilton Ward, Bloomfield N J, Woman's Medical College of the New York Infirmary for Women and Children, 1890, aged 70, died, November 15, in the Community Hospital, Montclair, of heart disease

Joseph Charles Buckley, Bay St Louis, Miss Tulane University of Louisiana Medical Department New Orleans 1910 served during the World War, aged 47, died, October 27, of cerebral hemorrhage.

Jean Baptiste Masse, Lawrence, Mass., School of Medicine and Surgery of Montreal Que Canada, 1902, member of the Massachusetts Medical Society, aged 59, died suddenly, October 16, of heart disease

Newman Hall Dewis Cox, Baltimore, Baltimore University School of Medicine, 1895 University of Maryland School of Medicine Baltimore, 1902, aged 67, died, October 17, in Richmond, Va

James H Leary, Rush N Y, University of Buffalo School of Medicine, 1897, member of the Medical Society of the State of New York, died, October 21, of carcinoma of the colon and myocarditis

Daniel David Coffey, Chicago, University of Maryland School of Medicine, Baltimore, 1903, for many years manager of the Chicago State Hospital, aged 55, died, November 22 of myocarditis

Cornelius Breckinridge Boyle, Libby, Mont Columbian University Medical Department Washington D C, 1891, aged 71, died October 3, in the Libby General Hospital, of cerebral hemorrhage

H Nelson Amidon Jr, Painesville, Ohio Western Reserve University Medical Department, Cleveland, 1884, formerly county coroner, aged 72, died, October 13, of gastritis and senility

Powhatan P Trueheart, Sterling, Kan., Hospital College of Medicine Louisville, Ky, 1876, member of the Kansas Medical Society, aged 84, died, October 26, of bronchopneumonia

James Gostanian, Detroit, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1899, served during the World War, aged 63, died, October 17, of cerebral hemorrhage

Charles Everett Banker, New York Columbia University College of Physicians and Surgeons, New York 1896 aged 70, died, November 24, of angina pectoris and coronary thrombosis

Edgar Hart Ellis, Nutley, N J, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1885, aged 76, died, October 10, of carcinoma of the prostate.

Edward Y Walker, Eatonton, Ga., College of Physicians and Surgeons, Baltimore, 1881, aged 78, died, November 5 in a hospital at Atlanta, of arteriosclerosis and hemiplegia

Garner Forseman Parker, Pocatontos, Iowa, Hahnemann Medical College and Hospital, Chicago, 1912, aged 49 died September 28, of x-ray burns received several years ago

John Duncan Stewart ♂ Hartford, Mich Detroit College of Medicine, 1905, served during the World War, aged 56, died, October 3, in the Borgess Hospital, Kalamazoo

Frank Wilbur Cornwell, Plainfield N J New York Homeopathic Medical College, 1900, aged 58, died, October 14, in Los Angeles, of a self inflicted bullet wound

George Randolph Morse, Saskatoon, Sask, Canada Dalhousie University Faculty of Medicine, Halifax, 1902, aged 60 died, August 5, of cerebral hemorrhage.

Eugene Florencio Raphael, Cumberland, Md University of Maryland School of Medicine, Baltimore, 1906, aged 57, died, October 30, of cirrhosis of the liver

Edward E Conrad, New York, Chaddock School of Medicine, Quincy, Ill, 1889, aged 67, died, November 7, in the Memorial Hospital, of adenocarcinoma

Horace Newell Williams ♂ Providence, R I, Bellevue Hospital Medical College, New York, 1882, aged 74, died, November 20, of cerebral hemorrhage.

Olin A Snyder, Schoharie, N Y, Eclectic Medical College of the City of New York, 1879, aged 85, died, October 22 of chronic nephritis and myocarditis

Victor Gregory Foley, Milwaukee, Marquette University School of Medicine, Milwaukee, 1915, aged 43, died, October 18, of carcinoma of the colon

Charles F Cluthe, Evansville, Ind., Medical College of Ohio, Cincinnati, 1891, aged 66, died, October 11, in St. Petersburg, Fla., of angina pectoris

Vladimir Alexis Shlanta, Olyphant, Pa Medico-Chirurgical College of Philadelphia, 1916, aged 42, died suddenly October 15, of heart disease

John Said Perekhan ♂ Chicago, Rush Medical College Chicago, 1888, aged 68 died, November 22, in a local hospital of carcinoma of the stomach

Dexter Horatio Hadley, Pittsford, Mich Northwestern Medical College St Joseph, Mo, 1890, aged 83, died, October 10, of cerebral hemorrhage

Manley Holland Russell, Star City, Ark (licensed in Arkansas in 1903), member of the Arkansas Medical Society aged 62, died, October 25

William L McGavic, Cave City, Ky Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1900 aged 92, died, October 5

Carl E Willan, Trafalgar, Ind., Medical College of Ohio Cincinnati, 1897, aged 63, died, October 1, of cerebral hemorrhage and acute nephritis

Marion X Corbin, Savannah Ga., University of the City of New York Medical Department, 1891, aged 69, died, September 29

Madison G Baldwin, Riverside, Calif Toledo (Ohio) Medical College, 1896, aged 63, died, October 13, of coronary thrombosis

Daniel W Bradfield, Wildersville, Tenn (licensed in Tennessee in 1902), aged 84, died, October 29, of bronchopneumonia

William Walter King, Milnor, N D, Miami Medical College, Cincinnati, 1893, aged 66, died, October 4, of pneumonia

Glenn Robert Keholm, Omaha Creighton University School of Medicine, Omaha, 1935, aged 26, died, September 28

Walter Pope Pillans, Raymondville, Texas, Missouri Medical College, St Louis, 1886, aged 70, died in September

Oliver W Foxworthy ♂ Leon, Iowa, College of Physicians and Surgeons, Keokuk, Iowa, 1884, aged 80, died, October 18

Samuel Dryden Snow, North Conway, N H, Dartmouth Medical School, Hanover, 1897, aged 62, died, September 19

Harry E Koons, Philadelphia, Southern Homeopathic Medical College, Baltimore, 1897, aged 63, died, October 26

William Frank Rhodes, Capleville Tenn, Memphis Hospital Medical College, 1907, aged 61, died, September 25

John T Wages, Macon, Ga., Chattanooga (Tenn) Medical College, 1899 aged 59, died, October 6, at Indian Springs

George H Musekamp, Cheviot Ohio, Medical College of Ohio, Cincinnati, 1884, aged 71, died, September 2

Benjamin Abbott Bradley, Hamlet, Ohio, Pulte Medical College, Cincinnati, 1882, aged 78, died, October 5

Alfred Jefferson ♂ Omaha, Omaha Medical College, 1900 aged 65, died, October 19, of coronary thrombosis

James Richard Smith, Cleveland, Medical College of Ohio, Cincinnati, 1907, aged 57, died, September 21

James Henry Kennedy, Pinola, Miss Gate City Medical College, Dallas, Texas, 1905, died in October

Oston Melton, Laconia, Ind Louisville (Ky) Medical College, 1881, aged 84 died, September 16

Frank S Byington, Los Angeles Louisville (Ky) Medical College, 1896, aged 66, died, December 3

William C Schwier, Knox, Ind., Louisville (Ky) Medical College, 1892, aged 67, died, September 22

Thomas B Hutto, Damascus, Ark. (licensed in Arkansas in 1903), aged 55, died, September 23

Correspondence

SHORT WAVE DIATHERMY

To the Editor—In *THE JOURNAL*, April 6, page 1237, a preliminary report on short wave diathermy by Krusen, published under the auspices of the Council on Physical Therapy, draws attention to the lack of data concerning the biologic effects of the new method and the imperfections and fire hazards of the apparatus. In the time elapsed since, the status of the therapeutic aspects of short wave diathermy has not changed, while the multiplicity of new apparatus and accessories has increased its potential hazards rather than diminished them. The following case may serve as an illustration.

In a woman patient two brand new pliable rubber pad electrodes were applied laterally to the neck, opposite each other without the interposition of any material between the skin and the rubber insulation covering of the metal condenser plates. As soon as the electrical energy from a fifteen meter short wave apparatus was turned on, the patient cried out that she was being burned. The apparatus was shut off immediately and under one electrode a carbonized area of the size of a silver dollar was found. Examination of the electrode revealed that the metal plate inside the rubber covering was not in the center but had slid down. It was covered only by a thin edge of rubber, and as soon as the electric energy was turned on arcing occurred from the metal plate to the skin, this melted the thin rubber covering instantly and inflicted a painful burn, which took several weeks to heal. There was no way for the physician to learn of the defective rubber insulation of the electrode beforehand, which the manufacturer, when called to task, acknowledged.

In addition to this case at least two others were seen in which accidental contact of the electrode cables with each other or with metal furnishings caused melting of the rubber covering and the sudden appearance of flames, frightening and burning the patient. I also know of cases in which there were burns due to overheating under the electrodes.

In administering short waves with the present apparatus, dosage is based entirely on the unreliable factor of subjective sensation of the patient, whereas in ordinary diathermy the meter reading keeps dosage at a safe maximum and enables its duplication at subsequent treatments. Questions of deeper and more uniform heat penetration and its desirability are still unsolved, likewise the problem of selective heating effects.

On the basis of these considerations it is imperative to sound warning against the prevailing campaign to sell short wave apparatus to inexperienced physicians under the claim that it is simpler, safer and more effective than the "old-fashioned" diathermy machine. No physician who is not well grounded in the application of regular diathermy should embark on the use of short wave diathermy apparatus. Notwithstanding the enthusiastic propaganda to the contrary, short wave diathermy is still in the experimental stage and its potential dangers are still problems even for the expert.

RICHARD KOVACS, M.D., New York

DIAGNOSIS OF CINCHOPHEN POISONING

To the Editor—In the clinical note by Dr. Samuel Peluse entitled "Cinchophen Poisoning, with Autopsy Report of a Case Due to Cinsa-Vess" which appeared in *THE JOURNAL* September 28 the author describes in detail the clinical picture presented by a patient suffering from a severe hepatic degeneration. After four weeks of hospitalization and extensive study (as a result of which no precise diagnosis was reached) she was seen by Dr. Andrew Sullivan, who we are told, immediately recognized the patient's clinical picture as one due to cinchophen poisoning. Subsequent questioning of the patient revealed the

fact that she had taken a proprietary preparation of cinchophen over a period of three months prior to the first signs of jaundice. The question paramount in my mind is this: By what means did Dr. Sullivan "immediately recognize the patient's clinical picture as one due to cinchophen poisoning"? So far as I have been able to determine, there is nothing peculiar to the symptomatology resulting from acute yellow atrophy of the liver that might point to etiology. I have always believed that the specific causal factor could be learned only from the history. If, however, in the absence of a history of cinchophen ingestion, Dr. Sullivan can recognize cinchophen poisoning, I am sure we should hear more from him. One other point in Dr. Peluse's article raises a question. He states that "Dr. Sullivan had recently survived a toxic jaundice due to cinchonism." Is it not exceedingly rare for quinine to cause jaundice?

CHARLES S. CAMERON, M.D., Philadelphia

[This letter was referred to Dr. Samuel Peluse, who writes:]

To the Editor—I wish to thank the writer for calling attention to the erroneous use of the term "cinchonism." The following is Dr. Sullivan's response:

"In this instance, although the diagnosis was clearly made without a history and by simple inspection of the patient, there is only one thing that was outstanding in the picture which caused me to differentiate instantly from the jaundice due to an acute catarrhal condition, to obstruction of lithiasis or to obstruction from neoplasm, and that was the uniformly intense deposit of bile pigment throughout the skin. In three other cases which I had seen, the pigmentation was to me characteristic in the uniformity and intensity, although in one case the color varied, the skin of the patient having a greenish hue. In this case, capsules of an unknown substance had been taken over a relatively long period of time. In other words, the whole question simmers down to the fact that I had a relatively large number of cases due to cinchophen poisoning, and the appearance of jaundice of this degree naturally arouses suspicion of cinchophen derivatives having been used. I believe that any one who has seen a number of these cases would receive a similar impression which would cause him immediately to suspect cinchophen compounds in this type of pigmentation and differentiate the majority of cases of jaundice due to other causes."

SAMUEL PELUSE, M.D., Chicago

SPONTANEOUS LATE DESCENT OF THE TESTIS

To the Editor—In *THE JOURNAL*, March 10, 1934, you published my observations on this subject. Although I suspect that general practitioners do not as a rule refer youngsters with undescended testes to surgeons for operation, several articles by surgeons have recently appeared urging operative intervention, and this prompts me to send you this communication. Not content with the Torek operation, which is a two stage procedure, one well known surgeon is now advocating in cases in which there is difficulty in drawing the testis down into the scrotum a preliminary procedure, the testis being brought first to the external inguinal ring and left there until the Torek operation is performed at a later date—a three stage operation.

Operation for this condition being no minor procedure, it would be all the more unfortunate if it should be undertaken unnecessarily. The increased incidence of malignancy in undescended testis which has been reported is such a remote possibility that surgeons as a rule do not give this as indication for operation. The operation is advocated usually in order to prevent atrophy of a testis after puberty. If most undescended testes descend spontaneously by the fourteenth year, this indication for operation is lacking. In my article mentioned, I

reported the experience of others and my own to show that spontaneous late descent does occur in nearly all the cases by the fourteenth year—some even later

To recite briefly the final outcome in my small series of eleven boys (one bilateral case), just one testis has not spontaneously descended to date. Since I wrote the article one of the two reported as still undescended has appeared outside the external inguinal ring, admittedly not at a satisfactory location but where it often remains following operation. One other which descended in the sixteenth year is now midscrotal in position and slightly atrophied. One boy developed a hernia on the side of the late descent, which required operation and later examination failed to disclose the whereabouts of the testis although it was not intentionally removed by the surgeon. In the remaining eight cases the testes are in the normal position low in the scrotum and normal in size.

Surgeons are, I believe, reporting better final results since the adoption of the Torek operation. Before this comparatively new operation the final results, to judge from the literature, were not at all satisfactory.

I am sending you this communication in order to call attention once more to a fact not universally recognized, that rarely is operative intervention for undescended testes indicated, and to save these little chaps from needless discomfort, expense and the certain amount of risk incident to any operation. For my own part I will continue to advise what one surgeon has referred to as my policy of "neglect" rather than to recommend what seems obviously to be meddlesome surgery."

CARL B. DRAKE, M.D., St. Paul

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address but these will be omitted on request.

DIABETES IN DOCTORS

To the Editor—In a survey on causes of deaths among physicians as reported in THE JOURNAL during 1934 my attention was attracted to the rather high incidence of diabetes fifty-one in all according to the following grouping: fifth decade three, sixth decade seven, seventh decade twenty, eighth decade seventeen, ninth decade three, tenth decade one. I have asked myself: Is it due to negligence or to lack of insulin used or has insulin not proved effective in the higher age groups? What is your explanation?

HANS SCHROEDER, M.D., New Orleans

ANSWER.—Diabetes is not excessive among doctors. Two hundred and twenty physicians died in Massachusetts during 1931 and 1932, according to figures compiled by the Massachusetts Department of Public Health. Diabetes was eighth in importance. For 1933 in the United States the percentage of the deaths of physicians dying of diabetes was 2.1 per cent, and diabetes ranked seventh.

In a certain clinic the average duration of life in ninety-six fatal cases of diabetes in physicians was 10.8 years, and in 1934 145 living physicians (excluding one patient who cannot be traced) under observation at this clinic had already reached ten years. The average age at death of these ninety-six doctors was 63.9 years, and the average age of the living doctors is 55.6 years. As a great proportion of the fatal cases occurred prior to the discovery of insulin, it is evident that the duration of life of the 145 living physicians with diabetes will probably reach fifteen or more years.

The onset of diabetes in the medical profession as based on the data from this clinic runs true to form, because the greatest number developed the disease in the sixth decade. In no instance was the onset in the first decade, there was one case in the second, twenty-four occurred in the third, making it probable that a considerable number of students having diabetes entered medical schools, thirty-six in the fourth, fifty-six in the fifth, seventy-four in the sixth, forty in the seventh, nine in the eighth, none in the ninth, and in two cases the onset date was unknown.

A diabetic heredity in diabetic doctors reaches approximately 33 per cent and presumably is considerably above this figure, because in fourteen of the 242 cases the data on heredity were

unknown or unsatisfactory, and many of the other doctors have not been seen recently. The total heredity was demonstrable in seventy-three cases. In forty-seven it was of a hereditary character and in forty of a familial character, but in fourteen cases it was both hereditary and familial and thus a reduction was made for this double heredity.

Among ninety-six diabetic doctors, tuberculosis and infections each caused 5.2 per cent, cancer 6.2 per cent, coma 15.6 per cent, cardiorenal and vascular disease, including gangrene and apoplexy, 55.2 per cent, and miscellaneous conditions 12.5 per cent of the deaths.

Since the average age of doctors who succumb, 63.9 years, is practically the average age of death of all doctors, it can be inferred that diabetes in doctors is fairly well treated. The fact that 145 living diabetic doctors have already had the disease nearly as long as the doctors who have died of it is evidence of the marked improvement in treatment.

THYROID IN ASTHENIA

To the Editor—For the last four months I have been treating a woman aged 29 married a nullipara who has been complaining of lassitude, tiredness and obesity. A year ago she was under the care of another physician complaining of irregular menstrual periods, a weight of 174 pounds (79 Kg) and the foregoing symptoms. She was placed on 2 grains (0.13 Gm) of thyroid daily, glycerin extract of whole ovary one pill twice a day, and diet, which treatment resulted in a loss of 22 pounds (10 Kg) and partial abatement of symptoms, the menstrual periods became regular but scant, lasting two-three days. My first physical examination of the patient revealed a weight of 165½ pounds (75 Kg), height 5 feet 4 inches (163 cm), pulse 69, blood pressure 130 systolic, 70 diastolic, basal metabolism —17, temperature 98.4 F., a blood count of 4,600,000 red blood cells, hemoglobin 90 per cent, 5,400 white blood cells, polymorphonuclear cells 65 per cent and lymphocytes 36 per cent. Urinalysis was negative. There was a mild edema of the extremities, nonpitting in character suggestive of myxedema. My diagnosis was pituitary-thyroid-ovarian dysfunction. She was put on a 1,500 calory diet, given 1 grain (0.065 Gm) of thyroid extract, 2 grains (0.13 Gm) of anterior pituitary substance and 5 grains (0.3 Gm) of whole ovarian gland three times a day after meals. For the next two months improvement followed; the weight went to 155½ pounds (70.5 Kg), the periods became normal and some diminution of the lethargic feeling resulted. In April her basal metabolism was —5.3 per cent and the lethargic feeling became more pronounced. She had also developed an eruption over her shoulders and neck, it extended into her scalp a short distance. This eruption is reddish brown, papular, flattened, slightly raised, does not produce itching unless aggravated by perspiration and tends to coalesce. The thyroid substance was discontinued for a month but the rash persisted. There is no history of other drugs taken or of food allergy. At the present time the patient is receiving 3 grains (0.2 Gm) of thyroid extract alone daily. Her weight now is 155½ pounds (70.5 Kg), pulse 85, blood pressure 138/84. Please advise me as to the correctness of the treatment. Can thyroid extract produce such a rash (a review of all literature fails to disclose any evidence of thyroid substance producing such a lesion)? Kindly give any suggestions that you can in the diagnosis and treatment of the case. Please omit name.

M.D., New York.

ANSWER.—The use of desiccated thyroid is correct, although if the patient's metabolic rate can be maintained at a normal level with less than 0.2 Gm of thyroid daily it is preferable to use the smaller amount. The use of pituitary and ovarian preparations does not offer much hope in this type of case. It is extremely unlikely that the thyroid has anything to do with the rash. The patient should adhere to a diet low in calories and yet relatively high in protein and vitamins. During the war it was discovered that women who did not receive an adequate amount of protein developed menstrual irregularities. In addition to the vitamins in the diet, it might be well to give the patient brewers' yeast and cod liver oil. Needless to state, the patient should be advised to have plenty of outdoor exercise and to maintain regular hours and habits of living.

USE OF ANESTHETICS BY GWATHMEY METHOD

To the Editor—I wish to place some anesthetic (topical) in the Gwathmey rectal ether oil solution (4 ounce mixture, 2½ ounces of ether) which will make it less irritating. I notice that Babcock's Surgery mentions chlorbutanol Gm 0.6 in an ounce mixture. It is my understanding that chlorbutanol and butyn are the same. Will you state an amount of butyn (2 per cent) that may be safely used in a 4 ounce mixture of oil ether for obstetrics. Please also advise whether the use of olive oil has any advantage over liquid petrolatum as the vehicle.

M.D., Alabama.

ANSWER.—Insert a well lubricated 22 F catheter from 6 to 8 inches into the rectum, passing the presenting part. Instill the rectal mixture within thirty seconds (within a pain interval) instead of fifteen minutes with either a McCormick apparatus or aseptosyringe, with instructions to the patient to "squeeze up" in order to retain the mixture completely. With this technique there will be no irritation, as a rule.

Chlorbutanol and butyn are entirely different in structure and composition. Chlorbutanol, 1 Gm, is used as a routine procedure in surgical cases as a suppository preceding the oil-ether mixture or combined with the mixture for the double purpose of allaying irritation and deepening the anesthesia. Chlorbutanol, 0.65 Gm, could be substituted for paraldehyde, 7.5 cc., in the mixture. Olive oil is commonly used as the vehicle but has no special advantage over liquid petrolatum.

PERSISTENT VAGINAL DISCHARGE

To the Editor—About six weeks ago a married woman of 32 consulted me because of a moderate vaginal discharge for seven months. The woman has one healthy child. There were no miscarriages or abortions and menstruation was normal. There were no urinary symptoms. Physical examination was essentially negative. Examination of the pelvic organs showed slight tenderness and thickening of the right parametrium. There was a moderately profuse purulent discharge from the cervix which, however, appeared to be normal otherwise. The vaginal mucosa was slightly reddened. Repeated smears for gonococci were negative and examination of a hanging drop for *Trichomonas vaginalis* was negative. The blood Wassermann and gonococcus complement fixation tests were negative. The woman received conservative treatment during the past seven months consisting of tampons and douches variously medicated. I continued these procedures, supplementing them with the use of silver nitrophenolate suppositories and the weekly intradermal injection of a solution of lactalbumin. In three or four weeks the discharge cleared up entirely (which it had never done before) and the injections and tampons were discontinued. In two weeks, however, the discharge recurred and at present is as annoying as it was at the beginning. I am writing to ask for information regarding further conservative measures. It is probable that this is a favorable case for the use of local heat in the pelvis. However, I do not have the suitable apparatus but, of course, if this is the only remaining measure will arrange for the patient to obtain the benefits of such treatment. She is interested in knowing whether operative removal of the right tube and ovary in such a case is desirable. I did not feel that the circumstances warranted such a procedure. What do you think about this?

M D New York

ANSWER—The policy of conservatism should be followed in this case. There is no assurance at all that removal of the right tube and ovary will result in the disappearance of the discharge, especially because tubo-ovarian inflammation is a rare cause of vaginal discharge. However, carcinoma of the tube is frequently accompanied by a discharge from the vagina. In spite of the fact that the description of the discharge is not typical of a monilia infection, it is advisable to look for this organism both in hanging drops and in stained smears. If the organism is found, rapid and decided improvement can be obtained by applying a 1 per cent solution of gentian violet all over the vaginal mucosa, the cervix and the vulva. This treatment should be given daily three or four times and another course of treatments repeated after an interval of a week. More hanging drops should be studied for *Trichomonas vaginalis*, especially immediately after a menstrual period. Likewise smears for the gonococcus should be made after the menstrual flow and after silver nitrate has been applied to the cervical canal. Occasionally the offending organism shows up at these times and at no other. Skene's and Bartholin's glands should be carefully examined for gonococci, and it may be advisable to investigate the rectum also for the presence of these bacteria. Naturally, if any pathogenic organisms are found, treatment should be instituted. The use of heat applied locally to the pelvis should be of help to the patient. Perhaps a discussion of the patient's sex life may shed some light on the etiology of the discharge.

FAILURE OF PERIPHERAL CIRCULATION

To the Editor—In your reply to a question in Queries and Minor Notes (THE JOURNAL, June 15 p 2204) concerning digitalis you speak several times of failure of the peripheral circulation as if myocardial and peripheral circulatory failure were separate and distinct things requiring different treatment. Will you be good enough to tell me just what you mean by failure of the peripheral circulation?

COLLINS H. JOHNSTON M D Grand Rapids Mich

ANSWER—In the proper function of the circulation, the normal activity of the heart and that of the peripheral minute vessels constitute the two most important factors. In a healthy person a relationship exists between the function of the heart and the function of the peripheral vessels which results in an economic function of the heart as well as in an economic local supply of blood to the tissues in case of active demand. In instances of disease of the heart, changes in the function of the peripheral minute vessels, particularly of the arterioles and of the venules, often compensate for the inadequate function of the heart. This, of course, also implies that frequently disease and failure of the heart may exist in the presence of normally functioning peripheral blood vessels. Contrariwise, there are

instances in which the function of the peripheral vessels becomes disturbed, in spite of the fact that the heart is not diseased. Such disturbance or disease of the peripheral blood vessels may result in death. When such a situation exists, one may speak of failure of the peripheral circulation. This term is often used synonymously with shock and peripheral collapse.

The detailed mechanism of failure of the peripheral circulation is not known as yet. The main feature of the condition is stagnation of blood in the periphery, usually in the small venous reservoirs of the vascular system. As a result of such stagnation there is a progressive lack of return of venous blood to the right side of the heart. This in turn results in a progressive decrease in the cardiac output and a generalized ischemic state of the arterial circulation. It is claimed by some that the arterioles are in active spasm and the venules in a state of paresis. The heart itself is capable of taking care of whatever blood arrives. The causes of failure of the peripheral circulation may be multiple, the most important etiologic factors, however, are depression of the vasomotor system and paresis of the minute vessels induced by circulating chemical substances. Often failure of the peripheral circulation does not exist in pure form but is associated with failure of the heart also.

As a postoperative circulatory complication, acute or subacute congestive failure of the heart is comparatively rare, while failure of the peripheral circulation (collapse or shock) is relatively common. The principles of treatment of failure of the peripheral circulation in many respects differ essentially from the principles of treatment of heart disease.

SENSITIZATION DERMATITIS

To the Editor—A white man aged 60, whose past history is negative except for smallpox in childhood, has had thickening of the epidermis and cracking and ulceration around the nails for the past twelve years. There is similar but less extensive involvement on other parts of the fingers and also severe itching of the hands and forearms. There are occasional discrete hard white masses about the size of millet seeds which develop in the skin of the fingers and which the patient scratches off from time to time. There is no history of other allergic symptoms or of exposure to any substance that might be responsible. The lesions do not develop crusts, are never purulent and are most severe on the dorsum of the finger completely surrounding the nail the distal phalanx being somewhat swollen. In places the skin is thick and hard with occasional itching and finally deep fissures are formed and desquamation occurs. On the forearms, especially on the flexor surface, the patient has innumerable scratches. He states that a small erythematous patch forms which itches severely. The patient has no other symptoms and physical examination is negative, the blood and urinary examination giving normal results. I doubt that this is infectious in origin and does not conform to my impression of eczema.

M D Illinois

ANSWER—The occupation is not given, but every one has plenty of daily contacts to account for a sensitization dermatitis, which the description of this one suggests. The paronychia is a manifestation of the chronic effects, the small erythematous patches, of the acute ones. The unrestrained scratching of the forearms suggests a nervous element.

The infiltration of chronic inflammation, with possibly some hyperkeratosis, decreases the elasticity of the skin and gives rise to fissuring. The ulceration is probably the result of finger nail removal of the small white bodies. If these are found only on the dorsum of the fingers, they may be milia, subepithelial pellets of hardened sebaceous secretion, which sometimes occur in areas of chronic inflammation. Eczema is a broad enough term to cover a case of this nature.

Further effort should be made to discover the irritant or irritants responsible, but in chronic cases the sensitization is commonly too complicated to be easily unraveled. Alkalis and other irritants should be avoided. For the acute erythematous patches, soothing in place of scratching is recommended, calamine lotion made with equal parts of lime water and rose water, or tragacanth lotion containing 2 Gm of tragacanth powder to 120 cc of water. In these may be incorporated phenol and glycerin, 0.5 per cent of each, or menthol 0.25 per cent.

On the areas of chronic inflammation a zinc oxide paste containing salicylic acid may be applied thickly at night, and cotton gloves or bandages used to retain it. This should be tried first on one finger during waking hours to make sure that it does not irritate. In the morning the paste should be removed with oil or liquid petrolatum and an ointment of sulfur and oil of cade, 5 per cent of each, should be applied. This also should have a preliminary trial. It may be that ordinary crude coal tar ointment, 6 per cent each of crude coal tar and zinc oxide in petrolatum, will be better borne. If irritation results, soothing remedies may be applied. When it subsides, treatment should be resumed.

The nervous element must not be overlooked.

CHEMICAL CAUSES OF NEURITIS

To the Editor—Following is a report of an analysis of a potash used for fertilizing purposes

| | Per Cent |
|--|----------|
| Moisture | 0.2 |
| Potassium chloride | 31.8 |
| Sodium chloride | 46.2 |
| Magnesium chloride | 0.9 |
| Calcium sulphate | 17.2 |
| Aluminum silicate | 3.5 |
| Iron sulphate | Trace |
| (Negative tests for thallium lead arsenic) | 99.8 |

I recently examined a man suffering from a typical case of multiple neuritis and am writing to ask you whether there is anything in this preparation that could possibly constitute the etiologic factor. The man had been unloading potash from the hold of a ship. Several reports have recently been made of longshoremen who have been engaged in unloading this substance complaining of general ill health with no particular symptoms but no other cases of multiple neuritis so far as I know, have occurred.

E. W. APPLEBY, M.D., Houston, Texas

ANSWER—Nothing in the mixture of chemicals cited is likely to lead to a neuritis. Although arsenic is specified as being absent after testing, crude fertilizer chemicals are likely to contain arsenic as an impurity. Arsenic could well account for a multiple neuritis. Of the three major constituents shown, potassium chloride attracts the most attention as a possible toxic agent. Any suspicion is dispelled through the fact that this substance is frequently used in medicine in doses as high as 26 Gm (40 grains). Cushney has been quoted by Addison with respect to potassium salts that "no danger arises to man unless given intravenously." The action of potassium chloride on the peripheral nerves is that of a depressant and therefore conceivably this substance might be utilized in the treatment of a multiple neuritis. When very large doses of potassium chloride are administered (from 5 to 10 Gm) no symptoms may arise except in nephritic states. When poisoning occurs under these circumstances, the chief manifestations are cyanosis, weak pulse and vomiting.

Although this combination of chemicals is regarded as an unpromising source of the causative agent of a multiple neuritis, additional inquiry should be instituted as to other chemicals that may have previously constituted the cargo of the ship. On occasion, relatively small quantities of previous chemical cargoes may react with chemicals making up subsequent cargoes leading to harmful gases, dusts and vapors. Unless some accidental combination of this character has taken place it is unlikely that much consideration should be extended to the chemicals mentioned (in the absence of impurities) as the ultimate cause of a multiple neuritis.

PERSISTENT HEMORRHIAGE AND INFECTION IN EAR

To the Editor—A woman who had a bleeding ear had a mastoid operation after consultation. The wound refused to heal on account of a greenish stain from *Bacillus pyocyaneus*. Reoperation has led to the cessation of bleeding but plenty of greenish exudate and stain. Dilute solution of sodium hypochlorite and the quartz light are now being used. The radical mastoid operation has not been done. Kindly advise me what you think of the case with treatment.

M. D. Delaware

ANSWER—In the absence of any statement as to the length of the discharge from the affected ear or as to the pathologic condition in the middle ear responsible for the bleeding, it is difficult to give a definite opinion. Ordinarily, bleeding from the ear, with the exception of those instances due to a new growth, is due to granulations in the middle ear, the result of a long standing bone disease. Conditions of this character do not yield to a simple mastoid operation. Probably the thing to be considered at present in the way of operative intervention from the symptoms as given is a radical mastoid operation.

ZINC CHLORIDE BURNS

To the Editor—In an automobile radiator manufacturing plant where I do the first aid work a zinc chloride flux with the following formula seems to be the cause of many deep necrotic so-called acid burns. I should appreciate any information you can give me as to the reagent actually causing the burns treatment and suggestions for prevention.

| | |
|--|-------------------------|
| Zinc chloride content | from 47.4 to 48% |
| Ammonium chloride | 3.0 plus or minus 0.50% |
| Free acid as HCl | 0.15% |
| Iron and aluminum total maximum | 0.05% |
| Heavy metals such as lead cadmium and antimony total maximum | 0.05% |
| Please omit name. | |

M. D. New York

ANSWER—The reagent causing the burns is zinc chloride, which is a powerful caustic. Treatment consists in removing the necrotic slough and filling the wound with sodium bicarbonate. Gloves should be worn when handling the flux.

ICTUS WITH APHASIA

To the Editor—A healthy man of 76 walks 2 miles to work every day because he likes it. About 11 a. m. while urinating but with no particular effort, he started to say something but discovered that he could only mumble unintelligibly. Being a telegraph operator he tried communication by telegraph with another operator in the office and it worked perfectly. He could not use a typewriter quite as usual as he kept striking too close. The blood pressure is 110 systolic 70 diastolic. Examination of the urine gives negative results. The heart is normal. In about an hour and a half improvement began and in another half hour recovery was complete. Hysteria and neurosis are utterly out of the question. It was very galling to his pride. There were no previous symptoms pain or muscle impairment except that he felt as though his mouth were drawn to one side at first. It was symmetrical when I arrived. What is the probable explanation?

M. D. Michigan

ANSWER—The history given sounds as if the patient had a small ictus. It is possible that this was due to a thrombosis of a small blood vessel, which produced the symptom of aphasia because of the associated edema. When this edema cleared up his ability to talk returned, as evidently the thrombosis did produce a softening in the speech center. It is likely that the patient will have further attacks of a similar nature.

TREATMENT OF LOCOMOTOR ATAXIA

To the Editor—I would appreciate some information as to the best treatment of a case of beginning tabes in a woman aged 44. She has had syphilis for a number of years. The blood Wassermann reaction has been negative for the last two years. A recent spinal fluid reaction was slightly positive with 0.2 and 1 cc. The colloidal gold test is 0122100000. Ross Jones and Noguchi faintly positive. The patient is beginning to show the early symptoms of tabes as a velvety feeling of the feet and stumbling in the dark. Please omit name.

M. D., Wisconsin

ANSWER—The special method of treatment in this case is probably that which Stokes terms the mild routine treatment. Neoarsphenamine in doses of 0.45 Gm. should be given intravenously twice a week for six weeks, accompanied by the administration of a heavy metal. For this purpose a 50 per cent mercurial unguent should be rubbed into the extremities four times a week during the six weeks course of neoarsphenamine. In administration, care should be taken to avoid mercurialism. A rest period of two or three months should be given before another course, followed by careful reexamination of the patient.

EMPTYING SEMINAL VESICLES

To the Editor—A man aged 31 with a history of urethritis five years ago and a relapse three years later complains of deficient erection and premature ejaculation. This condition antedated the infection. Examination shows a morning drop containing many pus cells. Prostatic massage shows the prostate about normal in size and 2 cc. of secretion obtained shows about 20 pus cells to a high power field and many sperms. The seminal vesicles can be outlined as being quite distended but are beyond the point at which adequate finger pressure can be applied in order to evacuate their contents. For the past month the patient has been treated with massage, urethral irrigation of potassium permanganate, posterior urethral instillation of 1 per cent silver nitrate, and foreign protein intramuscular injection twice a week. Sounds are passed preliminary to the instillations. Is there any means at hand of securing emptying of the seminal vesicles and is there any efficient instrument available on the market for this purpose in such cases? At present he practices rather unsatisfactory intercourse about once a week. Would a normal orgasm produce appreciable emptying of the seminal vesicles as described?

M. D. New Jersey

ANSWER—There is an instrument on the market which can be fastened to the index finger for the purpose of carrying out high rectal massage. This should be used with caution, as it is difficult at times to judge the amount of pressure produced. A normal orgasm will empty the seminal vesicles fairly well, provided the ejaculatory ducts are patent. These are frequently narrowed as the result of inflammation, or blocked by the products of inflammation, preventing thorough emptying of the vesicles.

NAUSEA AT MENSTRUAL PERIOD

To the Editor—A single woman aged 35 has attacks of nausea every time she menstruates. This phenomenon has occurred with regularity for the last six times that she has menstruated. When she finishes menstruating the nausea subsides immediately. I thought that this may be associated with some endocrine dysfunction but I am unable to figure it out. Would you suggest using endocrine preparations?

M. D. Pennsylvania

ANSWER—Since this patient has arrived at the age at which marriage and childbearing seem remote to her, there may be a strong psychic factor in the occurrence of the nausea during the menstrual periods. However, it is advisable to try to rule out any organic disturbance in the gastro-intestinal tract, par-

ticularly in the gallbladder. Endocrine therapy will most likely be helpful only if it has an effect on the psyche. If no organic disturbance can be detected, a frank discussion of the patient's outlook on her future may prove of value.

TOXICITY OF METHYL ETHYL KETONE—BUTANONE

To the Editor—Will you kindly supply me with information concerning methyl ethyl ketone also known as butanone. This substance is mixed with benzene in the proportion of 40 per cent butanone and 60 per cent benzene and used as a solvent in a certain process of petroleum refining. Owing to the nature of this process employees might be subjected to skin exposure to the liquid form as well as to the vapor form. Also the fumes or vapors might be inhaled by employees from time to time. I understand that the product is manufactured by the Shell Chemical Company but I do not know its address. I also understand that this company is the first to use methyl ethyl ketone on a commercial basis although this product has been a laboratory chemical for some time. So far I have had a little clinical experience with the effects of the benzene methyl ethyl ketone mixture. The effects which I have observed are as follows: 1. Effects on the skin. A reddening and the patients have complained of a stinging and burning sensation over the affected areas. It is my opinion that these areas would have blistered soon if treatment had not been given. 2. Effects on the respiratory system. Hoarseness, complaint of a burning stinging sensation in the nose, throat and lungs, increased rate and depth of respiration, slight reddening of the mucosa of the nose and throat. 3. General effects. Headache, vertigo, nausea, vomiting, a feeling as if the patient were floating away, increased pulse rate and a feeling of weakness in the legs. All these effects have apparently been transitory, with no permanent ill effects. I have noted no symptoms or signs after forty-eight hours following the exposure. All cases that I have seen have been acute and I have not seen any chronic effects. The information that I desire consists of the possible and probable effects of the liquid as well as the gaseous form. The treatment that I have used has been bismuth paste for the skin lesions, aromatic spirit of ammonia by mouth and by inhalation and mild protein silver into the eyes and nostrils. Soap and water are applied to the skin prior to the paste. Does this treatment seem adequate? If not, what treatment do you recommend? What procedure do you suggest for checking up on the possible ill effects on workmen handling the benzene methyl ethyl ketone combination? In other words, please give me all the available information concerning the diagnosis, treatment, prevention and possible ill effects of the liquid and gaseous forms of the benzene methyl ethyl ketone combination described.

M D Texas

ANSWER.—It is presumed that, in this mixture of 60 per cent benzene and 40 per cent methyl ethyl ketone, no new chemical is produced and that the two substances mentioned remain as entities. Of these two, benzene (benzol) is far more toxic. Methyl ethyl ketone is not known to possess toxic properties beyond the capacity to defat the skin and thus pave the way for minor dermatitis. The ketones are ordinarily rated as having about the same toxicity as acetone. This matter is discussed by Loevenhart, Kerr and Walton in "A Comparison of the Pharmacological Action of Diacetone Alcohol and Acetone" (*J Pharmacol & Exper Therap* 33:175, 1928). On the other hand, benzene is a highly dangerous substance to which workers should not be subjected under conditions that lead to the inhalation of vapors in concentrations above 300 to 500 parts per million parts of air. Benzene may be absorbed through the skin, although this portal of entry is not well established as a source of systemic benzene poisoning. Like methyl ethyl ketone, benzene serves as a defatting agent for the skin and readily leads to a dermatitis. The effects are described as "general" and "on the respiratory system" are fairly characteristic of acute benzene poisoning. It is predicted that any consistent exposure will eventuate in direful chronic manifestations. Examinations of the blood should be made for leukopenia, diminutions in the total red count, hemoglobin and increase in the clotting time of the blood. Extensive information on benzene poisoning will be found in the publication by McCord and others entitled "Benzol (Benzene) Poisoning," 1932. The treatment mentioned may be adequate on a symptomatic basis but much more extensive preventive measures should be undertaken. Direct contact with the skin should be obviated. The inhalation of more than 500 parts of the mixture by workers should not be tolerated. The wearing of respirators as a means of protection against benzene is ordinarily not efficacious. The wearing of positive pressure helmets may provide adequate protection, but such practice is onerous for workmen and impossible unless the work is fairly closely limited to fixed areas such as ordinarily does not prevail around petroleum refineries. Completely enclosed systems or venting systems have proved to be safest in providing acceptable work conditions in connection with the utilization of benzene under conditions otherwise favorable to high concentrations of vapors that might be respired by workers.

Alice Hamilton in her textbook (*Industrial Toxicology*, New York, Harper & Bros., 1934, p. 156) says in regard to benzene

"It is so recognized [as the most dangerous poison in industry with the exception of tetrachlorethane], and its use has been abandoned, often at a good deal of sacrifice, by conscientious employers who refuse to subject their workers to such a risk. But apparently as soon as it is given up in one industry it is adopted in another, and eternal vigilance is needed if chronic benzol poisoning is to be prevented."

DIAGNOSIS OF PERNICIOUS ANEMIA

To the Editor—A white woman aged 60, widowed, had been feeling weak for six weeks with palpitation of the heart and fainting spells. She stated that she had been conscious of lack of blood for the past twenty years. She had an operation for goiter at the Mayo Clinic in 1915. She had associated symptoms of palpitation, syncope, a tingling sensation in the feet and hands, sore tongue and diarrhea with an absence of hydrochloric acid in the Ewald test and splenomegaly. Pernicious anemia was diagnosed and she was placed on dilute hydrochloric acid and raw liver on which diet she gained 38 pounds (17 Kg.) Jan. 29, 1934. 3 cc. of concentrated solution liver extract every other day was prescribed. At that time the blood count was 1,980,000 with 46 per cent hemoglobin. Reticulocyte response was immediate, so that on January 31 it was 6.4 per cent, February 2, 12 per cent, February 5, 11.6 per cent, February 7, 7.2 per cent, February 9, 5 per cent. The first rise occurred on February 2 with the second rise February 19. The erythrocytes increased from 1,980,000 with 46 per cent hemoglobin at the beginning of treatment to a maximum of 6,300,000 with 110 per cent hemoglobin (photometer) and 2 per cent reticulocytes on May 5. The liver medication was discontinued on March 2 at which time the erythrocyte count was 5,030,000, with 100 per cent hemoglobin. The reticulocytes numbered 2 per cent. The leukocyte count ranged from 6,800 with 46 per cent polymorphonuclears, 52 per cent lymphocytes and 1 per cent eosinophils prior to the administration of liver to between 6,000 and 8,000 with 74 per cent polymorphonuclears, 26 per cent lymphocytes except for a period between February 19 and March 2 when an acute infection of the upper respiratory tract brought the leukocyte count up to 12,000 or over, with 82 per cent polymorphonuclears, 12 per cent lymphocytes and 6 per cent eosinophils. Additional laboratory reports April 25, 1934, revealed a negative Wassermann reaction, nonprotein nitrogen 46, urea 15, uric acid 6.4, creatinine 1.5, sugar 125. When the fragility of the blood was tested, hemolysis began at 0.48 per cent and was completed at 0.32 per cent. Marked hemolysis occurred up to 0.44 per cent. Control 1.2. Hemolysis began at 0.46 per cent and was not completed at 0.28 per cent. Marked hemolysis occurred up to 0.36 per cent. The gastric contents showed a heavy trace of bile, complete absence of hydrochloric acid, total acid 7 and no occult blood. The patient was next observed Jan. 15, 1935, because of a cellulitis of the left leg due to injury. The temperature was 100 and the respiration rate 24. Leukocytes numbered 17,000 with 88 per cent polymorphonuclears. Hemoglobin was 110 per cent. There were 4,700,000 erythrocytes. The patient was next seen April 24 when the erythrocytes numbered 6,200,000 with 135 per cent hemoglobin (Sahli). The leukocytes numbered 12,400 with 85 per cent polymorphonuclears. The erythrocytes increased to 6,330,000 with 142 per cent hemoglobin (Sahli) at which time the patient died, apparently from cardiac failure, general debility and polycythemia. This is rather an unusual picture to have gone from oligocythemia to polycythemia particularly after the liver had been discontinued for a period of three months. I felt sure that the case had all the earmarks of a pernicious anemia owing to the reticulocyte response to liver, the absence of hydrochloric acid, the absence of a vibratory sense in the bones and other neurologic changes. Have there been any such cases reported in medical literature?

M D Oklahoma

ANSWER.—There appears to be no reference in the literature to a case with exactly the characteristics of this one. Naegeli (*Blutkrankheiten und Blutdiagnostik*, 1931, p. 577) mentions a "reparative polyglobuly" during the period of compensation after anemias. The exact nature of the anemia in this patient is not clear from the data given. There may have been myxedema following the "operation for goiter." An anemia of this type, with response to liver therapy, may occur during the course of cirrhosis of the liver. The splenomegaly, rare in true pernicious anemia, is compatible with this. The response to liver therapy is quite unusual, quantitatively, especially the continuation of the rise in the number of red blood cells for such a long period after the cessation of the treatment. It is suggestive of the polycythemia that accompanies, at times, cardiac decompensation. Absence of vibratory sense and non-secretion of hydrochloric acid may be characteristic of other conditions besides pernicious anemia.

CRACKING NOISE IN JAWS

To the Editor—A woman aged 19 after a tonsillectomy some years ago developed a cracking noise on opening her mouth. I believe that this condition is termed clacking jaw. At present she has great discomfort on eating or having dental work done. What is the most advisable treatment for this condition?

SAMUEL J. HILLER, M.D., Milwaukee

ANSWER.—The condition is brought about by an irritation of the synovial membrane of the temporomaxillary articulation (glenoid fossa). It is caused either by trauma, such as opening

the jaw too wide or holding it open too wide for too long a period, or by paralysis of the nerve innervation to the membrane.

The treatment in these cases is complete rest and massage. It may be necessary to ligate the teeth into occlusion for two or three weeks in order to reduce the inflammation of the membrane. It is then necessary to watch that the patient does not open the mouth too wide in eating, yawning or having dental work done, until the condition is cured. The massage should be light and over the area of the head of the condyle, should begin at once and should continue until the cure is complete.

BLOOD TESTS FOR PATERNITY

To the Editor—Will you please tell me how old an infant should be before agglutination tests can be used to determine his paternity? I understand of course that these tests only eliminate certain men as parents. But I want to know how old the infant should be before they can be depended on.

M D New York

ANSWER—In cases of disputed paternity, reliable results can be obtained even when the blood of new-born infants is tested. Although it is true that as a rule the blood group is not completely developed at birth, this in no way interferes with the determination of the blood group. The reason for this is that the defect involves only the iso-agglutinins in the child's serum, since the agglutinogens are present in the red blood cells at birth. For the determination of the blood group, the usual procedure is to test the unknown blood cell suspension with known serums of group A and group B. The converse test, of the patient's serum against known blood cells of groups A and B, serves as a useful check on the grouping, which, incidentally, should never be omitted in forensic cases but which is not absolutely essential. This check is naturally not available when infant's blood is tested, but if testing serums of high potency are used, the group can be reliably determined by testing the red cells alone. If any doubt remains, the blood should be retested at a later date, after the agglutinins have developed.

CANNABIS INDICA—ALCOHOL—KETOGENIC DIET IN EPILEPSY

To the Editor—I will appreciate information on the chemistry and physiologic action of Cannabis indica in fact anything written authoritatively on this subject. What is the physiologic action of alcohol on the sympathetic nervous system including the adrenals? What is the latest treatment of epilepsy based on scientific principles and not on wishful thinking? What is the scientific explanation for the use of the ketogenic diet in epilepsy? Can you give me any good authors on these subjects?

E J AAVIS M D Philadelphia

ANSWER—Louis Lewin's book "Phantastica" (New York, E P Dutton & Co, 1931) may give satisfactory information on cannabis indica. Authoritative discussion of the action of cannabis as well as alcohol may be found in such books on pharmacology as that of Torald Sollmann (Philadelphia, W B Saunders Company). In "The Treatment of Epilepsy," by Fritz B Talbot (New York, Macmillan Company, 1930), a good book on the subject, the author says "Our understanding of the mode of action of the ketogenic diet may be summarized as follows. Whether the dehydration associated with the ketogenic regimen is the important therapeutic factor or whether the effectiveness of ketosis is to be ascribed to some unknown or unrecognized factor has not yet been demonstrated. About all that can be said therefore in conclusion is that the ketogenic diet appears to be the most effective form of the dietetic treatment of epilepsy."

DIET IN KIDNEY STONES

To the Editor—Recently a man aged 33 consulted me regarding kidney stones which he has been passing intermittently for the past five years. The stones are small and the chemical analysis indicates calcium oxalate, calcium phosphate and calcium carbonate. Will you please give me information regarding diet in such cases. He has not been taking soda and has no stomach disorder. His general health is excellent.

RADFORD F PITMAN M D Kansas City, Mo

ANSWER—The most important item in the diet is an abundance of water, at least half a gallon each day. The oxaluria requires a restriction of those foods which are rich in oxalates, most especially spinach, potatoes, beets, beans, endive, rhubarb, tomatoes, figs, plums, currants, strawberries, cocoa, chocolate and tea. The tendency to precipitation of calcium phosphate and carbonate should be antagonized by increasing the acidity of the urine, most especially by a diet rich in meat, eggs and cereals, with but little of fruit and vegetables, and no milk, as this is rich in calcium.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country March 14. Oral examination for Group A and B applicants will be held in Kansas City Mo, May 11-12. Applications for written examination should be filed with the secretary before Jan 15. Sec. Dr C Guy Lane 416 Marlboro St, Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada March 28. Applications must be filed not later than February 28. Oral clinical and pathological examination of all candidates will be held in Kansas City Mo May 11-12. Applications must be received not later than April 1. Sec. Dr Paul Titus 1015 Highland Bldg Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY Kansas City Mo May 11 and New York Oct. All applications and case reports must be filed sixty days before date of examination. Asst Sec Dr Thomas D Allen 122 S Michigan Ave Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St Louis Jan. 11. Sec. Dr Fremont A Chandler 180 N Michigan Ave, Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY Kansas City, Mo., May 9. Sec. Dr W P Wherry, 1500 Medical Arts Bldg Omaha.

AMERICAN BOARD OF PEDIATRICS Kansas City Mo May 9. Sec. Dr C A Aldrich 723 Elm St Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY New York, Dec. 30. Sec. Dr Walter Freeman 1726 Eye St N W, Washington D C.

COLORADO Denver, Jan 7. Sec., Dr Harvey W Snyder 422 State Office Bldg Denver.

CONNECTICUT Basic Science New Haven Feb 8. Prerequisite to license examination. Address State Board of Healing Arts 1895 Yale Station New Haven.

DISTRICT OF COLUMBIA Washington Jan 13-14. Sec., Commission on Licensure Dr George C Ruhland 203 District Bldg Washington.

HAWAII Honolulu Jan 13-16. Sec. Dr James A Morgan, 48 Young Bldg., Honolulu.

ILLINOIS Chicago Jan 28-30. Superintendent of Registration, Department of Registration and Education Mr Homer J Byrd Springfield.

MINNESOTA Basic Science Minneapolis Jan 7-8. Sec. Dr J C McKinley 126 Millard Hall University of Minnesota Minneapolis.

MEDICAL MINNEAPOLIS, Jan 21-23. Sec. Dr Julian F Du Bois 350 St. Peter St. St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Feb 17, 14, May 6-8 June 22-24 and Sept 14-16. Part III tentatively scheduled as follows Chicago Jan 7-9 and New York, Jan 13-15. Ex. Sec., Mr Everett S Elwood 225 S 15th St. Philadelphia.

NEBRASKA Basic Science Omaha Jan 14-15. Dir. Bureau of Examining Boards Mrs Clark Perkins State House, Lincoln.

NEVADA Reciprocity Carson City Feb 3. Sec., Dr Edward E. Hamer Carson City.

NEW YORK Albany Buffalo New York and Syracuse Jan. 27-30. Chief, Professional Examinations Bureau Mr Herbert J Hamilton 315 Education Bldg Albany.

NORTH DAKOTA Grand Forks Jan 7-10. Sec. Dr G M Williams 445 S 3d St Grand Forks.

OREGON Portland Jan 7-9. Sec. Dr Joseph F Wood 509 Selling Bldg Portland.

RHODE ISLAND Providence Jan 23. Dir. Department of Public Health Dr Edward A McLaughlin 319 State Office Bldg Providence.

SOUTH DAKOTA Pierre Jan 21-22. Dir. Division of Medical Licensure, Dr Park B Jenkins, Pierre.

WASHINGTON Basic Science Seattle Jan 9-10. Medical Seattle Jan 13-15. Dir. Department of Licenses Mr Harry C Huse Olympia.

WISCONSIN Madison Jan 14-16. Sec. Dr Robert E Flynn 410 Main St, La Crosse.

Maryland June Examination

Dr John T O'Mara, secretary, Board of Medical Examiners of Maryland, reports the written examination held in Baltimore, June 18-21, 1935. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. One hundred and fifty-five candidates were examined, 135 of whom passed and 20 failed. The following schools were represented:

| School | PASSED | Year Grad | Per Cent |
|--|--|-----------|----------|
| George Washington University School of Medicine | 84 84.3 86.4 (1935) 77.6 78.4 81.3 84 87.7 | (1934) | 80.7 |
| Georgetown University School of Medicine | 81.1 81.3 82.6 (1935) 77.1 79.6 | (1934) | 75.6 |
| Howard University College of Medicine | (1934) 75.8 83.2 (1935) 75.5 | (1933) | 77.5 |
| Johns Hopkins University School of Medicine | (1933) 81.1 84.1 86.4, (1934) 82.4 83.1 85.5 86.2 (1935) 75.1 78.3 79.2 79.3 79.6 79.6 79.7 80.3 80.4 80.6 80.6 81.1 82.1 82.2 82.3 83 83.5 83.5 83.6 83.6 83.6 83.8 84.3 84.4 84.5 84.7 84.8 85.7 85.7 85.8 86.1 86.3 86.5 86.5 86.6 86.6 86.8 87.3 87.3 87.4 88.5 88.5 89.1 89.7 91.7 | (1931) | 79 |
| University of Maryland School of Medicine and College of Physicians and Surgeons | (1932) 78.2 (1933) 86.4 (1934) 79.2 81.7 (1935) 78.1 79.3 79.7 80.4 81.2 81.8 82 82.1 82.4 82.6 82.7 82.8 83 83.1 83.5 84.1 84.1 84.1 84.3 84.5 85.2 85.2 85.4 85.5 85.6 85.6 85.8 85.8 86.2 86.2 86.4 86.4 86.5 86.7 87.1 87.1 87.6 87.6 87.6 87.8 87.8 88.1 88.2 88.7 88.7 89 89.1 89.1 90.8 | (1931) | 82.7 |
| University of Rochester School of Med | (1930) 81.7 | (1933) | 77 |
| Duke University School of Medicine | (1932) | (1932) | 79.4 |
| University of Pennsylvania School of Medicine | (1928) | (1934) | 86 |
| University of Toronto Faculty of Medicine | (1928) | (1928) | 90.5 |
| Regia Università degli Studi di Bologna Facoltà di Medicina e Chirurgia | (1929) | (1929) | 80.3* |
| Regia Università di Napoli Facoltà di Medicina e Chirurgia | (1931) 80.8 | (1933) | 78 |

| School | FAILED | Year | |
|---|---|-------------------|---------------|
| | | Grad | Number Failed |
| Georgetown University School of Medicine | (1932), (1934) | 6 | 7 |
| Johns Hopkins University School of Medicine | (1932) | | 1 |
| Friedrich Wilhelms Universität Medizinische Fakultät Berlin | (1932)* | | 1 |
| Regia Università degli Studi di Bologna | Facoltà di Medicina e Chirurgia (1931)* | (1934)* | 2 |
| Regia Università degli Studi di Padova | Facoltà di Medicina e Chirurgia (1934)* | | 1 |
| Regia Università degli Studi di Palermo | Facoltà di Medicina e Chirurgia (1929)* | | 1 |
| Regia Università degli Studi di Roma | Facoltà di Medicina e Chirurgia (1932) | (1933, 2) (1934)* | 4 |
| Regia Università di Napoli | Facoltà di Medicina e Chirurgia (1923) | (1928)* (1934)* | 2 |
| Universität Basel Medizinische Fakultät | | (1934)* | 1 |

Fourteen physicians were licensed by reciprocity and 6 physicians were licensed by endorsement from February 12 through July 26 after an oral examination. The following schools were represented

| School | LICENSED BY RECIPROCITY | Year | |
|---|-------------------------|------|------------------|
| | | Grad | Reciprocity with |
| George Washington University School of Medicine | (1912) | Dist | Colum |
| Emory University School of Medicine | (1926) | | Georgia |
| Indiana University School of Medicine | (1925) | Dist | Colum |
| Jefferson Medical College of Philadelphia | (1918) | | New Jersey |
| (1930) (1933) West Virginia | | | |
| University of Pennsylvania School of Medicine | (1931) | N | Carolina |
| Meharry Medical College | (1934) | | Tennessee |
| Medical College of Virginia | (1929) | W | Virginia |
| University of Virginia Department of Medicine | (1933) | 2 | Virginia |
| Dalhousie University Faculty of Medicine | (1924) | W | Virginia |

| School | LICENSED BY ENDORSEMENT | Year | |
|--|-------------------------|-------|----------------|
| | | Grad | Endorsement of |
| College of Medical Evangelists | (1935) | N B M | Ex |
| Georgetown University School of Medicine | (1934) | N B M | Ex |
| Johns Hopkins University School of Medicine | (1933) | 2 | N B M |
| University of Maryland School of Medicine and College of Physicians and Surgeons | (1929) | N B M | Ex |
| Washington University School of Medicine | (1931) | N B M | Ex |

* Verification of graduation in process

Michigan June Examination at Ann Arbor

Dr J Earl McIntyre, secretary Michigan State Board of Registration in Medicine, reports the written examination held at Ann Arbor, June 11-13, 1935. The examination covered 14 subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and twenty seven candidates were examined, 126 of whom passed and 1 failed. The following schools were represented

| School | PASSED | Year | |
|--|--------|-------|--------------|
| | | Grad | Per Cent |
| College of Medical Evangelists | (1935) | 78 3 | 82 5 |
| University of Colorado School of Medicine | | | 83 4 |
| Loyola University School of Medicine | (1935) | 79 4 | 86 3* |
| Northwestern University Medical School | (1935) | | 86 3 |
| (1935) 83 1* | | | 83 3 |
| Rush Medical College | (1935) | 82 1* | 85 2† |
| School of Medicine of the Division of the Biological Sciences | (1932) | | 84 1 |
| Harvard University Medical School | (1932) | | 87 |
| (1933) 82 9* | | | 83 8 |
| Detroit College of Medicine and Surgery | (1933) | | 84 5* |
| University of Michigan Medical School | (1930) | | 81 4* |
| (1932) 81 6* | | | 85 |
| 80 2 | 80 4* | 80 8* | 81 1* |
| 81 5 | 81 6* | 81 9* | 81 9* |
| 82 3 | 82 3* | 82 4* | 82 4* |
| 82 5 | 82 7* | 82 7* | 82 7* |
| 83 1 | 83 1* | 83 3* | 83 3* |
| 83 5 | 83 5* | 83 6* | 83 6* |
| 83 8 | 83 8* | 84* | 84* |
| 84 2 | 84 2* | 84 4* | 84 4* |
| 84 6 | 84 6* | 84 8* | 84 8* |
| 85 | 85 1* | 85 2* | 85 2* |
| 86 | 86* | 86 4* | 86 4* |
| University of Nebraska College of Medicine | (1934) | | 84 6* |
| New York Homeopathic Medical College and Flower Hospital | (1935) | | 86 4* |
| University of Buffalo School of Medicine | (1934) | | 85 5 |
| University of Rochester School of Medicine | (1935) | | 83 2* |
| University of Oregon Medical School | (1933) | | 83 4* |
| Vanderbilt University School of Medicine | (1933) | | 83 8* |
| Marquette University School of Medicine | (1935) | 81 9 | 84 5 |
| University of Manitoba Faculty of Medicine | (1932) | | 83 3 |
| McGill University Faculty of Medicine | (1930) | | 79 5* |
| (1934) 80 5* | | | (1935) 82 2* |
| Friedrich Wilhelms Universität Medizinische Fakultät Berlin | (1926) | | 82 8 ‡ |
| (1929) 83 2† | | | |
| Licentiate of the Royal College of Physicians of Ireland and of the Royal College of Surgeons of Ireland | (1923) | | 85 8* |
| Université de Genève Faculté de Médecine | (1931) | | 84 2 |

| School | FAILED | Year | |
|--|--------|--------|---------------|
| | | Grad | Number Failed |
| Hamburgische Universität Medizinische Fakultät Hamburg | | (1922) | |

† This applicant has not been issued

‡ This applicant has completed the medical course and will receive his M.D. degree on completion of internship. License has not been issued.

* Verification of graduation in process

Book Notices

Paying Through the Teeth By Bissell B Palmer DDS F.A.C.D.
Cloth Price \$2 Pp 297 with 9 Illustrations New York Vanguard Press 1935

The subtitle of this book, "A Critical Analysis of Dental Nostrums" describes in a sentence the character and scope of the work. The book does for the dental field what "Nostrums and Quackery" published by the American Medical Association does for the medical field. It gives names and calls a spade a spade; it gives the lay public sound and definite information regarding nostrums sold in the dental field.

Dr Palmer while giving due credit to the American Dental Association and, where necessary, to the American Medical Association, for the factual data presented in his book, does not attempt to belittle either of these great organizations. It is true that in one place he does criticize a group of advertisements that appeared in THE JOURNAL, although admitting that THE JOURNAL is "ordinarily most circumspect" in its advertising. Curiously enough, Dr Palmer fails to bring out what we believe was a fact that the official journal of the national dental organization carried the same advertisements.

"Paying Through the Teeth" should and will we believe, do a very useful piece of educational work. Dr Palmer is of the opinion that the vigorous action of the American Medical Association against the patent medicine evil resulted in many concerns in the "patent medicine" group turning their attention to the marketing of dental nostrums for, as the author so well brings out, the American dental profession, until comparatively recently made no attempt to protect the public against dental frauds. Dr Palmer falls into the common error of confusing the American Medical Association's Council on Pharmacy and Chemistry with the Association's Bureau of Investigation. The Council does not concern itself with those cruder proprietaries that are commonly called 'patent medicines', it confines its activities largely to the proprietary remedies that are sold nominally, at least, for the use of the medical profession for prescription purposes. It is the Association's Bureau of Investigation that has carried on a campaign for more than a quarter of a century against the crude nostrums colloquially called patent medicines."

Dr Palmer does well to bring out as he does in chapter 13 the pernicious commercial influences that have attempted to control the dental profession and which apparently still wield considerable power. His profession is having the same fight to overcome the commercial domination of dentistry that the medical profession, through the American Medical Association had to overcome a similar domination in the medical field. The thoughtful members of the medical profession who are familiar with the facts will agree with Dr Palmer in his statement that the dental profession has gone far, and is steadily progressing, toward acceptance of its full duty to protect the public against the use of nostrums and against the impositions and frauds of dishonest advertising."

"Paying Through the Teeth" is a good book for the physician to have in his reference library for it contains in easily available form a vast amount of information on tooth pastes, tooth powders, mouth washes, pyorrhea remedies and similar preparations. The book has an excellent index.

Basic Problems of Criminology By Professor Olof Kimberg M.D.
Boards Pp 438 Copenhagen Levin & Munksgaard 1935

Professor Kimberg is a leader in the study of medical jurisprudence with particular reference to Sweden and to the insane. For almost thirty years he has been studying the problems of criminal psychiatry and his shorter writings are known in this country. The present work is a massive rather thorough study of criminal 'responsibility,' for which term the author prefers an obsolescent term 'imputability.' The volume opens with a historical introduction to the subject of psychiatric criminology which is of much value because it supplements such American works as those of Weihen and Glueck (which confine themselves to English and American law) by presenting the Teutonic genesis of the subject. While many legal philosophers have discussed causes of crime, Kimberg presents a new philosophical approach. He devotes a good portion of the

historical part of the book to the development, from the classical period to the present, of the concepts of blame and punishment. About the last three fifths of the work is devoted to a careful analysis of the causes of crime, the situational picture surrounding crimes and criminals, and the attitude taken toward the whole subject by various criminological writers. To the American criminal psychiatrist the author's analysis of the criminal's mental processes and the causation of his acts may seem to be a rehash of already published criminological philosophy, still it is excellently done and European sources have been explored which tend to validate and agree with much American material previously needing confirmation. Kinberg is not, of course, down to date in his knowledge of criminology in this country, for much of the best work, like that being done by the Illinois state criminologist, is unpublished or only recently has been put into print. For a foreign publication in English, the style is satisfactory and in some places makes excellent reading. This volume belongs in the library of every potential or actual forensic psychiatrist.

A Textbook of Physiology. By William D. Zoethout, Ph.D., Professor of Physiology in the Chicago College of Dental Surgery (Loyola University). Fifth edition. Cloth. Price \$4. Pp. 694 with 271 illustrations. St. Louis: C. V. Mosby Company, 1935.

This well known textbook has been extensively rewritten in regard to endocrinology, nutrition and neurophysiology. The book is suitable for intermediate courses in physiology and should be intelligible to students with little previous knowledge of anatomy or biochemistry. There is a great deal of reliable information in the volume, although some of it has been too greatly condensed to be readily grasped. Occasionally it is difficult to agree with the author's choice of interpretations. For example, although he says that Hering's theory of color vision is less commonly accepted than Helmholtz's theory, he describes only the former. The physiology of the circulation occupies ninety pages, yet there is no mention of the electrocardiogram. A paragraph is devoted to the "staircase" phenomenon and one to tetanus in heart muscle. An incomprehensible picture of Dudgeon's sphygmograph, among other illustrations of obsolete apparatus, might well be eliminated from future editions. For a textbook in physiology there would not seem to be need for six semidiagrammatic illustrations of the mammalian heart to show the direction of blood flow and the function of the valves. There is no mention of the carotid sinus reflex mechanism. It is obvious from the abundance of anatomic illustrations that the book is intended for nonmedical students. A glossary adds considerably to its value for such students. As a relatively up to date treatment of the subject it can be highly recommended to the intermediate student group.

Gastritis and Its Consequences. By Knud Faber, M.D., LL.D.E., F.R.C.P.E.Hon., Professor of Internal Medicine in the University of Copenhagen. Cloth. Price \$3. Pp. 119 with 48 illustrations. New York & London: Oxford University Press, 1935.

This little monograph presents the views of Dr. Knud Faber, based solely on his personal experience with gastritis over a period of forty years. There are three parts, the first on acute and chronic gastritis, the second on gastritis and hyperacidity, and the third on gastritis and anacidity. The subject of gastritis is an interesting one in that about thirty years ago the term was a diagnostic one to be frowned on for many years and to reappear recently as the result of examination of the stomach itself by direct vision, gastroscopy, and of the tissues removed by resection of the stomach for ulcer or carcinoma. The author's method of immediate postmortem, intragastric injection of 4 per cent solution of formaldehyde has made it possible to obtain tissues that have not undergone lytic degeneration and to report the true story of what he thinks gastritis really is. This work has been done by many others, whose conclusions are in accord with the author's. Tracing the condition from simple gastritis with slight or no dyspeptic symptoms and few local changes, he carried the work through the stages of acute and chronic gastritis and showed that chronic gastritis is frequently the results of repeated or acute gastritis. It may be of the erosive or pangastritic and atrophic type, the latter being the form in which anacidity is most common. Gastritis with hyperacidity may be the forerunner of peptic

ulcer, is generally associated with it, and not infrequently may give rise to the symptoms characteristic of ulcer, even hemorrhage without an ulcer being found on roentgen examination or at operation. The small acute ulcers that are often seen in the picture of severe gastritis may be the forerunner of the chronic peptic ulcer. The author says that the causes of anacidity are veiled in indefinite beginnings and that in his experience gastritis is always present wherever anacidity is found. He does not believe in the constitutional factor as a cause of anacidity, as Hurst does. The frequency of the occurrence of low or anacid states in the course of acute infections and intoxications the existence of which may have been forgotten, the many opportunities for the development of gastritis in the course of a lifetime from infancy to late adulthood, the tendency either to forget or to overlook trivial disturbances, are all sufficient reasons for postulating the presence of gastritis at some time or other which subsequently becomes severe enough to cause anacidity. Pyloric gastritis does but cardiac does not produce anacidity. The anacidity late in life looked on as normal is in the author's experience the result of gastritis, likewise the anacidity that may be the precursor and is always the accompaniment of pernicious anemia. The rare return of gastric acidity in this condition is the result of a recession of pyloric gastritis. Hypochromic anemia and anacidity may bear the same relationship. One cannot digress into a discussion with the author, because he makes these observations as his own personal opinion, even though he knows that many disagree with him. It is a well written book, reads well and is worthy of being scanned by any one interested in internal medicine. Attention might be called to the tautologic "X-ray Radiograms" on page 13 and "imitation" for "irritation" on page 32. There is a large bibliography.

Sex Worship and Disease (Phallic Worship). A Scientific Treatise on Sex Worship and Its Influence on Religion and Symbolism with Special Reference to Disease of the Sexual Organs. By Mason Daugherty, M.D. Cloth. Price \$3.50. Pp. 240 with 21 illustrations. Cleveland, Ohio: The Author, 1935.

There seems to be little reason for the appearance of a book of this sort even though the author does say that it was written for the physician (called a scientific treatise on the title page) and for his friends. Possibly the many lay friends of the physician, seeking information on that always interesting subject, sex, are meant in particular. The doctor is not forgotten, because the unfortunate victim of venereal disease is cautioned against going to an advertising quack, but to an "M.D." [sic]. Chapters on venereal disease, the evils of masturbation, care of the teeth, cancer of the breast, leukorrhea, a recital of Nero's cruelties and a new deal for women alternate in an irregular fashion with discourses on phallic worship, the anatomy of the generative organs, prostitution, marriage customs, birth control and early marriages among the Hindus. The information is too fragmentary to be of any value to a physician or to the layman seeking knowledge. Neither the manner of offering the information nor its literary qualities can recommend it to the intelligent reader.

Prognosis. Volume One. [Reprinted from the *Lancet*.] Cloth. Price, 10s. 6d. Pp. 372. London: Lancet Limited, 1935.

This is a companion volume to the previously published series on "Modern Technique in Treatment" and "Clinical Interpretation of Aids to Diagnosis." It contains, as did the others, a collection of articles published week by week in the *Lancet*. To the writing of each article the editorial staff invited those who have watched the progress of large numbers of cases of certain diseases to share this experience with their colleagues in more general practice. The choice seems to have been a happy one in each case for in every chapter one senses the word authority. "Of the three great branches of clinical science—diagnosis, prognosis and treatment, prognosis is admittedly the most difficult," says Robert Hutchinson. Hence it ought to be studied all the more assiduously. It is, indeed, just as true of prognosis as it is of diagnosis that neither of them can be separated from treatment. The three are merely different aspects of therapy "if we define this word, in its widest sense, serving the best interests of the sick." Thus says T. A. Ross, in his introduction to the chapter on "Prognosis in Hysteria and Anxiety States." It is of interest when

reading contributions on the subject of prognosis to note that nearly every author is compelled to make constant reference to treatment. Therapeutics are scoffed at so often that it is gratifying to find that hardly any one is in a position to discuss prognosis helpfully without doing this. It has been made abundantly clear in several articles in this series that in many illnesses prognosis depends not only on the nature of the illness but on the facilities for treatment which can be afforded. There are of course certain conditions such as coryza where whatever is done it is as near certainty as possible that the patient will become quite well, there are others, like established hydrophobia, where it is almost equally certain that he will die, but for probably a majority of illnesses prognosis depends to a great extent on treatment, and certainly this is true of the two psychoneuroses hysteria and anxiety states. No physician, be he specialist or generalist, can peruse this book without becoming a better doctor than he was.

Human Pathology A Textbook By Howard T. Karsner M.D. Professor of Pathology Western Reserve University Cleveland Ohio. With an Introduction by Simon Flexner M.D. Fourth edition. Cloth. Price \$10. Pp. 1213 with 461 illustrations. Philadelphia & London J. B. Lippincott Company 1935.

The first edition of this textbook appeared in 1926, this, the fourth edition in nine years, represents the efforts of the author "to keep the work wholly abreast of the times." This attempt is apparent in the careful way in which Dr. Karsner has revised the book. Many sections have been completely rewritten, new illustrations added or better ones substituted for previous ones, and the references at the close of each chapter modernized. The chapter on the general pathology of tumors has been rewritten and much new material has been added to the sections on diseases of the blood, diseases of the nervous system, and the pathology of the ductless glands and of the granulomas. Other subjects have been revised in the light of newer information, making the work much more satisfactory for teachers and advanced students.

Criticism of this book is made difficult by the fact that the author has attempted the impossible object of treating the subjects of general and special pathology in one volume that will be useful to students as well as to advanced workers in the field. He has succeeded better for the latter group than for the former. For beginning students further simplification would make the sections on general pathology more comprehensible. For example, the long paragraphs on pages 129 to 134 are rather confusing to beginners. Future editions might well include a general chapter on parasitic diseases written from the pathologic point of view. The book as a whole, however, will continue to serve and to inspire all students of pathology even more completely than it has in the previous editions. American pathologists may well be proud of Dr. Karsner's achievements in this textbook.

Psicologia social Pelo Professor Raul Briquet, catedrático da faculdade de medicina da Universidade de São Paulo. Paper. Pp. 265 with 10 illustrations. Rio de Janeiro São Paulo & Belo Horizonte Livraria Francisco Alzira Paulo de Azevedo & Cia 1935.

This book is a modern presentation of some of the more superficial facts of social psychology. It is somewhat less scientific and less exact than most American books, such as those of Bernard and Allport, and consists largely of quotations from authors on the various subjects discussed. The style is simple if one reads Portuguese, but there seems to be no reason for any American reading the present volume. The most important contributions discussed in it are those of Americans and are well known to the majority of people interested in social psychology. Its chief source of interest, however, is in its approach. It consists of two parts: the first is a general discussion covering such topics as the importance of biology and psychology and sociology to the subject in general. Under the topic of psychology is included behaviorism, gestalt, and the 'laws of human nature.' The way these matters are taken up indicates that there are some students in Brazil who follow the American psychologists closely. The second part deals with special topics, first the psychic factors and secondly social life. The usual topics are considered here and even though the book is for South American consumption the topic of revolution is not overemphasized. The value of this book to medical men is obscure.

The Principles and Practice of Hygiene By Dean Franklin Smiley A.B. M.D. Professor of Hygiene in Cornell University. Adrian Gordon Gould Ph.B. M.D. Assistant Professor of Hygiene in Cornell University and Elizabeth Melby M.A. R.N. Assistant Professor Yale University School of Nursing. Second edition. Cloth. Price \$2.50. Pp. 495 with 96 illustrations. New York Macmillan Company 1935.

This useful textbook for nurses was first published in 1930. In the previous edition the authors limited their discussion to matters relating to personal and individual hygiene. In the new edition they have made little change but have simply added a section on community sanitation. They have not been successful in condensing this comprehensive subject within some seventy-eight pages. The major titles of the material that is considered are (1) water supplies and their purification, (2) prevention of food-borne infections, (3) combating the hazards of the lower animals, insects and soil, and (4) home sanitation. All these subjects are discussed inadequately, while much equally important material is given no consideration whatever. The chapter on combating the hazards of the lower animals, insects and soil is a heterogeneous mixture of subjects that have little interrelationship. The chapter on home sanitation is perhaps the least adequate of the group. It probably would have been more advantageous if the authors had written a separate book on the subject 'Community Sanitation' rather than attempt to abridge and condense this information within the pages of their original volume.

Anemias y alimentación El principio antianémico del hígado y los factores cualitativos de los alimentos (vitaminas, aminoácidos, hierro y cobre). Por José Sánchez Rodríguez. Tesis doctoral premiada por la Academia Nacional de Medicina en 1935. Prólogo de Gregorio Marañón. Paper. Price 12 pesetas. Pp. 170 with 22 illustrations. Madrid Cruz y Raya, 1935.

The book is divided into two parts, theoretical and experimental. In the first part the chemistry of the red blood corpuscle and the factors that control the level of hemoglobin are considered. Anemias are classified as being caused by (1) insufficiency (lack or defective utilization) of the nutritive materials (iron, amino acids), (2) changes in the hematopoietic organs (toxic, infectious, metabolic, mechanical), (3) alterations in the catabolism of the blood pigment (toxic hemolytic, infectious hemolytic) and (4) alterations in the regulating factors (antianemic principle of liver, hormones, vitamins, copper). The importance of alimentation in the cause and correction of anemia is stressed. In studying the composition of liver extract to throw light on the qualitative factor of the defective alimentation of the antianemic substance in pernicious anemia, Rodríguez used a European preparation of liver that apparently differed in many respects from the preparation in use in America. He found no appreciable amounts of iron, copper, hydroxyproline, beta-hydroxyglutamic acid, or vitamins A, B₂, C, D or E. The author therefore questions Strauss and Castle's suggestion that B₁₂ is the 'extrinsic factor' in the production of antianemic substance, and he also eliminates B₁₂ as a factor. Both of these he finds in gastric mucosa, although he found no B₁₂ in normal gastric secretion. The hematopoietically active principle of liver is considered as a definite vitamin. There is appended a bibliography of 502 articles, including a large number from American literature.

Annual Review of Biochemistry Edited by James Murray Luck. Stanford University. Volume IV. Cloth. Price \$5. Pp. 639. Stanford University California Annual Review of Biochemistry Ltd 1935.

This collection of reviews in fields of current interest to biochemists and to others who deal with biochemical problems is now in its fourth year. As in past volumes, investigators from many parts of the world have been chosen to prepare the material on the various subjects, thus this book is truly an international achievement, representing the efforts of thirty-two authors from eight countries. The subjects reviewed in volume IV include permeability, biologic oxidations and reductions, enzymes, chemistry of carbohydrates and glucosides, acyclic constituents of natural fats and oils, proteins and amino acids, sulfur compounds, nucleic acids, purines and pyrimidines, muscle and bacteria, metabolism of carbohydrates, fats, amino acids and proteins, creatine and creatinine, and of brain and nerve detoxication mechanisms, hormones, choline compounds, vitamins, nutrition, chemical embryology, biochemistry of malignant disease, plant pigments, alkaloids, mineral nutrition

of plants, growth substances of plants, immunochemistry To review in detail this vast amount of material is obviously not feasible It is inevitable that the different reviews should vary in quality, some are more critical than others Despite the shortcomings of a few of them, the book as a whole serves as an admirable introduction to and synthesis of current literature of biochemistry Although it would undoubtedly add considerably to the difficulty and cost of preparing these annual volumes, it appears that a subject index would greatly enhance their utility as reference books

Archiv und Atlas der normalen und pathologischen Anatomie in typischen Röntgenbildern Atlas der normalen Ossifikation der menschlichen Hand Von Prof Dr F Siebert Ergänzungsband XLVII Fortschritte auf dem Gebiete der Röntgenstrahlen Herausgegeben von Prof Dr Grashey Paper Price 16 marks Pp 43 with 158 illustrations Leipzig Georg Thieme 1935

This statistical study of the ossification of the hand is based on the author's extensive material and is illustrated by thirty-six excellent plates with 134 roentgenograms of normal hands of both sexes and sixteen roentgenograms of the hands of patients with various pathologic conditions The author concludes from his observations that ossification takes place earlier in female children than in male but that in both sexes the order of ossification is relatively uniform Ossification may be of different types in different families and this fact should be remembered in attempting to distinguish between normal and pathologic conditions In the author's judgment the tables of Adams showing the relation between the length and the weight of a child are preferable to those of Pirquet

Laboratory Methods of the United States Army Edited by James Stevens Simmons B S M D Ph D Major Medical Corps United States Army Associate Editor Cleon J Gentzkow M D Ph D Major Medical Corps United States Army Approved by the Surgeon General of the United States Army Fourth edition Fabrikoid Price \$6.50 Pp 1 091 with 70 illustrations Philadelphia Lea & Febiger 1935

Planned originally to aid medical officers during the World War this volume is now in its fourth edition, much revised and greatly enlarged In its development many competent workers have given their aid and services, and they are credited in the book for their contributions The present volume is a complete guide to laboratory methods in medicine, veterinary practice and statistics Its usefulness can hardly be exaggerated, since it represents the experience of workers handling thousands of specimens under conditions enabling suitable controls There is a competent index The tests and methods offered are those usually followed in army work, in many instances only a single method is given although several methods may be available Thus, there is but a single rough and ready method for blood coagulation and there does not appear to be any method described for counting blood platelets Wassermann and Kahn tests are given in great detail with complete theoretical considerations For the determination of blood sugar, the Folin-Wu method is described Notwithstanding its minor deficiencies, the work is still a *vade mecum* in the laboratory field

Ear Exostoses By Aleš Hrdlička Curator Division of Physical Anthropology U S National Museum Smithsonian Miscellaneous Collections Volume 93 number 6 Publication 3296 Paper Price 50 cents Pp 100 with 13 illustrations Washington D C Smithsonian Institution 1935

The subject of ear exostoses does not occupy a prominent place in otology Curiously enough, however, the names of a number of famous otologists are associated with studies of these peculiar formations For the anthropologist too they hold peculiar interest The author has written a monograph of more than academic interest He discusses this subject as completely as can be, with literature, observations old and new, and the detailed data as to the age, sex, frequency of the occurrence, and etiology, and in a general discussion sums up the available information He concludes that exostoses of the ear are abnormalities rather than a disease, arising from the free ends of the tympanic ring They occur chiefly in later adolescence and early adult life They are seen in all races The otologist whose interest in things concerning the ear is not limited to the happenings of everyday practice will find this authoritative monograph absorbing reading

Incompatibilités pharmaceutiques Par le Prof A Goris directeur de la pharmacie centrale des hôpitaux et A Liot adjoint au directeur de la pharmacie centrale des hôpitaux Paper Pp 140 with 4 illustrations Paris Librairie E Le François 1935

The authors are right in their idea that it is time a newer book on incompatibilities was written, as the only two little books on the subject (Ruddiman's of 1908 and Hagers' of 1907) are now quite out of date One looks in vain in those relatively old books for information on the incompatibilities of many of the extensively used newer remedies For the French reading physician therefore this book will "fill a long felt want" An English book on incompatibilities is just about due

Medicolegal

Malpractice Negligent Treatment of Fracture—The plaintiff fractured both bones of his right forearm The defendant reduced the fractures, using only one splint The bones did not stay in alignment and three times successively within a week the defendant attempted a resetting, each time using only one splint A substantial permanent deformity and loss of function of the arm resulted and the plaintiff sued the defendant, obtaining judgment in the trial court The defendant appealed to the Supreme Court of Minnesota.

The whole issue, said the Supreme Court, was whether, in connection with the splint he did use, the defendant should have applied another or posterior splint to keep the bones in place The failure to use the second splint was improper practice, according to the medical testimony for the plaintiff The defendant was not a very good witness for himself, the court said When asked what made the bones "slip all the time," his answer was "I don't know" He testified that the use of a posterior splint "might have held the bones in proper alignment, yet he insisted that he was "proud of this job" The Supreme Court said that the evidence presented a *jury question* and the court could find from the record no ground on which it could properly interfere The judgment for the plaintiff was consequently affirmed.—*Citrouski v Libert (Minn)*, 260 N W 297

Workmen's Compensation Acts Traumatic Rupture of Diseased Appendix Compensable—The employee, during the course of his employment, assisted two fellow employees in carrying a heavy beam up a steep incline He slipped and fell to his knees and immediately complained of abdominal pain, which persisted and forced him to quit work An abdominal operation performed about thirty-three hours after the accident disclosed a diseased appendix and peritonitis, with the abdomen "filled with pus" No perforation was located, but an extensive exploration was not done because of the patient's grave condition The appendix was removed and drainage instituted, but the employee died seven days after the operation The department of labor and industries denied the claim of the employee's wife for an industrial insurance pension under the workmen's compensation act of Washington, and, from a judgment of the superior court sustaining the department's disallowance, the claimant appealed to the Supreme Court of Washington.

The operating physician stated the causes of death in the death certificate, as follows "The remote cause of death Accidental injury The immediate cause of death Peritonitis and infection causing obstruction also traumatic appendicitis" An autopsy proved to be of little or no value in locating a possible perforation because of the extent to which the peritonitis had progressed by the time of death and because the embalmer had removed the gas and fluid from the abdominal viscera It seems to have been conceded that prior to the accident the employee had a painless chronic inflammation of his appendix The operating surgeon testified that trauma may accelerate chronic appendicitis and cause a rupture or perforation of a weakened diseased appendix He expressed definitely the opinion that the injury received was the real beginning of the condition which caused the death of the employee While the evidence was clear, the court said, that the appendix was diseased and in the course of time would

have ruptured without any external pressure, yet there was evidence that the rupture of the appendix was accelerated by the injury. In view of this evidence, said the court, a rule laid down in *Shadbolt v Department of Labor and Industries*, 121 Wash 409, 209 P 683, applies.

Even though the appendix was diseased and in course of time would have ruptured without any external pressure if its rupture was accelerated by such pressure this would constitute an injury.

In the opinion of the Supreme Court, the claimant sustained the burden of proof that the accident suffered by the employee caused or accelerated a rupture of the appendix or intestine and that his death resulted therefrom. The judgment of the superior court was reversed, therefore, with direction to remand the case to the department of labor and industries with instructions to allow the claim.—*Thomas v Department of Labor and Industries* (Wash.) 44 P (2d) 765

Malpractice Facial Paralysis Following Mastoidectomy—The physician-defendant, a specialist in diseases of the ear, nose and throat, punctured the plaintiff's ear drum from which pus was immediately discharged. After observing the patient for four days he made a diagnosis of mastoiditis and performed a mastoidectomy. The operation resulted in a degree of facial paralysis. Another physician who performed a second operation to alleviate the paralysis found that the facial nerve had been injured. This operation improved the facial paralysis, but return of function was not complete. The plaintiff then sued the physician-defendant. From a judgment against him, the physician-defendant appealed to the Supreme Court of Washington.

The physician-defendant contended that he was not negligent in performing the operation but that during the operation the facial nerve was exposed, as the result of necrosis of the protecting bone, and somehow subjected to injury. Such necrosis, he said, could set in within four days after the onset of infection. The plaintiff argued that infection had not existed for a sufficient time to cause such necrosis and that if the operation had been performed skillfully the facial nerve would not have been injured. The physician who performed the second operation testified that two weeks to a month in an average case of mastoiditis, and never less than eight days, was required for an infection in the middle ear to spread into the mastoid and produce the necrosis in question. The plaintiff testified that the physician-defendant told her that he had made a mistake and had cut the nerve saying nothing at the time about any necrosis or crumbling of the bone. The physician-defendant denied having made this statement and testified 'I told her that during the operation I had accidentally uncovered the facial nerve and that I did the best I could under the circumstances I had to deal with and that was what had happened.' There was sufficient evidence said the Supreme Court to justify the jury in finding that the time between the detection of infection and the operation was insufficient for such necrosis to have set in. It was not contended that the physician-defendant adopted an erroneous method of operating or that the operation which he performed was not proper and necessary. The contention was that the operation was performed in a negligent manner. The distinction between the two classes of cases involving negligence on the part of physicians is pointed out in *Swanson v Hood* 99 Wash 506 170 P 135 wherein it was said:

But there is an obvious distinction between a claim of negligence in the choice of methods of treatment and a charge of negligence in the actual performance of the work or treatment after such choice is made. As to the first the charge is refuted as a matter of law by showing that a respectable minority of expert physicians approved of the method selected thus taking the case from the jury. As to the second a charge of negligent performance where there is any evidence tending to show such negligence the case is for the jury as in other cases of negligence whenever upon the evidence the minds of reasonable men might differ.

The record in the present case said the Supreme Court contains substantial evidence to support the jury's finding that the operation was negligently performed. There was no testimony to the effect that in operations similar to the one here involved the facial nerve is frequently injured. The evidence went no further than to indicate that such injuries occasionally occur. The plaintiff was not required to prove negligence by

direct and positive evidence. It was only necessary that a chain of circumstances be established from which negligence was reasonably and naturally inferable. The jury had a right to take into consideration the fact that a second operation was necessary in order to correct the condition resulting from the first operation.

The Supreme Court could find no reversible error and therefore affirmed the judgment of the trial court for the plaintiff.—*Marlowe v Patrick* (Wash.), 44 P (2d) 776

Malpractice Roentgen Burns, Accrual of Right of Action—The plaintiff in 1928 sustained a roentgen burn as a result of treatments administered by the defendant, for the purpose of preventing conception. According to the complaint, the physician minimized the severity of the burn and continued to attend the patient until 1932, when, the burn having gradually become worse, he suggested that she seek relief from another physician. Claiming permanent injury as a result of the burn the patient and her husband in 1934 sued the defendant. The trial court sustained the defendant's demurrer to the complaint, on the ground that the suit was barred by the three year statute of limitations. The plaintiffs thereupon appealed to the Supreme Court of Washington.

In Washington, said the court it has been held in several malpractice cases arising against attorneys that the cause of action is founded on a breach of duty arising out of contract and that the three year statute of limitations is applicable. In the present case, six years elapsed between the infliction of the burn and the commencement of suit. The plaintiff contended, however, that her action was not barred by the statute of limitations because (1) the defendant fraudulently concealed from her the severity of the burn, and (2) the statute did not begin to run until 1932, when the defendant's professional services were terminated. With respect to the first contention, the Supreme Court said that the decision in the case of *Cornell v Edson* 78 Wash 662 139 P 602, was controlling. In that case, wherein it was alleged that an attorney had wrongfully dismissed an action and had concealed that fact from his client, it was urged that the concealment tolled the statute of limitations. In holding to the contrary, the court in that case said, in part:

The action is plainly one based upon a breach of duty growing out of the relation existing between the parties a contractual relation which calls for a full disclosure and when by reason of the failure to make a full and complete disclosure or the withholding or concealment of facts which should have been disclosed loss is suffered there is a breach of duty and for such breach an action will lie. But like any other action founded upon a breach of duty imposed either by law or contract the action arises out of the breach and the statute of limitations begins to run from the time of the breach and not from the time of its discovery.

In this case the duty is one growing out of the relation between the parties and that relation is one based upon contract. The relation it is true is fiduciary, but that does not disturb the fact that it is contractual and that a cause of action based upon the breach of the contract accrues when the contract is violated and not when the violation is discovered.

With respect to the contention that the statute of limitations did not begin to run until after the defendant discontinued his services, the court again referred to a prior decision, *Jones v Gregory* 125 Wash 46, 215 P 63. In that case the plaintiff alleging that she suffered loss by the negligence of her attorneys contended that the statute of limitations did not begin to run until the services of the attorneys had ceased. In disposing of that contention, the court said:

The contention made in appellant's behalf seems to be that in some way the starting of the running of the statute was stayed by the efforts put forth by respondents as counsel for appellant looking to the setting aside of the original decree of distribution and the entering of another decree of distribution awarding to her all of the property of the estate. We are quite at a loss to understand how such action on the part of respondents or how such subsequent proceedings in court, looking to the setting aside of the original decree of distribution could stay the starting of the three year statute of limitations. Surely whatever respondents did resulting in damage to appellant occurred not later than the entering of the decree of distribution on December 4, 1918. Manifestly appellant's right of action if any she ever had accrued not later than that date. Every act of respondents which could possibly have resulted in the damage claimed to have been suffered by appellant was committed before or upon that date.

In the *Jones* case the Supreme Court pointed out the attorneys, after making their mistake, endeavored to correct it, in

the present case, after the act of malpractice, the defendant continued to treat the plaintiff in an effort to alleviate and correct his first mistake. The gravamen of the present action is the defendant's malpractice in the performance of the service for which he was originally employed. It would be trifling with the facts, the court said, to say that the present action was brought, not for the original injury, but for the defendant's subsequent failure to correct the original wrong. Numerous authorities cited by the plaintiff to support her position related generally to cases in which the physician's employment had relation to an existing injury or malady which the physician was called to treat. In the present case, the court said, the defendant's original employment by the plaintiff was not to cure the roentgen burn but to prevent conception. The defendant's breach of duty to the plaintiff consisted in the negligent manner of his treatment to effect this purpose, and this is the wrong for which the plaintiff seeks recovery.

The Supreme Court therefore concluded that the trial court correctly sustained the defendant's demurrer, and the judgment of dismissal was affirmed—*McCoy v Stevens (Wash)*, 44 P (2d) 797

Hospitals Operation of a Municipal Hospital a Governmental Function—The defendant city of McAllen owned and operated a hospital, supplying hospital care to all persons within the city who were in need of it and charging a fee only to those who were able to pay. The hospital was built by means of a city bond issue and was operated as a part of the city government. The plaintiff, a pay patient, was injured as the result of the negligence of a student nurse employed by the hospital. The plaintiff and her husband sued the defendant city and its insurance carrier. From a judgment in favor of the plaintiff, the city and its insurance carrier appealed to the court of civil appeals of Texas.

A hospital, said the court, constructed and maintained by a city for the principal purpose of conserving the public health, as was the defendant hospital, receiving indigent patients without charge, and applying all money received to expenses, is a charitable institution and is not liable to a pay patient for injuries due to the negligence of an employee. Furthermore, the defendant city operated the hospital in the performance of a governmental function and consequently was not for that reason liable in the present case. Accordingly, the court reversed the judgment of the trial court for the plaintiff—*City of McAllen v Gartman (Texas)* 81 S W (2d) 147

Optometry Corporate Practice of Optometry Illegal, Injunction to Restrain Practice—The two cases here abstracted hold that corporations may not lawfully practice optometry.

In New York, the Secretary of State refused to accept for filing a proposed certificate of incorporation whereby the corporation was to be authorized, among other things, "to transact and carry on the optical business, to do render and perform optometrical and oculists' work and services and to engage in the practice of optometry, provided it employs only licensed optometrists to do the work." The plaintiff instituted proceedings in the supreme court of New York to compel the Secretary of State to accept for filing the proffered certificate. The defendant Secretary of State contended that a corporation may not be lawfully formed to practice optometry or to perform "oculists' work and services," even though it employs licensed optometrists to do the work. With this contention, the supreme court agreed. In *Matter of Co-operative Law Co*, 198 N Y 479, 92 N E 15, it was held that a corporation may not lawfully practice law in New York. In *People v John H Woodbury Dermatological Institute*, 109 N Y S 578 85 N E 697, it was held that it was against the policy of the state to permit corporations to practice medicine. Likewise, in *Hannon v Siegel-Cooper Co*, 167 N Y 244, 60 N E 597, it was held that a corporation cannot lawfully practice dentistry in New York by employing a licensed dentist to do the work. If, said the supreme court, it is repugnant to the policy of the state to have the professions of medicine, dentistry and law practiced by a corporation, it is equally repugnant to have the profession of optometry practiced by a corporation. The practice of optometry the court pointed out, may be carried on only by

those persons who have complied with the requirements of the statute regulating the practice of optometry as to moral character and educational fitness. It necessarily follows that the right to practice optometry is a personal one and confined to real persons and not to legal entities. A corporation as such cannot meet the requirements of the statute, it cannot have completed a course in a high school or in a university where optometry is taught, it cannot present the necessary certificate of character, it cannot pass a state board examination. In denying the plaintiff's petition, the supreme court concluded

The proposed certificate of incorporation provides for the carrying on of the optical business and the rendition and performance of optometrical and oculists' work and services. A corporation is forbidden both by statute and judicial decisions from performing an oculist's work and services, an oculist being a duly licensed physician specializing in the diseases of the eye. While this motion could well be denied on the ground that a corporation may not render oculists' services I have been requested to base this decision on the question of whether or not a corporation may be organized for the purpose of practicing optometry. I hold that it cannot lawfully be organized for such purpose.

In West Virginia, two licensed optometrists, suing on behalf of themselves and all others similarly situated, obtained an injunction against the defendants, the Buhl Optical Co, a corporation, and the O J Morrison Department Store Company, another corporation, prohibiting them from practicing optometry through registered and licensed optometrists. The defendants appealed to the Supreme Court of Appeals of West Virginia.

The defendant optical company maintained an optometry department in the defendant department store, in charge of a licensed optometrist paid by the optical company. A fixed percentage of the gross receipts from this department went to the department store, the remainder went to the optical company. The optometry practice act, said the court, recognizes optometry as a profession and provides that it shall be unlawful for any person to practice optometry in the state who has not been licensed and registered. It requires that applicants shall have attained the age of 21 years, shall be of good moral character and temperate habits, and shall pass specified educational qualifications. A licensee is forbidden to advertise, practice or attempt to practice "under a name other than" his own. This prohibition, the court said, is certainly antagonistic to the view that a corporation may practice optometry through a licensed optometrist. In holding that a corporation could not lawfully engage in the practice of optometry in West Virginia, the court cited with approval the New York case abstracted above. In a specially concurring opinion, Judge Maxwell said

The act precludes all persons not properly registered from practicing optometry. A corporation is a person and in the nature of things it cannot possess the qualifications to practice optometry. A person, individual or corporate may not do by indirection what he or it is precluded from doing directly.

The decree of the trial court, granting the injunction, was therefore affirmed—*Stern v Flynn (N Y)*, 278 N Y S 598
Eisensmith v Buhl Optical Co (W Va), 178 S E 695

Society Proceedings

COMING MEETINGS

- American Student Health Association New York Dec. 27-28. Dr Harold S Diehl University of Minnesota Medical School, Minneapolis Secretary
- Eastern Section American Laryngological Rhinological and Otolological Society Newark N J Jan 3 Dr Henry B Orton 24 Commerce St Newark N J Chairman
- Middle Section American Laryngological Rhinological and Otolological Society Milwaukee Jan 11 Dr William E. Grove 324 East Wisconsin Avenue Milwaukee Chairman
- Mid Western Section American Laryngological Rhinological and Otolological Society St Louis Jan 15 Dr Harry W Lyman Carleton Building St Louis Chairman
- Society of American Bacteriologists New York Dec 26-28 Dr I L Baldwin College of Agriculture University of Wisconsin Madison Wis Secretary
- Society of Surgeons of New Jersey Jersey City Jan 15 Dr Walter B Mount, 21 Plymouth St Montclair Secretary
- Southern Section American Laryngological Rhinological and Otolological Society Jackson Miss Jan. 18 Dr Robin Harris Lamar Building Jackson Miss Chairman
- Western Section American Laryngological Rhinological and Otolological Society Del Monte Calif Feb 12 Dr Carroll Smith Paulsen Building Spokane Wash Chairman

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below

Alabama Medical Association Journal, Montgomery

5: 137-172 (Oct.) 1935

Some Lesser Known Manifestations of Allergy M. T. Davidson Birmingham—p. 137

Minor Allergic Manifestations C. K. Weil, Montgomery—p. 141

Prostatism Its Present Day Diagnosis and Treatment J. P. Robertson Birmingham—p. 144

American Journal of Cancer, New York

25: 251-500 (Oct.) 1935

Melanoma of Choroid Prognostic Significance of Argyrophil Fibers G. R. Callender, Ancon Canal Zone and Helenor Campbell Wilder Washington D. C.—p. 251

Inquiry into Origin of Mixed Tumors of Salivary Glands with Reference to Their Embryonic Interrelationships P. L. Li and C. S. Yang Changsha China—p. 259

*Dysontogenetic Origin of Basal Cell Carcinoma J. McFarland E. F. Ciccone and J. Gelehrter Philadelphia—p. 273

Normal Development of Mammary Glands of Virgin Female Mice of Ten Strains Varying in Susceptibility to Spontaneous Neoplasms W. U. Gardner and L. C. Strong New Haven Conn.—p. 282

Estrous Cycles of Mice During Growth of Spontaneous Mammary Tumors and Effects of Ovarian Follicular and Anterior Pituitary Hormones E. Allen A. W. Diddle L. C. Strong, T. H. Burford and W. U. Gardner New Haven Conn.—p. 291

*Artificial Fever of 111.4 F. as Means of Destroying Cancer in Animal Body G. Walker Baltimore—p. 301

Photosensitivity of Chick Embryo Cells Growing in Mediums Containing Certain Carcinogenic Substances Margaret Reed Lewis, Baltimore—p. 305

Atypical and Pathologic Multiplication of Cells Approached Through Studies on Crown Gall A. J. Riker and T. O. Berge Madison Wis.—p. 310

Differential Mortality from Cancer in White and Colored Population S. J. Holmes—p. 358

Tumors of Peripheral Nerves C. F. Geschickter Baltimore—p. 377

Dysontogenetic Origin of Basal Cell Carcinoma—

McFarland and his collaborators plotted a number of carefully selected and histologically confirmed cases of basal cell carcinomas from two hospitals on two diagrams of the face in order that their distribution might be studied with reference to their possible dysontogenetic origin through defective concurrence of the embryonal facial fissures as suggested by Glasunow. The observations have been compared with the plottings of other supposed dysontogenetic lesions, sequestration dermoids and mixed tumors, with the result that all three types of lesions are found to conform to about the same anatomic distribution, which is entirely different from that of the more common squamous cell or prickle cell carcinomas. The authors do not believe that their observations settle the question but they do believe that they support the theory of Glasunow that the basal cell carcinomas are dysontogenetic tumors which originate in imperfections in the closure of the embryonal facial fissures.

Artificial Fever as Means of Destroying Cancer—

Walker found that tumor 256, a scirrhous carcinoma of the mammary gland, was destroyed in vitro at a temperature of 111.4 F. His experiments on the living animal show that if it were possible to raise the temperature of a tumor-bearing rat up to 111.4 F. and to maintain it at that point for twenty minutes, all the malignant tissues throughout the body could be destroyed. Up to the present, however, exposure to this temperature has proved uniformly fatal. Raising the temperature to 109 F. at repeated intervals does not destroy the tumor nor does it seem to retard the growth. The artificial fever produced by the high frequency apparatus appears to be more damaging than the artificial fever produced by the thermostat. There seems to be something especially injurious in the high frequency

method, for in no instance did the animal live as long as the required twenty minutes after the temperature reached 111.4 F. The construction of a large thermostat, in which it would be possible to maintain a temperature of 100 F. with complete saturation of the air with water vapor, might offer a safer method of producing artificial fever than the use of the high frequency apparatus.

American Journal of Syphilis and Neurology, St. Louis

19: 473-622 (Oct.) 1935

Comparative Chemotherapeutic Studies of Arsenoxide (3 Amino-4 Hydroxy Phenyl Arsenoxide) and Neocarsphenamine G. W. Ratzeis and Marie Severac Philadelphia—p. 473

*Changes in Technic of Kolmer Wassermann Test J. A. Kolmer Philadelphia—p. 481

Some Modifications of Kolmer Wassermann Test F. Boerner and Marguerite Lukens Philadelphia—p. 489

Preliminary Study of Thio-Arsene Disodium Bis (P Sulfophenyl) (Acetamidophenyl) Dithio-Arsenite C. R. Eckler and H. A. Shonle Indianapolis—p. 495

Clinical Observations on Treatment of Syphilis by Combination of Bismuth Salicylate and New Arsenical Synthetic Preliminary Report S. W. Becker and M. E. Obermayer Chicago—p. 505

Therapeutic Value of Thio-Arsene Clinical Study of Therapeutic Efficiency and Toxicity of Disodium Bis (P Sulfophenyl) (Acetamidophenyl) Dithio-Arsenite Based on Twenty Two Hundred and Eighty Two Injections Administered to Two Hundred and Fifty One Patients with Syphilis W. H. Connor and H. C. Shaw in collaboration with E. A. Levin and R. B. Palmer Cleveland—p. 514

Treatment of Syphilis with New Arsenical Drug (Thio-Arsene) H. M. Robinson and J. E. Moore, Baltimore—p. 525

Congenital Syphilis in Children Results of Treatment in Five Hundred and Twenty One Patients Part I F. R. Smith Jr. Baltimore—p. 532

Changes in Technic of Kolmer-Wassermann Test—

Kolmer states that the amounts of serum employed in the Kolmer quantitative complement fixation test for syphilis have been changed to 0.2, 0.1, 0.05, 0.025 and 0.005 cc. with 0.2 cc. in the serum control. In the qualitative test the amounts have been changed to 0.2 and 0.1 cc. with 0.2 cc. in the serum control. By using a first dose of 0.2 cc. of serum, the sensitiveness of the reactions has been increased without any increase of nonspecific reactions. The antigen has been improved by reinforcing with acetone-insoluble lipoids. It is used in a dose of 20 instead of 10 antigenic units, which increases the sensitiveness of the reactions while preserving specificity and freedom from falsely positive reactions, the test is otherwise conducted exactly as described originally.

Annals of Otol, Rhinol. and Laryngology, St. Louis

44: 611-912 (Sept.) 1935

Ossification of Cartilages of Larynx and Its Relationship to Some Types of Laryngeal Disease H. M. Taylor Jacksonville, Fla.—p. 611

Osteoma of Nasal Accessory Sinuses T. E. Carmody Denver—p. 626

Branchial and Thyroglossal Duct Cysts and Fistulas J. M. Brown Los Angeles—p. 644

Sphenoid Sinus and Sphenopalatine Ganglion as Factors in So-Called Atypical Trigeminal Neuralgia H. W. Lyman St. Louis—p. 653

*Differential Diagnosis of Enlargement of Lymph Glands of Neck R. F. Farquharson Toronto—p. 662

Further Study of Effects of Drugs on Ciliary Activity New Method of Observation in Living Animal D. M. Lierle and P. M. Moore, Iowa City—p. 671

Relationship of Gustatory to Olfactory Systems L. Felderman Philadelphia—p. 685

Torula Mycosis in Man with Especial Reference to Involvement of Upper Respiratory Tract Case Reports W. D. Gill, San Antonio Texas—p. 702

Cicatricial Atresia of Esophagus H. L. Kearney New Orleans—p. 719

Paralysis of Larynx Suggested Explanation of So-Called Continued Median Position of Vocal Cords in Bilateral Paralysis Consideration of Semons' Law C. J. Imperatori New York—p. 730

Use of Free Metallic Silver in the Nose L. S. Powell Lawrence, Kan.—p. 734

Differential Diagnosis of Enlargement of Cervical

Lymph Nodes—Farquharson states that the diagnosis of enlargement of cervical lymph nodes is usually made without difficulty on the history and the clinical and hematologic examination alone. Of the swellings affecting only cervical lymph nodes difficulty is sometimes found in differentiating certain cases of tuberculous adenitis from lymphosarcoma and early Hodgkin's disease. A biopsy is often helpful in these circumstances but the histologic picture is not always decisive and then the diagnosis may be determined only by the subsequent course of the disease. In patients with generalized involvement

of the lymph nodes one must be careful not to confuse infectious mononucleosis, which is never serious, with acute leukemia, which is always fatal. The differentiation is clearly made by clinical examination and study of the blood picture. The importance of history and clinical examination with a consideration of the blood picture is stressed. The information obtained by histologic examination of the excised gland is often useful but sometimes indeterminate and occasionally misleading. It should be considered together with all the clinical data in the final summing up of difficult cases.

Arch of Physical Therapy, X-Ray, Radium, Chicago

10: 577 640 (Oct.) 1935

Passive Vascular Exercise for Diseases of Peripheral Vessels. Description of New Device. F. H. Krusen. Rochester, Minn.—p. 581.

*Short Wave Therapy in Pyogenic Skin Infections. T. de Chohnoky, New York.—p. 587.

Analysis of Selective Effects of Short Wave Therapy. C. J. Breitwieser, Pasadena, Calif.—p. 594.

New Type of Vaginal Radium Applicator. H. Swanberg. Quincy, Ill.—p. 598.

Range of Penetration of Different Ray Qualities in Radiation Therapy. J. L. Weatherwax. Philadelphia.—p. 600.

Method for Studying Effectiveness of Seven Hundred Kilovolt X Rays. T. R. Folsom. Lincoln, Neb.—p. 604.

Lincoln General Cancer Clinic Preliminary Report on Six Hundred Kilovolt Constant Potential Radiation. R. L. Smith. Lincoln, Neb.—p. 608.

Ionization in Hay Fever. Indications. Technic. Scope. B. L. Bryant. Cincinnati.—p. 613.

Short Wave Therapy in Pyogenic Skin Infections.—De Chohnoky presents six cases that give a clear picture of the effectiveness of short wave therapy in promoting the healing of furuncles. He has gained the impression that the conservative treatment of furuncles with the aid of short wave therapy is a decided advance over methods employed heretofore. It is a simple method with no attendant dangers and in most cases renders surgery unnecessary. Nevertheless, in appropriate cases it may be necessary to make a small incision in order to hasten the healing process and facilitate evacuation. In his thirty-seven cases of furuncle it was necessary to incise only twice. These were instances in which abscess formation was present which inconvenienced the patient by its size or location. When surgery is employed in conjunction with short wave therapy, it shortens the time of recovery. The author also employed short wave therapy in carbuncles, axillary sweat gland infection and abscesses, erysipelas and erysipeloid. The treatment terminates with good cosmetic results.

Archives of Surgery, Chicago

31: 677 850 (Nov.) 1935

*Pathogenesis of Fibro-Adenosarcoma of the Breast. R. C. Grauer and G. H. Robinson. Pittsburgh.—p. 677.

*Fibro-Adenoma of the Breast During Pregnancy and Lactation. C. S. Moran. Omaha.—p. 688.

*Osteoid Osteoma. Benign Osteoblastic Tumor Composed of Osteoid and Atypical Bone. H. L. Jaffe. New York.—p. 709.

Mild Acute Appendicitis. Appendical Obstruction. O. I. Cutler. Loma Linda, Calif.—p. 729.

Pilonidal Sinus. Surgical Treatment and Pathologic Structure. H. Rogers and M. G. Hall. Boston.—p. 742.

Pathologic Changes of Diseased Gallbladders. New Classification. E. Andrews. Chicago.—p. 767.

Essential Hyperhidrosis Cured by Sympathetic Ganglionectomy and Trunk Resection. A. W. Adson, W. M. Craig and G. E. Brown, Rochester, Minn.—p. 794.

Osgood Schlatter's Disease. C. J. Sutro and M. M. Pomeranz. New York.—p. 807.

Congenital Median Cleft of Chin. W. J. Stewart. Columbia, Mo.—p. 813.

Late Subcutaneous Rupture of Tendon of Extensor Pollicis Longus Muscle. B. Lipshutz. Philadelphia.—p. 816.

Intracranial Pressure in Head Injuries. A. A. Zierold. Minneapolis.—p. 823.

Fifty Eighth Report of Progress in Orthopedic Surgery. J. G. Kuhns, E. F. Cave, S. M. Roberts, J. S. Barr, R. J. Joplin. Boston. J. A. Freiberg. Cincinnati. J. E. Milgram. New York and R. I. Stirling. Edinburgh. Scotland.—p. 833.

Pathogenesis of Fibro-Adenosarcoma of Breast.—Grauer and Robinson state that the correlation of their experimental observations with the clinical observations establishes fibro-adenosarcoma as a definite clinicopathologic entity and apparently explains the pathogenesis of this type of neoplasm of the breast. The suggestion that this tumor be considered an adenofibrosarcoma is a logical one for it is a generic as well as a

descriptive term. Although the term sarcoma implies a highly malignant condition which is not observed in this particular tumor, one must necessarily employ it because of the fibrous nature of the tumor. This raises the point concerning the character of the fibrous tissue which is found immediately around the acini and from which it appears that this tumor arises. The periacinal fibrous tissue is of a looser texture and more embryonic in appearance. Owing to some unexplained factors it overgrows the epithelial elements and produces the alterations in the character of the tumor that were observed in the various transplants. The newer interpretation of the production of various abnormalities of the breast as being an expression of hormone activity appears logical to the authors, but they are reluctant to consider a definite neoplasm, such as fibro-adenoma, as being merely an area of abnormal involution. They consider this especially true since they demonstrated that an adenofibroma of the breast will continue to grow indefinitely during transplantation, whereas breast tissue when transplanted exhibits no neoplastic characteristics.

Fibro-Adenoma of the Breast During Pregnancy.—Moran observed twenty-seven fibro-adenomas removed during pregnancy and lactation or present during that period and removed at varying intervals following the cessation of lactation. The tumors were modified by pregnancy and lactation and the changes produced in them were similar to those occurring simultaneously in the surrounding normal breast. The endocrine factors involved in the development and function of the breast are chiefly discussed, and it is suggested that the changes observed both in the breast and in the fibro adenoma are of hormone origin.

Osteoid-Osteoma.—Jaffe presents clinical, roentgenologic and pathologic details concerning five cases of a peculiar bone neoplasm. He denotes this lesion osteoid osteoma and considers it as a distinctive, not heretofore classified, type of bone neoplasm. It is a benign osteoblastic tumor composed of osteoid and atypical bone. In the cases seen it always arose intramedullary in spongy areas. The patients were either adolescents or young adults. The principal complaint was of local pain. As observed by roentgenogram, the pathologic areas were roundish and rather small. Complete eradication resulted in the eventual disappearance of all symptoms. The lesion had no features suggesting an inflammatory origin or origin from an embryonic rest or that it represented an unfamiliar healing stage of a giant cell tumor, localized osteitis fibrosa or cyst. Despite the fact that the lesion of osteoid-osteoma remained small and globuloid in these five cases, the character of the pathologic tissue in the more diffuse tumor previously described by Mayer and the author suggests to him that the latter lesion may be related to the type of tumor under discussion. It also seems likely that the lesion described by Bergstrand as being of embryonic origin and which he regarded as neither an inflammatory process nor a tumor is likewise related to osteoid osteoma.

Arkansas Medical Society Journal, Fort Smith

32: 93 106 (Nov.) 1935

The Doctor. His Problems. His Duty. F. O. Mahony, El Dorado.—p. 93.

Vaginal Hysterectomy with Original Pryor Clamp. H. D. Wood, Fayetteville.—p. 94.

Strangulated Femoral Hernia with an Unusual Content. O. J. T. Johnston. Batesville.—p. 96.

Georgia Medical Association Journal, Atlanta

24: 353 388 (Oct.) 1935

Surgical Treatment of Thyroid Diseases. Analysis of Two Hundred Consecutive Cases. D. H. Poer. Atlanta.—p. 353.

*Hypothyroid Heart Disease. Report of Case. J. W. Brittingham, Augusta.—p. 362.

Hookworm Disease as Focus of Infection. S. P. Sanford. Savannah.—p. 365.

Preservation of Learning Ability After Total Removal of Cerebral Cortex. F. A. Mettler. Augusta.—p. 371.

Hypothyroid Heart Disease.—Brittingham cites the case of a person with typical clinical, roentgenographic and electrocardiographic manifestations of "myxedematous heart disease," who became normal under thyroid therapy. The characteristic manifestations of this condition are described and attention is called to the dangers of too rapid or uncontrolled thyroid

administration The author believes that this type of cardiac abnormality is more common than is supposed and that cardiograms taken of all hypothyroid individuals will add many more cases to those already reported He has seen the condition in three patients in the last five years

Iowa State Medical Society Journal, Des Moines

25 573 634 (Nov.) 1935

- Injuries of the Eye H S Gradle, Chicago—p 573
The Business Side of the Practice of Ophthalmology and Otolaryngology S B Chase Fort Dodge—p 576
Management of Hemorrhage in Ophthalmology and Otolaryngology W J Foster Cedar Rapids—p 577
Precautions Against Malpractice W J O'Brien Des Moines—p 583
Survey of Cesarean Sections in Iowa for Years 1930 1931 and 1932 Preliminary Report E D Plass, Iowa City—p 586
Ambulant Treatment of Hernia A F Bratrud Minneapolis—p 591
Amebiasis J S McQuiston, Cedar Rapids—p 597
Farm Accidents R D Bernard Clarion—p 601
Automobile Accidents E H Files Cedar Rapids—p 606
Industrial Accidents H A Spillman Ottumwa—p 608

Johns Hopkins Hospital Bulletin, Baltimore

57 183 246 (Oct.) 1935

- Essential Hypertension in Boy of Two Years of Age Helen B Taussig and D B Remsen Baltimore—p 183
Observations on Reproduction in Chimpanzee A H Schultz and F F Snyder Baltimore—p 193
Syphilitic Aortitis in Childhood and Youth Report of Two Cases with Sudden Death R F Norris, Baltimore—p 206
Subacute Streptococcus Viridans Septicemia Cured by Excision of an Arteriovenous Aneurysm of External Iliac Artery and Vein L Hamman and W F Rienhoff Jr Baltimore—p 219
Rupture of Papillary Muscle in Heart as Cause of Sudden Death R R Stevenson and W J Turner Baltimore—p 235

Subacute Streptococcus Viridans Septicemia—Hamman and Rienhoff discuss the examination and diagnosis of a young man who had been febrile for six months The observations demonstrated that the patient was ill with *Streptococcus viridans* septicemia, but it was not clear where the infection was located The long duration of the illness, the persisting fever, the anemia the enlargement of the spleen and the repeatedly positive blood cultures demonstrated that there must be a locus of infection having direct access to the blood stream and continuously discharging bacteria into it The anticipated evidence of a valvular defect was completely wanting The heart sounds were clear and of normal quality, except that there was a systolic murmur at the pulmonary urea Being convinced by repeated examinations that the infection was not located on the heart valves, the authors considered two possibilities that the vegetations were on the endocardial surface of the chambers of the heart or that they were situated within the arteriovenous aneurysm Investigation led the authors to believe that in all probability *Streptococcus viridans* had settled and grown within the arteriovenous aneurysm and from this site of advantage was continuously pouring bacteria directly into the blood stream Should this be the case, the septicemia might be cured and the patient restored to health by excision of the aneurysm The specimen removed at operation measured 85 cm in length and consisted of a portion of the external iliac artery and vein, a portion of the common iliac vein and surrounding connective tissue and fat After the wound had been dressed it was apparent that the circulation in the right leg was defective, for the skin was cold and mottled by areas of cyanosis During the operation the leg had been elevated above the level of the heart The patient was adjusted in the recovery bed so that the leg was held level with the heart and was surrounded with hot water bottles At the end of an hour the circulation had improved greatly and the temperature of the skin had risen to a point a little above normal The skin was then a bright pink and the areas of cyanosis had disappeared As vascular tone returned the color of the skin became normal and the edema disappeared From then on the patient's recovery was uneventful Four months after operation the patient had gained 40 pounds (18 Kg), had an excellent color and was a picture of robust health He had been working steadily for a month at first for half a day, but during the previous week for seven hours He walked about without any support and complained only of a little pain in the leg if he walked too far At the end of the day there was a little swelling about the ankle which disappeared during the night The pulse rate was 76 The

right leg was normal in appearance The right thigh and calf measured 1 cm. more than the left No pulsation could be felt in the right femoral artery or in any other arteries of the leg

Journal of Bacteriology, Baltimore

30 335-446 (Oct.) 1935

- Precision Photometer for Study of Suspensions of Bacteria and Other Micro-Organisms H Mestre Stanford University Calif—p 335
Microbial Content of Soft Wheat Flour D F Holman, Columbus, Ohio—p 359
Microbiology of Upper Air II B E Proctor, Cambridge, Mass—p 363
Investigation of Sterility of Fish Tissues B E Proctor and J T R Nickerson Cambridge Mass.—p 377
Some Chemical Changes Exhibited in Sterile and in Contaminated Haddock Muscle Stored at Different Temperatures J T R Nickerson and B E Proctor, Cambridge Mass.—p 383
*Method for Estimating Bacterial Content of Mouth by Direct Count Mary C Crowley and U G Rickert Ann Arbor, Mich—p 395
Denaturation of Staphylococcal Proteins A P Krueger and V C Nichols Berkeley Calif—p 401
Ultrafiltration Experiments with Viruses of Laryngotracheitis and Coryza of Chickens C S Gibbs Amherst, Mass—p 411
Studies on Effect of Synthetic Surface Active Materials on Bacterial Growth I Effect of Sodium Disecundary Butyl Naphthalene Sulfonate on Growth of *Mycobacterium smegmatis* J Katz and A Lipsitz Detroit—p 419
Simple Apparatus for Pouring an Exact Quantity of Agar into Plates Aseptically and Free from Foam and Bubbles E Leifson Baltimore—p 423
Metabolic Activity of Various Colon Group Organisms at Different Phases of Culture Cycle Grace Mooney and C E A Winslow New Haven Conn—p 427

Estimation of Bacterial Content of Mouth—With the aim of separating the clumps of bacteria, due to mucin and epithelial cells in the saliva and to the thread forms which entangle masses of bacteria, Crowley and Rickert employed a method similar to that used by Breed and Brew (1933) for making direct bacterial counts of milk, with the exception that an atomizer was used to break up the larger masses and a very dilute sodium hydroxide solution was used as a diluent to dissolve the mucin They found that the difference in counts made by this method is 13 per cent The number of bacteria in sprayed washings increased appreciably (at least 36 per cent) over the unsprayed material Four hundred normal sodium hydroxide treated washings gave a better distribution of bacteria in a smear without, however, materially increasing the count Counts taken at different times of the day and on different days varied greatly in the same individual No correlation was noted between counts made by the method described and the "diurnal tide" of Feirer and Leonard

Journal of Biological Chemistry, Baltimore

111: 285 566 (Oct.) 1935 Partial Index

- *New Method for Determination of Minute Amounts of Lead in Urine J R Ross and C C Lucas Toronto—p 285
d Xylomethylolose and Derivatives P A Levene and J Compton New York—p 325
Some Effects of Dinitroresol on Oxidation and Fermentation M E Kralik and G H A Clowes Indianapolis—p 355
Liver Arginase in Myasthenia Gravis Contribution to Question of Origin of Creatine A T Milhorat New York—p 379
Synthesis of Homocystine W I Patterson and V du Vigneaud Washington, D C—p 393
Absorption of Carbon Monoxide with Reduced Hematin and Pyridine Hemochromogen L E Clifton V W Meloche and C A Elvehjem Madison, Wis—p 399
Method for Direct and Quantitative Study of Amylolytic Activity of Amylases M L Caldwell and F C Hildebrand New York—p 411
*Improvements in Methods for Calcium Determination in Biologic Material C C Wang, Cincinnati—p 443
The Ergot Alkaloids VI Lysergic Acid W A Jacobs and L C Craig New York—p 455
Cholesterol Esterase in Blood W M Sperry New York—p 467
Application of Microquinhydrone Electrode to Determination of Hydrogen Ion Concentration of Aqueous Humor of Rabbitt and Normal Rats J A Pierce, Baltimore—p 501
Determination of Tissue Carbohydrates A R Blatherwick Phoebe J Bradshaw Mary E Ewing H W Larson and Susan D Sawyer New York—p 537
Hemicellulose from Oat Hulls E Anderson and P W Harnatich Tucson Ariz—p 549
Inactivation of Insulin Effects of Certain Metal Derivatives and of Sulfhydryl Compounds Ellen D Schoel H Jensen and L Hellerman Baltimore—p 553

New Method for Determination of Minute Amounts of Lead in Urine—Ross and Lucas report a microcolorimetric method for the determination of small amounts of lead in urine

The method is applicable for use in a clinical laboratory, since the time required for a determination is reduced to three hours. The procedure may be readily applied to the urine of young children when only small samples are available.

Calcium Determination in Biologic Material—Wang states that a new washing solution for calcium oxalate precipitation of 2 per cent ammonia in equal parts of alcohol, ether and water prevents flotation and permits washing of the precipitate without appreciable loss of calcium. The treatment of urine with trichloroacetic acid and carbon allows direct calcium determination on urine.

Journal of Bone and Joint Surgery, Boston

17: 827-1122 (Oct.) 1935 Partial Index

- Osteogenic Sarcoma W. C. Campbell Memphis Tenn.—p. 827
 *Mycosis of Vertebral Column Review of Literature M. Meyer and M. B. Gall Strasbourg France—p. 857
 *Regrowth of Bone at Proximal End of Radius Following Resection in This Region C. J. Sutor, New York—p. 867
 Some Considerations Based on Three Hundred Cases of Arthritis Critically Treated R. Pemberton Philadelphia—p. 879
 Obtaining Union in Ununited Fractures of Humerus P. B. Magnuson and J. K. Stack Chicago—p. 887
 Gas Gangrene and Gas Infections R. K. Ghormley Rochester, Minn.—p. 907
 Further Observations on Fractured Distal Radial Epiphysis A. P. Aitken Boston—p. 922
 Fractures of Femoral Neck Treated by Blind Nailing J. W. O'Meara, Worcester Mass.—p. 928
 *Recovery of Function in the Hand in Chronic Arthritis J. G. Kuhns Boston—p. 939
 Shelf Stabilization of Hip Report of Fifty Three Cases with Particular Emphasis on Congenital Dislocation M. B. Howarth New York—p. 945
 Bunions L. L. Stanley and L. W. Breck San Quentin Calif.—p. 961
 Fractures of the Carpus K. Speed Chicago—p. 965
 Results Following Tenosuspension Operations for Habitual Dislocation of Shoulder M. S. Henderson Rochester, Minn.—p. 978
 Operative Correction of Genu Recurvatum A. L. Brett Boston—p. 984
 Use of Kirschner Wire in Maintaining Reduction of Fracture Dislocations of Ankle Joint Report of Two Cases J. Dieterle, Milwaukee—p. 990
 The Hobart Operation New Combination Operation for Recurrent Dislocation of Shoulder M. H. Hobart Evanston Ill.—p. 1001
 Operation for Correction of Deformities of Wrist Following Fracture D. C. Durman Saginaw Mich.—p. 1014
 Vascular Massage Its Technic and Use H. Jordan, New York—p. 1021
 Operative Procedure for Correction of External Rotation Contracture of Hip M. S. Burman New York—p. 1028
 *Neglected Factor in Etiology of Gout J. Krafka Jr., Augusta Ga.—p. 1049
 Giant Cell Tumor of Sacrum M. H. Rogers Boston—p. 1052
 Congenital Absence of Trapezius and Rhomboideus Major Muscles B. R. Selden, Bethlehem Pa.—p. 1058
 Congenital Absence of Sacrum P. M. Girard Dallas Texas—p. 1062
 Treatment of Depressed Fractures of Zygomatic (Malar) Bone and Zygomatic Arch R. F. Patterson Knoxville Tenn.—p. 1069

Mycosis of Vertebral Column—Meyer and Gall review the reports of forty-seven cases of actinomycosis, twelve cases of blastomycosis and one case of sporotrichosis of the vertebral column. The infection of the vertebrae is most often found to be secondary, with a primary focus of infection situated principally in the respiratory and digestive tracts. The vertebrae are infected either by direct contact with a suppurating focus, in which case the external surfaces of the vertebrae are eroded, or by vascular metastasis, in which the bone destruction is found to be central and surrounded by a condensed ring of bone. The first possibility appears to be most frequently the case in actinomycosis, the second in blastomycosis. The differential diagnosis of mycosis of the vertebrae and Pott's disease, for which the former is usually mistaken, is to be made chiefly on the following grounds: 1. The angular deformity is most often absent in mycosis. 2. Mycosis shows multiple sinuses, more destructive invasion and a more rapid opening of abscesses than in Pott's disease, the skin lesions in mycosis are characteristic. 3. Roentgen examination shows erosion of the cortical portion of the vertebra, erosion that is present on the articular processes and pedicles as well as on the vertebral body, or cavity formation in the cancellous portion, surrounded by a zone of increased density. None of these signs are ordinarily seen in tuberculous spondylitis. The bony rarefaction of the latter disease sometimes gives place to a dense appearance in mycosis. One of the factors in the high mortality rate of mycosis of the vertebral column appears to be the difficulty in making an early clinical diagnosis.

Regrowth of Bone at Proximal End of Radius Following Resection—Surgical resection of a fractured or dislocated proximal portion of the radius may be complicated by the regeneration of a "new head of the radius," as Sutor noted in the four cases that he reports. This eventuates most probably from the accumulation and organization of blood in the space left by the surgical resection of the head of the radius with or without excision of the neck. The marrow spaces of the long tubular bones contain tissue with osteogenic potentialities, and it apparently makes its way into the adjoining organized hemorrhage. Furthermore, the periosteum of the radius adjacent to the resected area, as well as the tissue of the joint capsule, apparently participates in the formation of this bone. Most of the newly formed trabeculae, which result in an increase in the length and width of the proximal end of the radius, are formed by osteoblastic activity as well as by metaplasia of the contiguous fibrous tissues. Some of the recently formed fibrous bone is soon transformed into adult bone. The "new head of the radius" may present a cortex and a medullary canal. However, it lacks hyaline articular cartilage. The proximal surface of the "new radial head" may be capped either by fibrocartilage or by fibrous tissue. This is most probably derived from the capsular tissue about the joint. The formation of bone at the site of the resection of the original head of the radius may lead to an unusual lengthening of the shaft of the radius when compared with the normal opposite radius. In cases in which surgical removal of the proximal portion of the radius is necessary, a reconstruction operation should be attempted, fascia lata being used to prevent abnormal growth of the stump. The periosteum on the proximal (free) end of the shaft of the radius should be stripped back, all bone fragments, periosteal strips or capsular tissue, either lying free in the joint or loosely attached to contiguous tissues, should be removed. In addition, if an unusually large segment of the proximal portion of the original radius is resected, the gap should be filled by a bone graft.

Recovery of Function of Hand in Arthritis—Kuhns states that improvement in the function of the hand crippled by arthritis is possible, no matter how severe the disability. Prevention of deformity in chronic arthritis is much easier and gives a better end result than correction of deformity after the arthritis becomes quiescent. Deformity can be prevented by careful supervision and frequent splinting. The treatment for rehabilitation of the hand can be divided into three stages. The first, when deformity can be corrected passively, splints, exercises and heat will usually correct the deformity. The measures are carried out simultaneously with the treatment of the patient for the chronic arthritis. In the second stage, when deformity cannot be corrected passively and definite bony ankylosis is not present, more active measures, such as manipulations and constant traction should be added. The third stage of operative correction of deformity should be undertaken only in cases of quiescent arthritis. Surgical procedures should be performed on the hand only after an appraisal of the functional status of the whole arm and with due regard to the functional need of the individual patient.

Neglected Factor in Etiology of Gout—Krafka points out that any condition which tends to stimulate the erythropoietic system becomes an important factor in the overproduction of uric acid and thus a potential etiologic agent in gout. He presents two cases, the results of which are thoroughly in accord with his hypothesis and follow in logical sequence—marrow stimulation, overproduction of uric acid, gout. Another phenomenon, which has heretofore been obscure, is the association of the "gouty diathesis" with polycythemia. The obscure relationship between gout and lead poisoning loses much of its mystery when it is remembered that lead is a very active hemolytic agent and that every low blood count is compensated by an increased marrow activity. The author states that the spontaneity, the afebrile character and the tendency to become polyarticular all fit in with his hypothesis. Marked uric acid outputs have occurred in experimental animals immediately after hemorrhage or hemolysis, reaching a peak in about three days. He explains the disappearance of the old fashioned gout of a hundred years ago on the basis of the discontinuance of the medical practice of "bleeding," since even small hemo-

rhages are marked hematopoietic stimuli. By directing attention to the principal source of the offending agent, uric acid, a more satisfactory treatment of gout is possible. All hemolytic and hematopoietic agents should be used with discretion. In determining whether or not such agents are indicated, the normal reticulocyte count of 0.5 per cent should be the guiding factor.

Journal of Comparative Neurology, Philadelphia

62 263 532 (Oct 15) 1935 Partial Index

- Corticofugal Fiber Connections of Cortex of Macaca Mulatta Parietal Region F A Mettler Ithaca N Y—p 263
Comparative Cyto-Architectonic Study of Motor and Premotor Areas in Primate Cortex P C Bucy Chicago—p 293
Presence of Sensory Nerve Cells in Central Root of Trigeminal Nerve G A Peters Bloomington Ind—p 349
Comparative Volumetric Study of Gray and White Substance of Spinal Cord A M Lassek Chicago—p 361
Mitosis in Neural Tube F C Sauer Wichita Kan—p 377
Retrograde Cell Degeneration in Thalamus of Macacus Rhesus Following Hemidecortication A E Walker Chicago—p 407
Extent and Structure of Electrically Excitable Cerebral Cortex in Frontal Lobe of Dog W K Smith Rochester, N Y—p 421
Posterior Column Fibers and Their Termination in Macacus Rhesus A Ferraro and S E Barrera New York—p 507

Journal of Experimental Medicine, New York

62:457 620 (Oct 1) 1935

- Hemoglobin Regeneration in Chronic Hemorrhagic Anemia of Dogs (Whipple) I Effect of Iron and Protein Feeding C C Sturgis and G E Farrar Jr Ann Arbor Mich—p 457
Quantitative Theory of Precipitin Reaction II Study of Azoprotein Antibody System M Heidelberger and F E Kendall New York—p 467
Lipids and Immunologic Reactions I Relation of Phospholipins to Type Specific Reactions of Antipneumococcus Horse and Rabbit Serums F L Horsfall Jr and K Goodner New York—p 485
Immunologic Studies with Virus of Influenza T Francis Jr and T P Magill New York—p 505
Inactivation of Poliomyelitis Virus in Vitro by Crystalline Vitamin C (Ascorbic Acid) C W Jungeblut New York—p 517
Progression to Carcinoma of Virus Induced Rabbit Papillomas (Shope) P Rous and J W Beard, New York—p 523
Jennerian Prophylaxis by Means of Intradermal Injections of Culture Vaccine Virus T M Rivers and S M Ward New York—p 549
Infection of Mice with Swine Influenza Virus R E Shope Princeton N J—p 561
Cutaneous Reactivity of Immune and Hypersensitive Rabbits to Intradermal Injections of Homologous Indifferent Streptococcus and Its Fractions C McEwen and H F Swift New York—p 573
Distribution of Blood Group Properties and Blood Group Property Destroying Factors in Intestinal Tract of Man E Witelsky and E Neter New York—p 589
Bile Fistulas and Related Abnormalities Bleeding Osteoporosis Cholelithiasis and Duodenal Ulcers W B Hawkins and G H Whipple Rochester N Y—p 599

62 621 732 (Nov 1) 1935

- Phenomenon of Local Skin Reactivity to Bacterial Filtrates Elicitation of Local Reactivity by Way of Vascular System G Schwartzman, New York—p 621
Colony Morphology of Tubercle Bacilli III Relation Between Virulence and Colony Form K C Smithburn New York—p 645
Comparative Behavior of Mammalian Eggs in Vivo and in Vitro I Activation of Ovarian Eggs G Pincus and E V Enzmann Cambridge Mass—p 665
Epidemiology of Equine Encephalomyelitis in the Eastern United States C TenBroeck, E W Hurst and E. Traub Princeton N J—p 677
Transmission of Equine Encephalomyelitis Virus by Aedes Aegypti M H Merrill and C TenBroeck Princeton N J—p 687
Quantitative Theory of Precipitin Reaction III Reaction Between Crystalline Egg Albumin and Its Homologous Antibody M Heidelberger and F E Kendall New York—p 697
Further Observations on Blood Cholesterol of Rabbits in Relation to Atherosclerosis K B Turner and Emily H Bidwell New York—p 721
Immunologic Studies with Virus of Influenza—According to Francis and Magill, following infection with the virus of influenza both ferrets and mice develop a state of active immunity to reinfection. The serum of these animals contains neutralizing antibodies, as evidenced by the capacity of the serum to confer passive protection to mice against infection with the Puerto Rico 8 and Philadelphia strains of the virus of human influenza. Rabbits apparently insusceptible to infection with the virus of influenza produce specific antibodies in response to repeated injection of virus-containing material. The serum of immunized rabbits affords passive protection to mice against mouse virulent virus. Although the subcutaneous or intraperitoneal injection of the living virus does not produce infection in mice, animals so treated acquire active immunity against subse-

quent infection by the intranasal route. Neutralization tests with the serum of patients before and after recovery from influenza pneumonia and the common cold indicate that neutralizing antibodies arise as a specific response to infection with the virus of influenza. The immunologic identity of strains of influenza virus recovered from human sources has been established and the possible existence of strains of related, but not identical, antigenic structure is discussed.

Bile Fistulas and Related Abnormalities—Hawkins and Whipple state that it is not easy to keep a bile fistula dog in a normal state for months if proper attention is given to the diet and physical condition. The most significant abnormalities are intestinal disturbances, spontaneous bleeding, osteoporosis, cholelithiasis and duodenal ulcer. They used three types of bile fistula in their experiments, and each one has its advantages and disadvantages. Intestinal intoxication is best controlled by diet, whole bile or bile salts or combinations of dog and ox bile. Spontaneous bleeding seems to be due to the loss of something by way of the bile, and this can be prevented by bile feeding. The blood deficiency appears to be a lack of prothrombin. Osteoporosis appears inevitably after many months if bile is excluded from the intestine. This state is related to the lack of absorption of vitamin D. It is of some interest that liver feeding will prevent it. Duodenal ulcers and cholelithiasis are common in bile fistula dogs and absolute control or prevention is not easy. Bile secretion into the intestine is necessary for normal health and even for actual continuation of life beyond a period of a few months. The authors believe that some of these experimental data should be of value to physicians and surgeons in the care and study of human fistula cases and should emphasize the necessity of prompt dietary control.

Journal of Immunology, Baltimore

29 267 342 (Oct.) 1935

- Relation of Heterophile Antigen to Serum Sickness H M Powell W A Jamieson and G F Kempf Indianapolis—p 267
Chemical Study of Pollen Sensitizing Antibody Combination F M Stevens New York—p 273
Hemorrhagic Reaction at Site of Injection of Toxins After Intravenous Injection of Starch in Young and Adult Rabbits J Freund and Elizabeth Page Hosmer New York—p 279
Cutaneous Reactions and Antibody Response to Intracutaneous Injections of Pneumococcus Polysaccharides M Finland and H F Dowling Boston—p 285
Studies of Anaphylaxis in Albino Rat with Reference to Diet and Histamine H N Pratt Boston—p 301
Immunologic Study in Laboratory Animals of Thirteen Different Strains of Equine Encephalomyelitic Virus Beatrice F Howitt San Francisco—p 319

Response to Intracutaneous Injections of Pneumococcus Polysaccharides—Finland and Dowling elicited immediate cutaneous reactions, similar to those described by Tillett and Francis, in patients recovering from pneumonia. These reactions were, in general, type specific and were associated with the homologous type antibody in the serum. Very similar reactions were elicited with preparations of soluble specific substances and cellular carbohydrates prepared from the same pneumococcus types by the methods of Heidelberger, Goebel and Avery and those of Wadsworth and Brown. Characteristic delayed reactions were seen only with the cellular carbohydrates. These were not associated with type specific antibodies. They were most frequently observed with the cellular carbohydrates of the atypical type I pneumococcus and with that obtained from the virulent type I strain. Delayed cutaneous reactions with the cellular carbohydrate of an atypical type I pneumococcus were obtained regularly during the febrile stage of a variety of infectious disease and could not be elicited soon after recovery in such cases. These observations are similar to those obtained by Francis and Abernethy with the C substance of Tillett, Goebel and Avery. All the type specific polysaccharides were antigenically active in human subjects. They produced in almost every instance a strictly specific antibody response. Only minor differences were observed with the different preparations of types II and III polysaccharides. The type I cellular carbohydrate however was quantitatively more active than the corresponding SSS in this respect. Occasional subjects showed specific antibodies, particularly against type I pneumococci, following injections of the atypical cellular carbohydrate.

Journal of Lab and Clinical Medicine, St. Louis

21 110 (Oct.) 1935

Influence of Dextrose Ingestion on Amino Acid Nitrogen Urea Nitrogen and Hemoglobin Concentration of Blood E G Schmidt and J S Eastland Baltimore—p 1

*Comparative Study of Glucose and Sucrose Tolerance Tests E G Schmidt J S Eastland and J H Burns Baltimore—p 13
Bactericidal and Photochemical Properties of Irradiated Petrolatum and Mineral Oil F A Stevens, New York—p 26

Bactericidal Action of Short and Ultrashort Waves C K Gale and D Miller New York—p 31

The Doctor as Author E Podolsky Brooklyn—p 32

*Blood Sedimentation Rate in Diabetes Mellitus Analytic Study of Five Hundred and Ten Tests Performed on Three Hundred and Sixty Six Patients D W Kramer Philadelphia—p 37

Subclinical Scurvy in Children Application of Capillary Resistance Test M Molitch Jamesburg N J, with technical assistance of R F Cousins—p 43

Experimental Arthritis in Rabbits Comparison of Arthritis Producing Ability of Inagglutinable Streptococci Which Resist Bactericidal Action of Fresh Diluted Defibrinated Guinea Pig Blood and Those Which Are Agglutinable But Sensitive to the Bactericidal Agent W B Rawls and G H Chapman New York—p 49

Effect of Hydrogen Ion Concentration on Determination of Calcium in Blood Serum Phosphomolybdic Acid Centrifugates J H Defandorf Washington D C—p 65

Technic of Molding and Casting for Medical Sciences C D Clarke, Baltimore—p 68

*Improved Congo Red Test for Amyloidosis M M Friedman and O Auerbach Staten Island N Y—p 93

Improved Procedures for Estimating Bismuth in Body Fluids and Tissues A J Lehman, A P Richardson and P J Hanzlik San Francisco—p 95

Study of Dextrose and Sucrose Tolerance Tests—

Schmidt and his co-workers made a comparative study of the blood sugar curves and sugar excretion, if any, on a series of fifty-seven hospital patients after the ingestion of dextrose, followed a few days later by an equal quantity of sucrose, or vice versa. With one exception these patients were admitted for conditions other than diabetes and only through tolerance studies were the diabetic tendencies discovered. A group of eighteen patients, free from obvious carbohydrate metabolism abnormalities, gave normal blood sugar curves and urines negative to Benedict's solution with both sugars. The average blood sugar curve given by the sucrose meal was 1151, 1271 and 275 per cent lower than that given by dextrose for the one-hour, two-hour and three-hour periods. Therefore the ingestion of approximately 100 Gm of sucrose ordinarily yields a blood sugar curve well within the normal limits as established by dextrose tolerance tests. The urines were free from sucrose or reducing sugars, regardless of the type of sugar ingested. Twelve patients with diabetes mellitus showed marked hyperglycemia and glycosuria with both sugars. The average blood sugar values for these sucrose tolerance tests were 118, 225, 3, 184 and 1496 mg per hundred cubic centimeters for the fasting, one-hour, two-hour and three-hour periods, as compared to 1178, 2478, 2226 and 185 mg for dextrose at the respective time intervals. Both sugars resulted in glycosuria to approximately the same extent. In no case did the administration of sucrose fail to bring out the diabetic tendencies of these patients. Clinically, sucrose is as satisfactory as dextrose for the detection and evaluation of diabetes mellitus. Twenty-seven patients with various arthritic and infectious conditions have also been studied in a like manner. The average blood sugar values following sucrose ingestion were 1039, 1834, 1604 and 1237 mg per hundred cubic centimeters for the fasting, one-hour, two-hour and three-hour periods, as compared to 1037, 1983, 1738 and 1369 mg for dextrose at similar time intervals. Sucrose tolerance tests as well as dextrose tolerance tests show that an abnormality in carbohydrate metabolism is present during arthritis, infections and similar conditions. In addition, sucrose ingestion shows equally well that this abnormality disappears as the infection clears up. Despite the high values for the blood sugars, the urines were usually free from reducing sugars. Glycosuria was present during six dextrose tolerance tests and during two sucrose tolerance tests.

Blood Sedimentation Rate in Diabetes Mellitus—

Kramer performed 510 tests on 366 office and outpatient patients. The technic employed in the study was the one advocated by Cutler. Abnormal readings were obtained in 346 (67.8 per cent) of the 510 sedimentation tests. The explanation for this high percentage must be either the diabetes or the

presence of infections, or both. A study of the duration of the diabetes showed that the maximal difference of the percentages in the various diabetic groups was only 5.3 per cent. These figures evidently do not permit one to attach much significance to the effect of the duration of the diabetes on the sedimentation rate. Also the possible influence of the blood sugar was studied. There was a striking similarity of the percentages in the hyperglycemic group and those whose blood sugar was 180 mg or below. In the former there were 194 cases (67.1 per cent) which showed abnormal lines, and in the latter (nonhyperglycemic group) there were 152 records (68.8 per cent) with abnormal lines. The blood sugar by itself had no influence on the sedimentation rate. Since the duration of the diabetes and the blood sugar cannot explain the high incidence of the abnormal sedimentation rates, the inference is that the most likely explanation is infection. Analysis of the patients showed a high incidence of the minor infections, particularly in the teeth, tonsils and upper respiratory tract. However, the urinary tract and gallbladder must also be kept in mind.

Improved Congo Red Test for Amyloidosis—Friedman and Auerbach state that the disadvantages of the congo red test for amyloidosis can be overcome by the use of ethyl alcohol which precipitates the proteins and dissolves the congo red giving a clear solution that can be read with the colorimeter. The test is carried out on the patient in a postabsorptive state. Ten cc. of a 1 per cent congo red solution is injected into a vein and four minutes later about 10 cc. of blood is withdrawn from another vein. The second sample of blood is taken one hour after injection. It is advisable for the tubes to stand about two hours, permitting the clots to retract. The tubes are next centrifugated at a moderate speed (3,000 revolutions per minute) for ten minutes and the serum is decanted carefully. Two cc. of serum is pipetted into 15 cc. graduated conical test tubes and made up to 10 cc. with 95 per cent ethyl alcohol. The tubes are corked, shaken for thirty seconds and centrifugated at a high speed for ten minutes. The clear supernatant fluids are poured into colorimeter cups and readings are made on the colorimeter. The readings are best when the four minute specimen is set at 20 mm. The calculation is 100 minus the factor of a four-minute reading divided by a one hour reading multiplied by 100 equals per cent absorption. The solution remains unchanged indefinitely when corked. Lipoidal serum gives a very clear supernatant alcoholic solution.

Journal of Pharmacology & Exper Therap, Baltimore

53 127 234 (Oct.) 1935

Studies of Morphine Codeine and Their Derivatives IX. Methyl Ethers of Morphine and Codeine Series N B Eddy Ann Arbor Mich—p 127

Purification of Pressor and Oxytocic Hormones of Pituitary Gland and Some Observations on Chemistry of Products. R L Stehle and A M Fraser Montreal—p 136

Some Unsymmetrical Alkylaryl Ureas Preparations Physical Properties and Hypnotic Effects A M Hjort E J deBeer J S Buck and W S Ide Tuckahoe N Y—p 152

Effect of Temperature on Calorigenic Action of Dinitrophenol in Normal and Thyroidectomized Pigeons O Riddle and Guinevere C Smith, Cold Spring Harbor N Y—p 173

Mechanism of Chemotherapeutic Action XII. Comparison of Binding of Chemotherapeutic Agents by Normal and Resistant Trypanosomes J T Pedlow and L Reiner Tuckahoe N Y—p 179

Antipyretic and Toxic Effects of Combinations of Acetanilid with Sodium Bromide and with Caffeine P K Smith and W E Ham-bourger New Haven Conn—p 200

Effect of Zinc Salts on Action of Insulin D A Scott and A M Fisher Toronto—p 206

Acetanilid Studies B Fantus H A Dymewicz and J M Dymewicz, Chicago—p 222

Kentucky Medical Journal, Bowling Green

33: 439-482 (Oct.) 1935

Primary Adenocarcinoma of Kidney L Atherton Louisville—p. 440
Deadly Trend of Goiter and Its Cure W D Haggard, Nashville, Tenn.—p 444

Chondroma of Os Calcis and Fibula M Thompson, Louisville—p 448
The Heart E C McGehre Ashland—p 451

Preview of Economic Security in Kentucky V E Simpson Louisville—p 453

Use of Corbus Ferry Filtrate in Treatment of Gonorrheal Urethritis J M Townsend Louisville—p 463

Brain Abscess Complicating Acute Otitis Media Case Report J R Peabody Louisville—p 465

Treatment of Hirschsprung's Disease F W Rankin, Lexington—p 474

Laryngoscope, St. Louis

45: 741-826 (Oct.) 1935

- Treatment of Otosclerotic and Similar Types of Deafness by Local Application of Thyroxine A A Gray London England—p 741
Clinical Symposium I Two Cases of Early Carcinoma of Larynx and a Number of Cases of So Called Adenoma of the Bronchi Apparently Cured by Diathermy J D Kernan New York—p 760
Id II Series of Cases of Total Laryngectomy for Cancer R E Buckley New York—p 769
Id III Series of Cases of Radical Mastoidectomy with Skin Graft D S Cunniff New York—p 776
Id IV Present Status of Radical Sinus Surgery E R Faulkner New York—p 782
Spontaneous Perforation of Eardrum Case P Panneton Montreal—p 786
Mortality of Mastoiditis and Cerebral Complications with Review of Thirty Two Hundred and Twenty Five Cases of Mastoiditis with Complications M M Kafka, Brooklyn—p 790

Medical Annals of District of Columbia, Washington

4 263 288 (Oct.) 1935

- The Major Importance of Minor Infections P A Caulfield Washington—p 263
*Lymphogranuloma Inguinale Cause of Rectal Stricture W B Marbury Washington—p 268
Pharyngotomy Analysis of Results in Thirty Six Cases E Horgan and J W Peabody Washington—p 274
Fundamentals of Internal Medicine Diseases of the Nervous System A Schneider Washington—p 277

Inguinal Lymphogranuloma—During the last three years Marbury has seen twelve cases of lymphogranulomatosis showing stricture of the rectum. In all but one case in which colostomy was performed, the treatment has been digital dilation of the strictured area with the patient under general anesthesia. He feels sure that many more cases of lymphogranuloma have been seen in the outpatient department but have not been recognized or treated. The condition seems to be limited to individuals in the lower walks of life although he believes that several patients from the middle strata would have given a positive reaction to the specific antigen. Eleven of the twelve patients having rectal stricture were Negro women the other a white male. Their ages ranged from 18 to 40 years, spanning their active sex life. All the patients complained of piles. On further inquiry they admitted that they had had a change of intestinal habits beginning from one month to seventeen years previously. The usual history was that there had been a progressively increasing constipation, which required more and more cathartics and resulted in very painful stools. None of the patients admitted having any remembrance of a primary sore, though most of the women said that they had had some vaginal discharge at times. The Wassermann test was negative in seven cases, positive in three and was not made in two. The Frei test was positive in the three cases in which it was performed. The constricted area gave much more readily to dilation than it does in cases of carcinoma or of stricture due to scar tissue. When the area was sufficiently dilated, a large well lubricated rectal whistle, 5 inches long and 1½ inches wide was inserted and left in for two days. During this time the patient was given a generous allowance of morphine. When the whistle was removed, retention enemas of warm water and hamamelis were given twice daily. The patients have usually remained in the hospital less than a week and on discharge they have been instructed to keep up the enemas and to return to the dispensary for treatments. Dilation with bougies is carried out once or twice a month or as long as the patient continues to come to the dispensary.

Minnesota Medicine, St. Paul

18 695 760 (Nov.) 1935

- Prevention of Whooping Cough with Bacillus Pertussis Vaccine L. Sauer Chicago—p 695
Inception and Development of Fluoroscopy The Influence of Carman on Its Status in America P Brown Boston—p 699
Prognosis and Treatment of Coronary Occlusion W S Middleton Madison, Wis.—p 710
Correlation of X Ray Heart Shadows with Clinical and Autopsy Findings A Hoff St. Paul—p 724
Verruca Senilis and Keratoma Senile H Montgomery Rochester—p 735
Essential Hypertension and Tuberculosis C G Morlock Rochester—p 738
Herpes Zoster Ophthalmicus P D Berrisford St. Paul—p 741
Some Observations on Intra nasal Operation for Frontal Sinusitis C M Anderson, Rochester—p 744

New England Journal of Medicine, Boston

213 741 786 (Oct 17) 1935

- Use of Dilaudid in Treating Patients with Cancer I T Nathanson and E M Daland Boston—p 741
Muscle Grafts for Hemostasis in General Surgery H M Clute Boston—p 746
Amebiasis in a Rural Community F H Connell, Hanover, N H—p 748
Carcinoma of the Breast in New Hampshire Preliminary Report J C Donchess Hanover N H—p 752
Evolution or Revolution R J Ward Worcester Mass—p 757
The Adult Tuberculosis Contact H R Edwards New York—p 760
Coincidence of Cholecystitis and Peptic Ulcer E G Laird New York—p 764

213 787-840 (Oct 24) 1935

- Psychopathy and the General Practitioner H K Richardson Stockbridge Mass—p 787
*Diathermy in Lobar Pneumonia Preliminary Report W Wetherbee Jr J A Foley and J Resnik Boston—p 796
Specific and Nonspecific Arthritis with Especial Reference to Trauma B H Archer New York—p 799
Gonadotropic Hormone (Prolan) in Relation to Carcinoma of Cervix J A Halsted Boston—p 803
Progress in Hematology Late 1933 and 1934 W Dameshek Boston—p 805

Diathermy in Lobar Pneumonia—Wetherbee and his co workers employed the standard treatment for lobar pneumonia, including serum and/or oxygen when indicated, in thirty-six cases. In addition, one half of these patients, alternately chosen were given physical therapy in the form of diathermy. The mortality for the entire series was 22.2 per cent, for the diathermy group 11.1 per cent, and for the control group 33½ per cent. The cases are presented in some detail and the effects of diathermy noted. Lobar pneumonia is a self-limited disease. If during its course rest and relaxation can be obtained, if the patient can be made comfortable, the pain eased, the dyspnea relieved and the apprehension lessened or if, in other words, the patient can be carried along until such time as the illness has run its course, the most valuable thing will have been done that can be done in any self-limited disease. The authors feel that if the mortality of lobar pneumonia is ever lowered it will be as a result of treatment directed along these lines rather than as a result of any more specific treatment. They do not imply that serum, for instance has no value. The fact remains, however, that in any large series of cases the mortality is about what it was before serum was used. There is beyond question a growing feeling that specific therapy is not as valuable as it appeared to be at first. Because the mortality in the diathermy group was one-third that of the control group and because of the definite subjective improvement in the patients treated by this method, they feel justified in continuing with this form of treatment until a sufficiently large series of cases with controls, has been accumulated and more definite conclusions can be drawn.

Northwest Medicine, Seattle

24 369 412 (Oct.) 1935

- Pertinent Suggestions to the Washington Profession N L Thompson Everett Wash—p 369
Allergy Its Recognized Causes, A H Rowe Oakland Calif—p 371
*Prostatic Hypertrophy Treated by Acid Nitrate of Silver Solution M E Reitzel McMinville Ore—p 374
Mumps Meningitis and Meningo-Encephalitis Report of Six Cases L H Smith Portland Ore—p 375
Dermatoconjunctivitis Probably Due to Eyelash or Hair Dye Report of Case C A Veasey Sr Spokane Wash—p 379
Hypertension Growing Appreciation of Its Importance O H P Pepper Philadelphia—p 380
Hypophysis and Adjacent Structures Their Normal and Pathologic Physiology A B Luckhardt, Chicago—p 384
Rectal and Rectosigmoidal Cancer Surgical Treatment and Prognosis F W Rankin Lexington Ky—p 387
Extraperitoneal Cesarean Section J F Scott Yakima Wash—p 391
Internal Derangement of Temporomandibular Joint D G Leavitt Seattle—p 393

Prostatic Hypertrophy—Reitzel used a 20 per cent solution of silver nitrate with from 1 to 4 per cent nitric acid in cases of prostatic hypertrophy the acid addition depending on the degree of alkalinity of the urine. The urethra was anesthetized with butyn or metycaine (2 per cent solution) and the bladder was drained through a catheter lubricated with a water soluble jelly. A urethroscope was inserted and the prostatic urethra

dried with a cotton wrapped probe. A tubular metal instrument, slightly curved and fitted with an obturator, was passed into the prostatic urethra and the obturator was withdrawn. From 20 to 25 drops of the acid silver solution was run into the tube and the obturator was reinserted and pushed home. From three to five such treatments were given at intervals of from three to five days. The author has employed the treatment in 103 cases to date. Most of the cases have been followed up and reports are gratifying.

Oklahoma State Medical Assn. Journal, McAlester

28: 357-394 (Oct.) 1935

- *Preliminary Observations on Vitamin A Deficiency as Shown by Studies with Visual Photometer. I. O. Park, Muskogee.—p. 357
Cancer of the Skin. R. L. Sutton Jr. Kansas City, Mo.—p. 364
Some of the Causes Why Infants Are Removed from the Breast with the Idea that Mothers' Milk Is the Offender. C. V. Rice, Muskogee.—p. 368
Personal Experiences with Prostatic Resection. H. S. Browne, Tulsa.—p. 371
Reducing Mortality Rate in Cases of Perforated Appendixes. J. T. Colwick, Durant.—p. 374

Vitamin A Deficiency as Shown by Visual Photometer

—Park shows the therapeutic value of vitamin A in a number of pathologic states and in seemingly healthy individuals and calls attention to the use of the photometer, according to the technic of Jeans and Zentmire, as a simple method to be used by the general practitioner for the detection of vitamin A deficiency and for measuring response to vitamin A therapy. The author has tested more than 275 individuals, including normal cases, gastro-intestinal disorders, sinus and miscellaneous infections, nervous and mental conditions, kidney disorders, pernicious anemia, leukemia, diabetes and marked night blindness. Carotene or provitamin A rapidly restores the vitamin A content in cases in which its activity is not hindered by disease or complications that serve to prevent its absorption and conversion. No bad effects have been noted from the use of carotene in oil in large doses. From the tests made covering people in every walk of life, it appears that a large proportion of our population is low in vitamin A. There is no definite proof that vitamin A is anti-infectious, but all results point to its action as a barrier against infection by stimulating healthy epithelial tissue. The author states that examinations of specimens of liver from 300 necropsies (Moore) for vitamin A showed about the same results as found by the photometer in his series, the different pathologic states showing the same proportionate deficiency as found by the photometer.

Pennsylvania Medical Journal, Harrisburg

39: 1-60 (Oct.) 1935

- The Problem of Appendicitis. C. F. Freed, Reading.—p. 5
*Hyperthyroidism and Heart Disease. Case Report. T. J. Ryan, Philadelphia.—p. 10
*Hypoglycemia as Cause of Mental Symptoms. Report of Cases. J. Greenwood Jr., Houston, Texas.—p. 12
The Well Fitted Brassiere and Its Use. P. S. Seabold, Lebanon.—p. 16
Rattlesnake Bite. Case Report. W. M. Cashman, Warren.—p. 19
Benzylmethyl Carbinamine (Benzedrine). Study of Rapidity and Duration of Its Shrinking Action in Nasal Turbinates. A. A. S. Giordano, Philadelphia.—p. 20
Treatment of Diabetic Gangrene. W. A. Steel, Philadelphia.—p. 22
Analysis of Two Hundred and Fifty Nine Cases of Syphilis Complicating Pregnancy. M. A. Castallo and A. E. Rakoff, Philadelphia.—p. 24
The Common Sense of Maternal Mortality. O. J. Toland, Philadelphia.—p. 29

Hyperthyroidism and Heart Disease—Ryan states that the presence of hyperthyroidism may easily be overlooked as the basic cause of cardiac symptoms. When the patient applies for treatment, the cardiac symptoms may be of such severity that the immediate therapy is directed to the heart. This mistake may be avoided by insisting on a basal metabolic rate determination in all cases of cardiac disease. The hypertension case and the colloid goiter in the young should not be erroneously diagnosed as hyperthyroidism until repeated estimations of the basal metabolic rate have given a true basic reading. Occasionally in the borderline case the Goetsch test will give valuable diagnostic information. The presence of paroxysmal tachycardia or fibrillation should suggest immediately that the thyroid is hyperfunctioning. A case of a large nodular goiter involving the whole left lobe of the thyroid and associated

general anasarca involving both lower extremities, the abdomen and both pleural cavities is discussed. The radial pulse was very rapid and irregular. Marked dyspnea and cyanosis were present. Medical therapy was directed to the heart with little success, and operation was deferred because of the poor condition of the patient. It was hoped that, as improvement occurred in the heart, a thyroidectomy might be performed. The improvement in the heart did not occur; the patient developed bronchopneumonia and later an uncontrollable neurosis. Two months after admission it was decided that a thyroidectomy should be attempted, and the left lobe of the thyroid was completely removed under local anesthesia. The right lobe was examined at the time of operation and found normal. Examination one year after operation showed that the patient had gained 70 pounds (31.8 Kg.). Her pulse rate was 90, and the rhythm was normal. The tone was good, and no murmurs could be heard. The heart was completely compensated.

Hypoglycemia as Cause of Mental Symptoms—Because of definite evidence in the literature that many of the symptoms of hyperinsulinism are mental, Greenwood has looked for these cases in psychopathic wards of the Philadelphia General Hospital. It is significant that there is a somewhat higher percentage of low blood sugar determinations found in psychopathic patients than in patients in the general medical and surgical wards. The diagnostic features are (1) a psychosis, which may take almost any form, often violent in character and belonging to the organic group in that the sensorium is always affected; (2) psychotic manifestations, which alternate with periods of normal behavior, a more or less transient psychosis depending on the severity of hypoglycemia; (3) a low blood sugar estimation during the psychotic period; (4) relief from symptoms when dextrose is given; (5) a high dextrose tolerance, as evidenced by a dextrose tolerance curve, which is below normal either during the period of fall or at any point in its course; and (6) a tendency for the psychotic episodes to occur in the early morning, late at night or occasionally just before mealtime. Starvation or irregularity in meals seemed to be a precipitating factor in three of the six cases reported. The omission of a meal might cause a low blood sugar level to descend further to a dangerous point and so initiate the mental symptoms. There is little doubt that hypoglycemia may cause a definite psychosis necessitating institutional care, and it is important for the general practitioner to be able to recognize these cases. The symptoms are so quickly relieved by the oral or intravenous administration of dextrose that confinement in a mental hospital could be avoided, except in a few of the more severe cases.

Puerto Rico J. Pub. Health & Trop. Med., San Juan

11: 1-166 (Sept.) 1935

- Evaluation of Ultraviolet Radiation for Use in Medicine. W. W. Coblenz, Washington, D. C.—p. 1
*Treatment of Anemia Associated with Hookworm Disease. Preliminary Report. R. Rodriguez Molina, San Juan.—p. 49
Actinomyces and Actinomycosis. C. W. Emmons, San Juan.—p. 63
Intensive Method of Control Applied to Yaws. Preliminary Report. J. B. Gotay, O. Costa, Mandry and G. C. Payne, San Juan.—p. 91
Spore Form Common to Three Etiologic Agents of Chromoblastomycosis. A. L. Carrion and C. W. Emmons, San Juan.—p. 114
Epidemiologic Study of Ascaris Trichuris and Hookworm in Coastal Village in Puerto Rico. P. K. Nair, Trivandrum, Travancore State, South India.—p. 118
Vitamin A Content of West Indian Shark (*Carcharias* sp.). Liver Oil. C. F. Asenjo, L. M. Dalmau and J. H. Axtmayer, San Juan.—p. 158

Treatment of Anemia Associated with Hookworm—Rodriguez Molina's study of five cases suggests that iron administered in large daily doses (6 Gm.) is the treatment of choice in the anemia associated with hookworm disease as compared to liver extract with iron by mouth, to a widely known commercial preparation used in the treatment of secondary anemia, and to a well balanced full hospital diet. The administration of each of the therapeutic agents used during a period of thirty days without removal of the worms resulted in a rise of the red cell count and hemoglobin percentage to a practically constant subnormal level. This level was reached more quickly by patients receiving iron alone. After this rise there was no further significant increase previous to removal

of the worms Administration of an anthelmintic was followed in all cases by a rapid (from five to seven days) increase in the red cell count to normal values In the two patients who received iron alone a rapid increase in hemoglobin parallel to the increased red cell count was observed. It is inferred that intensive iron therapy and a well balanced and nutritious diet aided by an effective anthelmintic seem to provide the optimal conditions of a rapid recovery from the chronic anemia encountered in hookworm disease.

Radiology, Syracuse, N Y

25: 391-520 (Oct.) 1935

- Biologic Measurement of Radium Gamma Rays F M Exner and C Packard New York—p 391
*Radiotherapy of Sarcoma of Soft Parts (on the Basis of Statistical Analysis) T Leucuta, Detroit—p 403
*Roentgen Treatment of Certain Types of Arthritis L H Garland San Francisco—p 416
Effect of Irradiation of Pituitary in Dysmenorrhea R R Newell and A V Pettit, San Francisco—p 424
Localized Pleural Effusion Accompanying Congestive Heart Failure Report of Two Cases E L Shiffett, Indianapolis—p 429
Blood Changes in Patients Having Carcinoma of Cervix of Uterus Irradiated with a Three Hundred Thousand Volt Roentgen Apparatus Report of Nine Cases S Richman New York—p 433
Pathologic Rarities in Cancer Two Unusual Cases A M Sala New York—p 437
Xanthomatosis Case of Schüller-Christian's Disease Treated by Irradiation H I Teperson Brooklyn—p 440
Some Lawsuits I Have Met and Some of the Lessons to Be Learned from Them Second Instalment I S Trostler Chicago—p 451
Osteopikilosis C G Sutherland Rochester, Minn—p 470
New Technic for Roentgen Examination of Shoulder Joint H Jordan New York—p 480
Flatfoot Consideration of Anatomy and Physiology of Normal Foot, Pathology and Mechanism of Flatfoot with Resulting Roentgen Manifestations M Kaplan and T Kaplan New York—p 485
Roentgen Mensuration by Stereoroentgenometry C R Johnson Los Angeles—p 492
Congenital Bronchiectasis in Children G S Reitter East Orange N J—p 495
Developmental Changes in Vertebral Articular Facets J G Kubus, Boston—p 498

Radiotherapy of Sarcoma of Soft Parts—In reviewing the statistical results in relation to the therapeutic method used in sarcoma of the soft parts, Leucuta finds that neither surgery nor radiation therapy has hard and fast rules As concerns the former, though the general principle may be that every operable sarcoma should be removed at once, there are instances in which primary radiation therapy may appear of greater benefit. Especially is this true of some highly cellular sarcomas of the fibroblastic group, such as round cell sarcoma of the tonsil or any other location, reticulum cell sarcoma, large spindle cell sarcoma and the like, of the myxosarcomas, liposarcomas and xanthosarcomas and of the Kaposi sarcoma of the skin Moreover, when biopsy is taken in all these instances it appears considerably safer to attempt to remove a metastatic node rather than to try to cut into the tumor proper As concerns radiation therapy, the degree of radiosensitivity forms the basis of procedure. Yet radiosensitivity in the clinical sense may mean "spectacular regression in one case and slow progressive tumor shrinkage in another The criteria dominating such response must be closely scrutinized and classified. It will be found that in the majority of cases they may be harmonized to greater advantage with surgical indications and that, therefore, an association of surgical and radiotherapeutic methods in the treatment of sarcoma of the soft parts must constitute an essential and most desirable requirement. In the same sense statistics dealing with a combination of the two methods rather than their opposition will prove of the greater clinical value.

Roentgen Treatment of Certain Types of Arthritis—Garland believes that, besides being contraindicated in arthritis in patients with cardiac disturbances, marked arteriosclerosis and nephritis, pyrotherapy appears to be more uncertain in its results than roentgen therapy He treated nine cases of acute infectious arthritis in which a total of thirteen individual joints were involved Four patients became free from symptoms two were considerably improved and three were not improved Absence of the immediate and often spectacular relief that occurs in cases of gonorrheal arthritis was conspicuous Three cases of chronic infectious arthritis were treated, in which ten individual joints were involved. Two cases became free from

symptoms and one was not improved at all Seven cases of chronic degenerative arthritis of the spine (spondylitis deformans) were treated Only one became symptom free, four were improved and one was not improved. Thirty cases of acute infectious (gonorrheal) arthritis were treated with small doses of x-rays delivered to the involved joints twice weekly for two or three weeks Twenty-eight cases (93 per cent) were much improved and two (7 per cent) were unimproved Approximately half of the improved cases appeared to be completely cured within a few weeks of the end of treatment, the remaining cases improved gradually, but, while there was freedom from pain, some slight stiffness or disability remained in the involved joints Five patients, in whom the joints were left untreated as controls, showed no improvement in the joints that were not treated

Southern Medical Journal, Birmingham, Ala

28 959-1074 (Nov.) 1935

- Neurologic Hyperinsulinism S Harris Birmingham Ala—p 959
Injuries to Ureters K D Lynch and R F Thompson, El Paso Texas—p 965
Unilateral Fused Kidney with Calculus Case Report H J Lindner New Orleans—p 972
Bronchoscopy and Esophagoscopy with Presentation of Some Interesting Problems S Israel Houston Texas—p 974
Discussion of Essential Procedures Employed in Diagnosis of Diseases of Esophagus E B Freeman Baltimore—p 981
Phytobezoar Diospyri Virginianae Report of Two Cases H C Schmeisser Memphis Tenn—p 987
Open Reduction for Fractures and Dislocations Indications and Methods H R Mahorner New Orleans—p 993
Treatment of Creeping Eruption J L Kirby Smith, Jacksonville Fla—p 999
Allergic Conjunctivitis R M Balyeat and R Bowen Oklahoma City—p 1005
Allergic Ocular Manifestations M Wiener St. Louis—p 1011
Analysis of One Hundred and Fifty One Consecutive Fetal and Neonatal Deaths During an Eight Year Period at the Southern Baptist Hospital of New Orleans T B Sellers and J T Sanders, New Orleans—p 1017
Prevention of Birth Injuries C R Hannah Dallas Texas—p 1021
Conflict and Physical Symptoms M S Gregory Oklahoma City—p 1023
Brief Consideration of Radical Surgery in Paranasal Sinuses J W Jervey Greenville S C—p 1026
Mesenteric Cyst Case Report L G Livingston Cordell, Okla—p 1028

Tennessee State Medical Assn. Journal, Nashville

28: 403-444 (Oct.) 1935

- Clinical Application of Some Recent Studies on Gastric Secretion L Martin Baltimore—p 403
Pathologic Uterine Bleeding W C Dixon Nashville—p 410
Diverticulitis of the Colon C H Heacock Memphis—p 416
Diagnosis and Treatment of Intestinal Obstruction E G Kelly, Memphis—p 423

Western J Surg, Obst. & Gynecology, Portland, Ore

43: 535-596 (Oct.) 1935

- Twenty Years Experience in Management of Goiter E C Moore and H D Van Fleet Los Angeles—p 535
Etiology and Management of Recurrent Hyperthyroidism G S Fahrni Winnipeg Manit—p 542
Riedel's Struma A M Boyden F A Collier and J C Bugher Ann Arbor Mich—p 547
Myxedema Spontaneous and Postoperative S D Conklin Sayre, Pa—p 564
Some Problems in Thyroid Disease F E Rogers Denver—p 576
*Thyroidectomy for Hyperthyroidism with Manic Depressive Psychosis L D Long Oklahoma City—p 583
Adequate Anterior Approach for Removal of Cervicodorsal Sympathetic Ganglions P G Flothow Seattle—p 589

Thyroidectomy for Hyperthyroidism with Manic Depressive Psychosis—To explain the development of psychosis in connection with hyperthyroidism, Long calls attention to the supposed role of the thyroid in controlling cerebral circulation. In hyperthyroidism there are tachycardia, increased arterial tension and increased metabolism. It is reasonable that in connection with these phenomena there might be an increase of the blood supply to the brain to the extent that mental disturbances would be produced. The etiologic role of the toxic products of hyperthyroidism should be considered also. If this reasoning is sound, it follows that thyroidectomy ought to be followed by a modification of the abnormal cerebral circulation and by a reduction of toxic material going to the

brain The author has seen a few patients who had so called thyroid psychosis (toxic psychosis), which appeared at the height of hyperthyroidism, either shortly before or after operation, and was quickly alleviated by control of the hyperthyroidism, by administration of iodine or operation, or by both. The three cases that they report have not been of this type but have instead exhibited long standing frank manic depressive psychosis before operation, which cleared up slowly following thyroidectomy. The period of active postoperative psychiatric treatment has averaged two years, but at the end of that time these patients have been regarded as mentally cured. This belief exists with the full knowledge that manic depressive psychosis untreated, shows remissions. In each of these the mental and physical results have been so satisfactory that the author feels that thyroidectomy is worth while and is a means of securing permanent relief from the physical, and apparently permanent relief from the mental, disturbances. These patients, who have been under the careful observation of competent mental experts, are said to be mentally cured and are now leading healthy useful lives.

West Virginia Medical Journal, Charleston

31 485-532 (Nov.) 1935

- President's Address Hospitalization in West Virginia Today Its Future J A McClung Richwood—p 485
The Medical Profession and the Hospital R H Walker Charleston—p 495
Bluefield Periodic Payment Plan of Providing Hospital Care R O Rogers and W A McCue Bluefield—p 504
The Status of Hospitals in Medical Relief Setup B H Swint Charleston—p 509
The Hospital and the Community J J Swint Wheeling—p 512
Causes of Stillbirth and Neonatal Death C C Fenton Morgantown—p 513

Yale Journal of Biology and Medicine, New Haven

8:1 112 (Oct.) 1935

- Limiting Factors in Advancement of Science as Observed in History of Embryology J Needham Cambridge England—p 1
Congenital Pericardial Deficiency with Other Anomalies Report of Case with Necropsy Findings D S Egbert and S Little New Haven Conn—p 19
*Renal Changes in Hypertension H E MacMahon Boston—p 23
Electrical Characteristics of Living Systems H S Burr and C T Lane New Haven Conn—p 31
Fundamental Factors for Delay and Nonunion in Fractures D S O Connor New Haven Conn—p 37
Elisha Perkins and His Metallic Tractors W S Miller Madison Wis—p 41
Fat Embolism H H Groszkloss Philadelphia—p 59

Renal Changes in Hypertension—MacMahon discusses the renal changes in "primary" hypertension. A study of a large number of cases belonging to the group of "primary" hypertension shows that one is not dealing with a single but with several clinical syndromes. Four groups are considered: (1) temporary hypertensions of young and middle-aged persons observed during certain of the toxemias of pregnancy, (2) permanent hypertension uncomplicated by clinical signs and symptoms as seen in young individuals, (3) permanent hypertension of middle-aged and elderly persons associated with a variable degree of generalized arteriosclerosis and (4) permanent, though variable, hypertension in young and middle-aged individuals associated with destructive and inflammatory lesions throughout the body—known as malignant nephrosclerosis. Patients having temporary hypertension during toxemia of pregnancy may develop in later years the classic signs and symptoms of malignant nephrosclerosis. The great majority of patients of the second group ultimately fall into one or the other of the two remaining groups—benign or malignant nephrosclerosis. This might suggest a link in common between these groups and indicate that they are not different diseases but only different phases of the same disease. In favor of such a hypothesis, perhaps, is the indisputable fact that borderline and transitional forms do occur which do not fall clearly into any one of these four groups. These impressions, however, in no way contradict the observation that, at least on the basis of morphologic pathology, each may exist as a distinct and separate disease but rather suggest that from the standpoint of etiology certain factors may be common to all.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

16 435-496 (Oct.) 1935

- Relationship Between Serologic Reactions and Infectivity of Potato Virus X F C Bawden—p 435
*Experimental Anemia in Monkeys with Especial Reference to Macrocytic Nutritional Anemia Lucy Wills and Alice Stewart—p 444
Bacteria Aertrycke Endotoxin Study on Its Production Detoxication and Practical Utilization of Its Antigenic Properties E. Grassie, A Zoutendyk and A Schaafsma—p 454
Effect of Certain Constituents of Culture Medium on Production of Diphtheria Antitoxin in Normal and Immunized Guinea Pigs. P Hartley—p 460
Effect on Degree of Immunity Produced of Injecting Same Dose of Diphtheria Formol Toxoid Contained in Different Volumes of Normal Salt Solution P Hartley—p 468
Effect of Injury on Level of Plasma Proteins Note D P Cuthbertson and S L Tompsett—p 471
Relationship Between Heterophile Hapten and Specific Polysaccharide Hapten of 'Smooth' Form of Bacterium Shigae K. Meyer and W T J Morgan—p 476
Application of Specific Levulose Determinations to Levulose Tolerance Test L D Scott—p 489

Experimental Anemia in Monkeys—The experiments of Wills and Stewart show that the hematopoietic system of the rhesus monkey behaves in a manner remarkably similar to that of man. Only the bone marrow hypertrophy in macrocytic anemia in monkeys differs from that in man. The megaloblastic reaction was similar to that seen in pernicious and other human macrocytic anemias, but the large, pale primitive cells, which were present in such large numbers in the marrow from some of the animals, are not commonly seen in preparations from human material. These cells were found in greatest number in the bone marrow from a monkey that died during a blood crisis, during which numerous nucleated red cells appeared in the blood stream and they would appear to be stem cells though their relation to the red and white cell series could not be determined from preparations (since identified by Turnbull as leukoblastic cells of the neutrophil series). No consideration of macrocytic anemia in animals should fail to include the possibility of a Bartonella infection. Thus a macrocytic anemia has been produced in intact rats on deficient diets. This anemia, however, was accompanied by the appearance of Bartonella bodies in the circulating blood, and, while many animals died in the acute stage of the illness, those that survived made a spontaneous recovery, the anemia disappearing without any specific treatment (Wills and Mehta, 1930). Recently also Miller and Rhoads (1935), who have induced a macrocytic anemia in dogs by faulty feeding, have reported the finding of Bartonella canis in their experimental cases after splenectomy. The interpretation of this is obscure, as the Bartonella bodies were never found in nonsplenectomized animals fed on the same faulty diet, even after they had received injections of blood from the infected animals. Moreover, the infected animals could be cured of their anemia, with the disappearance of the Bartonella bodies, by adding lean meat to the diet. The question of whether a latent Bartonella infection is present in the monkeys has not been determined.

British Journal of Radiology, London

8 601-668 (Oct.) 1935

- *Radiologic Estimation of Fetal Maturity R E Roberts—p. 601
Fetal Cephalometry L A Rowden—p 610
Id Simple and Exact Method of Determining Biparietal Diameter of Fetal Head in Utero C L McDonough—p 613
Behavior of Oscillating Currents in Complex Circuits P Bauwens—p 615
Depth Doses of X Rays L H Clark and E W Chapman—p 625
Description of X Ray Couch Designed for Use on Field Service, Incorporating New Type of Localizing Device H E Yorke—p 637
Variations in Sensitivity of Cell to Radiation in Relation to Mitosis J C Mottram—p 643
Direct X Ray Cinematography Preliminary Note on Nature of Non propulsive Movements of Large Intestine A E. Barclay—p 652

Radiologic Estimation of Fetal Maturity—Roberts describes a method for estimating the maturity of the fetus from certain cephalic diameters. The patient is placed in the prone position, the weight resting on the elbows, with a cast beneath her. If not already in contact, the hypogastrum is

brought into contact with the case. The X-ray tube is centered above the fetal head at a distance of 4 feet and a roentgenogram is taken (50 milliamperes at 60 kilovolts, three seconds). The suboccipitobregmatic diameter is most frequently seen on the film and can be measured by a ruler (preferably of the transparent type) marked off in tenths of an inch. (Failing this, the diameter intermediate between the suboccipitobregmatic and biparietal will be seen and measured or, more rarely still, the biparietal diameter itself.) The diameter in inches so measured multiplied by 10 will give in the majority of cases a fairly accurate estimate of the fetal maturity. For instance, a suboccipitobregmatic diameter of $3\frac{7}{10}$ inches will in an average case indicate a fetal maturity of thirty-seven weeks. If the patient is fat, or if it is impossible to bring the hypogastrium into contact with the case, or if a lateral view shows the position of the head to be occipitoposterior, a week or, in extreme cases, two weeks should be deducted from the maturity computed. The method is recommended only for single vertex presentations. If difficulty is experienced in roentgenography at 4 feet without a Bucky diaphragm, a formula and table are given for estimating the maturity from the prone Potter-Bucky roentgenograph at 30 inches. If the Potter-Bucky diaphragm is used, the film should be $1\frac{1}{2}$ inches from the surface of the Bucky table. The author presents this method as a preliminary note. There has as yet been insufficient time or opportunity to test out the method in a large number of cases. From the small number of cases examined, however, he feels that it will be of help.

British Journal of Surgery, Bristol

23: 241-480 (Oct.) 1935

- Traumatic Hemangiomas of Skeletal Muscle R. Maier — p. 245
Hemangioma of Voluntary Muscle. Brief Review of Literature Two Cases E. N. MacDermott — p. 252
History of Plaster of Paris in Treatment of Fractures J. A. Monro — p. 257
Hemorrhage per Rectum as Indication of Disease in Meckel's Diverticulum J. T. Chasterman — p. 267
Intussusception of Jejunum into Stomach Through Gastro-Enterostomy Stoma J. A. M. Cameron and W. D. Macfarlane — p. 274
Further Note on Development of Cysts in Connection with Semilunar Cartilages of Knee Joint R. Ollerenshaw — p. 277
Nature and Recognition of Endothelium with Especial Regard to Silver Methods of Staining C. E. Jenkins — p. 279
Angioma of Kidney. Report of Case with Analysis of Twenty Six Previously Reported Cases R. H. J. Swan and H. Balme — p. 282
Thrombosis Following Strain R. H. O. B. Robinson — p. 296
Late Results of Operations on Biliary Tract in Three Hundred and Fifty Nine Cases, with Cholecystographic Studies in Eighteen J. H. Sant — p. 299
Traumatic Rupture of Congenital Solitary Kidney J. R. H. Turton and J. C. F. L. Williamson — p. 327
Squamous Cell Carcinoma of Renal Pelvis. Report of Case M. Silverstone — p. 332
Sacrococcygeal Cysts and Tumors R. W. Raven — p. 337
Pylephlebitis Complicating Appendicitis and Its Treatment by Ligation of Mesenteric Veins A. M. Stewart-Wallace — p. 362
Intestinal Obstruction by Gallstones C. P. G. Wakeley and F. W. Willway — p. 377
Lymphatic Spread in Cancer of Rectum W. B. Gabriel, C. Dukes and H. J. R. Bussey — p. 395
Role of Sympathectomy in Treatment of Peripheral Vascular Disease R. I. Harris — p. 414
Peripheral Sympathetic Nervous System H. H. Woollard — p. 425
Results of Sympathectomy. Analysis of Cases Reported by Fellows of Association of Surgeons J. P. Ross — p. 433
Central Control of Sympathetic Nervous System J. Beattie — p. 444
Technic of Sympathectomy E. D. Telford — p. 448

Rectal Hemorrhage and Meckel's Diverticulum—Chasterman reports four cases of rectal hemorrhage due to peptic ulcer of Meckel's diverticulum. The ages of the patients were 6, 11, 16 and 22 years. From the available literature the etiology of all forms of bleeding due to disease of this diverticulum is given together with the differential diagnosis. The following in their order of frequency, may be associated with the hemorrhage from the rectum: anemia, pain, vomiting and intestinal irregularity. The diagnosis is made by a process of exclusion, though rectal hemorrhage in a juvenile between the ages of 5 and 15 years especially if a boy, is very suggestive. The hemorrhage is usually sudden and severe, though in cases of growth it may be slight and continuous. Pain occurs in about half the cases is of colic type and never severe and prolonged unless associated with intestinal obstruction and is

situated in the umbilical region. Laparotomy for the removal of an ulcer containing diverticulum is urged in children between the ages of 5 and 15 years showing rectal hemorrhage the cause of which is not revealed by sigmoidoscopy and blood examination.

Thrombosis Following Strain—Robinson has seen two cases of primary thrombosis, the result of excessive muscular effort affecting the thoraco-epigastric vein of the right side. The patients were healthy and in the prime of life, there was little subcutaneous fat, so that the vein was both visible and palpable. In one the condition developed after digging in the garden and in the other after shifting some heavy furniture. The symptoms were pain felt in the side of the chest wall and the discovery of a tender cord. On examination a stringlike band under the skin, running up from the costal margin just behind the breast under the anterior axillary fold and disappearing in the axilla, was palpable and tender. The physical signs cleared up completely in six weeks. The condition is of clinical interest particularly in the female sex, because its close relationship to the breast may give rise to confusion in diagnosis. As a cause of thrombosis one can postulate congestion and injury of the venous intima during contraction of the underlying muscles, possibly with injury of the valves in the lumen of the vein. It is possible that axillary thrombosis may originate in this vein, the primary thrombosis being overlooked in the major condition affecting the axillary vein, especially as it is unlikely that the patient will draw attention to the original condition.

Lymphatic Spread in Cancer of Rectum—Gabriel and his co-workers discuss a means for the examination of operative specimens of cancer of the rectum in order to determine the extent of lymphatic spread. As a rule the regional lymph nodes are the first to be affected by metastases in cancer of the rectum. Lymphatic spread then proceeds from below upward along the chain of glands accompanying the superior hemorrhoidal artery. Irregular or interrupted spread is uncommon. Lateral or downward lymphatic spread is found only in a late stage of the disease when the hemorrhoidal lymphatics are blocked by metastases. The examination of the operative specimens permits a distinction to be made between cases in which glandular spread has already reached the glands at the point of ligation of the inferior mesenteric pedicle and those in which the upward spread has not extended to this point. The prognosis in the latter is thought to be much better than in the former. In the 100 glands dissected the authors found lymphatic metastases in sixty-two cases. This is a slightly higher proportion than is usually reported in any series of operation specimens of cancer of the rectum. The dissection of seventy specimens removed by perineo-abdominal excision showed that in only a small proportion (eleven) the disease had actually spread by lymphatic channels to the limit of surgical removal, that is, the inferior mesenteric pedicle.

British Journal of Tuberculosis, London

29: 191-254 (Oct.) 1935

- Why Do Relapses Occur in Pulmonary Tuberculosis? R. C. Wingfield — p. 193
The Mantoux Test. Comparison of Old Tuberculin with Tuberculin Prepared on Synthetic Protein Free Medium G. G. Kayne — p. 201
Examination of Blood by Loewenstein's Method for Presence of Bacillus Tuberculosis J. W. Edington — p. 210
The Arrested Case of Tuberculosis in the Village Settlement J. B. McDougall — p. 216
Influence of High Altitudes on General Health and Convalescence After Acute Illness B. Hudson — p. 223
Inhalation Therapy in Pulmonary Tuberculosis G. B. Charnock — p. 227
Contribution to Study of Oleocholesterol. One Hundred Cases of Pulmonary Tuberculosis Treated in a Sanatorium by Suspensions of Gold Salts in Oil M. Gilbert and A. Miegé translated by Margaret V. Saul — p. 232
Immediate Results in One Hundred Patients to Whom Gold Salts Were Given H. Roche — p. 244

Relapses in Pulmonary Tuberculosis—Wingfield states that there are three forms of relapse. They differ completely in their pathology, symptomatology, recognition, prevention and treatment. 1. Relapse due to the deposition of an entirely fresh lesion in a heretofore undiseased portion of the lung—new lesion relapse. 2. Relapse due to spread by contiguity of a heretofore quiescent or arrested lesion—spread relapse. 3. Relapse due to

changes taking place in an apparently arrested lesion, unaccompanied by actual spread of the diseased area—late relapse. The pathology, etiology, clinical evidence, physical signs, appearances, clinical course, recognition and treatment of each type are discussed.

British Medical Journal, London

2 771 828 (Oct 26) 1935

- Some Epochs in Medical Research H Dale—p 771
Esophageal Obstruction H S Souttar—p 777
Premedication F W Green—p 780
Sinusitis in Children G C Scantlebury—p 781
Low Voltage X Ray Therapy Preliminary Note W Morison, D Hugo and W V Mayneord—p 783

East African Medical Journal, Nairobi

[12]: 199 226 (Oct) 1935

- Endemicity of Plague in East Africa J I Roberts—p 200
Anencephaly with Hydramnios Case R B Michener—p 219

Journal of Anatomy, London

70 1 202 (Oct) 1935

- Nerve Cells in Spinal Ganglions D M Blair P Baensch and F Davies.—p 1
Innervation of Kidney Ureter Testicle and Epididymis G A G Mitchell—p 10
Consideration of Constancy of Muscular Nerve Supply R W Haines—p 33
Evolution of Human Foot with Especial Reference to Joints H Elftman and J Manter—p 56
Development of Prepuce Notes R H Hunter—p 68
Studies on Area Vasculosa of Embryo Chick I First Differentiation of Vitelline Artery A F W Hughes—p 76
Sex Difference in Proportion of Suprarenal Cortex Occupied by Lipoid in Guinea Pigs Over One Year Old R Whitehead—p 123
Study of Adrenal Cortex of Rabbit R Roaf—p 126
Detailed Study of Movement of Wrist Joint R D Wright—p 137
Changes in Alveolar and Demilune Cells of Simple and Stimulated Paralytic Submaxillary Gland of Cat H E Rawlinson—p 143
Patterns of Aortic Arch in Series of One Hundred and Thirty Three Macaques C F De Garis—p 149
Further Abnormalities in Blood Vascular System of Frogs C H O Donoghue—p 159

Journal Obst. & Gynaec. of Brit. Empire, Manchester

42 733 952 (Oct) 1935

- Upper Urinary Tract in Pregnancy and Puerperium with Especial Reference to Pyelitis of Pregnancy D Baird—p 733
*Significance of Shape of Fetal Head in Mechanism of Labor E. Rydberg—p 795
*Some Observations on Malaria Occurring in Association with Pregnancy with Especial Reference to Transplacental Passage of Parasites from Maternal to Fetal Circulation G A W Wickramasuriya—p 816
Thymophysin Question Observations Based on Eighteen Hundred and Fifty Cases K Heyrowsky—p 835
Carcinomatous Change in Polyp of Uterine Body D M Vaux—p 845
Spontaneous Rupture of Uterus During Pregnancy H H Fletcher—p 848
Treatment of Posthemorrhagic State. W Hunter—p 852
Prognosis in Carcinoma of Cervical Stump After Subtotal Hysterectomy Critical Analysis of Thirty Eight Cases J R Nuttall and T F Todd—p 860
Acute Inversion of Uterus Two Cases M L Treston—p 867
Fatal Case of Pregnancy Complicated with Mumps P C Dutta—p 869
Anephrogenesis. F J S Gowar—p 871

Significance of Shape of Fetal Head—Rydberg gives a historical survey and a critical examination of theories advanced in explanation of the mechanism of labor, heretofore no generally accepted explanation has been found. His investigation of the shape of the fetal head shows that it has a decided and characteristic asymmetry, in that the bulk of its mass is situated above the mento-occipital diameter. An investigation as to how this asymmetry may be conceived as determining the movements of the head during labor shows that the usual mechanism can be traced to it, if it is assumed that the deformability of the birth canal corresponds on the whole with that of a curved tube of a homogeneous elastic material. Cases in which the normal internal rotation is absent are also explained, if the atypical deformation of the fetal head appearing in these cases is obvious. The author believes that the shape of the fetal head is the factor which chiefly determines its movements during labor, and that an incomplete forward flexibility of the fetus at most may have some importance in cases of prolonged occipitoposterior position. He states that the hypothesis is in itself reasonable and is supported by what can be observed dur-

ing obstetric work. The movements of the fetal head during labor are fully explained by its shape alone. The conception that the shape of the head is the essential and decisive factor is strongly supported by all obstetric experience, which testifies unmistakably as to the dominating importance of the head for the whole course of labor under both normal and pathologic conditions, and to the high degree of plasticity and passivity of the fetal body and neck.

Malaria During Pregnancy—Wickramasuriya asserts that quinine is still indispensable in the treatment of malaria in gravid as well as nongravid women. Pregnancy is not a contraindication to its use. Clinical experience does not suggest that quinine administered in therapeutic doses possesses oxytocic powers. Far from being an oxytocic, quinine administered in effective therapeutic doses, by rapidly controlling the malarial infection and the high temperature, prevents premature interruptions of pregnancy and intra-uterine fetal death. Atabrine is regarded by many as an alternative to quinine in the treatment of malaria during pregnancy. While it should be regarded as a useful addition to the therapeutic armamentarium, it must be said to occupy but a subordinate place to that of quinine in the treatment of the disease during pregnancy, as it does not control the malarial infection and the high temperature so rapidly. Relapses do occur after its use as with quinine, and whether it is as efficacious and as safe for general use as quinine is yet to be seen. Atabrine appears to be contraindicated in patients with toxemia of pregnancy, preexisting nephritis and advanced hookworm disease.

Journal of Physiology, London

85 117 276 (Oct. 26) 1935

- Occurrence of Several Kinds of Hemoglobin in Human Blood R. Brinkman and J. H. P. Jonxis—p 117
Some Physiologic and Physical Aspects of Surface Tension of Urine. P. W. Perryman and C. F. Selous—p 128
Action of Ovarian Hormones on Uterine Muscle Measured in Vivo and in Vitro J. M. Robson—p 145
Separation of Pubic Bones Following Administration of Estrogens to Male Mice H. Burrows—p 159
Effect of Food and of Exhaustion on Pituitary Thyroid Adrenal and Thymus Glands of Rat Dorothy H. Andersen—p 162
*Effects of Sodium Citrate on Alkali Reserve and Coagulability of Blood. D. de Souza and F. D. M. Hocking—p 168
Changes in Coagulability of Blood Produced by Citric Acid and Some of Its Decomposition Products D. de Souza and F. D. M. Hocking—p 173
Action Potential of Superior Cervical Ganglion J. C. Eccles—p 179
Facilitation and Inhibition in Superior Cervical Ganglion. J. C. Eccles.—p 207
Carbohydrate Metabolism of Gut Muscle. B. N. Prasad.—p 239
Mechanical Activity of Gut Muscle Under Anaerobic Conditions B. N. Prasad—p 249
Afferent Fibers from Abdomen in Vagus Nerves. A. A. Harper B. A. McSwiney and S. F. Suffolk—p 267

Effects of Sodium Citrate on Alkali Reserve—As the results of the intravenous injections depend on the amount of citrate injected and as intramuscular injections are given to make the blood more coagulable, de Souza and Hocking believe that it is important to know whether the effects of the intramuscular injections, both on the coagulability of the blood and on the alkali reserve, show a similar dependence on the quantity of citrate. Their results show that an intramuscular injection of 0.125 Gm. per kilogram of body weight may be safely and effectively given to increase the coagulability of the blood, but that an injection ten times as large eventually diminishes coagulability and may in certain circumstances produce tetany. Repeated small intramuscular injections of sodium citrate have a cumulative effect in increasing the alkali reserve and the coagulability of the blood. Anesthetized cats were used for the experiments.

Journal of State Medicine, London

43: 559-620 (Oct) 1935

- Tuberculosis of the Knee Joint C. L. Pattison—p 559
Increase of Tuberculosis in Young Female Adult. W. S. Gilmore—p 567
Elimination of Tuberculosis from Milk Supply D. S. Rabagliati—p 576
Rheumatism in Industry C. W. Buckley—p 587
Spa Treatment in Industrial Diseases A. Cox—p 596
Study of Weather and Climate in Relation to Public Welfare L. C. W. Bonacina—p 611

Journal of Tropical Medicine and Hygiene, London

38:249 264 (Oct 15) 1935

- Some Newer Aspects of Schistosome Infection in the Western Hemisphere. E. C. Faust—p 249
Treatment of Staphylococcus Infections with Staphylococcus Toxoid M. A. Gohar—p 259

Lancet, London

2:869 926 (Oct 19) 1935

- *Bacteremia and Oral Sepsis, with Especial Reference to Etiology of Subacute Endocarditis. C. C. Okell and S. D. Elliott—p 869
Achloric Jaundice Serial Onset of Acute Blood Crises in Entire Family A. M. Scott—p 872
Hodgkin's Disease in Natives of Nigeria Results of Biologic Test E. C. Smith—p 874
Congenital Defect of Sternum Case A. Jordan—p 877
Internal Pneumolysis Results of One Hundred and Ten Consecutive Operations F. G. Chandler—p 879
Perforation of Tuberculous Intestine in Pulmonary Tuberculosis Report of Two Cases D. B. Rosenthal—p 882

Bacteremia and Oral Sepsis—In searching for the source of streptococci concerned in the production of subacute bacterial endocarditis, Okell and Elliott state that attention must inevitably be turned to the oral cavity. The majority of endocarditis streptococci are of the salivary or *Streptococcus viridans* type. These abound in the mouth and its neighborhood but are found elsewhere only in small numbers and under exceptional conditions, above all it is in conditions of oral sepsis such as pyorrhea of the gums, that this type of streptococcus is found in the greatest numbers. The blood was examined for bacteria in 138 patients undergoing extraction of teeth. Eighty-four of these showed a transient streptococcal bacteremia after extraction, and in cases considered to be of a severe type of oral sepsis (group A) the positive streptococcus cultures reached as high a figure as 75 per cent. In all cases from which streptococci were recovered, the organisms were of the nonhemolytic type. In the majority of cases in which the result was positive, streptococci were recovered from the cultures grown under aerobic and anaerobic conditions of cultivation, and in a few instances the organisms were found in the aerobic or anaerobic cultures. None of the streptococci recovered were obligatory anaerobes. In general, it was found that the occurrence and degree of a bacteremia depended on the severity of the disease of the gums and the amount of damage done at the operation. The bacteremia following extraction is of short duration. The transient bacteremia following operative trauma is analogous with that described by Barrington and Wright in catheter fever in which *Bacillus coli* was the usual organism isolated from the blood. In persons with severely septic mouths, nonhemolytic streptococci (mostly of the *viridans* type) may enter the blood stream in the absence of any obvious trauma. The authors have been unable to ascertain whether the condition of "leak" into the blood stream in the positive cases is continuous, intermittent or merely a fortuitous single occurrence. Nor have they yet determined whether minor traumas, such as brushing the gums or chewing have any effect on the occurrence of the bacteremia. The efficient mechanism which exists for clearing the blood stream of organisms of low virulence, no doubt allows a leak of organisms into the circulation to be detectable in blood from an arm vein only when the leak exceeds a certain magnitude or the organisms are abnormally resistant to phagocytic clearing. The leak, which is of little consequence in the normal person, might determine the infection of diseased or malformed valves. The direct observation of such an invasion of blood provides a tentative explanation of how streptococci reach the cardiac valves in cases of subacute bacterial endocarditis.

South African Medical Journal, Cape Town

9:625-656 (Sept 28) 1935

- Microallosal Brain Discussion of Role of Corpus Callosum in Cerebralization. M. R. Drennan—p 625
Some Observations on Control of Infectious Disease F. A. Donnelly and H. Nelson—p 629
Results of One Hundred Friedman Pregnancy Tests Notes on Two Informative Cases W. Lewin—p 641
Tuberculosis of Bones and Joints in Native Patients in the Ciskei A. Macvicar—p 643
Recent Views on Brucella Group E. M. Robinson—p 645
Blood Groups of the Hottentot. R. Eldson Dew—p 651
Intestinal Myiasis Caused by Larvae of *Chrysomya Chloropyga* Wiedemann (Diptera, Calliphoridae) B. de Meillon and H. S. Osburn—p 654

Journal de Chirurgie, Paris

46 657 848 (Nov) 1935

- *Interlumbosacral Sympathectomy in Trophic Disorders of Lower Limbs. D. Danielopolu A. Aslan and I. Marcou—p 657
Cholecystogastrostomy and Gastric Ulcer P. Mallet-Guy and P. Van Der Linden—p 676
Experimentation on Changes of Vesicular Mucous Secretion Resulting from Cholecystogastrostomy P. Mallet-Guy, M. Chambon P. Van Der Linden and P. Croizat—p 684
Action of Different Metals on Osseous Tissue. G. Menegaux and D. Odette—p 695
Resection of Splanchnic Nerves Critical Review J. Meillère and J. Brebant—p 727

Sympathectomy in Trophic Disorders of Lower Limbs

—Danielopolu and his associates practiced interlumbosacral sympathectomy in cases of arteritis of the lower extremities. It consists in sectioning of the sympathetic cord above the promontory. They feel that this procedure is preferable to lumbar sympathectomy for several reasons. It satisfies the necessary physiologic and anatomic principles and is technically relatively easy to perform without producing the occasional paralytic ileus of some of the other methods.

Presse Médicale, Paris

43 1561 1576 (Oct. 9) 1935

- Diagnosis of Kala Azar by Dermal Scrapings E. Benhamou—p 1561
Treatment of Acute Corrosive Esophagitis S. Bélinoff—p 1564
*Lack of Importance of Stasis in Pathogenesis of Biliary Lithiasis I. Pavel—p 1565
New Method of Gastro-Enterostomy Robert Didier—p 1568

Stasis in Pathogenesis of Biliary Lithiasis—Pavel

advances several arguments which militate against the generally accepted concept that stasis is a necessary prerequisite to the formation of gallstones. There have been numerous cases of prolonged biliary stasis, confirmed by operation or necropsy, without any development of stones. Furthermore, recent studies of icterus from functional stasis due to spasm of the sphincter of Oddi have shown that it does not favor the formation of calculi. Cholecystography has furnished additional evidence of this view. There are numerous instances in which atony of the gallbladder has been found without any stones. On the other hand, vesicles have been seen showing normal contractile powers, but nevertheless containing stones. The author feels that all these observations tend to prove that the classic idea of stasis should no longer be accepted uncritically.

43:1601 1624 (Oct 16) 1935

- *Hyperpolypeptidemia in Course of Tetanus H. Warembourg and J. Driessens—p 1601
Evacuation Puncture of Serofibrinous Pleuritis in Therapeutic Pneumothorax D. Micheli and A. Roulet—p 1605

Hyperpolypeptidemia in Tetanus—Warembourg and

Driessens describe three cases of tetanus. One patient, after being accepted as having recovered from his infection, died later of uremic coma, and the other two patients, before dying of tetanus, showed signs of grave blood uremia with marked hyperpolypeptidemia. The cause was investigated from a clinical, chemical and morphologic standpoint, but the authors were unable to relate this to any deficiency in blood chlorides. Systematic histologic study of the organs was practiced with the aim of determining any preexisting chronic disorder of the liver or kidneys or any acute lesion of these organs that might play a part in the uremia. No old lesions were found at first but acute and subacute changes of great importance were noted. The authors therefore concluded that the important etiologic factor was probably the continuous administration of strong doses of serum loaded with foreign proteins. The resulting increase in the blood urea nonprotein nitrogen and polypeptides coincides with an intense congestive hepatitis and nephritis. The final responsibility of the therapeutic maneuvers in the determination of this intoxication remains to be clarified. Certain practical conclusions may be drawn, nevertheless. Naturally, antitoxins must still be administered but the course of the blood urea should be watched, diuresis should be favored by the administration of isotonic or hypertonic dextrose solution, the patient may be given liver extracts, and the antitoxin that is administered should be as free as possible from heterogenous proteins.

Schweizerische medizinische Wochenschrift, Basel

65: 1041 1064 (Nov. 2) 1935 Partial Index

Male and Female Hormone E. Laqueur—p. 1041

*Interreno Insular Syndrome. Is There a Primary Polynesia That Leads to Fatal Cachexia? M. Askanazy and F. Sciclounoff—p. 1046

Treatment of Tumors of Bladder A. Egger—p. 1051

Casuistic Contribution to Therapy of Gastric Ulcers F. Leins—p. 1054

Interreno-Insular Syndrome—Askanazy and Sciclounoff describe the clinical observations and the necropsy on a girl, aged 20. The clinical symptoms were edemas, severe atrophy of some of the organs, bradycardia, hypotension, hypothermia, hypoglycemia, amenorrhea and dryness and pigmentation of the skin with lanugo formation. Since implantation of hypophyseal tissue had effected a certain improvement, a hypophyseal cachexia seemed possible. The necropsy, however, disclosed that this diagnosis was erroneous. There was hyperplasia of the adrenals, the pancreas was of normal size, but practically all other internal organs showed severe atrophy. The authors describe the histologic aspects of the organs, pointing out that the most noteworthy changes were detected in the pancreas, in that the number of its islands was greatly increased. This polynesia was found in all parts of the pancreas, the islands being about two and one-half times as numerous as is ordinarily the case. The structure of the islands was normal. The authors regret that they were unable to subject the enlarged adrenals to microscopic examination. In their interpretation of the pathologic observations they say that the adrenals and the pancreas are antagonistic, which would make a hypofunction of the adrenals seem logical in a case of polynesia. However, the pancreas and parathyroids are considered blood sugar reducing organs, and the thyroid hypophysis and adrenals as blood sugar increasing organs. Since in this case the sugar reducing action was driven to the extreme, the organs that produce the blood sugar probably were overtaxed. The authors assume that this explains the hypertrophy of the adrenals. Moreover, if the action of the hypophysis is compensatory for the sugar reducing polynesia, it is understandable why the implantation of hypophyseal tissue effected some improvement. They discuss the case also from the point of view of a primary adrenal hyperplasia, pointing out that among the various pathologic manifestations of adrenal hyperplasia there are two types, those which seem to be the result of the increased production of adrenal hormones and those in which, in spite of the hyperplasia, a disordered or deficient hormone function seems likely. The clinical aspects of the described case contradict the first type, for it is usually accompanied by obesity, hypertension, hyperglycemia and so on. In the second type there develop signs of an intoxication which, particularly in the case of newborn infants, rapidly brings on a fatal outcome. The clinical picture of the latter type is usually that of a severe atrophy which was the case also in the girl whose history is described, but in some respects this case deviated somewhat from the symptomatology of other cases. The authors concede that the question of a causal relation between primary polynesia and fatal cachexia cannot be definitely answered on the basis of this case. Nevertheless, there is an interrenopolynetic syndrome.

Clinica Chirurgica, Milan

38 831 902 (Sept.) 1935

Relations Between Hepatitis and Cholecystitis G. Gagliardi—p. 831

*Importance of Silk Suture in Genesis of Postoperative Peptic Ulcer F. Paolucci—p. 852

Rare Tumors of Thyroid A. Billi—p. 863

Silk Sutures and Postoperative Peptic Ulcer—Paolucci performed in six dogs the operation of transmesocolic posterior gastroenterostomy combined with pyloric exclusion according to Eiselsberg using silk threads as suture material. In a second series of six dogs he severed the duodenum directly below the pylorus and closed the two stumps, he performed a transmesocolic posterior gastrojejunostomy according to von Hacker. He severed the duodenum below the entrance of the pancreatic duct and closed its distal end by a purse string suture, and he made a terminolateral anastomosis between the proximal end of the duodenum and the last loop of the ileus from 10 to 20 cm. from the cecum. Five dogs of the first series and four of the second survived the operation. Fifteen days after the

operation, on histologic examination, one of the five dogs showed a small tissue loss without the characteristics of a true ulcer and the presence of a long silk thread in the shape of a loop. The tissues at the anastomotic suture points were slightly edematous and hyperemic. In the right anterior portion of the anastomosis in another dog, the author found a tag of omentum, markedly hyperemic and adhering to the stomach and to the jejunum. The tag occluded hermetically a small ulcer involving the anterior wall of the jejunum. No silk threads were observed on the margin of the ulceration. Numerous loops of silk thread were present at the lumen of the anastomosis without there being a trace of ulceration. Below the tag of hyperemic omentum there was a second round ulcer with clear cut margins about 3 cm. from the left angle of the anastomosis. Ulcers were found in the jejunum of each dog of the second series. In all the loss of substance was of variable size and the ulcers were always round and had clear cut margins. They were always observed in the jejunum on the afferent or efferent loop at various distances from the anastomosis. In the two ulcers produced in the first series of dogs no suture thread was found, whereas at the sites of the sutures no ulcers were present. The ulcer produced on the afferent loop was at such a distance from the anastomotic stoma that it excludes any possible influence of the sutures. The ulcers present in the second group, constantly found in the jejunum on the afferent and efferent loop, could not be attributed to the presence of sutures, because the losses of substance were produced at a distance not only from the anastomosis but also from the loops of suture. The author concludes that there is no relation between postoperative peptic ulcer and the silk thread suture.

Riforma Medica, Naples

51: 1461 1500 (Sept. 28) 1935

Pathogenesis and Surgical Treatment of Muscular Torticollis in Adults. L. De Gaetano—p. 1463

Henry Flocculation Test in Diagnosis of Malaria A. Costantini—p. 1467

*Action of Irradiations from Lecithin on Development of Bacteria. G. Acanfora—p. 1475

Effect of Irradiations from Lecithin on Bacteria—Acanfora proved that the radiations of lecithin that has been submitted to radiations of light inhibit the cultural development of certain fungi. His work was reported in the *Annali di medicina navale e coloniale* 41 193 (March-April) 1935. The author repeated the experiments by subjecting cultures of bacteria especially those of the *Bacterium melitense* group, to the same irradiations in order to ascertain whether or not they have the same action on the cultural development of bacteria as they have on that of fungi. He found that these irradiations have no action on the cultural development of bacteria, except in the case of bacteria of the paratyphoid and meta dysentery groups. This different behavior of lecithin irradiations is due to the fact that fungi are less differentiated organisms than bacteria. While the irradiations have an inhibitive action on the former, the latter can stand it and even derive some benefit from it in certain cases.

Semana Medica, Buenos Aires

42 1045 1120 (Oct. 10) 1935 Partial Index

Experimental Trichinosis in Rats F. L. Niño—p. 1045

Treatment of Arterial Hypertension by Octyl Alcohol C. Rossi Belgrano and E. Zucal—p. 1073

*Treatment of Trachoma by Diathermocoagulation G. von Grolman—p. 1080

Pneumography of Breast J. Benzadón—p. 1085

Modern Treatments of Exophthalmic Goiter and Hyperthyroidism. L. Goldemberg—p. 1095

*Painful Nodule of the Ear Case E. L. Othaz—p. 1105

Treatment of Trachoma by Diathermocoagulation—Von Grolman states that diathermocoagulation is the surgical treatment of choice in trachoma. The scars it leaves in the palpebral conjunctiva are small and nonretractile. The operation is not complicated by entropion, symblepharon, hemorrhages and shock. It has a thrombotic and hemostatic action on the vessels of the operative field and causes sterilization of the tissues and complete destruction of the granulations. Its

technic is simple and rapid. Owing to the fact that there are several methods for graduation of the intensity of the currents, it is possible to determine the proper dose to be given and to repeat the operation whenever it is necessary.

Painful Nodule of the Ear—Othaz makes a general study of painful nodules of the ear, in the etiology of which heredity, climate and nationality of the patient do not play a part, but trauma and the action of either heat or cold may. While infection is not the cause of the disease, it may complicate it. As a rule, it is a solitary unilateral growth seated at the helix. The predominant symptom is spontaneous or provoked intense pain of the neuralgic type, related to the congestive condition of the ear. Some relief is obtained by removing the little scar covering the nodule. The evolution is chronic. The differential diagnosis should be made with Darwin's tubercle (congenital malformation of the helix), verruca vulgaris, gouty tophus, cyst and epithelioma. The prognosis is good.

Archiv für Gynakologie, Berlin

159 585 741 (Oct 10) 1935 Partial Index

- *Clinical Aspects and Genesis of Brenner Tumors E Fauvet—p 585
Cultivation of Trichomonas Vaginalis Hominis and Its Transmission to Small Experimental Animals H Wittfogel—p 612
Clinical Significance and Pathology of Ovarian Teratomas Z von Sathmery—p 653
Order of First Appearance and of Development of Ossification Nuclei of Foot in Intra Uterine Fetus (So-Called Bone Age of Fetus) G A Bakscht and T N Siltschenko—p 701
Changes in Fat Metabolism Before Onset of Labor Pains During Normal Pregnancy Contribution to Problem of Onset of Birth G Effkemann—p 718

Genesis of Brenner Tumors—Fauvet describes and discusses the histories of four women with Brenner tumors and then gives his attention to the genesis of these tumors. He evaluates the theories advanced by others in the light of his own observations. He emphasizes that the comparison between the endometrioses and the Brenner tumors should not go too far insisting that the Brenner tumors are always of ovarian origin whereas this cannot be said about the endometrioses. But, although always of ovarian origin, the Brenner tumors apparently may derive from various elements in the ovaries either from Walthardt's cell foci, as Robert Meyer assumes, or from the ovarian rete, as is indicated by Schiller's and the author's own observations. In discussing the hormone aspects of the Brenner tumors, he emphasizes that in his cases he observed nothing which would justify the assumption that their development is regulated by ovarian hormones. On the contrary, he gained the impression that the development of the Brenner tumors is promoted by the subsidence of the ovarian function. In this connection he calls attention to von Behring's statement with regard to hemorrhagic metropathy, chronic cystic mastopathy and the endometriosis, which that author regards as "paramenstruations" and not as the result of hyperfunction, but rather of a dysfunction of the gonads assuming that other substances might become active as the result of an insufficiency of the ovaries. The author says that the analysis of his own cases indicates that other than ovarian hormones play a part in cases of Brenner tumors. He gave his attention to the adrenal cortex but reaches no definite conclusion since the knowledge about the functions of this organ is as yet incomplete.

Changes in Fat Metabolism and Onset of Birth—Effkemann discusses the incretory changes that take place in the pregnant organism before the onset of labor and reports his own studies on the changes in the fat metabolism. He found that from three to six days before delivery the fatty acid content of the blood increases slightly over the values that are found during the second half of pregnancy. He observed values of from 700 to 850 mg per hundred cubic centimeters. He further observed that the acetone bodies increase likewise before the onset of the labor pains. The acetoneuria of pregnant women which on the average amounts to 240 mg commences to increase with the sixth day before delivery and reaches values of 640 mg in the daily urine. The anterior hypophyseal hormone of the fat metabolism is slightly increased in the blood at this time.

Archiv für Verdauungs-Krankheiten, Berlin

58: 121 248 (Oct.) 1935 Partial Index

- Gastritis A F Hurst—p 121
Significance of Catalase (and Triboulet) Reaction for Diagnosis and Prognosis of Intestinal Disturbances S Kemp and T T Andersen—p 144
Autovaccines and Antivirus in Treatment of Chronic Colitis D Gutierrez Arrese D Lopez Blanco and J M Lastra—p 167
*Palpatory Examination of Pancreas J W Grott—p 181

Palpation of the Pancreas—Grott found that if the patient lies on his back with the knees flexed and with a support under the lumbar portion of the vertebral column (either an arm or a sand sack, 8 or 10 cm in thickness), greater relaxation of the abdominal walls can be obtained. The patient is examined first without the support under the lumbar vertebral column and then the examination is repeated with this support. At the beginning of the examination the examiner places the right hand on the abdomen in such a manner that the slightly bent fingers reach the external edge of the left abdominal rectus muscle. The fingers of the right hand are used for palpation, those of the left hand to exert the necessary pressure. The patient is told to breathe deeply and quietly so as to effect complete relaxation. During a deep inspiration the fingers of the right hand pressed by those of the left go deep down into the abdominal cavity. When the greatest depth has been reached, the external edge of the left rectus muscle is pushed aside and an attempt is made to reach the side of the vertebral column with the fingers of the examining hand. The examination must be made slowly and with precaution so as to avoid any painful pressure, which might result in an erroneous interpretation of the palpation. A roentgenologic control of the examination disclosed that the stomach recedes in the direction of the epigastrium in the course of the palpation. The author assumes that the intestines are also pushed aside. He advises that the palpation be begun not in the region of the pancreas itself but rather in the adjoining regions. He begins below the line that goes through the umbilicus. If this is done the patient becomes accustomed to the examination and, when the pancreas is reached, he is capable of differentiating between the sensation produced by the pressure of the hand and by pain in an organ. This method permits the detection of a pain to pressure at the site where the pancreas crosses the lumbar portion of the vertebral column and the abdominal aorta. The forward bending of the vertebral column makes its lateral surface larger, and the pressure of the diseased organ against this hard support elicits the pain symptom. The author made this examination in 101 patients and palpation of the pancreas was possible in eighty-eight. Of the latter, thirty-two complained of pain, seventeen stating that the pain was severe and fifteen that it was mild. Further tests on the seventeen patients indicated that ten had a chronic inflammation of the pancreas, while in the other seven such a disorder could only be assumed.

Klinische Wochenschrift, Berlin

14 1561 1592 (Nov 2) 1935 Partial Index

- *Use of Purified Protein Deficient Therapeutic Serums in Diphtheria Patients A Hildebrandt—p 1563
*Psychic Behavior During Short Sojourn at Five Thousand Meter Elevation Effect of Climate of High Altitude J Jongbloed—p 1564
Functional Tests of Liver in Latent Hepatic Impairment W Rubbaum and W Matheja—p 1568
Gonadotropic Hormone of Anterior Lobe of Hypophysis and Menstrual Cycle Quantitative Determination of Sex Hormones in Healthy Persons and in Persons with Mental and Nervous Disorders W Österreicher—p 1570
Composition of Blood and Elimination of Urine Following Administration of Fluids W von Morawski, S Grzycki and T Sadowski—p 1574

Purified, Protein-Deficient Serums in Diphtheria—Hildebrandt points out that it is known that pseudoglobulin is the carrier of the antitoxin. This knowledge is the basis for the purification of the serums, in that attempts were made to eliminate the other protein fractions that do not carry antitoxin. It proved possible to produce therapeutic diphtheria serums the protein content of which does not exceed 5 per cent. Animal experiments with protein-deficient serums indicated that the rapidity of resorption is inversely proportional to the protein content. For this reason it was assumed that the serums with low protein content are of especial therapeutic

value, because they fulfil one of the most important requirements of successful serum therapy, namely, rapid resorption. The author decided to compare the efficacy of the serum that is deficient in protein with that of native diphtheria serum. Another factor that induced him to try this treatment was that the protein-deficient serum might be important from the point of view of serum disease. He employed the two types of serum in alternate cases of diphtheria that came up for treatment. He used the serums in fifty-eight and fifty-seven cases, respectively. In each group there occurred five deaths. A tabular report indicates that 28 per cent of the group of patients who were treated with native serum and 20.7 per cent of the group treated with protein-deficient serum developed signs of serum disease. This rather high percentage for both groups is explained by the fact that the symptoms of serum disease were carefully watched for, so that probably none escaped observation. A comparison of the severity of the symptoms of serum diseases in the two groups disclosed that in the patients who had been treated with the protein-deficient serum the symptoms were on the whole somewhat milder than in the other group. The author is as yet unable to render a definite evaluation of the therapeutic value of the protein-deficient serum, but he maintains that he saw nothing indicating its inferiority to the native serum.

Psychic Behavior at High Altitudes—Jongbloed investigated whether the oxygen deficiency would impair the alertness of an aviator flying at an altitude of 5,000 meters, pointing out that such heights occasionally are necessary when high mountains have to be crossed, particularly if cloudiness obscures the mountains. The alertness of the aviator is especially important in case of so called blind flying that may be necessary on account of the cloudiness. The author found that the rarefaction of the atmosphere at the altitude of 5,000 meters causes only slight impairment of the mental alertness in the radio telegrapher. He found that the slowing down of the mental alertness was most noticeable in the choice reactions, the regularity being influenced more strongly than the duration of the reaction time. However, the author is convinced that a trained aviator can safely fly for about an hour at an altitude of 5,000 meters but that a further increase in the altitude decreases the alertness rapidly and, for instance, blind flying during bad weather makes higher demands on the alertness of the aviator. Three of the author's test subjects had to breathe oxygen shortly after an altitude of 5,000 meters had been reached, while four others had difficulties. This indicates that at this altitude difficulties may be encountered in passengers, for, although the aviators can be selected in air transportation, the passengers cannot. Accordingly it is necessary to take measures so that air transportation will not cause difficulties even in the weakest of the passengers. The author states that an oxygen supply should be available for altitudes of more than 5,000 meters. However, he thinks that breathing-masks and other instruments are likely to alarm the passengers and should be avoided. He thinks that since the cabin of a modern plane has a regulable ventilation system, it would probably be possible to keep the oxygen tension high enough by forcing in a supply of oxygen.

Medizinische Klinik, Berlin

31: 1385 1420 (Oct 25) 1935 Partial Index

Indications for and Results of Irradiation in Tuberculosis of Lymph Nodes G von Pannewitz—p 1394

*Impairment of Heart by Roentgenotherapy G W Parade.—p 1396

Differential Diagnosis of Ureteral Calculi F Kerschner—p 1397

*Papillary Cystocarcinoma of Thyroid in Girl Aged 14 F Kriegelstein—p 1399

*Special Form of Staphylococcal Infection of Leptomeninges A Ghon and Maria Mittelbach—p 1403

Cutaneous Pigmentation and Roentgen Irradiation J Borak and D Eisenklamnn.—p 1405

Impairment of Heart by Roentgenotherapy—Parade says that in 1933 he called attention to exacerbations of thyrotoxic cardiac disturbances following roentgenotherapy of the thyroid. He reports the histories of two patients whom he observed recently and in whom roentgenotherapy was followed by disturbances in the cardiac rhythm. The first patient was a man aged 42, who had mitral stenosis and who was subjected to roentgenotherapy of the right lower field of the lung because of a suspected tumor. At first the irradiations given at inter-

vals of two or three days were well tolerated, but considerable acceleration of the pulse and severe arrhythmia developed a few hours after the last irradiation. Electrocardiography disclosed closed auricular fibrillation and absolute arrhythmia of the ventricles. The arrhythmia proved extremely refractory, it did not yield to treatment with large doses of quinidine, but later it was somewhat improved by digitalis. The second case was that of a woman, aged 58, who likewise had mitral stenosis and developed auricular fibrillation and absolute arrhythmia following the roentgen irradiation of a carcinoma of the uterine cervix. The anamneses of both these patients revealed that the mitral stenosis had caused practically no discomfort previous to the roentgenotherapy. In view of the fact that the arrhythmia developed in both patients immediately after the irradiation, the author assumes a connection between the two. It is noteworthy that in the one patient the heart had been directly exposed to the rays, whereas in the second case the action must have been indirect. The author assumes that substances liberated in the course of the roentgenotherapy might exert their harmful effect on the heart or on the centers regulating it. He cites the case of a woman with polycythemia rubra, in whom the long tubular bones had been irradiated with roentgen rays and who had developed a threatening auricular flutter. This case was somewhat more complicated in that the flutter responded to quinidine treatment, but ten days later a fatal coronary thrombosis developed. The author concludes that great precaution is necessary if roentgenotherapy is employed in patients with heart disease.

Staphylococcal Infection of Leptomeninges—Ghon and Mittelbach describe a case of staphylococcal meningitis which is noteworthy because of its macroscopic and histologic aspects. The case had been diagnosed clinically as meningo-encephalitis and cardiac and aortic defect. The primary disorder had been an ulcerous endocarditis, and death was caused by septicopyemia. Histologic examination of the brain disclosed recent meningo-encephalitis with abscess formation. The majority of the abscesses contained bacteria either in the form of emboli or in clumps free in the tissues. Evaluation of the various aspects indicates that the process was a septicopyemia caused by *Staphylococcus pyogenes-aureus* which originated in a recurring, ulcerous-polypous endocarditis of the aortic valves and led to hematogenic metastases in the liver, kidneys, spleen, epicardium, brain and leptomeninges. The case is especially noteworthy because of the anatomic aspects of the leptomeninges, which contained small and miliary abscesses with hemorrhagic areolas at the convexity of the cerebrum and in the cerebellum. With the exception of small hemorrhages in the cerebellum, which indicated encephalitic foci, the brain was free from encephalitic signs. The author is convinced that the abscesses in the leptomeninges are hematogenic metastases of the endocarditis. This form of hematogenic, metastatic infection of the leptomeninges is unusual and for that reason noteworthy, for the metastatic infiltrations of the brain in case of acute infections usually appear in the form of abscesses in the cortex and medulla. The reported case contradicts the statement of Spatz, according to which the meningitic foci develop as the result of the encephalitic ones, that is, secondarily, for the histologic aspects of this case justify the assumption that the encephalitic foci were caused by the leptomeningitis either by direct transition or by way of the vessels and possibly also partly by the hematogenic route from the endocarditis.

Zeitschrift f Geburtshülfe u Gynäkologie, Stuttgart

111: 273 416 (Oct 22) 1935 Partial Index

Studies on Function of Uterine Muscles L Kraul—p 273

Studies on Susceptibility to Solution of Pituitary of Musculature of Human Uterus in Surviving Organ K Podleschka—p 293

*Thyroid Therapy of Preeclampsia and Modification of Basal Metabolism During Preeclampsia and Pregnancy H Dietel—p 326

Missed Abortion Histologic Examination of Embryo Dead for Several Weeks in Uterus and Then Removed by Operation G Ilberg—p 336

*Pathologic Histology of Tumors of Breast H Limburg—p 353

Basal Metabolism During Pregnancy and Preeclampsia—Dietel shows that the basal metabolic rate is increased in the majority of pregnant women and that this increase disappears again during the puerperium and remains constant after it. Thyroid substance or its preparations are incapable of further increasing the heightened basal metabolic rate of

pregnant women. It is probable that the thyrotropic hormone of the anterior lobe of the hypophysis plays an important part in the heightened metabolic rate during pregnancy. In preeclamptic patients the basal metabolic rate is lower than in normal pregnant women, but it is impossible to compensate for this reduction by the administration of thyroid substance or of thyroxine. These observations show that the actions of thyroid preparations, particularly their effect on the basal metabolism, are reduced during pregnancy and preeclamptic and eclamptic conditions. The author points out that this explains the high tolerance for thyroid preparations in healthy pregnant women and in those with preeclampsia. He says that this resistance to thyroid preparations is being further investigated in order to find a better treatment for the preeclamptic conditions.

Histology of Tumors of Breast—Limburg shows that in the great variety of histologic pictures of mammary tumors there are borderline cases that stand between benign tumors and malignant ones. At his clinic thirty-two such cases came under observation (in addition to 784 unsuspected cases) within the last ten years. He describes eighteen cases in which the histologic examination of the exploratory excision did not permit a definite prognosis. Only three of these patients were subjected to a radical operation (amputation of breast and removal of axillary glands), but all were kept under clinical observation and during a period of from one to six years all remained free from relapse. In view of this observation and although he is aware of the fact that the number of cases is rather small, the author thinks that a malignancy index of from 25 to 50 per cent is too high for cases of cystic breast and that the epithelial proliferations do not deserve the unfavorable estimation to which they are generally subjected.

Zeitschrift für Krebsforschung, Berlin

42 347 448 (Sept 21) 1935 Partial Index

- Influence Exerted by Male Gonads on Taking and Growth of Transplantation Tumors. E. Pribram—p. 368
Influence of Diet on Growth of Inoculation Tumors. Influence of Zigzag Diet. G. F. De Gaetani—p. 373
*Attempt at Bacteriotherapeutic Modification of Course of Tar Cancer. L. H. Peretz, A. I. Newler and L. T. Larionow—p. 417
*Does Cancer Mortality Increase? H. Schwarz—p. 426

Bacteriotherapy of Tar Cancer—After calling attention to previous studies with colon bacilli, Peretz and his associates describe further studies which they made on sixty-two mice with tar cancer. Observations made in the course of these studies on the treatment of tar cancers with coli agar revealed that (1) in a number of cases this treatment cleanses the cancer wound surface, inhibits the crust formation and prevents suppuration, (2) occasionally it produces a certain inhibition of the growth of the tumors, (3) it seems to prolong the life of the mice with extremely large tumor wounds. Studies were made also on the microflora of the tar cancer and on its modification by the coli therapy. Tests that were made before the onset of the bacteriotherapy revealed in many cases streptococci and staphylococci, in some cases *Bacillus proteus* and in others sporogenic bacteria. However, the most frequent microflora were gram negative organisms that belong to the coli group. The authors refer to them as the "tar cancer bacilli." Tests made in the course of the coli therapy revealed that it counteracts to a great extent the staphylococci, streptococci, sporogenic bacilli and other microbes but that it exerts only a slight influence on the "tar cancer bacilli." Experiments *in vitro* corroborated these observations. In further studies they attempted to find an antagonist to the "tar cancer bacilli," but without success for the experiments proved that coli therapy represents the most effective antagonist. Attempts to counteract the resistant "tar cancer bacilli" with a polyvalent antiviral failed likewise. In summarizing their observations, the authors reach the conclusion that the favorable action of coli therapy on tar cancer is due to the fact that it vigorously counteracts the staphylococci, streptococci and other micro-organisms and that it influences the "tar cancer bacilli" at least slightly. They hope that coli therapy will eventually be applicable in human beings, particularly in those with cancer of the intestinal tract.

Cancer Mortality—Schwarz analyzes the cancer statistics of Czechoslovakia, which indicate a great increase in cancer

mortality in recent years. He shows that this increase is apparent rather than real, it being accounted for partly by the predominance of the higher age groups and partly by the fact that a larger number of cancers are now recognized than was formerly the case. The importance of the latter factor is proved by the fact that the increase in cancer mortality is especially great in the eastern portion of Czechoslovakia, where formerly lay persons gave the cause of death in a larger number of cases than is the case today. As this part of the country becomes better supplied with physicians and hospitals, cancer is more often recognized as the cause of death. A comparison of the cancer statistics of recent years with those of the previous ones indicates that the increase in mortality from cancer is largely explained by the decrease in such diagnoses as death from "old age" and from other indefinite causes.

Vestnik Khirurgii, Leningrad

40:1 270 (Nos 112 113) 1935 Partial Index

- Morbidity and Mortality of Appendicitis. I. M. Rokhkind—p. 15
Anatomopathologic Aspects of Acute Appendicitis. G. V. Shor—p. 34
*Data Regarding Time of Operation in Acute Appendicitis. M. V. Krasnoselskiy—p. 45
*Treatment of Indurative Stage of Acute Appendicitis. B. G. Stuchinskiy—p. 60
*Acute Appendicitis in Children. V. A. Shaak—p. 99
Appendicitis in the Aged. N. D. Kamenskaya—p. 113
Erythrocyte Sedimentation Test in Acute Appendicitis. E. P. Chernyaeva—p. 158
*Operative Treatment of Appendiceal Peritonitis Without Drainage. M. V. Krasnoselskiy—p. 193

Time of Operation in Acute Appendicitis—Krasnoselskiy studied 1,944 cases of acute appendicitis from the point of view of operative indications at various stages after the onset of the attack. The study of the pathologic alterations in the appendix demonstrated that neither the time elapsed since the onset of the acute attack nor the clinical picture made it possible to estimate the underlying pathologic condition of the appendix and of the adjacent structures. The prognosis cannot be established with any degree of certainty on these data. The author therefore believes that operation is indicated as soon as the diagnosis is made, regardless of the time elapsed or of the degree of severity of the clinical symptoms. Conservative treatment is permissible only in cases with well defined palpable induration, provided the patient is kept under observation in the surgical division. The incidence of acute appendicitis in women was less than in men. It ran a milder course and its mortality was about one third that occurring in men. The deciding factor in mortality was not the time element and the consequent loss of immunobiologic properties of the organism, but the pathologic alteration in the appendix and the surrounding structures. Comparison of a series of 500 cases up to January 1933 with a series of 1,444 cases from Jan. 1, 1933, to July 15, 1934, showed that the mortality was lowered from 3.2 per cent to 1.8 per cent. The mortality for the two series was 2.16 per cent, 3 per cent in men and 1.12 in women.

Indurative Stage of Acute Appendicitis—Stuchinskiy analyzed the 172 cases of appendiceal abscess occurring in 1,944 cases of acute appendicitis admitted to the Leningrad Institute for Quick Aid. Of these 54 per cent occurred in women and 46 per cent in men. The average day of admission for cases complicated with a tumor was the sixth. The causes for tardy reference to the hospital were (1) delayed or erroneous diagnosis in 33 per cent, (2) attempt at conservative treatment at home, because of an impression that surgical intervention was not indicated, in 32 per cent, and (3) refusal of hospitalization or operation in 30 per cent. Patients admitted to the institute in the stage of tumor formation were treated conservatively. In the absence of signs of peritoneal inflammation the treatment was limited to rest and the application of heat. Spontaneous absorption of the induration took place in 141, or 83 per cent of the cases, usually on the twelfth to the thirteenth day. In twenty-seven the induration went on to suppuration. Operation was performed in these cases. It consisted of incising the abscess and draining without opening the peritoneal cavity or attempting to remove the appendix. There were three fatalities among the 172 cases (1.7 per cent). The follow-up study for the next two years revealed 32 per cent of recurring attacks. Emergency operation was performed in 18 per cent. Because of persistent pains, 14 per cent of the patients were

operated on in the cold stage. The examination of the removed appendixes showed that this structure persisted in 97 per cent of the cases. The author therefore believes that the appendix should be removed in the interim stage following the recovery from an appendiceal abscess.

Acute Appendicitis in Children—Of 140 cases of acute appendicitis in children reported by Shaak, 58 per cent were in boys and 42 per cent in girls. Acute appendicitis in children runs a more severe course than in adults and gives a higher mortality. The total in this series was 8.5 per cent, for cases of later stages it ranged from 16 to 20 per cent. The younger the child the more serious the prognosis, the mortality for those less than 3 years of age amounting to 20 per cent. The pathologic alterations in the appendix and in the peritoneal cavity develop with great rapidity, and perforation may occur earlier than twelve hours after the onset. The diagnosis in young children is difficult, and errors are more frequent than in adults. Pneumonia furnishes a high percentage of diagnostic errors. The operative indications are the same as in adults, the insistence on an early operation, however, must be even more urgent here because of the rapid progression of the process. The author advocates operative intervention in any stage of acute appendicitis, even after forty-eight hours, if the symptoms are not abating.

Treatment of Appendiceal Peritonitis Without Drainage—Krasnoselskiy analyzed the 1,944 cases of acute appendicitis in which operation was performed in the Leningrad Institute for Quick Aid between May 1932 and July 1934 with especial consideration of the results obtained with the method of closing the peritoneal cavity without drainage. He shares the view of many authors that the general peritoneal cavity cannot be drained and that therefore the drain is superfluous and at times injurious. If the appendix has been removed the bleeding arrested and peritonization complete, there exist no indications for drainage. This postulate is not influenced by the character of the exudate, by the existence of gangrene or perforation of the appendix, or by the time elapsed since the onset of the attack. Local drainage with the view of isolating the focus of infection from the rest of the peritoneal cavity is indicated in the presence of a suppurating area denuded of peritoneum, in failure to remove the appendix, in improperly carried out appendectomy, or in the presence of a raw, oozing surface. In a series of 950 cases of purulent appendicitis 98 per cent were closed without drainage. In a series of 360 cases of gangrene or perforation of the appendix, 67 per cent were closed without drainage. The percentage of drained cases in a total of 1,330 severe purulent appendicitis cases was 10.5. With regard to the character of the exudate, local drainage was practiced in 37 per cent of the seropurulent type, in 30 per cent of the purulent and in 54 per cent of the cases with abscess formation. Residual abscesses were less frequent when drainage was omitted. The incidence of abscess of the pouch of Douglas in the series in which drainage was not practiced was 3.3 per cent while in the series in which it was practiced it was 7.8 per cent. Abscess on the left side was seen in 0.34 per cent of the cases in which drainage was not done and in 2.16 per cent of the cases in which drainage was done. There was only one case of subdiaphragmatic abscess, and that occurred in the drained series. Mortality in the series in which drainage was not practiced was 1.5 per cent, while in the other series it was 17 per cent. The analysis of the twelve fatalities occurring in the series in which drainage was omitted shows that only seven patients died as the result of spreading peritonitis that was already present at the time of operation.

Bibliotek for Læger, Copenhagen

127 343 381 (Oct.) 1935

*Familial Occurrence of Chronic Suppurative Coloproctitis. O. Moltke.—p. 343

*Hyperproteinemia (Late Diagnosis of Myeloma: the Formol Gel Reaction, Bence Jones Proteinuria and Kidney Lesion). Case. J. Bing.—p. 354

*Hyperglobulinemia with Disturbance of Central Nervous System on Toxic Infectious Basis (Myelitis Polyradiculitis Changes in Spinal Fluid). Two Cases. J. Bing and A. V. Neel.—p. 369

Chronic Suppurative Coloproctitis—The malignant (ulcerous) form of this disorder appeared in two of the five families described by Moltke, and a more benign form in the

other three. He says that familial occurrence of the disorder is suspected in four additional families, but verification of the diagnosis has been impossible for various reasons. Transmission by infection from one member of a family to another is regarded as quite improbable in most cases of suppurative coloproctitis.

Hyperproteinemia—After repeated examinations, myelomas were finally demonstrated in one of Bing's three cases of hyperproteinemia, in patients aged from 56 to 59, but could not be confirmed roentgenologically in the other two. In the second case the diagnosis was verified after sternal puncture and on necropsy. The third patient continues under observation. The hyperproteinemia, in all cases a hyperglobulinemia, was indicated by a marked increase in the sedimentation reaction (from 75 to 159 mm in one hour), and the formol gel reaction was positive in these cases but negative in serum from normal patients and patients with other disorders. There were renal lesions in all three cases with elimination of large amounts of Bence-Jones protein in one case. Examination of the relative albumin percentage in the urine containing Bence Jones protein showed considerable variations depending on the total protein content, and the proteinuria varied with the creatinine clearance independently of the diuresis, as previously shown in ordinary proteinuria and cholesterolemia.

Hyperglobulinemia—Bing and Neel describe two cases of marked hyperglobulinemia associated with pronounced changes in the central nervous system, such as myelitis and polyradiculitis, and changes in the spinal fluid. The patients subsequently evinced a high rate of erythrocyte sedimentation and a positive formol-gel reaction. Infections were present in both instances. The authors assert that these cases present a picture not previously reported.

Finska Lakaresällskapets Handlingar, Helsingfors

77 527 588 (Sept.) 1935

Phlyctenular Diseases of Eye and Their Relation to Tuberculosis and to Some Ectoparasites and Endoparasites. O. Heinonen.—p. 527

*Puncture of Bone Marrow with Especial Reference to Bone Marrow in Pernicious Bothriocephalus Anemia. G. Totterman.—p. 547

*Grave Pseudoparalytic Myasthenia in Child Aged 2. L. Grönlund.—p. 559

Puncture of Bone Marrow—Totterman considers Annkin's method for intravital examination of the bone marrow the simplest procedure and uses it. In a typical case of cryptogenic pernicious anemia the bone marrow punctate was characterized by marked increase in the nucleated red blood corpuscles, 286 to 400 white, a large part consisting of promegaloblasts and megaloblasts. The number of reticulocytes in the punctate was the same as in the blood. In two cases of pernicious bothriocephalus anemia the bone marrow showed changes similar to those in the case of cryptogenic anemia, the resemblance between these two forms of pernicious anemia thus extending to the changes in the bone marrow. The difference between the blood and the bone marrow pictures in a case of chronic lymphatic leukemia and one of untreated chronic myeloid leukemia was slight. In a patient with a low leukocyte count in the blood more than 90 per cent myeloblasts were demonstrated in the bone marrow, after some weeks the blood presented the typical picture of acute myeloid leukemia.

Pseudoparalytic Myasthenia in Child—Grönlund says that the characteristic symptoms of ptosis and strabismus marked the onset in this case, and the chronic course, remissions, aggravation after five months with difficulty in chewing and swallowing, weakness in the muscles of the neck, indistinct articulation and greater intensity of the symptoms in the evening than in the morning pointed to a typical myasthenia. Three months' hospitalization with rest in bed for about two months and general strengthening treatment resulted in improvement. The history of occasional strabismus on the part of the child's father and brother afforded the only suggestion of a constitutional etiologic factor. The low values found in the sugar loading and epinephrine tests point to a disturbance in the carbohydrate metabolism and tend to support the hypothesis that the cause of myasthenia depends on disturbances in the endocrine system.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 105, No 26

CHICAGO, ILLINOIS

DECEMBER 28, 1935

TOXEMIA OF PREGNANCY

A CLINICAL AND PATHOLOGIC STUDY

JAMES ROBERT GOODALL, M.D., C.M. (McGILL),
D.Sc. (McGILL)

Gynecologist and Obstetrician to the Royal Victoria Montreal Maternity
Clinical Professor of Gynecology and Obstetrics to McGill University
Faculty of Medicine Gynecologist and Obstetrician to the
Jewish General Hospital

MONTREAL

Let it be stated that this work is far from completion some parts are quite clear in my mind, others are still nebulous, and do not as yet fit perfectly into the scheme of things. For the last reason, it is thought that the whole truth has not been grasped. This applies not to the observed facts, which are irrefutable, but rather to the interpretation that has been put on these. This criticism applies more especially to the pathology of the placenta—a new, almost virgin, field. A good deal has been written about the physiology of the placenta, but of the pathology there is next to nothing. This study will cover a most intensive application to 1,000 placentas, described in detail immediately after birth, then labeled and hardened for six weeks. These are then cut into slabs of 1 cm thickness, each slice is critically examined with a magnifying glass, and blocks for microscopic study are cut from these. The total will cover about three to five thousand slides. The clinical history is appended to each placental description, for study of relationship of pathologic changes and clinical signs. These 1,000 cases, of which 750 are completed—the other 250 are reserved for more intensive study—are consecutive hospital cases, normal and otherwise. The clinical study, on the other hand, comprises research on about 300 cases of toxemia of all grades of intensity. Lastly, an endeavor has been made to correlate clinical pathologic observations with placental disease. Here is the weak link, as yet quite incomplete, still nebulous, requiring careful circumspection and slow speed. Let me repeat, this is an incomplete report, subject to minor, perhaps some major, changes as new discoveries are made.

CLINICAL STUDIES

It is commonly taught that toxic cases in pregnancy fall into two great categories (1) the preeclamptic and (2) the nephritic. Let me most emphatically state that this is wrong. There is but one toxemia of pregnancy, and all cases fall into that group. Only the preeclamptic are being dealt with, and these should be spoken of as cases of toxemia of pregnancy, and not as preeclamptic. All cases of toxemia are potentially eclamptic, but not all of them are preeclamptic.

But what has led to this erroneous subdivision of cases into preeclamptic and nephritic is the hitherto unrecognized facts that, like all other diseases, toxemias are either (1) acute or (2) chronic, and these two groups differ so markedly in clinical picture and pathology that the connection has been overlooked. The chronic cases resemble the nephritic but are not nephritic, and when nephritis or kidney damage antedates a pregnancy, these cases ought to be spoken of as a nephritis complicated by a pregnancy, just as a heart or other diseased system may be complicated by a pregnancy. The clinical characters of acute cases will differ according to the organs that have to bear the brunt of the toxic attack, whether it be liver, kidneys, nervous system or gastro-intestinal tract, and those organs will show the first and perhaps the most dominant symptoms, which possess a low reserve, or an idiosyncratic weakness for that specific poison. So that whether the clinical picture of the toxemia is the so-called renal or hepatic or neurotrophic or vascular extravasatory is not due to different primary or intermediate causes but to individual system instabilities arising out of a low reserve, combined with the intensity and the duration of the toxic attack.

In acute fulminating toxic states, the systems have not time to adjust themselves to the sudden development of the toxemia. As a consequence, the symptoms differ as markedly as do those of acute from chronic infections. The chronic toxemias, on the other hand, present a very protean symptomatology, and the reason why these cases rarely pass into eclampsia is that the time element allows for the development of cell accommodation and for increased tolerance on the part of the autonomic nervous system. The mass group of chronic cases can be classified more or less according to their symptomatology, and, what is much more important, much can be gathered that permits one to form some opinion of the danger to both mother and fetus.

1 A group of chronic cases in which the only sign of toxemia is a very large quantity of albumin in the urine, with or without casts. The albumin may be as high as 12 Gm to the liter. It is not a matter of indifference whether casts are present or not. Into this further refinement I cannot enter here. But the total absence of symptoms and other signs is striking. These cases offer very good risks. Rarely do any serious damages to either mother or child develop. The placenta rarely shows any serious changes that might jeopardize the life of the fetus. The patients often wonder why so much concern is shown for them.

2 Cases similar to the former group but showing an elevated blood pressure. Here also there is a total absence of symptoms. In this group the prognosis of both mother and child depends more on the blood pressure than on the amount of albumin. In a percentage

of these, as in all toxic cases, the history of blood pressure before or in the early months of pregnancy may permit one to determine whether the pressure is due to the pregnancy or to some cause outside and antedating the pregnancy. It is only by watching cases from the early months, studying them in retrospect, that one can arrive at any differentiation. The prognosis varies with the blood pressure, and there is grave danger to both mother and fetus.

3 Cases without any symptoms whatever except a rising blood pressure and a progressive pallor. There may or may not be albumin and casts. In the majority of instances these are absent or intermittent. These are dangerous cases, with a doubtful prognosis for the mother and a bad prognosis for the child. The mother's future may be judged by the past observations and by the duration and intensity of the blood pressure. The life of the fetus is always a doubtful quantity, owing to the frequency of associated placental disease. The outcome for the fetus may be death in utero or intra partum, or the birth of an octogenarian.

All the foregoing have been symptom free.

4 Those with general or local edema and a normal blood pressure. These are relatively rare and are mostly found in twin pregnancies, and, as a rule, the prognosis for mother and child is good.

5 A group with edema, high blood pressure, albumin and casts, with nerve center symptoms such as headache, flashes in the field of vision, frosted glass visibility and intractable neuralgias. The prognosis for mother and child is poor if pregnancy is not soon terminated. The children often succumb. This is the common neutrotropic type, dangerous at the moment, and often leaving a train of nervous symptoms and ill health afterward.

6 A series with high blood pressure, gastro-intestinal disturbances, epigastric pain and possibly jaundice. Albumin may be large in quantity, with casts and a variable quantity of bile in the urine. The prognosis is bad, and unless the pregnancy is soon terminated, either spontaneously or artificially, the outcome will undoubtedly be serious.

These, of course, are more or less arbitrary lines of division, but they conform rather closely to types.

HEMATOLOGY

About 200 cases of toxemia have been examined by Dr. Rudolf Gottlieb and myself. In most of the cases of toxemia, even in the early stages before symptoms or clinical signs have developed, there can be demonstrated a definite shift to the right in leukocytes, such as one finds in many of the endocrine dyscrasias. The leukocyte count in pregnancy, normal and otherwise, is elevated to 10 to 12 thousand, owing chiefly to neutrophils, and in cases of advanced placental disease and necrosis this is shown in the blood by a definite microcytosis. But by far the most important change is found in pregnancy in the lowering of the hemoglobin coefficient. It has been found that the falling off of the hemoglobin content of the red blood cells (which by the way, do not show a corresponding reduction in number) begins rarely before the fifth month and is progressive from that time on. This is a true hypochromic anemia, and of the 300 cases that have shown this condition nearly every one has either a total, or nearly total, absence of gastric hydrochloric acid. This hypochromic anemia is particularly marked in cases in which the pregnancies have followed one another in rapid succession. In the young, and in those with few pregnancies, the hydrochloric acid begins to return post partum, before

the patients leave the hospital. In the graver cases, with multiple pregnancies, the return is much retarded or may be incompletely restored or totally and permanently absent. The interesting sequence is this: that these cases respond rapidly to huge doses of iron, and as their blood equation is restored, many of the symptoms, such as numbness of the forearms after sleep, muscular cramps, headaches and neuralgias, disappear rapidly, almost magically. I think it also a fair inference that the incidence of toxemia will be greatly reduced by raising the quality of the blood, and consequently also of the cells and function, to normal or nearly to normal, for the tissues cannot be healthier than the blood, and normal blood and normal tissues presage normal function.

When, on the other hand, one comes to a consideration of blood chemistry in relation to toxemia, the situation is constructive. In all, several hundreds of all grades of chronic toxemia have been studied, and one is forced to the conclusion that blood chemistry is almost labor lost. The reports come back in the gravest chronic cases without any signs of retention, except in the gravest true chronic nephritic, not true toxic, cases. The urea, nonprotein nitrogen, carbon dioxide capacity, van den Bergh test and uric acid content usually vary within the normal limits, except perhaps the uric acid content, which frequently is high but seems to have little, if any, clinical significance. The statement that a concentration of uric acid over 6 per cent is indicative of an impending eclamptic seizure is certainly not in conformity with our large experience. There seems to be a relationship between a high uric acid content and low blood sugar estimation, but this again seems to have slight or no prognostic value.

In cases of true nephritis, blood chemistry may be of inestimable value, but chronic toxemia is not nephritis. Would there not be more rational signs if one were dealing with nephritis? In all my cases there was but one case with signs of nephritis in the ocular fundi. The fundi are singularly free in chronic toxemia. The most one sees are occasional small hemorrhages and, in serious cases, edema of the disk. I purposely requested that these cases be examined by one man, a senior ophthalmologist in McGill, in order that the individual equation might be eliminated. Homatropine was used in every case so that there could be no mistake.

Moreover, I have already published reports of five cases of chronic "nephritis" cured by pregnancy—cases of true nephritis, if one can trust the symptoms and signs of nephritis as interpreted by professors of medicine in McGill. The patients had been hospitalized for a time and every known test performed, and had been under observation from two to five years. They were advised against pregnancy, but they took their courage in their own hands and today, after one or two pregnancies, are free from high blood pressure, albumin and casts—in fact, normal healthy individuals. It prompts the important question: what is nephritis? Several cases have been added to the list by my colleagues since my publication.

What, then, are the renal types of toxemia of pregnancy?

I am not prepared as yet to give an answer to that question. There are many more years of study ahead on the subject. But the vast majority of them are not nephritic when they appear so. Any deranged function, if sufficiently prolonged, will lead to progressive chronic organic changes, and that is the whole crux of this difficult problem. It is intensity and duration—but

chiefly duration—that lead to permanent organic disease. How long can deranged function persist without organic disease? The answer is that they are synchronous in operation, but functional dyscrasia may have to persist for quite a period and be of a certain intensity before the organic lesion becomes recognizable by our imperfect methods of examination. Hence the necessity of removing the cause as early as possible to reduce intensity and duration.

What is the cause of toxemia of pregnancy? I think it is an endocrine dysfunction. I published the study of the subject over a year ago. The reasons were as follows:

Pregnancy causes more change in the endocrine systems than in any other organs except the uterus. That is generally admitted today. The ovaries, thyroid, pituitary, pancreas, bone metabolism frequently all undergo marked alterations in pregnancy. In the majority of instances these changes usually retrogress when the pregnancy ceases. But occasionally pregnancy initiates a continuous train of endocrinologic sequences that are persistent, often permanent and progressive. That spells eventually progressive organic lesions. What glands are mostly at fault in toxemia? The major part of the blame would seem to lie with the posterior pituitary. The posterior pituitary has been shown to contain at least three ingredients which control uterine action, water balance, and blood pressure. Other glands of internal secretion have a profound effect on blood pressure also and may be incriminated with the posterior pituitary. Doubtless this is frequently the case, because endocrinologic dysfunctions are seldom uniglandular but mostly plurglandular. In two cases of death following eclampsia I have been able to demonstrate unusually large pituitaries. These as yet have not been serially sectioned, but enlargement is not necessarily an accompaniment of increased function.

The whole danger, not in relation to life but in relation to organic disease, lies in the persistence of the dysfunction after the pregnancy has ceased, and this persistence is almost proportionate to the duration of the dysfunction in the pregnancy. Naturally intensity plays a large part also, but not to the same extent. These last two statements are so important and regular in their application that they might be put into the form of an axiom.

Toxemia considered from an endocrinologic etiology can be explained logically and that hypothesis as to its etiology gives us a rational instead of an empirical understanding of its treatment. By the endocrinologic hypothesis a ready explanation can be found for the cure by pregnancy of so-called nephritis, and for the incidence of organic lesions following chronic toxemia.

For an explanation of the cures of chronic nephritis one has to study a graph of another gland, the thyroid. Its secretion is complex, like that of the pituitary. Its symptomatology is consequently complex, and the organic lesions that follow its prolonged hyperactivity are not the direct result of the gland overactivity but of metabolic dysfunction which it entails. These organic lesions are proportionate with the duration of the gland dysfunction but also with its intensity. So it is with the posterior pituitary: the remote effect of the overstimulation of these glands by the pregnancy will depend in the last analysis on the reserve of the affected gland. So that the intensity and duration of the impulse, on the one hand, and the sensitivity and reserve of the glands on the other, determine the lightness or severity of the reaction, as well as its duration and after-effects.

It must be well understood that every function of the body is under control of some gland of internal secretion and that the pituitary seems to occupy the position of a master gland, like the master machine in large industrial plants, which controls the rate of operation of all minor machines.

The study of the metabolic changes that occur in the body as a consequence of acute or chronic toxemia may furnish data that have a bearing on gravity and outcome but can never lead to a discovery of the causation, any more than an estimate of glycemia or of the organic changes that follow on it can give an inkling of the causation of diabetes. The renal, hepatic, gastrointestinal, cardiovascular changes of toxemia are merely consequences, not causes, and a study of these will give a clearer picture of the effects but not of the underlying primary agent or agents.

PATHOLOGY OF THE PLACENTA

A good deal has been written on the physiology and permeability of the placenta, but its pathology is almost a closed book. It has been my great privilege to turn over just a few pages. Seven hundred and fifty placentas taken consecutively have been subjected to careful study. Some knowledge has emerged from this. May I repeat that the statements I am about to make are facts not open to question, their interpretation is still decidedly questionable, requiring a great deal of atmospheric clearing before clear visibility is attained. One of the most striking facts is that placentas begin to degenerate at or about the seventh month, and that a normal healthy placenta at full term is a rarissima avis, so rare as to be almost nonexistent. The placenta at full term is a museum of pathology, in which the most startling and *suu generis* changes exist. Naturally these vary in degree in different placentas and at the various months of the third trimester. But, generally speaking, these degenerative changes are universal though varying in degree. This study has led to this understanding: that the placenta has a history like any other form of life. It has its embryony, its infancy, its adolescence, its maturity, and its senility. Interest lies chiefly in the end product. Generally speaking, decay begins about the seventh month and is progressive, though not necessarily so, and in this degeneration the placenta is not only frequently, but even liable—and more than liable, owing to its senility—to be overtaken by other disease processes, and it becomes one of my most difficult problems to separate senile changes from those of true organic pathologic changes. It will require years of intensive study to clear this field.

A question naturally rises to the mind. Why should placental degeneration occur when its full function has not been fulfilled? Let us go further. Why should degeneration occur when the fetal demands are still increasing? To the casual observer, this is an irrefutable statement. But it is a superficial view only of conditions. In early embryonic life the rate of life is greatly accelerated, and this rate gradually slows down throughout fetal life and throughout life in general until the end of senility. Therefore, fetal demands, cellularly speaking, grow less and less as intra-uterine term progresses. True, the number of fetal cells to be fed grows, but their appetites are smaller. But a much more important fact lies in this, that in the early stages of fetal life the embryo depends on its mother for all its needs. Differentiation has not yet occurred, and function, except the most essential, cardiac, has not yet been established. Later, when cell differentiation is complete, not only can the fetus supply most of its own

needs, but it may elaborate in excess to supply a deficiency in the parent—a reverse current, as it were. So that at the end of fetal life the placenta is merely the transmitter of oxygen and partly assimilable food, and the clearing house of products of fetal metabolism—almost a dialysis. Lastly, in placental function nature follows her general rule in doing things abundantly. The placenta normally is an organ with at least 75 per cent reserve. This to me was an astonishing finding, that a child in utero could live on less than 25 per cent of its full placental capacity. But my surprise diminished when I thought of nature's care for the species, and it ceased completely when I learned from our physiologists that the young healthy child calls on only about 40 per cent of the functional capacity of its organs. If this is the case in postnatal life, how much more must this be true in fetal life, when body heat production, food search, food effort and food elaboration are reduced to a minimal denominator—in fact, when energy expenditure is reduced to the lowest possible degree. For let it be well understood that the mechanical destruction of food products is all in the column of expenditures, whereas the chemical destruction of higher products to the lower is all in the column of energy generators. With the former, the fetus has nothing to do, the mother does all that part of the mechanical expenditure for her offspring. It has only to do with the function of chemically breaking down higher standards to lower, from which it probably derives most of its energy. That implies fetal function. Are we to suppose that fetal function starts only in postnatal life? On the contrary, birth is just an incident, life is just a continuation in a new medium. Birth is just a transition—a transition from an aquatic to a terrestrial life, with internal changes to allow easy accommodation. So we see that the function of the placenta diminishes as fetal life advances, and that therefore degenerations of that organ are in keeping with its diminished activity. In a word, in the last months of pregnancy it has already fulfilled its greatest function.

As yet, I cannot separate senile changes from those of active organic disease. That is for the future. But it can be stated that that which is consistently found in all placentas, though perhaps varying in degrees, must be degenerative and not active disease. But here again a disturbing factor is found. As pointed out by my colleague Dr. John Fraser, it is not improbable that a senile placenta is much more vulnerable to abnormal circumstances than is a placenta in the full bloom of functional activity. This interesting suggestion is quite true—true not only in the placenta but also in all forms of living matter.

What are the chief pathologic placental changes?

Roughly, in order of their frequency, placental pathologic changes are as follows:

- 1 Chorionic sclerosis and subchorionic degeneration
- 2 Placentosis
- 3 Placental hemorrhages
- 4 Infarctions (so called)
- 5 Placental degeneration cysts

In the space at my disposal I can spend but a few words on each of these.

Chorionic Sclerosis and Subchorionic Degeneration—A description of these changes—the fibrin deposits which spread from the fetal vessels like a lymph in response to maternal toxemia, the subsequent condensation of this, the sporadic deposit of lymph about a maternal node to constitute milk spots, the slow con-

striction of the deposits about the fetal blood vessels as they pierce the chorionic plate, the consequent subchorionic degenerations and diffuse blood extravasations—offers one of the most interesting chapters in human pathology.

Placentosis, a New Disease—The second most common disease of the placenta may be acute or chronic, massive or spreading, and runs a course closely resembling pneumonia in its gross but not its microscopic appearance. I can give but a sketchy outline of this common disease, heretofore unrecognized. In the very acute form of massive placentosis, the placenta is almost black and almost diffuent. When cut anywhere in the fresh state, the placenta oozes a pool of very black blood, on section, cavities filled with blood abound. The fetal vessels stand out turgidly engorged. The placenta also is turgid, giving it a firmer consistency than normal, the cotyledons swollen and rounded as if under tension. After hardening for from four to six weeks, the placenta cuts like liver tissue and is blue black on the cut surface, numerous hemorrhages are seen varying in size from millet seeds to large extravasations. The thickness of the placenta may be increased to 2 and even 3 inches. To this stage of the disease, owing to its resemblance to acute pneumonia and to liver tissue, I have given the name of "red hepatization of the placenta."

When massive and of great intensity, it will eventuate in a complete "infarction" of the placenta, and death of the fetus usually occurs between two and three days after the acute onset. This eventually, if not cast off immediately, gives place to a large white fatty degenerated placenta. If, on the other hand, the intensity is not so great or of long duration, recovery may take place. In this process the placenta presents the gross characteristics of a lung undergoing gray hepatization. The cotyledons become discrete, giving rise to an alveolar arrangement. The alveoli are separated by soft degenerated maternal decidual tissue, and the center of each alveolus usually shows a hemorrhage of various size. The whole placenta may be uniformly affected, but in many instances certain portions may be affected more intensely than other parts. Under these circumstances a fraction of the placenta may die, giving rise to a large infarction, whereas the rest of the organ may recover and eventually hypertrophy. The hypertrophy is always most marked in the parts most remote from the infarction. Absorption of the infarcts is always by a fatty degeneration, and cavitation, even to the size of walnuts, is common in the infarcted areas. These vomicae are usually filled with detritus. In the cases of chronic placentosis one has the same process at work, but it varies in intensity, and repair processes in one part of a placenta may synchronize with creeping destructive processes in another. The differences may be due to the life in the uterus of the attached placenta. This has been carefully studied in twin pregnancies and in cesarean sections. Placentosis is not a result of labor, because it is found to be as frequent in placentas obtained from selected cesarean sections.

Infarcts arise in other ways, but time will not permit me to enter into this subject. Hemorrhage is the third most common pathologic entity of the placenta. It is almost an invariable accompaniment of placentosis and occasionally appears without the disease. The vast majority of hemorrhages of the former type are centrally placed in the cotyledons, but many hemorrhages, of a toxic origin, also arise in the degenerated maternal tissues. The interesting fact is that placental hemor-

rhage is common, occurring in four out of five cases, and the still more interesting fact that of the 600 hemorrhagic cases in my series there were only eleven that presented symptoms that permitted a clinical diagnosis.

Placental degeneration cysts occur in about one case in three, when present, they are usually very numerous and vary in size from an almond to microscopic dimensions. They always occur in the maternal decidual tissues and are therefore always found between the cotyledons or in the subchorionic areas. They have no clinical significance except as an expression of the degree of degeneration of the maternal tissues. Their mode of formation consists primarily in a tremendous swelling of the decidual tissues by a hyaline deposit, and later a liquefaction spreading outward from the core. Their content is always a clear blue-green jelly, except when discolored by hemorrhage, which is not infrequent. The walls of the cysts are made up of decidual cells in various stages of hyaline degeneration. Most bizarre ghosts of these cells frequently ornament the jelly center.

CLINICAL SIGNIFICANCE

What is the clinical significance of all this? There is a very distinct connection between these placental diseases and clinical toxemia of pregnancy. What that connection is, I am unable at present to venture an opinion. Whether the placental disease is a sequel to toxemia or whether the toxemia is a result of placental disease is a problem of the first magnitude. Suffice it to state at this juncture that the relationship is intimate. But there is another interesting feature, and that is that there seems also to be an equally subtle connection between placental disease and the onset of labor.

If the theory is accepted that toxemia is the expression of a metabolic upset consequent on an endocrine dysfunction, the treatment of toxemia of the last few years becomes rational instead of empirical. It consists in blocking the nervous system until the primary exciting cause of the acute toxemia—namely, the pregnancy—can be removed. But it is the chronic cases that interest me most. Acute toxemias have almost been eradicated by close observation in the antepartum clinics. But chronic toxemias are as numerous as ever, and the attitude toward these cases in recent years has undergone a marked change. One is no longer justified in multiparas, with living children, in driving the mother to carry on to the end of her pregnancy. I have found that the longer the toxemia has lasted in the pregnancy, the greater is the tendency for the signs to persist when the pregnancy is over. And the converse is equally true. In primiparas, the risks should be clearly pointed out to the prospective mother, and she should have the last word in deciding her course.

The categories previously laid down, though far from being decisive, will often help in deciding on the issue. My experience, with early intervention, has taught that the incidence of chronic arteriosclerotic nephritis in later years is very markedly reduced, by shortening the duration of toxemic states. That so-called renal cases are not nephritic in the early stages of the disease is manifest. But that they are prone to become nephritic if the vitiated metabolism persists is parallel with similar conditions in thyroid and pancreatic and other endocrine dyscrasias.

Study of placental disease has taught me that a large percentage of children enter the first stage of labor handicapped by placental disease, and these may readily lose out in any prolongation or major effort in the second stage, at which time placental circulation is

greatly impeded by the slowly diminishing placental site. The wonder also is that clinical placental hemorrhage is so common when placental hemorrhages are so very frequent. There is still much that requires elucidation.

1472 Sherbrooke Street West

ABSTRACT OF DISCUSSION

DR. J. C. JANNEY, Boston. The most notable advance in the study of toxemia is with regard to placental disorders. Dr. Goodall speaks of the frequency of anemia in pregnancy. Davis and Walker have reported similar observations. Although this report dealt with nontoxic patients, no one who is familiar with the importance allotted to anoxemia in the production of toxemia can fail to see that fighting the anemia and preserving the oxygen carrying power of the blood is one of the important ways of preventing or minimizing local damage in organs with low functional reserve. As to the etiology of toxemia, I should like to accept the original suggestion of Hofbauer that the cause is hypersecretion of the posterior pituitary, and the work of Anselmino and Hoffman demonstrating the presence of pressor and antidiuretic substances in the blood of patients with severe grades of the disease. My associates and I have been trying to repeat the experiments but have reached no conclusion. The classification of toxemia as taught at present is unnecessarily complicated but I cannot simplify it to one group. I should make preeclampsia and eclampsia a single group as Dr. Goodall does and I agree with him that the different renal, hepatic, convulsive and gastro intestinal manifestations are not due to differing primary or intermediate causes but rather to individual system instabilities in different patients. Pernicious vomiting and acute yellow atrophy of the liver may be shown to be manifestations of the toxemia of pregnancy. Low reserve kidney and chronic nephritis form what might be termed the decompensated kidney. It makes no difference from the point of view of the present pregnancy whether the kidney has been damaged by previous illness or is congenitally inferior. The essential feature is decompensation from overload. From the point of view of prognosis, however, the two may behave very differently. Long-term prognosis has received insufficient stress. The old idea that eclampsia conferred an immunity in subsequent pregnancies has been forced into the discard by the work of Peckham and others, who have shown that a very high proportion of such cases have been left with chronic nephritis. Heretofore it has been the accepted practice, except in the convulsive type of toxemia, to continue the pregnancy as long as it was safe. This subjected the liver, kidneys and other important organs to the greatest amount of damage consistent with life whereas if the patient had had a convulsive type of the disease and recovered she might likely have had less permanent damage to these organs because the pregnancy was promptly terminated and the toxemia thereby halted.

DR. KATHERINE KUDER, New York. The lack at the present time of a uniform method of classifying the various types of toxemia of pregnancy is a drawback in any attempt to correlate the ultimate observations of different investigators. In the obstetric division of the Woman's Clinic of the New York Hospital the value of certain kidney function tests, especially the urea clearance test, is emphasized. Kidney function tests assist in the differential diagnosis between chronic nephritis and preeclampsia (eclampsia) and the group of toxemia in which the kidneys are not injured by pregnancy. In chronic nephritis the tests show decreased function. In a woman suffering from a definite and proved chronic nephritis, we advocate termination of the pregnancy and prevention of any further pregnancies. It is our practice to study carefully the blood chemistry of all patients suffering from a toxemia of pregnancy. The results show very slight variation from the normal in cases of chronic nephritis complicated by pregnancy except when the nephritis is so severe as to be accompanied by nitrogenous retention. However, in preeclampsia, the blood chemistry is of value as it shows a steadily increasing uric acid content and often a lowered carbon dioxide combining power. It is contrary to our teaching to classify toxemia on the occurrence of clinical manifestations for totally different pathologic conditions may

be accompanied by the same symptoms. In their follow-up study of a large series of patients with chronic nephritis complicated by pregnancy, Stander and Peckham have shown that 40 per cent of these women died within ten years after the diagnosis was definitely established. This shows the grave prognosis of the condition and the importance of recognizing early in pregnancy an underlying nephritis so that the patient may be given the proper treatment. Dr Stander regards nephritis complicated by pregnancy as a distinct and separate entity or disease process from eclampsia and preeclampsia. Blood studies, the subsequent history of the patient and the kidney function tests all support this contention. He has seen no patient in whom the diagnosis of nephritis complicated by pregnancy was established beyond doubt by chemical and laboratory observations, including repeated kidney function tests, who was cured of the nephritis during, after or by a pregnancy.

BLADDER ABNORMALITIES DUE TO INJURY OF MOTOR PATHWAYS IN THE NERVOUS SYSTEM

LLOYD G. LEWIS, MD

ORTHELLO R. LANGWORTHY, MD

AND

JOHN E. DEES, MD

BALTIMORE

It is important to recognize and catalogue the changes in micturition that may be produced by neurologic lesions. It is necessary to deal not only with trunks of sympathetic and parasympathetic fibers that supply the bladder but also with reflex arcs in the brain and cord extending as high as the cerebral cortex. Lesions may occur on the sensory or on the motor side of the reflex arc. The loss of sensory impulses may give rise to variable symptoms, depending on the level in the nervous system at which the fibers are interrupted and on the sensory pathways that are damaged. Tabes dorsalis furnishes a good example of an interruption of the sensory fibers in the posterior roots producing vesical symptoms. In this paper we discuss lesions of the motor pathways from the brain that influence the bladder. Of these long motor pathways two are known, one arising in the cerebral motor cortex and one in the midbrain.¹

The present study is based on physiologic experiments reported some years ago by one of us.² Later we discussed at some length the neurophysiology of the bladder in connection with lesions of the spinal cord.³ The reader is referred to these earlier reports for a consideration of fundamental theories concerning the function of the smooth muscle of the bladder wall in relation to its nerve supply.

METHODS

Under the heading of methods we consider the general principles of a successful apparatus. We feel that manometers utilizing water instead of mercury should be used for several reasons. The waves of contraction

This study of the control of the bladder by the central nervous system was supported by a grant from the National Research Council.

Read before the Section on Urology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.

From the Medical Service of the Baltimore City Hospital, the subdepartment of neurology and the James Buchanan Brady Urological Institute, the Johns Hopkins University and Hospital.

1. Langworthy O. R. and Kolb L. C. Demonstration of Encephalic Control of Micturition by Electrical Stimulation. *Bull. Johns Hopkins Hosp.* 56: 37 (Jan.) 1935.

2. Langworthy O. R. and Kolb L. C. The Encephalic Control of Tone in the Musculature of the Urinary Bladder. *Brain* 58: 371 (Dec.) 1935.

3. Langworthy O. R. and Lewis L. G. Urgency and Frequency of Micturition in Neurological Disease. *Bull. Johns Hopkins Hosp.* 56: 211 (April) 1935.

during filling will be found of great importance in reaching conclusions concerning detrusor activity. These waves are greatly damped or even lost by the inertia of mercury. An air-water system will at once record any rise or fall in intravesical pressure.

Another advantage of the water manometer is the inexpensiveness of the material required. With a few lengths of glass and rubber tubing it is possible to construct an apparatus that is adequate in every respect and that can be sterilized.

The instrument is shown in figure 1. A soft rubber catheter was inserted through the urethra into the bladder. This was connected by a T tube with a source of sterile fluid and with the manometer. We not only recorded the intravesical pressure during filling by measuring the height of fluid in the glass tube but also made records on a kymograph. We could not have reached certain conclusions concerning waves of vesical pressure unless these graphs had been available.

Respiratory waves may be differentiated easily from the slow waves of contraction of the bladder muscle. We noted any changes in pressure due to coughing, straining or movements on the part of the patient. The patient should lie flat on the back and remain as quiet as possible during the readings. Toward the end of filling, in certain cases in which it was of interest, the patient was asked to attempt micturition, and the subsequent rise of pressure was recorded. The type of graphic record that is obtained varies with the method of bladder filling. It is most satisfactory to introduce the fluid in equal portions (25 or 50 cc at one time) and record the behavior of the bladder in the intervals. By this method

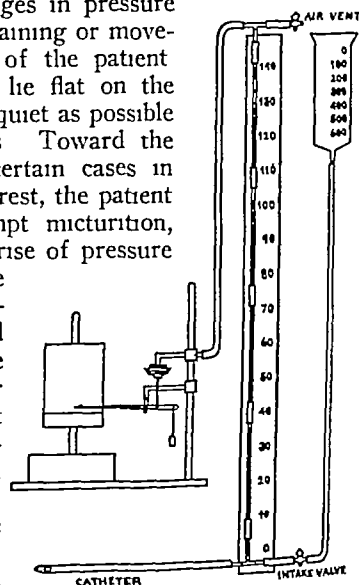


Fig. 1—Apparatus

it is possible to see the reaction of the muscle to sudden stretch and to measure the time required for the pressure to reach a resting level in accommodation to the new volume. The activity of the stretch reflex, which is of fundamental importance in the activity of the muscle, is tested in this way.

In this paper only the activity of the detrusor muscle is considered, and the pressure at which the sphincters opened. It is clear that the detrusor muscle normally is adapted for the storing of urine and that its contraction initiates micturition.

There is a certain distortion of the graphic record, owing to the stretch coefficient of the rubber diaphragm in the tambour. The rubber stretches markedly with slight increase in pressure, but the stretch is proportionately less marked as the pressure rises. Therefore slight changes when the pressure is low are magnified out of proportion to the changes at higher pressures.

CYSTOMETRIC READING MADE FROM A PATIENT WITH NORMAL BLADDER INNERVATION

The cystometric reading that is discussed as normal was made on a patient with an obstructive lesion at the vesical orifice and with a slightly contracted bladder.

The graph is shown in figure 2. An ideal adjustment of the catheter was made while the bladder was empty, so that respiratory waves were recorded. The pressure in the empty bladder was between 1 and 2 cm of water. Fluid was introduced in equal amounts of 50 cc until filling was complete. The intravesical pressure fell quickly to a resting level. Following the introduction of the first quantity of fluid the pressure was from 3 to 4 cm and was 8 cm only after 250 cc had been injected. When the bladder contained 150 cc and again at 200 cc there were irregularities in the graph resulting from movement on the part of the patient with 200 cc in the bladder there was the first feeling of distention. As filling progressed the bladder accommodated an increased volume less quickly. After 300 cc had entered the bladder the pressure fell slowly. There were a number of small waves of contraction, the pressure rose rapidly to 70 cm, and fluid escaped around the catheter. We felt that this was a normal record except that the total volume was somewhat below the average. A series of readings on normal individuals with bladder capacity of from 500 to 550 cc has been made.

TYPES OF LESIONS OF THE NERVOUS SYSTEM

In figure 3 we have endeavored to give a suggestion of the position of the lesions discussed in this paper. The bladder is bilaterally represented in the cerebral motor cortex. Patients were chosen with bilateral cerebral accidents that injured the motor pathways on both sides, the lesion would correspond to an injury at a level marked 1. Also patients with unilateral lesions were studied, the injury would correspond to the section of one pathway at 2. The changes in the extremities of the latter patients were manifested as a hemiplegia. The other motor pathway arises from cells in the region of the midbrain, they apparently have to do with the control of tone in the smooth muscle of the bladder wall. The manner in which the tracts from these two regions make connections in the

changes of the functioning of the bladder occur. The possible position of the lesion is indicated as 1 in figure 3. Under these conditions the bladder empties frequently and precipitously when small amounts of urine collect.

Usually the patient has little voluntary control and is constantly incontinent. If the sensory fibers to the cortex are uninjured, the patient may be aware of the imminence of micturition.

CASE 1—A white man, aged 64, was diagnosed as having syphilis, bilateral hemiplegia, pseudobulbar palsy and bladder and bowel incontinence of five months duration.

The record of the cystometric reading is shown in figure 4. The resting pressure in the bladder was 2 cm of water. After 25 cc. of fluid had been introduced the pressure gradually fell to a resting level of 6.5 cm. Respiratory waves were recorded. Then the volume of the bladder was increased to a total of 50 cc. A cough occurred which caused a sudden change of pressure. There was delayed accommodation. Then a wave of contraction occurred, followed by a fall of pressure and a sudden, precipitous rise to 96 cm. The bladder emptied completely around the catheter.

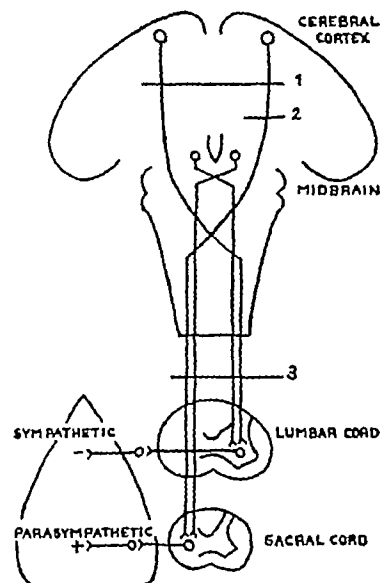


Fig 3—Position of lesions.

The average normal capacity of the human bladder is about 500 cc. In this patient the bladder contracted forcibly and emptied with a volume of 50 cc.

CASE 2—A white man, aged 51, was admitted to the hospital in 1935. The diagnosis was bilateral hemiplegia, pseudobulbar palsy, and bladder and bowel incontinence.

Figure 5 shows the behavior of the bladder as twelve equal amounts of fluid of 25 cc. were introduced, a total amount of 300 cc. of fluid was used. The rises in pressure due to the addition of fluid are marked with white dots in order to increase the ease of reading the graph. Immediately after 75, 125, 175, 225 and 300 cc were introduced, a contraction of the bladder musculature occurred. Some fluid escaped around the catheter at each rise of pressure, although the bladder did not empty completely. These contractions were of greatest force early in the process of filling, and they decreased in amplitude as a greater volume was attained.

The rises show that the muscle was hyperirritable to stretch stimuli. Contractions occurred only as every other 25 cc. of fluid was added.

UNILATERAL LESIONS OF THE CEREBRAL MOTOR CORTEX OR OF THE INTERNAL CAPSULE

In the basic work dealing with acute experiments with animals it was found that removal of one cerebral motor cortex caused a marked decrease in bladder volume.² Removal of both cerebral cortices produced a further decrease in bladder volume, the bladder then behaved after the manner described in the preceding section. Later the cerebral motor cortices were stimulated and the behavior of the bladder was noted.¹ This stimulation produced a fall in intravesical pressure followed by a sharp rise initiating micturition, if stimu-

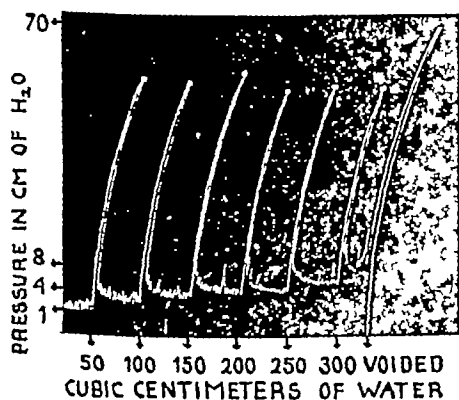


Fig 2—Normal cystometric reading

lous to influence the preganglionic autonomic cells is little understood. The final group of abnormalities that we shall discuss have to do with lesions of the motor tracts in the spinal cord. Here the two motor tracts lie close together in the lateral columns of the cord.

BILATERAL LESIONS OF THE CEREBRAL MOTOR CORTEX OR OF THE INTERNAL CAPSULE

After bilateral lesions of the cerebral motor cortex or of the internal capsule, injuring the fibers running from the cortex to the spinal cord, characteristic

lation was continued. We found that responses could be obtained more easily from one cortex than the other, and that usually the left was the more responsive. It was suggested that one cortex was dominant in bladder control.

We have studied the behavior of the bladder in seventeen persons with unilateral lesions of the cerebral motor cortex or internal capsule, with the typical changes in the extremities characteristic of hemiplegia.

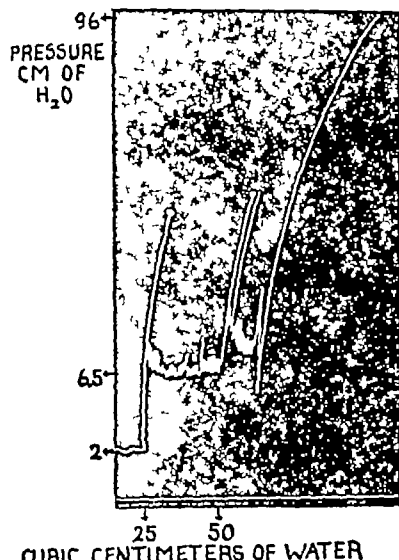


Fig. 4—Cystometric reading in case 1

one hemisphere is dominant in bladder control, and that this dominance is on the left side in right handed persons.

CASE 3—A Negro, aged 50, in August 1929 developed typical left hemiplegia with characteristic posture of the arm and leg.

A graphic record of the bladder function is shown in figure 6. Six equal quantities of fluid of 50 cc. were introduced into the bladder, which emptied on 300 cc. of fluid. The initial pressure in the empty bladder was 6 cm. of water, and the pressure remained below the level of 14 cm. of water until the bladder held 300 cc. Even with the viscous empty, and during the entire process of filling, small rhythmic contraction waves

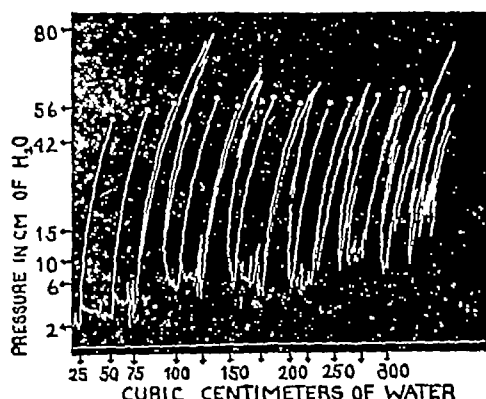


Fig. 5—Behavior of bladder in case 2

occurred. These have never been observed in the normal person. After the introduction of a quantity of fluid the pressure was slow in reaching a resting level, this became more marked as filling progressed. The rise of pressure at the end was definitely related to the introduction of fluid. Waves developed which rapidly fused into a tonic contraction, emptying the bladder. This is a typical illustration of the type of graph

obtained from patients with a left hemiplegia. The total volume, however, was comparatively small.

CASE 4—A Negro, aged 42, suddenly developed right hemiplegia with aphasia in October 1927.

The record of vesical function in this patient is shown in figure 7. Fluid was added in four equal quantities of 50 cc. Even with the bladder empty, contraction waves were present. They occurred throughout the course of filling, and the fall to a resting pressure was delayed after fluid was introduced. The pressure rose rapidly on 200 cc. of fluid, and the bladder emptied.

CASE 5—A Negro, aged 43, lost the use of his right arm and leg in June 1934. A marked aphasia developed at the same time.

Study of the bladder revealed marked motor abnormalities which are shown in figure 8. These have to do particularly with increased response to stretch stimuli. The pressure in the empty bladder was from 3 to 4 cm. of water, respiratory waves were recorded. After the first 50 cc. was introduced, the pressure fell slowly to a resting level of 6 cm. and there were small, irregular waves of contraction. Immediately following the introduction of each of the next three 50 cc. of water, the pressure rose to 76 cm. and sustained this level for some time. Irregularities of pressure were seen throughout the graph. Some urine was expelled with the strong contractions, but the bladder did not empty completely. When the bladder contained 200 cc. it contracted strongly not only once but a second time, and the experiment was terminated.

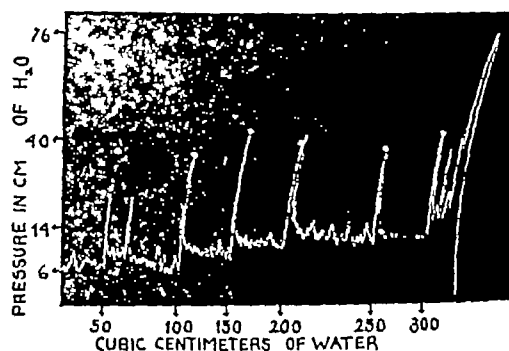


Fig. 6—Function of bladder in case 3

BEHAVIOR OF THE BLADDER AFTER INJURY OF THE MOTOR PATHWAYS IN THE SPINAL CORD

No cases of bilateral injury of the pathways arising in the midbrain that influence the activity of the bladder musculature have yet been recognized in isolated form. The pathway from the midbrain must be close to the corticospinal pathway in the lateral columns of the cord, and the two may be injured together. We shall present examples of spinal cord injury which produce abnormalities corresponding to those described in the preceding section. Later other examples will be given in which we feel that both the corticospinal tracts and the pathways from the midbrain had been injured bilaterally.

CASE 6—A Negro, aged 43, developed paraplegia in extension three years ago. This is a case of disseminated sclerosis. He never complained of any urinary symptoms. He stated that he micturated two or three times a day and twice at night.

Examination of the bladder function showed marked hyperactivity of the stretch reflex, as shown in figure 9. Fluid was introduced into the bladder in four equal quantities of 50 cc. The graph of the empty bladder recorded small waves of contraction. After each quantity of fluid was introduced, the pressure rose rapidly to over 65 cm. of water, and almost complete evacuation occurred with each rise. This is an excellent example of abnormality due to bilateral involvement of the corticospinal fibers to the bladder.

Another example of similar nature is given in which the bladder did not respond to each addition of fluid, and contractions due to more complicated causes were observed

CASE 7—A white woman, aged 39, suffered from disseminated sclerosis. In 1924 her legs became weak and a year later she noticed decreased visual acuity. In 1925 she first developed frequency and urgency of micturition, and this has been one of the most unpleasant symptoms of the disease as she had to empty the bladder almost hourly during the day and night. Report of the neurologic examination will be omitted except for the difficulties in the legs. The patient walked unsteadily on a broad base. There was outspoken ataxia of both legs. The deep reflexes were hyperactive in the legs, and there was a bilateral Babinski reflex. The blood and spinal fluid Wassermann reaction was negative.

The bladder record is shown in figure 10. Small contraction waves were seen with the bladder empty and throughout filling. The pressure with the viscus empty was 5 cm of water. The pressure fell to a level of 6 cm after the first 25 cc of fluid had entered the bladder. Then a sharp rise occurred to a pressure of 68 cm without the escape of fluid. We believe that this rise was dependent on psychic stimulation. The door was suddenly opened and some one spoke in a loud voice. We have shown in another place that the corticospinal responses

are sometimes not entirely lost in patients with the bladder symptoms characteristic of disseminated sclerosis, and that the intravesical pressure may be either raised or lowered by psychic stimuli.³ The pressure remained low after the next two quantities of 25 cc were introduced, but when the volume was made 100 cc it rose to 70 cm and the patient voided 75 cc, leaving a residual amount of 25 cc. The pressure fell to a resting level. Then no rise in pressure occurred until 75 cc had entered

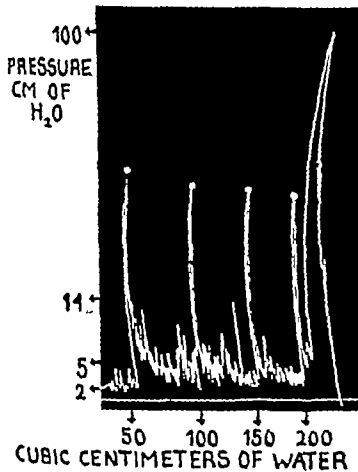


Fig 7—Vesical function in case 4

tered the bladder, making a total of 100 cc. Again the pressure rose to the former high level and 75 cc. was voided. It may be assumed in this case that the stretch reflex became active on a volume of 100 cc.

In the next two patients there was a different type of contraction wave with filling.

CASE 8—A Negro, aged 39 developed spastic paraplegia in 1925 due to syphilis. The patient complained of incontinence. This consisted of extreme urgency so that it was impossible to hold any quantity of urine, and dribbling occurred.

The bladder study is graphically represented in figure 11. Rhythmic waves were present even with the bladder empty. The introduction of 50 cc. of fluid was followed immediately by two large waves. The pressure then fell to a high resting level, and small contractions occurred at intervals. The patient was conscious of fullness during the large waves but was comfortable after they subsided. Increasing the volume of the bladder to 100 cc. is recorded on the graph by the second white dot. Then repeated large contraction waves occurred and the pressure never fell to a resting level. By engaging the patient in conversation we postponed the onset of the seventh wave. There was discomfort when the pressure was high. The waves continued with 150 cc. in the bladder, with moderate to severe discomfort. Some fluid escaped at the peak of the waves. With 200 cc. of fluid in the bladder the patient experienced severe pain. He could not voluntarily raise the pressure to a high level. The experiment was terminated at this point.

This record differs from the others in that the bladder was not only hyperirritable to stretch but rhythmic waves of contraction occurred continuously. These waves were relatively inefficient in discharging urine. There was little sensory involvement in the legs. We believe that in this case both of the motor pathways from the brain were interrupted bilaterally.

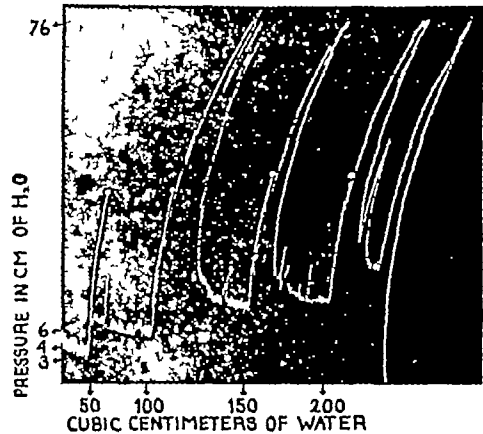


Fig 8—Motor abnormalities shown in case 5

CASE 9—A white man, aged 54, first noticed some weakness of both legs in 1932. Two years earlier he had developed frequency of micturition. In 1932 he suddenly became unable to void and since that time has used a catheter daily. There was slight spasticity of the legs. His gait was both spastic and ataxic, and the Romberg test was positive. Pain responses were poor in the ankles. The vibratory sense and sense of passive movement were unimpaired. There was a bilateral Babinski reflex and bilateral ankle clonus. The Wassermann test was negative in the blood and spinal fluid.

Figure 12 shows the filling record in this case. The pressure remained low until the volume was 150 cc. Then contraction waves appeared not only related to the introduction of fluid but also occurring rhythmically. They became more marked after the capacity reached 250 cc. The patient was very uncomfortable with 400 cc. in the bladder, and the waves were of great height. He was then asked to attempt to micturate and raised the pressure to 115 cm, fluid escaped from the bladder. The frequent waves during filling with no sustained rises of pressure suggest an injury of both motor pathways from the brain.

COMMENT

The graphic method of recording vesical activity through an air-water system gives a clear picture of contraction waves during filling. These waves are not present in normal individuals, and their study is of

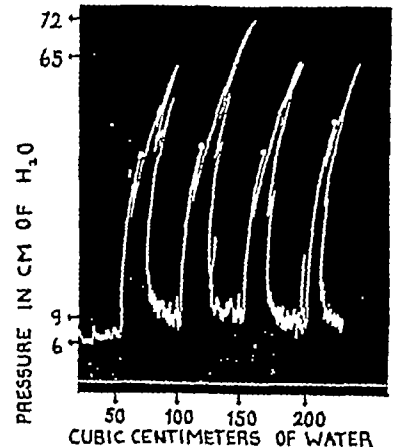


Fig 9—Marked hyperactivity of stretch reflex shown in case 6

importance in estimating the degree of loss of function. Normal micturition depends on a steady rise of bladder pressure of sufficient strength and duration to empty the viscus completely. When waves occur rhythmically and frequently, they do not have the strength or duration for efficient emptying. There may be some escape

of fluid at the height of the waves. As the neurologic control of the bladder is progressively lost, the waves become more frequent but their force and duration become smaller.

The cases reported are typical examples of a large group of patients who were studied. The first group recorded bladder activity after removal of all motor

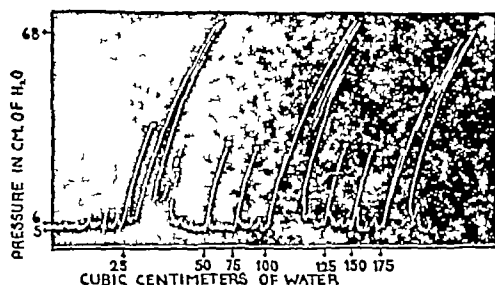


Fig 10—Bladder record in case 7

stimuli from the cerebral cortices. Just as in striated muscle so in the case of the smooth muscle of the bladder the cerebral cortex controls activity. It enables the bladder to hold large amounts of fluid at a relatively low pressure below the level of discomfort. After the removal of this influence the bladder capacity becomes smaller, and there is frequency of micturition.

The effect of loss of this cortical control can best be expressed in another way as a hyperirritability of the stretch reflex. Again an analogy with striated muscle can be used. The tone and to a certain extent the contraction of striated muscle is dependent on afferent stimuli, arising in the muscle itself. This is exemplified by the knee jerk. The sudden stretch applied to the tendon of the quadratus femoris stimulates the sensory endings in the muscle and produces a reflex contraction. These stretch reflexes are normally controlled by the cerebral motor cortex, and the deep reflexes become hyperactive after injury of the corticospinal fibers.

Denny-Brown and Robertson⁴ showed clearly that the smooth muscle of the bladder also responded to the stretch, and its activity was built up primarily on the basis of the stretch reflex. It is only necessary to

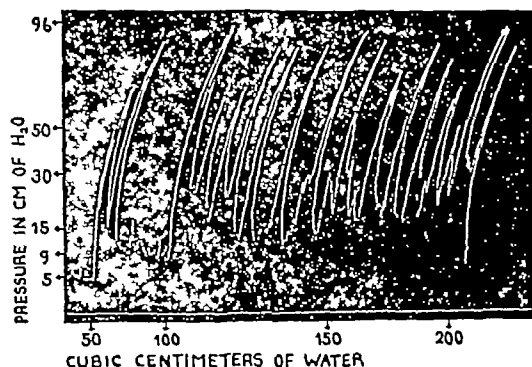


Fig 11—Bladder study in case 8

examine the graphs in this paper to realize that the stretch reflex in the smooth muscle of the bladder is hyperactive after loss of cortical stimuli. Immediately after the introduction of fluid a strong contraction of

the muscle occurs, which is dependent on the sudden stretch produced by the fluid. This rise does not occur in a normal person, at least till the end of filling.

After injury of the corticospinal fibers, even on one side, similar increase in the stretch reflex is often seen. This is particularly true with lesions of the left side of the brain producing a right hemiplegia. It may be concluded that one hemisphere is normally dominant in the control of vesical activity.

The rapid and forceful rise of pressure dependent on the hyperactivity of the stretch reflex demands an immediate emptying of the bladder and gives rise to the complaint of urgency. As the normal cortical control is no longer present, these patients are unable to overcome the waves of contraction and cannot postpone micturition by a conscious effort. If the force of the waves is less marked, the urgency is less severe.

The frequency of micturition with the expulsion of a small volume of urine is dependent to a great extent on this hyperactivity of the stretch reflex. It is largely a physiologic abnormality and is not dependent on fundamental anatomic changes making the bladder small. This is evident from the fact that the patients often notice frequency only on some days, while on other days the bladder will hold a normal quantity. Excitement may at times give rise to frequency in the normal person.

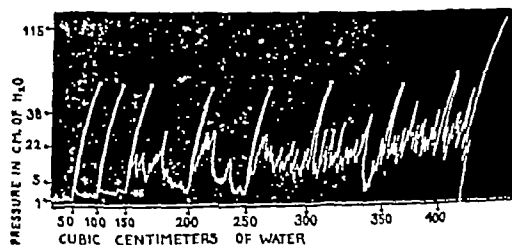


Fig 12—Filling record in case 9

There is, however, another factor that undoubtedly contributes to the small quantity of urine which these abnormal bladders hold. After section of the corticospinal fibers there is increased tone of the striated muscle. This again is dependent on the hyperactivity of the stretch reflex. The increase in tone is more difficult to demonstrate in the case of the bladder. If the pressure falls to a resting level, it seems little higher than the resting level in a normal bladder. In some cases, however, the pressure during filling was high even at a resting level. It is probable that the small volume is dependent on the increased tone of the smooth muscle of the bladder wall decreasing the lumen of the viscus.

In all these patients with bilateral or even unilateral lesions of the corticospinal tracts the external sphincter showed increased tone. Denny-Brown and Robertson⁴ have suggested that this is dependent on an increased tone of the striated muscle entering into the composition of the external sphincter. This is not an all inclusive explanation, as the external sphincter has marked tone in patients with tabes. In these patients the striated muscle shows loss of tone.

When the interior of the hyperirritable bladder is examined with a cystoscope, coarse trabeculations of the detrusor are seen and the trigon shows hypertrophy. Whether this is due to actual increase in muscle volume or to thickening of the wall dependent on its small size it is difficult to say.

⁴ Denny Brown D. E. and Robertson E. G. On the Physiology of Micturition. *Brain* 56: 149 (July) 1933, The State of the Bladder and Its Sphincters in Complete Transverse Lesions of the Spinal Cord and Cauda Equina, *ibid* 56: 397 (Dec) 1933.

It is thought that the pathway from the midbrain influencing the bladder has to do with the control of tone in the wall. This mechanism is released from cortical influence and permitted to overact after bilateral injury of the corticospinal path. We have not recognized a case in which this mechanism was injured bilaterally without involvement of the corticospinal fibers. Theoretically this would produce an enlargement of the bladder with difficulty in emptying.

If these midbrain pathways are injured in the cord together with the adjacent corticospinal fibers, one would expect that bladder function would be less efficient. The waves of contraction, while occurring more often, are not of sufficient strength or duration to permit efficient emptying of the bladder. Fluid escapes from the urethra at the height of the waves, and the patient has little if any voluntary control, because of interruption of the corticospinal fibers. We have presented graphic records from two cases that fall into this group.

Rose⁵ has done a great service in popularizing cystometry among urologists. Recent workers⁶ have spoken of hypotonic and hypertonic bladders. This is perhaps a convenient classification, but it does not explain all possibilities of bladder abnormality. A hypotonic bladder may be one produced by injury of the posterior spinal roots in *tabes dorsalis*. Here, owing to overdistention and loss of tone, the bladder is able to accommodate large amounts of fluid at a relatively low pressure. We have been able to produce this condition experimentally and follow its evolution.⁷ The bladder would also be hypotonic immediately after a severe injury to the spinal cord, as the result of the so-called shock resulting from sudden interruption of pathways in the cord. Later with the development of reflex micturition it would be considered hypertonic. It has been shown that the bladder of small capacity after bilateral pyramidal tract injury is probably a hypertonic bladder in the true sense of the word. Here the resting pressure in the bladder is usually greater than normal. Of more importance than the resting pressure is the powerful, sudden contraction of the bladder that follows stretching of the muscle.

SUMMARY

By means of an air-water manometer and recording tambour we have made graphic records of the behavior of the detrusor muscle during bladder filling. The bladder muscle characteristically responds to stretch stimuli, and important information can be obtained by observing and recording waves of bladder contraction. Patients were studied who suffered either bilateral or unilateral pyramidal tract injuries or had lesions of motor tracts in the spinal cord. With release from cortical control, the stretch reflex is hyperactive. The bladder empties precipitously with a small volume of fluid. When the motor pathways from the midbrain are injured bilaterally along with the corticospinal tracts, the waves of bladder contraction are frequent but of small amplitude. They are ineffective in emptying the bladder. A study of contraction waves of the muscle during filling is of aid in forming an opinion of the efficiency of a bladder with damaged innervation.

Medical Arts Building

⁵ Rose, D. K. Various Cystometrograms and Their Interpretation. *J. Urol.* 27: 207 (Feb.) 1932.

⁶ Muschat, Maurice. The Value of Cystometry. *J. Urol.* 33: 366 (April) 1935.

⁷ Drees, J. E., and Langworthy, O. R. Experimental Study of Bladder Disturbances to Those of *Tabes Dorsalis*. *J. Urol.* 34: 359 (Oct.) 1935.

ABSTRACT OF DISCUSSION

DR. JOHN DUFF, New York. I congratulate the authors on their skilful use of cystometry in arriving at conclusions as to basic neurologic control of the normal and abnormal function of the bladder. It would appear that cystometry is not used with sufficient frequency in urologic clinics as a means of differential diagnosis and research. The authors have drawn interesting parallelisms between spastic voluntary musculature and what one might term a spastic urinary bladder, both resulting from interruption of cortical control. The commonly known efferent nerve fibers to the urinary bladder are the autonomic, sympathetic and parasympathetic fibers. The well known fibers of the cerebrospinal system are the somatic fibers assembled in the pyramidal tracts. The authors have shown that the central somatic system seems to establish connection not only with the lower voluntary motor neurons but also with the peripheral autonomic system of the bladder. I believe it true that pathologic lesions interrupting the pyramidal tracts frequently involve other related structures of the central nervous system. It is possible that the bladder disturbance in involvement of the pyramidal tract could be due to damage to adjacent visceral pathways. One might suppose that such visceral pathways could arise subcortically. The further postulation as to tonic control of the bladder from the midbrain centers explains satisfactorily the diminution of bladder tonus in lesions of the cord, which are so widespread as to intercept pathways both from the cortex and midbrain. The idea of central antagonistic pathways to the urinary bladder, inhibitory from the cerebral cortex and tonic from the midbrain, is most interesting and significant. It should help further to clarify problems of bladder dysfunction in lesions of the central nervous system. The work of Barrington, Dennig, Muller, Learmonth, Denny-Brown and Robertson bears out many of the significant points of this paper.

DR. MAURICE MUSCHAT, Philadelphia. Studies of relationship of the nervous system to the urinary bladder are now abundant, but they always remained a laboratory procedure and of merely academic interest. It was Dr. Rose's great contribution to apply this work at the bedside and thus aid the clinician in diagnosing a neurogenic bladder. With the simplification of the cystometer, such bedside studies have become popular. By using a water manometer, one is able to note the slightest fluctuations in the tonus of the detrusor and to evaluate the variations noted. For the ordinary clinical work of the urologist, a water manometer is somewhat unhandy and unnecessary. I feel that a practicing urologist should not as yet enter into discussions of the complicated neurologic problems. This is still the work of the neurologist. By means of the cystometer one obtains three factors: the desire to void, the pressure curve and the maximal voluntary pressure. With a normal bladder the desire is to void from 150 to 250 cc. of urine, the pressure curve is gradually ascending and the maximal pressure is from 40 to 60 mm. In the hypertonic bladder the factors are altered. The desire to void is less than 150 cc. of urine, the curve is very acute, and the maximal voluntary pressure is more than 60 mm. In the hypotonic bladder it is just the opposite. The desire is to void more than 250 cc. of urine, the curve is flat and the maximal voluntary pressure is less than 40 mm. Alteration of at least two factors is characteristic for a neurogenic bladder. The authors did not stress strongly enough the fact of finding marked abnormalities of the bladder in cases in which there were no urinary complaints. This possibility must be borne in mind and bladder dysfunction as evidenced by the cystometer looked for in every case in which a central or a spinal lesion is suspected. A positive finding becomes of inestimable value in the diagnosis of such cases.

DR. IRVING SIMONS, New York. In my clinic we have been interested in a study of the function of the bladder in various diseases including diseases of the central and autonomic nervous systems. Physiologically the bladder should be considered as made up of two organs: (1) a detrusor or bladder proper, the contraction of which is governed by the parasympathetic nerves, and (2) an inner lock or internal involuntary sphincter, the tonus of which is governed by the sympathetic nerves. Beyond this is a second or external lock composed of the external sphincter, assisted by the bulbocavernosus and other perineal muscles. Cystometry records data merely of the action of the

detrusor, and this gives an idea only of the force but does not take into consideration the resistance that this force has to overcome. I have devised an instrument which may be termed a sphincterometer, by means of which we have been able to measure the tonus of the internal as well as the external sphincter. Clinical reports on this instrument will appear in the near future. In order to use this sphincterometer, it was necessary to construct an instrument, the portable microcystometer, which will accurately inject any amount of fluid at any rate and pressure. It will measure the tension or pressure on the bag developed by such an injection, or, if a plain catheter is used, it will measure the pressure exerted on the fluid injected into a muscular organ, the bladder. This is recorded with the greatest accuracy, as it is equipped with a reservoir type manometer of U S Bureau of Standards specifications, with accurately calibrated scale. The instrument is equipped with a pressure tube or intermediary, the fluid and air capacity of which has been diminished to the lowest point possible for clinical use, by which reduction the errors of pressure have been minimized and the load of fluid to be lifted by the bladder has been diminished to a point that will ensure the greatest accuracy possible. In making cystometric observations we have used the fractional injection method advised by Rose, using as the unit injections of 50 cc., injecting these increments without undue force or haste, and recording the pressure of each increment immediately so as not to allow the detrusor to relax after its reception of the increment. It is of paramount importance that the sensory filling points, of desire to void of pain and of severe pain, be accurately elicited by questioning the patient as without them curves of pseudoneurogenic or nonneurogenic hypertonia and hypotonia cannot be accurately differentiated from true neurogenic hypertonia and hypotonia. We feel that the accuracy of this cystometer has allowed us to separate four groups from the normal instead of the two described previously. In our work we have substituted for the graphs of Rose a numerical record similar to that of recording a gold chloride report.

DR. WILLIAM BISHOP, New York. In a series of cases studied by Dr Simons and myself by the fractional method with the microcystometer we were able to define four distinct groups that varied from the normal. Particular attention was paid in eliciting the sensory points: desire to void, pain and severe pain. We charted our results without graphs, separating the pressure obtained at each increment of 50 cc. by a comma and each 250 cc. by a semicolon. In five separate series of cases the average results obtained were as follows: 1 True neurogenic hypertonia was found in spastic paraplegia and combined sclerosis. These patients have short records averaging four increments. All the sensory points are moved to the left. 2 In nonneurogenic hypertonia consisting of cases of increased intracystic pressure in which no essential neuropathologic condition could be found, pressure develops rapidly, usually after 200 cc. of fluid has been introduced. Their sensory points are normally situated and the average length of their record is twelve increments. 3 Normal cases show gradual rise in intracystic pressure with a record of twelve increments. The sensory points were found in the fourth, eighth and tenth increments. 4 In nonneurogenic hypotonia neuropathologic changes were excluded clinically and serologically. Cystometrically they masqueraded as true neurogenic hypotonia because of their low tension and the length of their record. Their sensory points, normally or nearly normally placed, distinguish them from the true neurogenic hypotonia. 5 True neurogenic hypotonia was found in a series of cases of tabes and tabes with dementia paralytica. They have very long records with an average of twenty increments. All sensory points are moved to the right.

DR. LLOYD G. LEWIS, Baltimore. I wish to emphasize the value of obtaining graphic records of cystometric studies. The cystometer should be sensitive enough to record accurately every change in vesical pressure, but the graphic record is of great importance for a comparison of curves and for reaching conclusions. With our simple apparatus we have been able to record variations in bladder pressure due to respiration, variations of tonicity of bladder musculature and fluctuations due

to hyperactive stretch reflex and straining pressures. It is obvious that only detrusor pressure can be determined by this instrument. Lesions of the motor pathways of the bladder in the brain and spinal cord may be studied satisfactorily by this type of apparatus. Dr Simons' instrument may be well adapted to study of the vesical sphincters.

ARTIFICIAL FEVER THERAPY OF SYPHILIS

WALTER M. SIMPSON, M.D.
DAYTON, OHIO

Artificial fever therapy now occupies a commanding position in the management of neurosyphilis. During the eighteen years that has elapsed since the monumental researches of Wagner-Jauregg¹ in the malaria therapy of dementia paralytica, it has become more and more apparent that simple fever production is the one factor common to the great variety of infectious, chemical and physical agencies that have been employed as substitutes for malaria therapy. This observation has led to a diligent search for physical methods which would overcome the inconstancy and hazards that attend the production of artificial fever by infectious agents, such as malaria, rat-bite fever or relapsing fever. Experiments in fever production have been conducted with many physical modalities (hot baths, hot air, diathermy, radiothermy and electric blankets). While comparable clinical results may be obtained with any of these methods, it has been recognized that many possess inherent hazards.

In a previous report,² the early results obtained in the pyretotherapy of neurosyphilis were described. Ultra-high frequency electric currents (10,000,000 cycles, 30-meter waves) applied by means of condenser discharges of a modified short wave radio transmitter, developed by Whitney,³ Page⁴ and De Walt,⁵ were applied in an air-conditioned cabinet, developed with the collaboration of Mr. Charles F. Kettering and Mr. Edwin C. Sittler of the Research Laboratories of the General Motors Corporation. The purpose of the air-conditioned cabinet was to dissipate sweat as it collected on the skin surface and thus to prevent arcing and burning of the skin as the result of concentration of the short radio waves in the drops of sweat.

Soon after this report was made, an accidental observation caused us greatly to alter the method of producing and maintaining artificial fever. While subjecting a child with congenital syphilis to artificial fever therapy by the combined radiotherm and air-conditioned

From the Kettering Institute for Medical Research, Miami Valley Hospital.

This investigation was made possible by a grant from the Charles F. Kettering Foundation.

Read before the Section on Dermatology and Syphilology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.

Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

With the collaboration of Charles F. Kettering, Sc.D. (deceased), Edwin C. Sittler, B.S. in Engineering, Fred K. Kislig, M.D. (deceased), H. Worley Kendall, M.D., Arthur M. Culler, M.D., L. G. Kauffman, M.D., Eunice Frazer, M.S., Carl McD. Ritter, B.S., Florence Storck, R.N., Mary Louise Wolf, R.N., Ruth Walters, R.N., and Florence Burlofer, R.N.

1 Wagner-Jauregg, Julius. Ueber die Einwirkung der Malaria auf die progressive Paralyse. Psychiat. Neurol. Wehnschr. 20: 132-134 (Aug. 31) 1918.

2 Simpson, W. M., Kislig, F. K., and Sittler, E. C. Ultra-High Frequency Pyretotherapy of Neurosyphilis. A Preliminary Report, Ann. Int. Med. 7: 64-75 (July) 1933.

3 Whitney, W. R. Radiothermy. General Electric Rev. 35: 410-412 (Aug.) 1932.

4 Carpenter, C. M., and Page, A. B. The Production of Fever in Man by Short Radio Waves, Science 71: 450-452 (May 2) 1930.

5 De Walt, K. C. A Study of High Frequency Heating. Electronics 5: 338 1932.

cabinet method, the nurse-technician failed to turn on the switches controlling the output of the high frequency currents. The rectal temperature reached the desired level of 106 F in the usual time (fifty minutes). It was then discovered that the high frequency currents had not been utilized for fever induction. By adjusting the air temperature-humidity factors in the air-conditioned cabinet the temperature was maintained at this level for the usual five hour period.

This fortunate occurrence led us to develop a much simpler, safer, less costly and more easily controllable air-conditioned apparatus (Kettering hypertherm) for fever production and maintenance (fig 1). High frequency currents are no longer employed. Deep tissue temperature studies made with thermocouples revealed no essential difference in deep heating effect when fever was produced by either high frequency currents (diathermy or radiothermy) or by conditioned air alone.

In its present state the Kettering hypertherm⁶ consists of an insulated cabinet in which the nude patient lies, with his head extending outside the cabinet. Sponge-rubber insulation is utilized in the neck region to permit the patient to shift his position. The patient lies on an air mattress, supported by a boxlike bed which is rolled in and out at will. In the rear of the cabinet is a small insulated fire-proof compartment in which the air-conditioning apparatus is housed. The dry bulb air temperature is controlled by a thermostat. The wet bulb temperature, which governs the percentage of relative humidity, is controlled by a humidistat or by a wet bulb thermostat. The air velocity within the cabinet is controlled by blowers of fixed speed. Dry bulb and wet bulb temperatures within the cabinet are indicated on large dials, equipped with warning pilot lights, on the top of the front end of the cabinet, where they may be constantly observed by the nurse-technician. The temperature-humidity factors may be controlled by the turning of a single knob. The average set of air conditions to which the patient's body is subjected is as follows: dry bulb air temperature of from 130 to 150 F, relative humidity of from 35 to 50 per cent, and air velocity of 425 cubic feet per minute. The elevation of the rectal temperature to 105 F is ordinarily accomplished in from forty minutes to one hour. The air is constantly conditioned by continuous passage through the air-conditioning compartment. The safety and comfort of the patient are greatly enhanced by the accurate control of the relative humidity.

The mechanism of fever induction with the Kettering hypertherm depends primarily on heat transfer by conduction from the circulating heated air. This factor combined with prevention of the normal rate of heat loss from the body by radiation and evaporation, is responsible for the elevation of the body temperature and its maintenance at any desired level.

The simplification of the apparatus, the removal of hazards inherent in certain other physical modalities, and the supplying of large quantities (2 to 4 liters) of sodium chloride solution (0.6 per cent) by mouth

6 Fifty five of these units have been lent to twenty medical research centers strictly for investigative purposes. The physicians and nurses charged with this undertaking received special training in the Department of Fever Therapy Research at the Miami Valley Hospital before the apparatus was released. A simpler, smaller and less costly apparatus is now being developed. It is probable that this apparatus will ultimately be available to certain qualified institutions. Adequate preliminary training of physician and nurse personnel is an essential requirement for this type of work. Artificial fever therapy should be restricted to qualified institutions. Otherwise this method of therapy is almost certainly doomed to a period of discredit not unlike that which followed the introduction of roentgen rays. The production of artificial fever at a high level is not adaptable to ordinary office practice.

during the treatment to replace chloride loss⁷ have converted this form of therapy from one requiring hospitalization to one in which the patient is usually able to return to his work on the day following treatment.

METHOD OF TREATMENT

During the last four years we have subjected 383 patients to 2,844 artificial fever treatments (approximately 16,000 hours of sustained fever). With the exception of occasional mild skin burns, which occurred particularly at the beginning of this undertaking, no person has been injured by the treatments. Of these, 175 patients have been treated for syphilis.⁸ Forty-three patients failed to cooperate, either during treatment or in the progress studies, the records of these patients are incomplete and are not included in this analysis. Forty-two patients have been under observation less than six months, these are also excluded from consideration. Sixteen patients with early syphilis have been treated with either fever therapy alone or chemotherapy alone, as control groups. One hundred and six syphilitic patients have been under observation for from six months to three and one-half years, these provide the data on which this report is based.

Many observers⁹ have found fever therapy combined with or followed by chemotherapy to be more effective than fever therapy alone in the treatment of neurosyphilis. On this basis we have combined chemotherapy, usually in the form of bismuth arsphenamine sulfonate (Bismarsen), with the fever treatments. In some patients neoarsphenamine and bismuth therapy was substituted. One advantage of the induction of artificial fever by physical methods is that the antisyphilitic drug may be given during the course of fever treatments. It is our practice to inject the antisyphilitic drug half an hour before the fever treatment is begun, on the basis that the general vasodilatation which occurs during sustained high fever may permit greater diffusion of the chemical substances. Bratz¹⁰ believes that fever produced by malaria increases the permeability of the small vessels of the brain and permits protective substances to reach the diseased brain tissues. After the ten sessions of fever therapy plus chemotherapy twenty injections of the antisyphilitic chemical agent are given, at weekly intervals.

7 Simpson, Kislug and Sittler.³ Simpson W. M. Influence of Radiothermy Pyretotherapy on Chloride Metabolism. *J. A. M. A.* 100: 67-68 (Jan. 7) 1933.

8 Most of the other patients were treated for some form of gonococcal infection or for chronic infectious arthritis.

9 These include:

(a) Wagner Jauregg, Julius. *Malaria-therapie*. Wien med. Wchnschr. 78: 275-287 (Feb. 25) 1928.

(b) Wagner Jauregg, Julius. Ueber maximale Malaria-behandlung der progressiven Paralyse. *Klin. Wchnschr.* 13: 1028-1031 (July 14) 1934.

(c) Kyrle, J. Die Malaria-behandlung der Syphilis. *Wien klin. Wchnschr.* 37: 1105-1109 (Oct. 23) 1924.

(d) Matuchka, J. and Rosner, R. Die Malaria-therapie der Syphilis. Vienna. Julius Springer 1927.

(e) Kauders, O. Ueber die Nachbehandlungsperiode nach Malaria-behandlung der progressiven Paralyse. *Wien klin. Wchnschr.* 14: 1199-1200 (Sept. 18) 1931.

(f) Paige, A., Rickloff, R. J. and Osborne, E. D. The Treatment of Neurosyphilis Other Than Paresis with Malaria. *New York State J. Med.* 31: 1441-1446 (Dec. 1) 1931.

(g) Neustaedter, M. The Treatment of Cerebrospinal Syphilis with Malaria. A Report of Twenty Six Cases. *J. Nerv. & Ment. Dis.* 73: 591-599 (June) 1931.

(h) Gugenheim, F. Das Schicksal der mit Malaria behandelten Lues-cerebrospinal-kranken. *Ztschr. f. d. ges. Neurol. u. Psychiat.* 131: 525-541 (Jan. 24) 1931.

(i) Reese, H. H. Nonspecific and Malarial Therapy in Neurosyphilis. *Am. J. Syph.* 13: 348-359 (July) 1929.

(j) Solomon, H. C. and Epstein, S. H. Tryparsamide in the Treatment of Neurosyphilis. *New York State J. Med.* 31: 1012-1015 (Aug. 15) 1931.

(k) O'Leary, P. A. and Welsh, A. L. Treatment of Neurosyphilis with Malaria. Observations with Nine Hundred and Eighty Four Cases in the Last Nine Years. *J. A. M. A.* 101: 498-501 (Aug. 12) 1933.

10 Bratz, E. Hat sich die Malaria-behandlung bei Paralyse und Tabes bewahrt? *Ztchr. f. arztl. Fortbild.* 26: 560-561 (Sept. 1) 1929.

We have regarded a minimum course of artificial fever therapy for patients with syphilis to consist of fifty hours of sustained fever between 105 and 106 F. This more or less arbitrary choice is based on the observation that the highest remission rate following malaria therapy occurred in patients who had experienced at least fifty hours of fever above 102 F. The treatments are usually given in ten weekly sessions, each of five or more hours' duration. Many patients experience the most marked improvement after five or six treatments, a few require more than ten.

All patients are subjected to a thorough diagnostic survey to determine eligibility for fever therapy. Special studies are made of cardiac, vascular and renal functions, including electrocardiographic, basal blood pressure and blood chemical analyses. Blood and spinal fluid serologic reactions, spinal fluid cell count, protein and sugar content, and colloidal gold reactions are determined before treatment is begun, at the end of the combined fever-chemotherapy regimen, and at intervals of six months thereafter. As an additional control measure duplicate blood and spinal fluid specimens from these patients were submitted to Kahn in the laboratories of the University of Michigan Hospital for repetition of the serologic examinations. The Kahn standard diagnostic, presumptive and quantitative procedures were carried out in those laboratories, without any knowledge of the clinical condition of the patients, and reported to us.¹¹ Old age (above 60 years), cardiac or renal insufficiency, advanced cardiovascular syphilis, aortic aneurysm, and the demented form of advanced dementia paralytica are regarded as contraindications. Patients between 45 and 60 years of age are treated with great caution. One or more mild treatments are usually given such individuals as a test of cardiac function. Occasionally treatments are spaced two weeks apart.

EARLY SYPHILIS

For centuries, laymen have known that sustained heat exerts a favorable influence on the cutaneous lesions of syphilis. The popularity of balneotherapy in many parts of the world has persisted since the ancient Greek priest-physicians first converted their thermal springs into baths. While emphasis has been placed on the mineral content of the waters, it now appears that the virtue of balneotherapy lies in its ability to produce local or general fever. The advent of scientific methods for the controlled production of fever provides a rational explanation for some of the results attained with the purely empirical use of these older methods.

Perhaps the first published observations on the artificial production of fever by balneotherapy appeared in 1884 in a paper by W. H. Phillips.¹² During a visit to Hot Springs, Ark., Phillips observed that patients who had remained in the sudatorium for long periods left with "faces flushed, eyes brightened, breathing hurriedly and sweating profusely." His curiosity aroused, Phillips experimented on himself. By gradually increasing the temperature of the bath water he elevated his mouth temperature to 103 F. At the conclusion of his stimulating paper, Phillips makes this prophetic remark: "Finally, it is when we are called upon to treat the more chronic forms of syphilitic disease that we are enabled to appreciate the immediate advantage of uniting these powerful constitutional agents [artificial fever and chemotherapy] for good."

There is a rapidly accumulating mass of experimental data which provides strong evidence of the unfavorable influence of high body temperature on *Spirochaeta pallida*. Many observers have reported their inability to find spirochetes in the brain tissue of patients who have died following malaria therapy.

In 1919 Weichbrodt and Jahnel¹³ placed rabbits with scrotal chancres in a thermostatically controlled incubator with the air temperature at 105.8 F. The temperature elevation in the rabbits induced by this procedure ranged from 104 to 107.6 F. The rabbits were subjected to this treatment for thirty minutes once or twice daily for from three to five weeks. After the second day the spirochetes gradually lost their motility, declined in number and disappeared. The chancres healed much more rapidly than in untreated rabbits.

Schamberg and his associates¹⁴ found that multiple hot baths exerted a favorable influence on syphilis of rabbits and human beings.

Bessemans¹⁵ of Ghent and his associates have made valuable studies which demonstrate the feeble thermoresistance of *Spirochaeta pallida*. With the ingenious use of small thermocouples inserted into the scrotal chancres of rabbits it was shown that primary syphilis was cured by either local or general balneotherapy or aérothermotherapy when the tissue temperature of the chancre was sustained at 104 F. for two hours or 107.6 F. for one hour. Raising the rabbits' intratesticular temperature to the same levels after inoculation prevented the development of the disease.

The important researches of Carpenter, Boak and Warren²⁰ again emphasize the thermolability of *Spirochaeta pallida* and "suggest the practicality of fever therapy in the treatment of acute as well as chronic syphilis in man." Utilizing heat produced by the short radio waves of an ultra-high frequency oscillator, they were able to prevent the development of chancres in twenty-one of twenty-five rabbits when treatments were begun four, five and seven days after inoculation. In one treated rabbit a chancre developed, while the testis of another became edematous and indurated, increasing the duration and number of heatings caused the rabbits to become normal, two rabbits died. Eighteen untreated control rabbits developed the typical lesions of experimental syphilis. These workers also found that multiple unsustained fevers of from 105.8 to 107.6 F. destroyed *Spirochaeta pallida* in rabbits with active

11 The Kahn quantitative procedure was found to provide a reliable and sensitive index of therapeutic response.
12 Phillips W. H. Hydrotherapy. Columbus M. J. 2: 389-402 (March) 1884.

13 Weichbrodt, R. and Jahnel F. Einfluss höher Körpertemperaturen auf die Spirochaeten und Krankheitserscheinungen der Syphilis im Tierversuch. Deutsche med. Wchnschr. 45: 483-484 (May 1) 1919.
14 Schamberg, J. F. and Rule Anna M. Studies of the Therapeutic Effect of Fever in Experimental Rabbit Syphilis. Arch. Dermat. & Syph. 14: 243-245 (Sept.) 1926. Therapeutic Effect of Hot Baths in Experimental Primary Syphilis in Rabbits. J. A. M. A. 88: 1217-1218 (April 16) 1927. The Effect of Extremely Hot Baths in Experimental Syphilis. Arch. Dermat. & Syph. 17: 322-331 (March) 1928. Schamberg J. F. and Teeng H. W. Experiments on the Therapeutic Value of Hot Baths, with Special Reference to the Treatment of Syphilis. Physiologic Observations, Am. J. Syph. 11: 337-397 (July) 1927.
15 Bessemans A. de Potter F. and Hacquaert, R. Sur deux formes d'aérothermotherapie locale des syphilomes testiculaires primaires du lapin, Compt. rend. Soc. de biol. 100: 757-760 (March 15) 1929.
Bessemans A. Vercouille, J. and Hacquaert, R. Nouvel essai de thermoprophylaxie sociale antisiphilitique traitement aéro-thermique local du chancre primaire. Rev. belge sc. méd. 1: 425-430 (May) 1929. Influence de diverses applications locales de la chaleur sur les accidents syphilitiques primaires et secondaires chez l'homme. Compt. rend. Soc. de biol. 101: 483-486 (June 14) 1929. Bessemans A. The Local Application of Heat as an Adjuvant in the Social and Individual Prophylaxis of Syphilis. Urol. & Cutan. Rev. 34: 71-91 (Feb.) 1930. Bessemans A. and Thiry U. New Experiences with the Application of Local Heat Therapy (Hot Water Baths and Diathermy by Long Waves Slightly Damped) in the Treatment of Primary and Secondary Syphilis in Man. ibid. 37: 377-390 (June) 1933.
20 Carpenter C. M. and Boak Ruth A. The Effect of Heat Produced by an Ultrahigh Frequency Oscillator on Experimental Syphilis in Rabbits. Am. J. Syph. 14: 346-365 (July) 1930. Carpenter C. M., Boak, Ruth A. and Warren S. L. The Healing of Experimental Syphilis in Rabbits by Short Wave Fevers. J. Exper. Med. 56: 751-762 (Nov.) 1932. Boak, Ruth A., Carpenter C. M. and Warren S. L. The Thermal Death Time of Treponema Pallidum in Vitro with Special Reference to Fever Temperatures. J. Exper. Med. 56: 741-750 (Nov.) 1932.

syphilitic lesions, as determined by reinoculation experiments. It was also found that one febrile period of six hours at a temperature of 106.7-107.6 F was sufficient to destroy *Spirochaeta pallida*. The time interval between inoculations and fever treatment, or between the end of fever treatment and reinoculation, did not affect the results. Hence the fever treatment was effective at any stage of experimental syphilis in rabbits. The same authors investigated the thermal death time gradient of *Spirochaeta pallida* in testicular extracts in vitro. Five hours of temperature at 102.2 F, three hours at 104 F, two hours at 105.8 F and one hour at 106.7 F were required to render infective material innocuous to other rabbits.

Levaditi and de Rothschild²¹ carried out somewhat similar experiments in which thermocouples were used to determine local temperature, with less constant results. In many of the rabbits rapid healing of the primary lesions, disappearance of spirochetes, sterilization of lymph glands and negative serologic reactions occurred. Levaditi regards artificial fever as an effective factor in stimulating the defense mechanism. Kolmer and Rule²² demonstrated that the testicular lesions were prevented and the inguinal lymph glands became sterile if rabbits inoculated intratesticularly with *Spirochaeta pallida* four days previously were immersed in water at 113 F for twenty minutes daily for fifteen days. If, however, the testicular lesions were kept out of the heated water, active syphilitic lesions developed. These authors²³ also found that fever of from 2 to 5 degrees F which lasted several hours and which was induced in the rabbit by intravenous injections of increasing amounts of typhoid-paratyphoid vaccine or Coley's fluid showed much less effect on the course of acute testicular syphilis than did fever induced by hot baths.

We have confirmed the observations of Carpenter, Boak and Warren by a somewhat different experiment. Six male rabbits were inoculated intratesticularly with fresh testicular extract containing the Nichols strain of *Spirochaeta pallida*. Only rabbits with negative Kahn and Kolmer serologic reactions were selected. Chancres or syphilomas developed in both testes of all the animals within four to six weeks. Aspiration revealed the presence of spirochetes in all. The serologic reactions of all were strongly positive at the end of eight weeks. Hemicastration of each rabbit was then done. The testicular emulsion derived from the extirpated testis of each of these six rabbits was then injected into the testes of each of a new series of six seronegative normal rabbits, all developed chancres and positive serologic reactions in the usual time. Immediately after hemicastration, the syphilitic rabbits were subjected individually to sustained rectal temperature of from 107.1 to 108.1 F, average 107.6 F, for six hours. 30-meter waves of a high frequency oscillator being used. The remaining testis was then removed from each rabbit four days after the fever treatment. Injection of testicular suspensions from each heated rabbit was made into the testes of each of a new series of seronegative normal rabbits, none developed evidence of syphilis, the serologic reactions of all remained negative.

It is quite conceivable that the same uniformity in results might not obtain following the application of fever therapy to human subjects. Syphilis in rabbits apparently pursues a somewhat milder course, generalized lesions and central nervous system involvement are comparatively rare. Nevertheless, these experimental studies provide incontrovertible evidence of the spirochetocidal effect of sustained high body temperature. Many observers are convinced that fever therapy is capable of producing a distinctly favorable influence on the progress of early syphilis, particularly when fever therapy is combined with orthodox chemotherapy. Kyrle²⁴ gave 232 seropositive patients with early syphilis (under two years' duration) a course of arsphenamine (from 4 to 6 Gm), followed by malaria therapy (ten chills), followed in turn by another course of arsphenamine therapy. The results were incomparably better than by any other method employed. Of the 232 seropositive patients with early syphilis, the blood serologic reactions were favorably influenced in 230 (99.1 per cent) after a single combined arsphenamine-malaria-arsphenamine course. Fifty-four of these patients had exhibited positive spinal fluid reactions. All were reversed to negative and remained negative. When Matuschka and Rosner²⁵ reported on the work of Kyrle after his untimely death, not one of these patients had relapsed, clinically or serologically, during five years of observation.

In the introduction to the Matuschka-Rosner monograph,²⁴ Finger makes this statement: "The results are significant. They show that in the early period of syphilis nothing influences the serum and spinal fluid reactions so favorably as combined malaria arsphenamine therapy, that a single course is usually sufficient and that the earlier the treatment is begun, the better are the results."

Kemp and Stokes²⁴ found that fever therapy induced by bacterial proteins, combined with arsphenamine therapy and followed by arsphenamine and bismuth therapy, offered a more satisfactory outlook in the treatment of early syphilis than routine chemotherapy alone.

Richet and Dublineau,²⁵ after experimentation with animals and human subjects, conclude that early syphilis may be "cured" more rapidly and more certainly by combined fever and chemotherapy than with chemotherapy alone. The blood serologic reactions of thirty-five of thirty-seven patients with primary and secondary syphilis became negative during or at the end of one course of pyretochemotherapy.

Wagner-Jauregg,²⁶ O'Leary,²⁶ Jacobs and Vohwinkel,²⁷ Bering²⁸ and others have repeatedly emphasized that the best form of treatment of neurosyphilis lies in its prevention by combined fever and chemotherapy during its asymptomatic phase. The extensive cooperative clinical studies carried out by Stokes, Cole

24 Kemp J. E. and Stokes J. H. Fever Induced by Bacterial Proteins in the Treatment of Syphilis. *J. A. M. A.* 62:1737-1740 (May 25) 1929.

25 Richet C. Jr and Dublineau J. Pyréto et chimiothérapie associées dans le traitement de la syphilis du lapin. *J. de physiol. et de path. gén.* 31:794-811 (Sept.) 1933. Richet C. Jr Dublineau J. and Joly F. Pyréto et chimiothérapie associées dans la syphilis primaire et secondaire. Étude expérimentale et clinique. *Presse méd.* 41:1649-1651 (Oct. 25) 1933. Richet, C. Jr and Dublineau, J. La pyrétothérapie de la syphilis. *Paris med.* 1:197-205 (March 3) 1934.

26 O'Leary P. A. Treatment of Neurosyphilis by Malaria. *J. A. M. A.* 91:543-545 (Aug. 25) 1928. Treatment by Malaria in Asymptomatic Neurosyphilis. *ibid.* 97:1585-1587 (Nov. 28) 1931.

27 Jacobs J. and Vohwinkel K. H. Die Malaria-therapie der Früh und Spätsyphilis. *Dermat. Ztschr.* 57:321-346 (Jan.) 1930.

28 Bering Die Malaria-behandlung im Frühstadium der Syphilis des Zentralnervensystems. *Zentralbl. f. Haut und Geschlechtskr.* 17:41 (June 5) 1925.

21 Levaditi C. and de Rothschild H. Etude expérimentale de la chimiothérapie générale par les radiations à ondes courtes. *Ann. Inst. Pasteur.* 62:23-67, (Jan.) 1934.

22 Kolmer J. A. and Rule Anna M. Hot Baths in Experimental Primary Syphilis of Rabbits and in Trypanosomiasis of Rats. *Arch. Dermat. & Syph.* 27:660-662 (April) 1933.

23 Kolmer J. A. and Rule, Anna M. Bacterial Protein Fever in the Treatment of Syphilis in the Rabbit. *Arch. Dermat. & Syph.* 24:546-547 (Oct.) 1931.

Moore, O'Leary, Wile, Clark, Parran and Usilton²⁹ reveal that abnormal spinal fluid conditions were present in 33 per cent of patients with early syphilis, and in 56.1 per cent of patients with late secondary syphilis. The same observers have also stated that "even thoroughgoing [chemical] treatment does not necessarily prevent the development of abnormalities of the spinal fluid"^{29b} and that in latent syphilis "almost all of the serologic response to be expected occurs within the first four months of treatment, thereafter further [chemical] treatment has little effect."^{29c}

On the basis of the foregoing observations it seems logical to conclude that the best results are obtained when combined fever and chemotherapy are applied early in the disease. With the hope that the disastrous late neurologic and visceral manifestations of the disease might be prevented, we have subjected twenty-six patients with primary and early secondary syphilis to the combined fever and chemotherapy regimen (fifty hours of sustained fever above 105 F and thirty injections of antisyphilitic chemotherapy). All these patients have been under observation for from six months to two and one-half years. None had received any previous treatment. As a control measure, six patients with primary or early secondary syphilis were treated with only fifty hours of fever therapy above 105 F. In two cases, clinical relapse (cutaneous eruption) occurred following the fever treatments, chemotherapy was promptly instituted. Of the four patients who have had fever therapy alone, the Kahn and Kolmer serologic reactions became less positive in three and more positive in one. The spinal fluid reactions remained negative in all.

A second control group of fourteen patients with primary or early secondary syphilis received only the thirty weekly injections of chemotherapy. Clinical evidence of relapse (cutaneous eruption) occurred in two patients, fever therapy was then given, with prompt remission of the skin lesions. Of the twelve patients who received only chemotherapy, the Kahn and Kolmer serologic reactions were reversed to negative in five, became less positive in six and became more positive in one. The spinal fluid reactions remained negative in eleven and were reversed to negative in one.

Including the four patients who were transferred from the two previous control groups, twenty-six patients with primary and early secondary syphilis were treated with combined fever and chemotherapy. The cutaneous manifestations of the disease, including the chancres, responded with surprising promptness (figs 2 and 3). The Kahn and Kolmer serologic reactions were reversed to negative in fourteen, became less positive in ten, remained positive in one and remained negative in one. The ten patients whose serologic reactions became less positive, and the one patient whose serologic reactions remained positive by the Kahn and Kolmer standard diagnostic tests have been under observation for only six to nine months. Progressive decline in the intensity of the serologic reactions, as measured by the Kahn quantitative procedure, has occurred in all. The spinal fluid reactions remained negative in twenty-three and were reversed to negative in three. There has been no evidence of clinical or serologic relapse in the patients treated with combined fever and chemotherapy.

With due regard to the small number of patients and the short interval of observation, these observations provide suggestive evidence that fever therapy alone or chemotherapy alone (as applied to these patients) is often inadequate. These observations also suggest that combined fever and chemotherapy is a distinctly advantageous form of treatment for early syphilis, particularly in those patients who do not respond promptly to orthodox chemotherapy. It must be appreciated that this is strictly a preliminary report of the response of early syphilis to combined fever and chemotherapy. Every effort will be exerted to follow the progress of these patients, and others who follow, throughout their lifetime.

Under existing circumstances, strong forces operate to keep the patient with early syphilis from receiving adequate treatment. It requires about eighteen months of continuous therapy in cases of early syphilis and an indefinitely longer period for the treatment of late syphilis.³⁰ The high cost and inconvenience to the patient often result in inadequate treatment. More than 500,000 persons in the United States seek treatment for early syphilis each year.³¹ Any method that would appreciably decrease the time and expense involved in providing adequate therapy is worthy of thoughtful consideration. A growing body of evidence appears to indicate that artificial fever therapy fortifies and intensifies the curative action of chemotherapeutic agents. The advent of simpler and safer methods for the induction and maintenance of artificial fever should stimulate vigorous investigation of this possibility.

NEUROSYPHILIS

Dementia Paralytica—Twenty patients with dementia paralytica have completed the course of fifty hours of fever therapy plus thirty injections of chemotherapy. Twelve have experienced complete clinical remission, two have been restored to a working status. Thus fourteen patients (70 per cent) have been socially rehabilitated. Four patients were accorded 50 per cent clinical improvement, two were regarded as having received 25 per cent improvement. No relapse has occurred following treatment. Six of these patients had advanced dementia paralytica, four had been committed to a hospital for the mentally diseased. Thirteen of the twenty patients had received presumably adequate chemotherapy, two had relapsed after receiving malaria therapy, five had received no treatment.

The Kahn and Kolmer serologic reactions were reversed to negative in four, became less positive in nine and remained positive in seven. Spinal fluid Kahn and Kolmer reactions were reversed to negative in five, became less positive in seven, remained positive in six, and became more strongly positive in two. The level of the colloidal gold reactions was reduced in twelve, elevated in three and unchanged in five.

As with fever therapy induced with malaria, there is no parallelism between the immediate clinical response and the serologic or colloidal gold reactions. In most instances the serologic reactions become negative or less positive during a period of several months following the treatment.

Tabes Dorsalis—The ten patients with tabes dorsalis had received chemotherapy previously. One had also received five malaria inoculations, followed by a temporary remission after the first inoculation. Two other patients had received malaria therapy. Ataxia (in nine

²⁹ (a) Stokes J. H., Cole H. N., Moore J. E., O'Leary P. A., Wile, U. J., Clark, Talliaferro Parran Thomas and Usilton Lida J. Cooperative Clinical Studies in the Treatment of Syphilis. *Ven. Dis. Inform.* 13: 165-182 (May 20) 1932. (b) *ibid.* 13: 253-292 (July 20) 1932. (c) *ibid.* 14: 1-12 (Jan.) 1933.

³⁰ Exner M. J. The Value of Instructing the Syphilis Patient. *Ven. Dis. Inform.* 16: 59-64 (March) 1935.
³¹ Usilton, Lida J. Trend of Syphilis and Gonorrhea in the United States. *Ven. Dis. Inform.* 16: 147 (May) 1935.

patients) and lancinating pains or gastric crises (in all) were the chief complaints. Two patients with ataxia of three months' duration in one case, and of two years' duration in the other, were restored to normal gait. Six patients obtained some improvement in gait while two showed no change. There appeared to be a direct relationship between the degree of improvement and the duration of the gait disturbance.

The root pains were abolished in all. Often the pains disappeared after the first two or three treatments. Recurrence of pains occurred in one patient after the usual course of treatments. This was controlled by additional treatments. Normal function was restored in one case of so-called cord bladder.

The Kahn and Kolmer serologic reactions were reversed to negative in four patients, became less positive in three, remained negative in one and remained positive in two. The spinal fluid reactions were reversed to negative in two, became less positive in three, remained positive in four and became more positive in one.

Tabetic Form of Dementia Paralytica—Seven patients with the tabetic form of dementia paralytica were subjected to the combined treatment. All had previously received chemotherapy, one had also had malaria therapy, followed by a remission lasting six months. Improvement in mental orientation occurred



Fig 1—The Kettering hypertherm

in six, one demented patient showed no improvement and died seven months after the treatment was completed. Subsidence of root pains occurred in all, in two instances additional fever treatment was required. Improvement in gait occurred in four of the five patients with ataxia, one patient who had had a tabetic gait for three months was restored to normal gait. One patient with a "cord bladder" regained normal control of bladder function.

The Kahn and Kolmer serologic reactions were reversed to negative in two instances, became less positive in one, remained negative in three and remained positive in one. The spinal fluid Kahn and Kolmer reactions were reversed to negative in four, became less positive in one and remained positive in two.

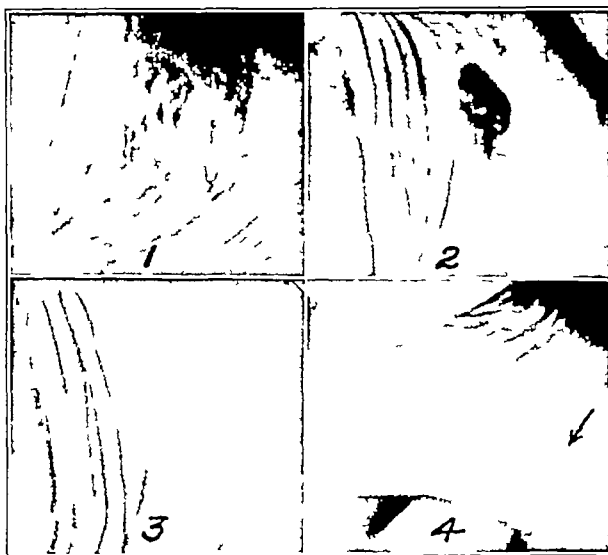


Fig 2—1 Appearance of hard chancre of penis March 23 1933 one day before pyretochemotherapy, numerous motile spirochetes. 2 Appearance of chancre March 26 two days after first treatment, no spirochetes present. 3 Appearance of chancre March 28 four days after first treatment, no spirochetes present. 4 Complete healing of chancre April 3 three days after second treatment.

Diffuse Central Nervous System Syphilis—In this group are placed thirteen patients with various manifestations of symptomatic neurosyphilis which could not be definitely classified as dementia paralytica, tabes dorsalis or the tabetic form of dementia paralytica. All but one had received antisyphilitic therapy. There were six cases of congenital syphilis and seven cases of acquired syphilis. In this group were nine cases in which ocular symptoms predominated.³³ Symptomatic remission occurred in nine of the thirteen patients, moderate improvement in three and no improvement in one. The Kahn and Kolmer serologic reactions were reversed to negative in one, became less positive in seven, remained positive in four and became more positive in one. The spinal fluid Kahn and Kolmer reactions were reversed to negative in five, remained negative in seven and remained positive in one.

Asymptomatic Neurosyphilis—Of seven patients with asymptomatic neurosyphilis, all of whom had previously received apparently ineffectual chemotherapy, the spinal fluid Kahn and Kolmer reactions were reversed to negative in six and became less positive in one. The blood Kolmer and Kahn reactions were reversed to negative in four, remained negative in two and remained positive in one. None have shown evidence of serologic relapse.

RESISTANT SEROPOSITIVE SYPHILIS

Included in this study were seven patients with so-called Wassermann-fast or what I prefer to term resistant seropositive syphilis. All had had presumably adequate chemotherapy. The Kahn and Kolmer serologic reactions were reduced to negative in four

33. The results obtained in these cases and in others manifesting ocular complications of syphilis will be discussed in a separate report by Arthur M. Culler and Walter M. Simpson in a forthcoming issue of the Archives of Ophthalmology.

became less positive in two and remained positive in one. The spinal fluid reactions remained negative in all. Serologic relapse has not occurred in any of these patients.

SUMMARY AND CONCLUSIONS

1 The value of artificially induced fever therapy as an adjunct to chemotherapy in the management of neurosyphilis is now firmly established. The one factor common to the wide variety of infectious, chemical and physical methods that have yielded comparable therapeutic results is simple fever production.

2 A simplified, controlled and relatively inexpensive method for fever induction and maintenance (Kettering hypertherm) has been devised. High frequency electric currents are not employed. During the past four years, 383 patients have been subjected to 2,844 artificial fever treatments, without any serious ill effects related to the method of treatment.

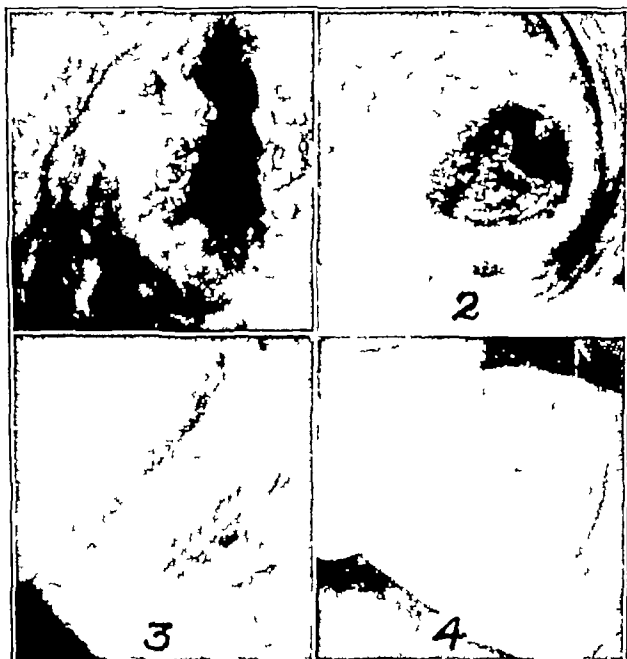


Fig. 3—1 Appearance of secondarily infected hard chancre of penis July 6 1933 the day before pyretochemotherapy numerous motile spirochetes. 2 Appearance of chancre July 10 three days after first treatment no spirochetes present. 3 Appearance of chancre July 15 one day following second treatment no spirochetes present. 4 Complete healing of chancre July 19 five days following second treatment.

3 The frequent observation that the best results occurred when neurosyphilis was treated by combined fever and chemotherapy during its earliest manifestations led us to apply the treatment to patients with primary or early secondary syphilis. The results provide evidence that fever therapy may be of great value in early syphilis, particularly when chemotherapy alone appears to be inadequate.

4 The results obtained in the treatment of symptomatic neurosyphilis, asymptomatic neurosyphilis and resistant seropositive syphilis are at least comparable to the results obtained with the more hazardous, time consuming and inconstant malaria therapy.

5 Hospitalization is not a requirement for fever therapy by physical means.

6 The advent of simple and safe methods for the production of artificial fever should stimulate vigorous investigation of the possibility that the time, effort and expense involved in the adequate antisyphilitic therapy may be greatly lessened.

7 There is evidence that artificial fever therapy fortifies and intensifies the action of antisyphilitic chemotherapeutic agents. It would appear that the therapeutic armamentarium of the syphilologist is now provided with a new and powerful weapon.

ABSTRACT OF DISCUSSION

DR. FRANK R. MENAGH, Detroit. The development of a practical air-conditioning cabinet that with the least discomfort to the patient will produce a controlled fever has been an achievement. The cabinet that Dr. Simpson and his associates have developed, with adequate apparatus for the easy control of temperature and relative humidity, has been at least in part responsible for the satisfactory results obtained. The accessibility of the patient for examination and treatment at all times is of great importance when it is remembered that the fever is maintained for five hours and that an extra hour is necessary to raise the temperature to 105 F or above. Since the autumn of 1933, my associates and I have had one or more of these hypertherms in our clinic and I wish to report our experience with one group of patients treated with this cabinet. Any one who follows the treatment of syphilis over a period of fifteen years gradually accumulates a group of problems in the form of patients who do not respond to the usual treatment with arsenicals, bismuth compounds, mercury and the iodides and in whom the malarial type of fever is inadvisable. A group of twenty-five such patients were given fever therapy. There were in this group twenty men and five women. They ranged in age from 17 to 63 years with an average age of 41 years. These patients had been under observation and treatment by us for an average period of four years and four months the longest period being more than ten years. These were given an average of 10.3 treatments each, a few receiving more than fifty hours of fever, and a few less. Twenty-one were given additional antisyphilitic therapy. As a result of treatment this especially refractory group showed twenty-two improved patients, two unimproved and one who died. The patient who died although he had syphilis was found at autopsy to have had a brain tumor. The two unimproved patients had tabes with tabetic pain and ataxia. They were thin, emaciated individuals and did not stand the fever well. In the improved group were eleven patients with syphilis of the parenchymatous type that is, positive spinal fluids with paretic gold curves, some of them with mild mental changes. This group did very well. Those with mental symptoms all improved, and at the present, one year after their treatment, none of the cases can be considered clinically active. This was the group that through the years had given us the greatest concern. There were six cases of tabes dorsalis, one with partial optic atrophy. The optic atrophy was arrested and apparently improved somewhat owing perhaps to the clearing of edema. I do not believe that any destroyed nerve fibers were ever regenerated. The remaining five patients never had a positive spinal fluid.

DR. CLARFANCE A. NEYMANN, Chicago. Momentous changes have come about since electropyrrexia was first introduced by Neymann and Osborne in 1929 based on researches begun in 1927. We have seen it develop into an accepted therapy for the treatment of certain diseases such as neurosyphilis and some forms of arthritis while we are not yet sure of its efficacy in a host of other conditions to which hyperpyrexia is being applied. In this connection I might mention early syphilis, asthma, chorea, minor gonorrhea and lately even malignant neoplasms. With the spread of the popularity of fever therapy induced by physical agents a great number of machines are being marketed. I believe that a perfect fever machine does not exist. As this therapy becomes better established, a more refined technique will undoubtedly be introduced. We have lately devised a cabinet the temperature of which closely approximates that of the patient's body at all times without in itself causing fever. We depend on electromagnetic induction for actually producing the fever. This method would seem to answer all questions of comfort and safety and yet not disturb the basic physiologic relationships which are reversed when ever external heat is applied. After all the external surface of the body is from 2 to 7 degrees F cooler than the interior.

The question of the modality or the machine used is of minor importance. The experience of the physician and his assistants is the main problem. I would stress the value of schooled personnel rather than the promotion of the use of a specific machine. I am sure that Dr Simpson agrees with me in this. During the last three years, Dr Theodore K Lawless, Mr S L Osborne and I have been working with primary syphilis. Chancres always disappear ten days after treatment with fever alone. Microscopic sections of chancres show spirochetes undergoing dissolution, both in the chancre and in concomitant inguinal lymph glands after one session of fever. I agree with Dr Simpson that fever therapy alone and chemotherapy alone are often inadequate for the treatment of all forms of syphilis both early and late. Bessemans, Van Haelst and De Wilde have shown that spirochetes found in the lymph glands of rabbits, guinea-pigs and mice are much more virulent and much more resistant to heat and chemotherapy than those obtained from concomitant chancres and skin lesions. These spirochetes have adjusted themselves to a more unfavorable environment. We have treated seven cases of primary syphilis with fever alone. Five of these developed late secondary syphilitic symptoms in the course of years. Two have remained free from all syphilitic manifestations.

DR. ALBERT N B LEMOINE Kansas City, Mo. Hyperpyrexia produced by malaria is one of the most valuable agents in the treatment of neurosyphilis. However as pointed out by Dr Simpson, it has disadvantages. Many of these can be overcome by production of fever by physical means. The various types of cabinets used have proved to be effective. However, the fact that a cabinet is necessary prohibits its universal use. Further many patients rebel against the prolonged treatment with these cabinets. To overcome these objections, Drs Charles Dennie and Polsky and I have adopted the hot bath treatment for cases of neurosyphilis and all manifestations of late or congenital syphilis. It has been found that such a course of treatment supplemented by chemotherapy gives much better results than was possible by chemotherapy alone. However we did not treat these patients with chemotherapy and the hot bath treatment at the same time, as did Dr Simpson. We used the hot bath treatment followed by chemotherapy. In some cases the results obtained were little short of miraculous. An ordinary tub is used in which the patient is submerged to the neck and covered with a poncho of light rubber. For the first hot bath the temperature of the water is started at 98 F and gradually increased to 102. This temperature is maintained for ten minutes. The second treatment two days later begins with a temperature of 100, is increased to 104 and is maintained for ten minutes at this temperature. The subsequent baths at two day intervals are all started at 100 and increased 4 degrees on each day, until 112 F is reached and maintained for fifteen minutes. This temperature should elevate the body temperature to over 104. In some cases a temperature of 106.5 was obtained. The best time to give these baths is just before retiring for the night. After the bath the patient should be immediately wrapped in a woollen blanket and allowed to cool off for an hour or two. We have found that maintaining the high temperature for fifteen minutes gives as good a result as an hour or two. The contraindications are the same as with the cabinet. We have treated cases of practically all types of late or congenital syphilis by this method that would not heal with chemotherapy, and all these latent cases of syphilis made remarkable improvement and the patients stayed well after using chemotherapy following the heat therapy. From this work we concluded that fever produced by the hot bath was a very effective therapeutic measure in late syphilitic lesions that were resistant to chemotherapy.

DR. M F ENGMAN JR St Louis. It seems rather difficult to divorce the foreign protein reaction or the thought of the foreign protein mechanism from all these heat applications. It is impossible to say that it is the heat alone which has accomplished the good results. In 1915 Dr Engman Sr began using shock therapy with typhoid in various diseases. He used it in lupus erythematosus annularis and in one or two cases of early syphilis. Later he conceived the idea of trying to mobilize in every way whatever defense mechanisms exist in the body against disease in an entirely nonspecific way. One of these methods was foreign protein injection that is typhoid serum

intravenously. Another was the use of iodide and he even thought that giving thyroid by mouth might increase the metabolism and help the desired result. So the idea was to do them all at once. We treated about thirty cases of early syphilis chancres and early secondary syphilis. We would prepare the patients with a high carbohydrate diet for a couple of days before the injection then have them on a small dosage of thyroid and on a moderate dose of iodide. Then the patients were given an injection of typhoid bacilli intravenously 25,000,000 then 50,000,000, 75,000,000 and so on, and a fever of about 102 to 105 was produced. When the fever reached its height, we gave 1 cc of 1 per cent mercury bichloride in physiologic solution of sodium chloride intravenously, hoping, as Dr Simpson mentioned that the increased capillary permeability would permit the mercury to have its desired effect. Our results in these thirty cases were not encouraging. We found that many of the patients would suffer from an almost toxic type of general debility. Some lost almost 25 pounds (11 Kg) not attributable to the syphilis. The quantitative Kahn reactions were reduced but with simultaneous studies in ordinary routine arsphenamine, and preparations of mercury and bismuth in the clinic this treatment was not as good, or if it was as good it was not superior. So we felt at the end that we might have benefited these patients somewhat. Then we put all of them on routine therapy, but our results in this routine were not particularly encouraging. We published the results in THE JOURNAL about four years ago.

DR. JOHN H STOKES Philadelphia. It should be pointed out that under no circumstances should the impression go out from this section or from syphilologists or fever therapists in general that primary and secondary syphilis are to be generally or uniformly dealt with by fever therapy. About all, it is unwise to create the impression that fever therapy can or should be expected in the near future to displace the now matured and carefully developed international and national systems for the chemotherapeutic management of early syphilis. This section and syphilologists in general can and I believe, should stand solidly for the application by all practitioners throughout the world of the standard worked out by the Health Organization of the League of Nations and the Cooperative Clinical Group with the United States Public Health Service in this country. These modes of treatment are supported by the largest material that has ever been accumulated and to their procedures and their conclusions for some time to come all other methods must be regarded as adjunct and subordinate. Especially is this true of the application of fever therapy to primary and secondary syphilis. These phases of the disease demand for their public health control chemotherapeutic methods of management which are accessible and easily available rather than esoteric and highly specialized. They must be applied on a grand in fact a universal scale. The effectiveness of such methods thus universally applied is no longer a matter for serious discussion or dispute. Fever therapy is fundamentally unable at the present time even granted a demonstrated comparable effectiveness to meet the situation as it stands. It is as its proponents repeatedly insist, a highly specialized form of procedure requiring special apparatus, trained personnel and centers for its application and there are comparatively few people equal to its responsibilities and few people able to avail themselves of its advantages. On the face of it this must for the time being discredit any procedure for the control of primary and secondary syphilis as a vast public health problem. The practitioner should treat early syphilis chemotherapeutically by the new standards and not vacillate over the possible but as yet unproved and comparatively inaccessible advantages of fever therapy in this phase of the disease.

DR. PAUL A O'LEARY Rochester Minn. I have observed Dr Simpson's work since its inception. The scientific manner in which he has studied these patients, not only while they are in the fever chamber but also subsequently to note the serologic results is worthy of comment. I think that his suggestion in regard to the use of saline solution by mouth during the course of fever has been of material value not only to patients in the hyperthermia chamber but also to those who are undergoing malaria therapy. There is nothing for the mechanotherapists the fever therapists and the chemotherapists to argue about so

far as the results of the treatment of syphilis are concerned The therapeutic results from malaria and treatment with the fever-producing units are quite similar Likewise, the unfavorable results from treatment with these units and with malaria are comparable. There are about 10 per cent of patients who cannot take malaria and about 10 per cent of patients who cannot tolerate these various fever units I think that the argument against malaria, viz , that it requires hospitalization, is not a very valid one, since for malaria therapy from twelve to fourteen days in the hospital is required at one time in contrast to a day in the hospital every week for a similar total for the hypertherm treatment Hence we fever therapists have nothing to argue about, we are all in accord The only point that we have to discuss is the mechanism by which these results are produced, and unfortunately we dont know very much about this I have been more interested in malaria therapy because I felt that there was a biologic interreaction of some sort between Spirochaeta pallida and Plasmodium vivax, the nature of which is unknown The part played by the reticulo-endothelial system or the changes in the plasmocytes has been suggested, but neither of these theories is established as yet I have felt, however that fever alone was not the sole cause of the therapeutic effects because I have observed that patients who underwent malaria therapy for active neurosyphilis which appeared during the stage of acute syphilis have developed cutaneous and mucous membrane recurrences six months or more after the fever treatment, likewise the appearance of cutaneous gumma in parietic patients following fever therapy is evidence that the spirochetes were not destroyed by the heat” Even more significant is the fact that the good results from fever therapy require a year or more to develop they do not appear in a few weeks or months as is noted following the use of arsphenamine Perhaps the biologic reaction is a catabolic one the result of the destructive process that occurs as a consequence of the fever

DR. WALTER M SIMPSON Dayton Ohio As Wade Brown, Louise Pearce and others have pointed out, there is no chemical agent that will insure complete sterilization in the treatment of syphilis It is apparent that the action of antisyphilitic chemo therapeutic agents is to stimulate natural immune processes Fever therapy apparently provides an additional immunologic stimulus It is quite possible that patients with early syphilis have been given too much fever therapy It is quite conceivable that a smaller amount of artificial fever would be equally effective The treatment of a series of early syphilitic patients has been begun, ten fever treatments being given at intervals of from three to five days of two and one-half to three hours duration at from 105 to 106 F, combined with chemotherapy (total dosage of 9 Gm of neoarsphenamine and 6 Gm of metallic bismuth) The least important factor in artificial fever therapy is the apparatus The potentialities for harm in the hands of unskilled or unscrupulous persons probably exceed any benefits that might be derived from it The application of fever therapy to early syphilis should be regarded as a strictly experimental undertaking for the next several years I am glad that Dr Stokes referred to the public health aspects of this problem Physicians now have at their command the means with which to abolish syphilis and gonorrhea from the face of the earth Little can be accomplished, however until the public has been aroused as to the appalling disasters wrought by these diseases Wide publicity has been the most potent weapon in the successful warfare against smallpox yellow fever, typhoid, diphtheria and tuberculosis The gains that are now being made in the fight against cancer are due to a large measure to organized lay publicity No great gains can be made in the conquest of syphilis and gonorrhea until the unreasonable prejudice against the dissemination of sound information to the millions of actual and potential victims of these diseases has been abolished. To regard these diseases as just punishment for sinfulness is to deny the innocent acquisition of these diseases in a great proportion of cases Organized molding of public opinion is a fundamental requirement if the enormous human wastage due to the present lack of control of these diseases is to be prevented New heights of absurdity were reached recently when a radio broadcasting company refused to permit an acknowledged authority to deliver a speech on the public health aspects of the problem because the word ‘syphilis’ was to be mentioned

GROWTH ARREST IN LONG BONES AS
RESULT OF FRACTURES THAT
INCLUDE THE EPIPHYSIS

EDWARD L COMPERE, M.D
CHICAGO

The importance of the growth cartilage of the long bones has been emphasized by embryologists and anatomists, but the ease with which growth may be arrested as the result of infection that injures the cartilage plate or by direct violence, which may be produced by the surgeon who is careless in his operative approach or may be secondary to fractures or crushing injuries in the region of the ends of the long bones, is not always appreciated by those who are called on to treat the lesions of the extremities of growing children

Haas¹ has stated that trauma is the most frequent cause of disturbances of growth in bones He further states that the greatest growth activity is localized in the cartilage columns on the metaphyseal side of the epiphyseal cartilage plate and that, after the destruction of this portion of the growth cartilage, length growth practically terminates In a series of experiments on young dogs and cats in which he damaged the

TABLE 1—Fractures of the Long Bones Treated at the University of Chicago Clinics from October 1927 to May 1935

| | |
|---|------|
| Total number of patients treated for fractures of long bones | 635* |
| Total number of fractures of long bones | 819* |
| Children with fractures of long bones 14 years of age or younger at time of fracture (34% of total fracture cases) | 91 |
| Fractures of long bones in children 14 years of age or younger at time of fracture (35% of total number of fractures) | 290 |
| Children with fractures of epiphyses or of fractures of the shaft that crossed the epiphyseal line | 37 |
| Fractures in children of epiphyses or of fractures of the shaft that crossed the epiphyseal line (14 4% of all the fractures in children) | 42 |

* Includes five pathologic fractures

growth cartilage itself, the epiphysis or the metaphysis in various ways, he found that injury to the epiphysis alone or to the metaphysis alone caused very little change in the rate or extent of growth of the extremity On the other hand, injuries in the shaft of the bone that extended to and across the epiphyseal line, injuries to the epiphysis that included in the applied trauma a portion of the cartilage plate, or direct insult to the growth cartilage alone did cause an early closure or a complete arrest of growth from the traumatized end of the bone

Gatewood and Mullen² have also shown that immediate closure of the epiphyses resulted from the destruction of the epiphyseal cartilage plate on the side nearest the joint Interruption of the extrinsic blood supply to the epiphysis, by stripping away the periosteum at the site of the epiphyseal cartilage, caused this epiphysis to fuse to the shaft earlier than in the control limb, although there was no immediate arrest of growth

Haas has also warned against the stripping of soft parts from the edges of the epiphyseal cartilage plate. He has stated that surgery of the extremities of chil

From the Division of Orthopaedic Surgery of the Department of Surgery University of Chicago
Read before the Section on Orthopaedic Surgery at the Eighty Sixth Annual Session of the American Medical Association, Atlantic City N J June 14 1935
1 Haas, S L. The Changes Produced in Growing Bone After Injury to the Epiphyseal Cartilage Plate, J Orthop Surg 1: 67 (Feb.) 166 (March) 226 (April) 1919 Growth Disturbances Following Resection of Joints Arch. Surg 13: 56 63 (July) 1926
2 Gatewood and Mullen B P Experimental Observations on the Growth of Long Bones Arch Surg 15: 215 221 (Aug) 1927

dren that did not take into consideration the danger of growth arrest has caused many growth disturbances and deformities. He demonstrated in experimental work that the mere passage of sutures through the actively growing columns of cartilage cells of the cartilage plate resulted in the arrest of growth.

During the seven and one-half years since the opening of the clinics at the University of Chicago, I have seen a group of cases showing deformities that developed as a result of fractures that crossed the epiphyseal cartilage and produced partial or complete growth arrest. Growth disturbances due to fractures

TABLE 2—Cases in Which Fractures of the Long Bones Extended to or Crossed the Epiphyseal Lines

| Patient | Age at Time of Fracture | Sex | Location of Fracture | Date of Fracture | Admission to U of C Clinics for Fracture or Deformity | Last Examination | Growth Arrest |
|---------|-------------------------|-----|--|------------------|---|------------------|---------------|
| R L | 4 | ♂ | Lower end of humerus | 9/14/32 | 9/15/32 | 5/17/35 | No |
| M R | 4 | ♂ | Distal humerus | 10/12/31 | 11/ 6/31 | 4/ 4/32 | Yes |
| E C | 5 | ♂ | Lower humerus | 5/16/33 | 5/16/33 | 5/16/35 | Yes |
| D S | 5 | ♂ | Distal humerus | 12/26/30 | 12/27/30 | 1/28/31 | ? |
| L G | 5 | ♂ | Old distal humerus | 10/15 | 1/16/31 | 4/ 8/31 | Yes |
| R H | 5 | ♂ | Distal humerus | 6/12/32 | 6/12/32 | 6/15/32 | ? |
| F E | 8 | ♂ | Distal humerus | 7/ 6/31 | 8/ 6/31 | 5/16/35 | Yes |
| A B | 10 | ♂ | T fracture lower end of humerus | 8/ 4/32 | 6/ 4/32 | 5/15/35 | Yes |
| D Mc | 12 | ♂ | Medial epicondyle humerus | 6/12/34 | 6/12/34 | 7/ 6/34 | Too recent |
| J S | 12 | ♂ | Distal humerus | 8/ 8/30 | 8/ 8/30 | 9/ 3/30 | ? |
| J P | 13 | ♂ | Distal humerus | 10/15/30 | 11/26/30 | 5/23/35 | Yes |
| M H | 14 | ♂ | Proximal humerus (postoperative infection) | 2/17/31 | 2/17/31 | 4/10/34 | Yes |
| T D | 6 | ♂ | Distal radius | 8/16/32 | 8/25/32 | 9/29/32 | ? |
| D A | 8 | ♂ | Distal radius old | July 1929 | 2/ 8/34 | 2/ 8/34 | Yes |
| M B | 8½ | ♂ | Head of radius (open reduction) | 1/ 2/34 | 7/16/34 | 5/17/35 | Yes |
| H B | 9 | ♂ | Distal radius | 10/ 3/32 | 10/ 3/32 | 11/ 7/32 | ? |
| S C | 11 | ♂ | Distal end of radius | 9/ 1/31 | 9/21/31 | 10/31/31 | ? |
| J B | 11 | ♂ | Head of radius | Oct 1933 | 3/10/34 | 3/10/34 | Yes |
| J H | 12 | ♂ | Distal radius comminuted compound | 7/24/33 | 11/23/33 | 4/18/35 | Yes |
| J R | 13 | ♂ | Distal radius | 7/ 4/32 | 1/ 4/32 | 7/26/32 | ? |
| P W | 9 | ♂ | Distal ulna | 11/ 9/31 | 11/ 9/31 | 12/10/31 | ? |
| D K | 13 | ♂ | Distal ulna | 5/10/35 | 5/10/35 | 5/11/35 | Too recent |
| I M | 7 | ♂ | Lower femoral old | 1927 | 10/29/34 | 4/25/35 | Yes |
| J W | 9 | ♂ | Distal femoral | 12/11/33 | 12/11/33 | 5/17/35 | Yes |
| H R | 12 | ♂ | Neck of femur with epiphyseal separation | 12/28/34 | 12/28/34 | 2/18/35 | Yes |
| T K | 12 | ♂ | Lower femoral | 2/16/30 | 3/ 9/31 | 4/30/35 | Yes |
| W L | 13 | ♂ | Lower femoral old | 1931 | 7/ 7/33 | 6/2/34 | Yes |
| H M | 13½ | ♂ | Intracapsular neck of femur | Oct 1932 | 5/15/33 | 3/12/34 | Yes |
| S W | 9 | ♂ | Medial malleolus | 7/24/33 | 7/24/33 | 8/21/33 | ? |
| M V | 10 | ♂ | Distal tibia compound old | 1928 | 3/21/32 | 3/21/32 | Yes |
| W M | 12 | ♂ | Distal tibia old | 1932 | 1/ 6/34 | 5/16/35 | Yes |
| M L | 14 | ♂ | Distal tibia epiphyses almost closed at time of injury | 12/21/30 | 12/21/30 | 11/ 8/34 | Yes |
| R W | 8 | ♂ | Tibia and fibula at ankle compound old | 8/12/31 | 10/19/31 | 10/27/31 | Yes both |
| A M | 9 | ♂ | Distal tibia and fibula | June 1932 | 6/27/32 | 8/18/32 | ? |
| E S | 9 | ♂ | Distal tibia and fibula | 10/16/34 | 10/16/34 | 5/16/35 | Yes both |
| D W | 12 | ♂ | Distal tibia and fibula | 10/28/34 | 10/31/34 | 5/16/35 | Yes |
| J G | 12 | ♂ | Both malleoli | 4/23/30 | 4/23/30 | 7/ 1/30 | ? |

? denotes no recent follow up

TABLE 3—Analysis of Cases in Table 2

| | |
|---|-----|
| 1 Total fractures of growth cartilages | 42 |
| 2 Old fractures admitted because of deformity | 8 |
| 3 Fractures complicated by infection (all had growth arrest) | 5 |
| 4 Fresh uncomplicated fractures of the epiphyseal cartilages | 33 |
| 5 Fractures in item 4 with roentgen follow up six months or more | 19* |
| 6 Growth arrests in group in item 5 | 18 |
| 7 Percentage of growth disturbances in the series with adequate follow up | 92% |
| 8 Ages | |
| (a) Youngest | 4 |
| (b) Oldest | 14 |
| (c) Average | 9½ |

*Two of the fractures were too recent to determine fate of the growth cartilage and ten patients (twelve fractures) had moved without leaving addresses or were otherwise lost.

Lewin³ in 1929 published a comprehensive review of the growth, development, injuries and diseases of the epiphyses, but he did not discuss growth disturbance secondary to fractures that involved the epiphyseal cartilage.

Elmslie,⁴ Reschke⁵ and Speed⁶ have reported cases of arrest of growth of long bones from simple fractures that extended across the cartilage plate. However, no analysis of a significant series of fracture cases to determine the incidence in which fractures in children have involved the growth cartilages or have resulted in growth disturbances has been reported.

3 Lewin Philip Epiphyses Their Growth Development, Injuries and Diseases Am. J. Dis. Child 37: 141-178 (Jan) 1929
4 Elmslie, R. C. The Relationship of Fracture of the Lower Epiphysis of the Tibia to Arrest of Growth of the Bone J. Orthop Surg 1: 215-218 (April) 1919
5 Reschke Karl Beobachtungen über erworbene Deformitäten durch Wachstumsstörungen infolge örtlicher Beeinflussung der Epiphysenknorpel Deutsche Zeitschr. f. Chir 197: 292-327 1926
6 Speed J. S. and Macey H. B. Fractures of the Humeral Condyles in Children J. Bone & Joint Surg 15: 903 (Oct) 1933

were thought to be relatively uncommon, but factual data to support this belief could not be found. A study of all the fractures of the long bones that had been treated in the University of Chicago Clinics from October 1927 to May 1935 to determine as nearly as possible the incidence of fractures with growth arrest was made. The results of this study are shown in table 1. Patients treated for fractures of the long bones reached a total of 693, with a total number of 819 fractures, 211, or 34 per cent of the total number of fracture cases studied, were in children 14 years of age or younger at the time the fracture occurred. In this group of children were 290, or 35 per cent of the total number of fractures. In thirty-seven of the 211 cases, the fracture involved the growth cartilage.

TABLE 4—Location of Fractures of Epiphyses or Fractures of the Shaft That Crossed the Epiphyseal Line, in Children

| | |
|--------------------------------------|----|
| Humerus (1 proximal 11 distal) | 12 |
| Radius (2 proximal 6 distal) | 8 |
| Ulna (distal) | 2 |
| Femur (4 distal 2 capital epiphysis) | 6 |
| Tibia (distal) | 9 |
| Fibula (distal) | 5 |
| Total | 42 |

In this group of thirty-seven patients there were forty-two such fractures, an incidence of 14.4 per cent of all the fractures in children.

Table 2 includes all the patients 14 years of age or younger at the time the fracture occurred who have been seen in this clinic because of an old fracture of a long bone that resulted in growth arrest and

deformity or recent fractures that definitely included the growth cartilage

An analysis of the cases that are listed in this table is given in table 3. The total number of fractures observed in children that involved the growth cartilage was found to be forty-two, which, as previously mentioned is about 14 per cent of all the fractures of the

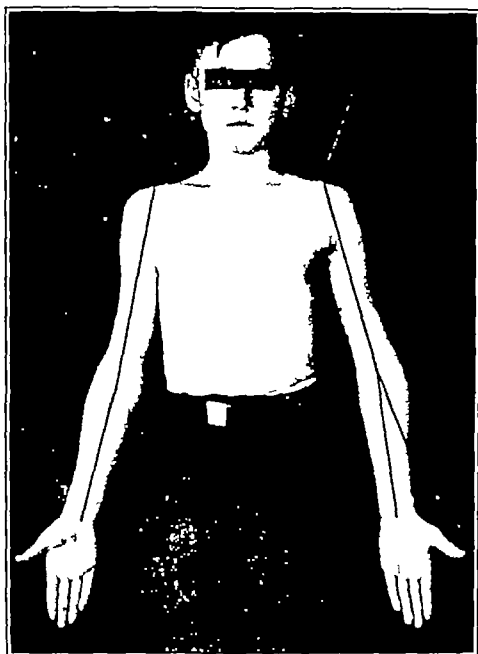


Fig. 1 (case 1)—Reversal of the carrying angle of the left arm. May 11 1935 due to the retarded and finally arrested growth of the medial condyle of the humerus

long bones in children which have come to this clinic. Of this number eight were old fractures admitted because of deformity due to arrest of growth. Three of the eight had been compound fractures, so that the growth cartilage was injured by the infection as well as by trauma from the fracture. Of the entire group of forty-two fractures, five were complicated by infection, in all of which growth was arrested. There were thirty-three fractures in which the epiphyseal cartilage was involved but were too recent to show deformity at the time of the first admission. In only nineteen of these have we been able to secure an adequate roentgen follow-up examination. Of the nineteen, eighteen have shown definite growth arrest, an incidence of 95 per cent.

In table 4 the location of the various fractures that involved the growth cartilage are shown. The most common fracture to extend across the epiphyseal line into the epiphysis is that of the distal end of the humerus, while the bone that is least often injured in this way, as judged by this rather brief series of cases, is the ulna.

The following cases are illustrative of the growth disturbances that may result from fractures which include the growth cartilages.

REPORT OF CASES

CASE 1—A B, a boy, aged 10 years, sustained a fracture of the lower end of the left humerus Aug 6 1932. Roentgenograms taken immediately after the injury showed a transverse supracondylar fracture and a split downward through the distal fragment across the epiphyseal cartilage into the joint. A satisfactory reduction was obtained. Following removal of

the cast, the distal fragment angulated posteriorly. The patient recovered complete extension and flexion through an arc of 130 degrees. In January 1934, roentgen examination revealed loss of the normal carrying angle of the left elbow. This cubitus varus deformity has slowly increased, owing to normal growth of the radial half of the distal humeral epiphysis and retarded growth of the medial half. Roentgen examination May 11, 1935, showed fusion of the medial portion of the distal growth epiphysis to the lower end of the shaft of the humerus (fig 1).

CASE 2—D A, a boy, aged 13 years, seen at the University of Chicago Clinics, Feb 8 1934, fell from a viaduct, July 19 1929, and both arms were fractured at the wrist (fig 2). Both fractures were reduced and union occurred. Normal function was restored in the right arm. Three years later the mother of the patient observed that the left arm was deformed at the wrist, with the hand deviating toward the radial side. A roentgenogram taken at this time showed fusion of the distal epiphysis to the metaphysis of the radius. Roentgenograms taken on admission to the University of Chicago Clinics (fig 3) showed shortening of the shaft of the left radius, fusion of the distal radial epiphysis to the metaphysis and deformity with radial deviation of the hand resulting from continued growth of the ulna. Arrest of growth of the ulna by excision of the distal end of the shaft was advised.

CASE 3—J W, a girl aged 8 years, was struck by a truck, Dec 11 1933, and was brought into the hospital unconscious. The right knee was painful and swollen. A roentgen examination showed backward displacement of the lower epiphysis of the right femur of about 1 cm and a simple fracture, without displacement, of the distal shaft, the cartilage plate and the epiphysis. The displacement of the epiphysis was reduced by extension traction, and a plaster cast was worn for five weeks. The patient recovered normal and painless function of the knee. She was last examined May 17 1935, and at this time she walked without any limp and had normal function. A roentgen examination May 16 1935, showed narrowing of the epiphyseal line and fusion of the lateral condyle to the shaft. This injury to the cartilage may result in growth arrest of the lateral condyle of the femur. Continued growth of the medial condyle will thus produce a genu valgum deformity.



Fig. 2 (case 2)—Fracture dislocation of the distal epiphysis of the left radius. July 26 1929

CASE 4—W L, a boy aged 15 years, admitted in July 1933 was struck by a car about two years prior to admission and sustained an injury to his right knee. Subsequently he developed a progressive right genu valgum deformity. Roentgenograms taken the day of admission showed unequal growth of the right lower femoral condyles, with the lateral shorter than the medial condyle (fig 4). Interpretation of these roentgenograms and the history led to the impression that the patient had sustained an incomplete fracture of the lower end of the

femur similar to that described in case 3, with arrest of growth of the lateral condyle. Correction was by supracondylar osteotomy.

CASE 5—I. M., a boy, aged 14 years, came to the University of Chicago Clinics because of a flexion deformity and 2 inches shortening of the right leg. Seven years before this admission he had fallen, sustaining a fracture of the lower end of the right femur with displacement of the femoral epiphysis (fig 5).



Fig 3 (case 2)—Appearance Feb. 8, 1934, five years after the fracture. There has been no further growth of the left radius from its distal epiphysis and the growth of the ulna has increased the deformity of the wrist.

Roentgenograms showed that it was accurately reduced. Subsequently the epiphysis became fused posteriorly to the shaft of the femur. Growth continued from the anterior portion of the distal growth cartilage but was retarded in the posterior portion. As a result of this the condyles became gradually tilted backward so that the proximal end of the tibia articulated with the femoral condyles in a posterior position and it was not possible for the patient to extend the leg more than 160 degrees. An operation for lengthening the femur similar to the technique described by Putti but with the addition of a full thickness tibial bone graft which would reinforce the femur in the region of the osteotomy, was performed Nov. 6, 1934. At this time an attempt was made to correct at the site of the osteotomy, the posterior displacement of the lower femoral epiphysis. The operation was successfully performed and approximately 2 inches of length was obtained by fixed skeletal traction continued for four weeks. The patient is now walking and is able to extend this leg completely.

CASE 6—K. S., a girl, aged 9 years, had growth arrest of the distal fibula and tibia. The patient fell while playing at school Oct. 16, 1934. Roentgen examination showed a fracture of the lower end of the tibia and across the epiphyseal cartilage into the epiphysis. There was also a fracture through the epiphyseal line at the distal end of the fibula with about 3 mm medial displacement of this epiphysis. Immobilization in a plaster cast was continued for one month. Weight bearing was permitted after six weeks. Restoration of normal function was accomplished, but roentgen examination, May 16, 1935, showed narrowing and irregularity through the line of the growth cartilage with beginning fusion of the epiphysis to the shafts of both the fibula and the tibia.

CASE 7—D. W., a girl, aged 12, sustained a simple fracture of the distal portion of the shaft of the left tibia and fibula Oct. 28, 1934. The fracture included the epiphyseal cartilage of both bones. A roentgenogram April 13, 1935, revealed smooth articular surfaces and there was no deformity. The epiphyses of both the tibia and the fibula have fused to the metaphyses. Since this patient is physically more mature than her age would indicate, not more than 1 to 2 cm of shortening of the leg is anticipated.

CASE 8—W. M., a boy, aged 14 years, came to the University of Chicago Clinics, Jan. 6, 1934, because of a progressively increasing deformity of the right ankle. Two years before, he had sustained a fracture of the tibia. Roentgen examina-

tion at that time showed that the fracture line had crossed the epiphyseal cartilage and the epiphysis and entered the ankle joint at its medial side (fig. 6-4). Roentgenograms which were taken at the time of his admission to the clinic showed an arrestment of the growth of the medial malleolus of the tibia (fig. 6-1). The lateral two thirds of the lower end of the tibia had continued to grow and the astragalus had become rotated medially toward the defect produced by the arrest of growth of the medial malleolus. A transverse line across the shaft of the tibia about 15 cm above the open epiphyseal line of the growing epiphysis and approximately directly continuous with the epiphyseal line of the growth arrested medial portion of the distal end of the tibia was interpreted as the site of the epiphyseal cartilage at the time of the injury and to have been produced by temporary arrestment of growth due to the fracture.

Jan. 29, 1934, an attempt was made to correct the varus deformity of the foot and to arthrodese the astragalus to the growing portion of the tibia. The deformity was corrected and the astragalus became fused to the growing portion of the epiphysis. The patient began to walk without crutches and without mechanical support for the foot, six months after the operation. Three months later he fell and sustained a spiral fracture of the tibia just above the distal epiphysis but this time the fracture line did not cross the growth cartilage. The second fracture united and for the past seven months the patient has walked without discomfort and only a slight limp. The last roentgen examination was made May 16, 1935, and showed that the deformity had not recurred. The astragalus is now firmly united to the growing portion of the tibia; the right leg is



Fig 4 (case 4)—Condition Aug. 29, 1933, two years after the injury, showing growth arrest of the lateral condyle of the femur with the development of a marked genu valgum deformity.

approximately 0.5 cm shorter than the left and there is no obvious disability (fig. 7). At his last visit in the clinics he requested permission to try for football at school next year.

CASE 9—G. D., a boy, aged 16, with growth arrest from operative trauma, came to the University of Chicago Clinics in 1930 at the age of 11 years because of a deformed left foot and short left leg. He had been born with a calcaneus deformity and was operated on at the age of 2 months, again at the age of 5 months, and a third time at the age of 8 months.

The exact nature of these operations could not be learned. The calcaneus position was not corrected, and after the operations the left leg grew more slowly than the right.

My examination revealed a marked deformity of the foot and an extreme calcaneus position (fig 9A). The left leg, measuring from the anterior superior spine to the medial malleolus, was found to be $3\frac{1}{2}$ inches longer than the right. A roentgenogram of the left foot revealed gross deformities consisting of absence of part of the talus, some of the midtarsal bones, and the distal epiphyses of the tibia and the fibula.



Fig 5 (case 5) —Condition Oct 31 1934 showing angulation posteriorly of the distal end of the femur due to growth arrest posteriorly while the growth cartilage in the anterior region has remained active. The epiphysis has now completely fused to the shaft of the femur while the epiphyseal lines at the proximal end of the tibia and fibula are still open. As a result of this growth disturbance there is shortening of 2 inches in this femur and extension of the knee is limited to 160 degrees.

The parents had been told by the surgeon who operated when the child was an infant that he had shortened the bones of the leg in order to correct the calcaneus deformity. Obviously he was ignorant of the importance of the growth epiphyses and had deliberately chopped them off or crushed them in an attempt to correct the deformity forcibly.

After a futile attempt to correct the calcaneus position by a turnbuckle brace, I performed a wedge resection through the remaining midtarsal bones and displaced the foot posteriorly under the astragalus. This operation made it possible for the patient to walk on the plantar surface of the foot. In addition to this the growth epiphyses at the lower end of the right femur and proximal ends of the right tibia and fibula were fused to the shaft by the method that has been described by Phemister⁷. At the time of this operation Jan 29 1932 the left leg was $3\frac{1}{2}$ inches shorter than the right. Teleroentgenogram measurements were last made Feb 14, 1934, two years and one month after arrest of the growth epiphyses at the right knee. These measurements showed that there had been a retardation of growth of the right leg so that the left leg had gained 2 inches. He now walks well, wears a standard oxford shoe and has little functional disability (fig 8B).

COMMENT

Textbooks have been notably lacking in warning of the dangers to the growth cartilage from fractures which include this portion of the long bone.

⁷ Phemister D. B. Operative Arrestment of Longitudinal Growth of Bones in the Treatment of Deformities. *J Bone & Joint Surg* 15: 115 (Jan) 1933.

Reschke has reported a brief series of cases of growth disturbances that resulted from fractures of the ends of the long bones in growing children. Elmslie reported one case of a fracture with growth arrest of the distal end of the tibia, while Speed has discussed the growth deformities that result from fractures of the distal end of the humerus. Snyder reported growth arrest from unilateral surgical trauma to the epiphyseal cartilage plate of the long bones of children. For correction of the deformities he recommended unilateral arrest of the cartilage plate of the opposite side or the use of braces or casts, which would be worn until growth ceased.

Phemister has recommended growth arrest of epiphyses of the longer leg in cases of inequality of leg length in children. He has also successfully performed growth arrest of a more rapidly growing unilateral portion of one epiphysis to correct deformity. Growth arrest operations were performed in case 9, in which there was $3\frac{1}{2}$ inches of shortening of one extremity due to surgical trauma to the distal end of the tibia and fibula when the patient was less than 1 year of age. This operation, which consisted of the arrest of growth of the distal epiphysis of the femur of the longer leg and the proximal epiphyses of the tibia and fibula, resulted in partial equalization of the length of the two legs.

I have not seen in a clinical case an example of the condition which Hans Selye⁸ has described in rats. Selye has shown that, if the distal end of the femur is removed during the first few weeks of life in the rat, a new growth cartilage is formed and the growth in length is resumed. This new growth cartilage forms always in a plane at right angles to the shaft, irrespec-

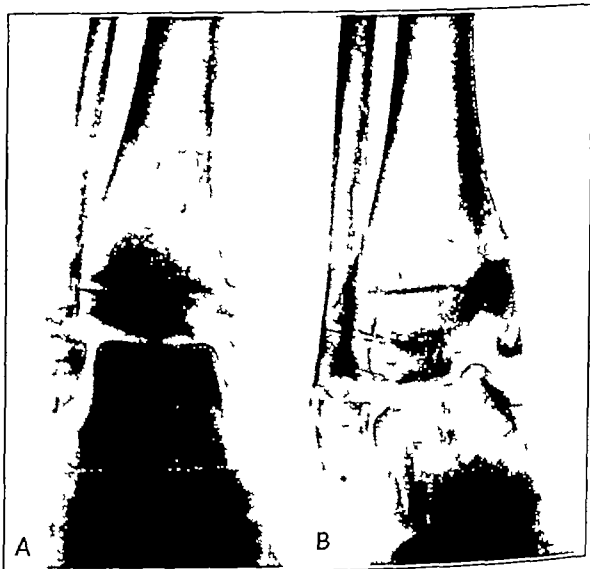


Fig 6 (case 8) —A injury of the medial portion of the distal epiphysis of the tibia Sept 23 1931 which extends across the epiphyseal cartilage but cannot be seen to include the metaphysis. The epiphysis of the fibula has been dislocated medially. B Jan 6 1934 two years after the fracture. The medial portion of the epiphysis has become fused to the metaphysis. There is a transverse line across the tibia 1 cm. above to the metaphysis. This is the open epiphyseal line of the growing portion of the tibia and this is directly continuous with the fused epiphyseal line in the medial portion of the tibia. This is attributed to the temporary cessation of longitudinal growth of this bone which immediately followed the injury.

tive of the plane of the amputation. In case 9 of the present series the distal epiphyses of the tibia and fibula were excised when the patient was less than 1 year of

⁸ Selye Hans. On the Mechanism Controlling the Growth in Length of the Long Bones. *J Anatomy* 68: 289-292 (April) 1934.

age. I was not able to secure interval roentgenograms but when the patient was 11 years of age, at the time of his first visit to the clinic there was no evidence of a growth cartilage that could be seen in the roentgenograms of the distal ends of these two bones. The shortening that had resulted was as much as would have been expected from complete absence of any growth from the distal epiphyses of the tibia and fibula.

Gilhes⁹ has shown that the characteristic fractures in the region of the wrist in childhood are either trans-

verse or torus, the point of fracture being above the site of the classic radius fracture in adults. This has been found to be true in my own series and since fractures of this type do not disturb the longitudinal growth of bone, it would seem to be a fortunate circumstance.

Birth fractures or those which occur during infancy, are commonly of the transverse type and are shown by Truesdell¹⁰ to be located in the midshaft region. None of the birth fractures reported by Truesdell included the end of a long bone. The youngest patient in the present series in which the fracture included growth cartilage was $4\frac{1}{2}$ years of age. The average age was $9\frac{1}{2}$ years. Since it has been shown that growth may continue for from one to three years after such an injury before the premature closure of the epiphyseal line occurs in only a relatively small percentage of the cases in which growth is arrested by



Fig. 7 (case 8)—The deformity noted in figure 6 B has been corrected. The astragalus is now firmly united to the growing portion of the distal epiphysis of the tibia. The distal epiphyses of both the right tibia and the right fibula have become fused to the shafts while the epiphyseal lines of the left tibia and fibula are open.

verse or torus, the point of fracture being above the site of the classic radius fracture in adults. This has been found to be true in my own series and since fractures of this type do not disturb the longitudinal growth of bone, it would seem to be a fortunate circumstance.

Fractures of the epiphyseal cartilage of the long bones do not necessarily cause immediate arrest of growth. Growth disturbances may not be apparent six months or even a year after the fracture, but the epiphysis may be expected to fuse earlier than on the uninjured side. Instances of this have been noted in the present series. One year after the fracture in case 1 there was no evidence of a growth arrest but three years afterward the epiphysis had fused, while the distal epiphyseal line of the uninjured humerus was still open. In case 3, six months after the fracture, a roentgenogram was taken which did not show a growth disturbance. One year and five months after the fracture had occurred however, a roentgenogram showed definite fusion of the lateral condyle. In case 5 there was a deformity due to an early fusion of the posterior portion of the epiphysis of the femoral condyle, while growth continued anteriorly and resulted in tilting the condyles of the femur backward, but after two or three years of continued growth of the anterior portion this also fused, while the longitudinal growth continued in the normal leg and resulted in 2 inches of shortening of the femur in which the fracture had occurred. A somewhat similar condition was noted in case 8. Two years after the fracture had occurred, a roentgenogram showed complete growth arrest of the medial portion of the distal epiphysis of the tibia, but growth had continued at approximately a normal rate

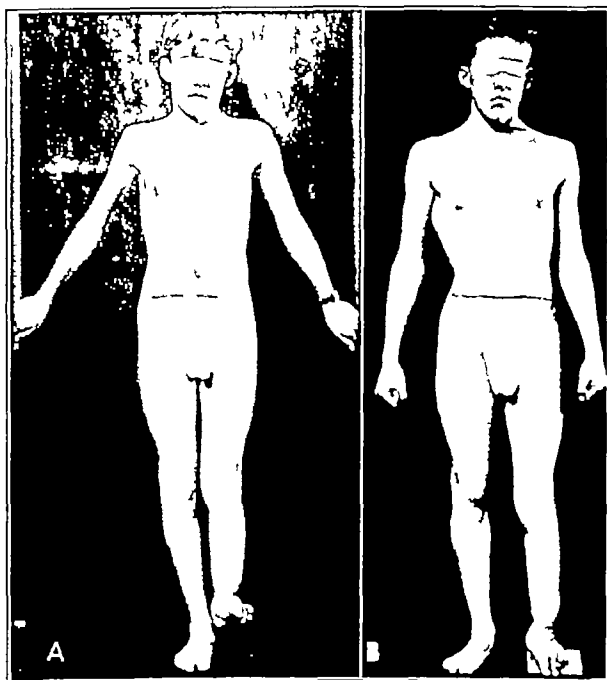


Fig. 8 (case 9)—A, condition in 1932. The left leg is $3\frac{1}{2}$ inches shorter than the right because of trauma to the distal epiphysis of the tibia and fibula from an operation during infancy to correct a calcaneus deformity of the foot. B, condition in 1934, two years after operation for fusion of the distal epiphysis of the right femur and the proximal epiphyses of the right tibia and fibula. The difference in the length of the two legs is now $1\frac{1}{2}$ inches.

such fractures will there be an appreciable deformity. Those cases in which the fracture occurs after the age of 12 years, even though growth may be arrested, would be expected to result in a minimal degree of deformity.

⁹ Gilhes, Carl I. Fractures in the Region of the Wrist in Childhood, Puberty and Adolescence. J. Iowa M. Soc. 23: 15 (Jan.) 1935.

¹⁰ Truesdell, E. D. Birth Fractures and Epiphyseal Dislocations. New York: Paul B. Hoeber, 1917.

Truesdell has reported a series of cases in which there were dislocations of the cartilaginous epiphyses as a result of birth trauma. In some of these deformity, but no serious disturbance of growth persisted throughout infancy. None of the cases reported had been followed until growth was complete. There was a striking tendency in these cases studied by Truesdell for the construction of new shafts of the long bones between the dislocated but invisible cartilaginous epiphysis and the epiphysis at the other end of the bone so that for a time the roentgenograms showed a double shaft with subsequent absorption of the older bone.

CONCLUSIONS

1 About 35 per cent of all the fractures that have been treated in this clinic occurred in children 14 years of age or younger.

2 Fourteen per cent of the fractures in children involved the growth epiphysis.

3 Of the fractures in children that involved the growth cartilage and were seen before deformity had occurred and were followed for more than six months with roentgen examinations, eighteen of nineteen cases, or 95 per cent showed growth disturbances.

4 Growth disturbance from fractures near the ends of the long bones in children are more common than is generally recognized.

5 The clinician should be reserved in his prognosis in the cases of such fractures and should follow these patients with periodic roentgen examinations for from one to two years after union of the fracture has taken place.

950 East Fifty-Ninth Street

ABSTRACT OF DISCUSSION

DR F. C. KIDNER, Detroit. Dr Compere's statistical study of the harmful effect on growth of injury to the epiphyseal line of long bones focuses attention on a condition that surgeons rarely recognize. It first came under my observation in 1918 when I saw a girl of 17 whose left foot was in such extreme supination that she walked on the outer border of her foot, the external malleolus almost touching the ground. She injured her ankle ten years before. The deformity developed gradually. There was a sharp, inward angulation of the lower end of the tibia so that its lower articular surface was at an angle of 45 degrees with the shaft. The fibula, which was much longer than the tibia, had grown like a bow around the ankle joint. It seemed probable that the original trauma had stopped the growth of the lower tibial epiphysis completely and that the deformity was the result of adaptive changes incident to the excessive growth of the fibula. Simple osteotomy of the inner border of the tibia and osteotomy of the fibula allowed correction. A recent case of a girl of 12 with almost no disability shows an extreme outward tilting of the astragalus apparently resulting from loss of growth of the outer half of the lower tibial epiphysis. The inner half and the epiphysis of the fibula have grown equally so that the general alignment is good. The extreme tilt of the astragalus has been compensated by adaptive growth of the whole tarsus so that the weight bearing and function are excellent. These and other experiences with deformities following epiphyseal fracture at the knee, elbow and ankle have been sufficiently common to lead me to warn the parents of children with such fractures that such deformities are possible. I have always felt that traumatic rupture of blood vessels with resultant poor circulation to a part or all of the epiphyses is the determining factor rather than actual injury to the cartilage cells. The best hope of prevention lies in accurate, gentle reduction of the fracture, followed by long periods of fixation and prolonged delay in weight bearing. My rule in epiphyseal fractures is not to allow weight bearing in less than three months.

DR J. DEWEY BISGARD, Omaha. It has been known since the studies of Stephen Hale in 1747 that all growth in the length of long bones takes place by deposition of new bone at the diaphyseal extremities, also that this growth is unequal from the two ends of each long bone. The proportion of growth that takes place at each end has been calculated by Digby from measurements made from each end to the point at which the nutrient canal, when projected, intersects the center of the medullary canal. The accuracy of these calculations I was able to affirm experimentally. If growth is arrested at the end of a bone that contributes very little growth, little or no deformity from shortening results whereas the converse is likewise true. Angulation and torsion deformities such as varus and valgus develop from asymmetrical growth arrest. Injuries and inflammatory lesions near the epiphyseal line often stimulate rather than retard growth and may cause deformity from overgrowth of an extremity. Overgrowth not infrequently prevents deformity by compensating for shortening of a bone in which a fracture has united with the fragments overriding. I wish to emphasize the importance of another type of injury which occasionally causes arrest deformity, and that is excessive roentgen and radium irradiation. The cells of the epiphyseal cartilage are moderately radiosensitive, so that therapeutic irradiation over or near the cartilage should be carried on with caution.

DR EDWARD L. COMPERE, Chicago. It is fortunate that fractures in children are mostly of the shaft. In the University of Chicago Clinics 86 per cent of the fractures in children were of this type and did not reach the region of the growth cartilage. Of the 14 per cent that did cross the epiphyseal cartilage, eighteen of the nineteen cases did show arrested growth. Fortunately, most of these patients were approaching the limit of their growth period before growth was arrested, which accounts for the fact that not many of them developed marked deformities. Three per cent of all cases of fracture in children did have growth deformities that required correction. Truesdell in his book on fractures and epiphyseal dislocations in the newborn did not report a single instance in which the fracture involved the epiphyseal line. They were all midshaft fractures. As the patient grows older the incidence of fractures that involve the epiphyseal line increases, but the danger of deformity is less, since the residual growth period is shorter. Deformity from growth arrest due to fracture, infection or surgical trauma is likely to be a late result after the case has been discharged. Unless the surgeon is wise enough to continue to follow all cases treated for a lesion that involves an epiphyseal cartilage for several years or until their full growth has been attained the patients may seek advice from other physicians when the deformity becomes apparent. When I was 11 years of age, I had osteomyelitis of the femur and was operated on by a doctor who didn't know about the epiphyseal line. The knife incision reached to the level of the knee joint on the inner side of the femur. As far as I can tell from subsequent roentgenograms the disease itself did not involve the epiphysis or the epiphyseal cartilage. Three years after the osteomyelitis had entirely healed the leg was straight and there was no evidence of growth deformity. About the age of 15 the leg began to be bowed. There was then no shortening that I could detect. The growth was first arrested on the medial side where the operation crossed the epiphyseal line, while it continued for a time on the lateral side. Subsequently it was arrested laterally also while the left leg continued to grow, so that I now have a shortening of 1 inch in addition to the outward bow of the femur. The injury to the growth cartilage led to premature closure of the epiphyseal line, but deformity was not observed until three years later. In cases of fracture or insult to the epiphyseal cartilage from any cause, patients should not be allowed to bear weight for several months and guarded prognosis should be made.

Precordial Pain—The very first symptom of which a patient may complain when the myocardium begins to fail and before the patient has reason to believe that his heart is not doing its work, is precordial pain without hypertension.—Dr Henry Mohler, quoted by Fisher, Alexander. *Aphorisms in Clinical Medicine Canad J Med & Surg* 77 166 (June) 1935.

HEALING OF THE NEWER BUMPER FRACTURES OF THE TIBIA

WALTER G. STERN, M.D.
AND
LOUIS E. PAPURT, M.D.
CLEVELAND

The popularity of the automobile as a locomotive agency has made it our greatest destructive force and changes in design have immediately been reflected by changes in the type character and relative frequency of the various resultant fractures. The great importance of the automotive factor in traumatic and fracture surgery is readily recognized when one realizes that in 1934 there were 1,250,000 nonfatal automobile accidents. This is 16 2/3 per cent of all nonfatal accidents occurring in the United States.

In the early days the reverse Colles fracture caused by the blow of the crank lever from the backfire of the motor, became commonplace. "Cowl" fractures of the patella are a recent innovation as a result of a change in body styling, while fractures of both tibia and the lower jaw have become common since the use of non-shatterable glass in windshields.

In this presentation we are dealing with a new "bumper" fracture of the midthird of the tibia. This fracture of both bones of the leg is so characteristic that an automobile accident as the causative agent can often be deduced from the typical appearances on the

the cortex usually on the anterior surface and often lying free from the rest of the fragments. The injury to the soft parts is usually severe and the fracture is often compound.

Other types of injuries will however occasionally produce the same characteristic fractures. In reviewing the literature of fractures of both bones of the leg we have carefully gone over the illustrations of the fractures presented and have occasionally found that

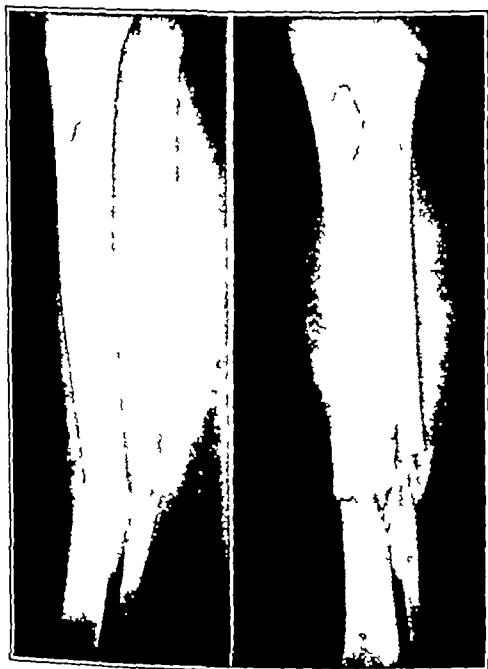


Fig. 1—A typical bumper fracture. Note severe comminution long linear fracture lines and diamond shaped fragment in center of comminution. Roentgenogram retouched.

roentgenogram alone. This the newer type of bumper fracture is characterized by a severe comminution and splintering of the bone with many larger and smaller fragments with long linear fracture lines running up and down the tibia and in the center of the comminution a diamond or pyramid shaped fragment out of

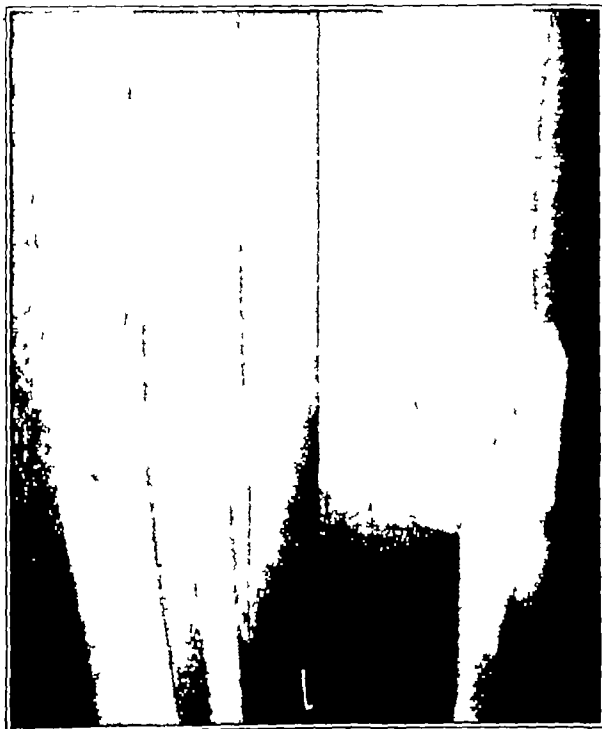


Fig. 2—Typical bumper fracture. Note loose pyramid shaped fragment from anterior cortex and comminution.

injuries in mines from coal cars, falling rock and the like, produce similar fractures. One can readily see that the mechanism of this fracture-producing violence is rather similar to the direct violence of the bumper of an automobile.

A few years ago Dr. N. A. Cary of Oakland, Calif. described a comminuted fracture of the head of the fibula and the external tuberosity of the tibia as a bumper fracture of the knee. An illustration in his paper depicts an automobile of the 1929 or earlier vintage. In the early days the bumper was placed much higher, but in the newer style with low center of gravity motors, the bumper is placed low and usually has a \sim shaped curve in the center. In the most popular of these low priced cars the bottom of the bumper stands normally only 13 inches from the ground, and then when the speeding automobile is suddenly stopped the front end is thrust downward several inches more, thus carrying the point of impact still lower, till it is centered exactly at the middle of the tibia in the average man.

The reduction of bumper fractures of the tibia offers the same problems as other fractures of both bones of the leg except that the severe comminution usually makes the reduction more difficult, and a greater variety of methods other than simple extension or manipulations and casts such as Kirschner wires, single or double pin technic, Boehler frames and the many other

mechanical means which are rapidly appearing on the horizon, are gaining vogue. Although this paper deals primarily with the healing of these fractures, there are several points in the reduction and fixation which have a great bearing on the ultimate healing, to which we would direct attention.

1 Excessive Manipulations to Obtain Anatomic Approximation—We have seen any number of bumper fractures in which there has been a satisfactory alignment but with only a mild overriding or displacement, necessitating from two to five manipulations to obtain complete approximation only to end in extremely delayed union. These repeated insults added to the original injury increase the local hyperemia with its decalcifying effects exhausts the regeneration power of the bones breaks up the early hematomas and fibrous framework of the future callus and is really putting too much of a strain on the reparative mechanism of the body to heal the fractures readily.



Fig. 3—Old type bumper fracture of knee described by Dr. Cary in 1932

traction overextension was little considered and seldom encountered. Most men felt that overextension could not occur and advised as much extension as could possibly be obtained by manual or mechanical means. Today, however, the advocates of the recent double pin traction, well leg traction or special wire traction apparatus almost universally warn against overextension.

3 Inadequate Immobilization—There are two factors of inadequate immobilization (1) incomplete immobilization and (2) immobilization for too short a period. Complete immobilization can best be secured by a well fitting plaster cast pins being used when necessary.

I believe with many others that the standardized time of fixation universally given for the healing time of fractures is fallacious. A fracture should be immobilized until clinically and roentgenologically union has taken place or until all hope of union has been forsaken and reconstructive surgery is decided on.

It is our experience that in the severely comminuted fracture, such as the bumper fracture of the tibia, the usual period of immobilization is altogether too short, the healing time is more apt to be sixteen or more weeks than six. This does not necessarily mean a greatly prolonged period of nonuse with its resultant stiffness of joints, atrophy of muscles and tissues plus impaired circulation. It is this prolonged nonuse that has con-

verted so many advocates to early massage, passive motion of joints and other forms of early manipulations that require splitting of casts, release of extension and interference with the proper immobilization. The advocates of early motion state that there is a right way to do this without causing motion in or displacing of the fragments, but how many surgeons or physical therapists are there on whom one can rely to do this? Such measures can only cause repeated traumatism to the early connective tissue, which is the framework of future callus, with recurring hyperemia of the part and promotion of decalcification of bones rather than calcification. Many authors state that slight motion within a fracture area promotes union. I believe this is unphysiologic and that union is obtained in spite of the motion. However, every orthopedic surgeon has seen fractures of long bones that have healed in the absence of all treatment, probably because the Lord is good.

Our experience leads us to agree with Watson Jones of Liverpool, that the greatest cause of nonunion in fractures of both bones of the leg is inadequate immobilization.

4 Compound Fractures—Our stand for the conservative treatment of compound fractures has been frequently presented before this and other medical associations and in the literature. Our experience with bumper fractures with direct and often severe compounding has not altered this view. We have treated them conservatively by first cleansing the wound and temporary immobilization, and then delaying reduction and all manipulations until the time arrives—usually

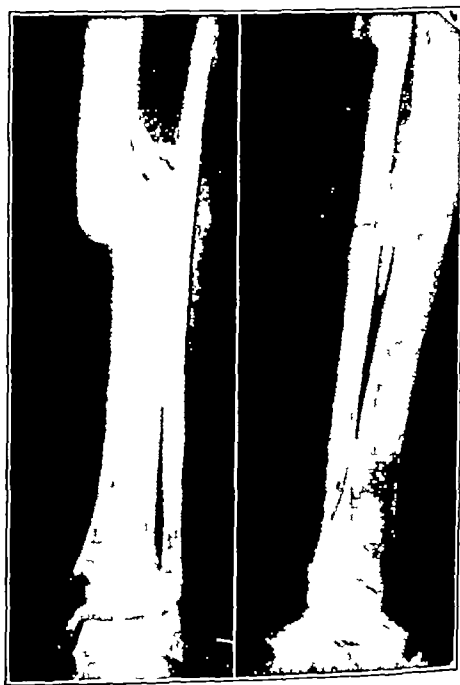


Fig. 4—Bumper fracture. Union after five months. Mild overriding and lateral displacement. Excellent alignment. no disability.

from five to eight days—when the danger of immediate infection is overcome. Our success has been uniformly good as in other compound fractures, and union has always been obtained in these cases.

The compounding of these fractures adds to the local hyperemia and inflammation and even if they are not infected they heal slower than simple fractures and therefore the rigid and active immobilization period to be described must necessarily be prolonged.

The most important purpose of this presentation is to emphasize the extreme slowness with which the bumper fracture unites. In our contacts with the various Cleveland hospitals and surgeons of northern Ohio, the story is always the same, these fractures are not healed after six to twelve weeks' immobilization no matter what method of treatment has been used. We encounter frequent instances of abandonment of fixation after ten to twelve weeks of immobilization with resultant deformity and nonunion already spoken of.

The literature fairly abounds in methods of reducing such fractures of the leg but little is said about the prognosis of these fractures the healing time or even as to what to do with them after the fracture is once reduced. Mention is sometimes made that fractures of the lower leg are slow to heal and that a convalescent brace is sometimes indicated, but the usual time of healing is given as from eight to ten weeks whereas in

our experience bumper fractures are infrequently united in this period of time. Our message is that bumper fractures of the leg are usually not united in less than sixteen weeks and often take much longer and that the treatment should be planned with this in mind and should not be abandoned under one year, unless solid union has been obtained before this.

Our plan of treatment is as follows:

1 Primary reduction and fixation is carried out by the elected method for about eight weeks.

2 After eight weeks the cast, if applied, is removed and a plaster mold of the leg is made and measure taken for a walking brace reaching to the thigh, with lock joints at the knee.

3 The plaster cast with walking iron or walking heel is reapplied.

By this time usually sufficient fibrosis has taken place within the fracture area so that the leg is no longer flail and there is no longer a danger of slipping of fragments. If this is not the case the cast without a walking splint is reapplied and the patient is compelled to use his crutches for from four to six weeks longer.

4 From the mold a model of the leg is made and a leather steel envelop brace with ring locks at the knee is constructed. This is form fitting and allows full weight bearing without any motion between fragments or any danger of angulation. The ordinary caliper brace is inefficient and does not completely immobilize the fragments.

By this weight bearing and active function the circulation of the extremity is improved, muscle tone is reestablished and bone production is stimulated. There is a gradual deposit of lime in the callus with increasing fixation of the fragments until solid union finally takes place.

The accompanying table shows the length of healing in bumper fractures actually treated by us. (We also have incomplete records of several hundred more treated at other hands in which the average healing time is about the same.)

Length of Healing in Bumper Fractures

| Time of Union in Months* | Number of Cases | |
|---------------------------------|-----------------|----------|
| | Closed | Compound |
| 1 | | |
| 2 | 17 | |
| 3 | 13 | 3 |
| 4 | 12 | 3 |
| 5 | 21 | 1 |
| 6 | 12 | 2 |
| 7 | 6 | 3 |
| 8 | 9 | 1 |
| 9 | 6 | 2 |
| 10 | 3 | 1 |
| 11 | 3 | |
| 12 | 7 | 1 |
| 13 | | |
| 14 | 1 | |
| 15 | | |
| Average healing time 6.2 months | | |

SUMMARY

1 The new bumper fractures of both bones of the leg are characterized by a severe comminution of the tibia with long linear fracture lines and a free diamond or pyramid shaped fragment out of the cortex.

2 These fractures are extremely slow in healing. The average healing time in a series of more than 100 cases was 6.2 months.

3 The treatment must be persistent or nonunion will result.

4 A practical method is employed of maintaining fixation of the fracture while allowing functional activity of the extremity.

1304 Hanna Building

ABSTRACT OF DISCUSSION

DR WILLIAM E. GALLIE, Toronto. The views of the authors may be sound, but I cannot agree with them on this subject of the newer methods of treatment. One might say that they are advocating that we cling to the older and well tried methods and be slow to take up such new fangled ideas as those advanced by Kirschner and Böhler. There is so much that is good however in these newer methods that I am sure that we would leave ourselves open to the criticism that we are showing our age if we were to condemn them. I believe that the Kirschner wire method of applying traction is the most valuable improvement in the treatment of fractures. The suggestion that these newer methods of treatment are too dangerous to be taught to our students applies equally well to treatment by manipulation and plaster, and as far as malunion and nonunion are concerned I think that it is the experience of most of us that the majority of such patients when ultimately sent to us for treatment have been treated according to the doctor's conception of it by just the plan that Drs. Stern and Papurt have outlined. The fact of the matter is that in most medical schools and hospitals the treatment of fractures is badly taught and we have only ourselves to blame that our students and interns get into trouble when confronted with difficult fractures. To test this out I would suggest that when the next serious compound fracture of the leg turns up we request the intern to carry out the whole treatment interfering only when the malpractice becomes too obvious. I fear that we shall not be pleased. This paper draws attention to the principles of treatment and clearly shows how failure to observe these principles leads to unfortunate results.

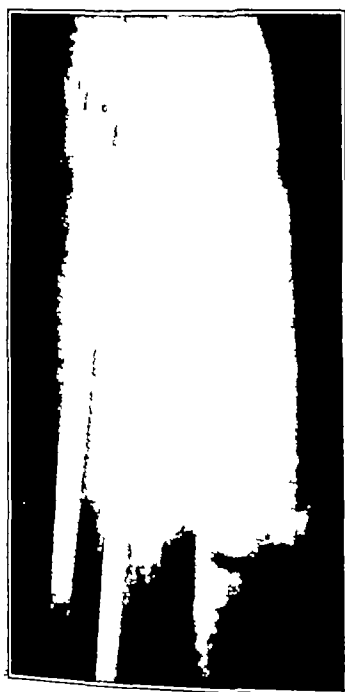


Fig. 5.—Typical bumper fracture. Over extension by double pin technic.

DR. PAUL B. MAGNUSON, Chicago The principles of treatment have not changed much for centuries. The first article that I can find on the subject was written about 462 B. C., and fractures were treated then in the same way—by extension and counterextension. The method of application of course depends on what is required in the individual case and what one has to work with at the time. Individual methods have been discussed many times to the exclusion of principles that are involved. When there is end bearing between the fragments, any simple method of traction or countertraction that will maintain reduction should be used. But when there is no end bearing and the fragments are constantly displaced by the muscle pull, traction and countertraction must take the place of end bearing of the fragments and some method must be devised to maintain them in position. The method chosen must depend on the circumstances under which the fracture must be treated. All fractures below the knee heal slowly, especially those involving both bones of the leg, owing probably to the poor circulation and poor nutrition. If the fracture involves the upper end of the tibia with a split into the joint, other methods of treatment must be considered, and in my experience bumper fractures are frequently complicated by such a split into the joint which slightly malaligns the joint. The object in these fractures is to obtain a good weight bearing line, and sometimes too much dependence cannot be placed on what is shown in the roentgenogram. Frequently the fibula will heal promptly and the tibia will not—why I do not know. With the increase in automobile accidents there has been a consequent increase in methods of treatment. Fractures nowadays come not alone to the man who is doing industrial surgery but to the man in general practice in rural districts because that is where most automobile accidents occur. The man in general practice therefore is the one who sees the fracture first, and the first reduction is a matter of importance so far as the end result is concerned.

DR. H. EARLE CONWELL, Fairfield, Ala. Fractures cannot be treated by one method in every instance. The treatment should be applicable to the fracture and not the fracture to the treatment. It has been customary in my clinic to classify all fractures, especially those of the leg, not only according to the bone injury but to the muscle and other soft structure damage as well. My associates and I classify our fractures as 1, 2, 3 and 4 plus. Treatment is then carried out according to the individual classification. The fracture of the tibia discussed by Drs. Stern and Papurt is usually of a severe type and in our clinic would fall under the classification of a 3 plus or a 3.5 plus leg injury, in which there is a tremendous amount of damage to the soft structures with comminution of the bone which may or may not be compound. This is the type of case in which skeletal traction by the Kirschner wire through the lower end of the tibia is definitely indicated. The patient should be hospitalized until some form of external fixation, preferably a plaster cast, can be applied. After the soft structures have healed sufficiently and this severe fracture has been reduced to a simple fracture, we apply our circular cast. Skeletal traction should always be removed as soon as possible and it is not always necessary that it be kept in the bone until firm union has taken place. I agree with the authors that there are dangers in skeletal fractures as in any other type of treatment, including the type of treatment that they have described. Fixation in the convalescent period of these fractures as the authors have emphasized is most important. The too early removal of fixation and too early weight bearing will frequently bring about angulation of the fragments and also delayed union in many cases. These cases are major problems and should not be handled by inefficient subordinates.

DR. LOUIS E. PAPURT, Cleveland I don't think that Dr. Stern meant to imply that he does not use pins or pin traction apparatus. We have Dr. Anderson's splint in our hospital and also the Macmillan splint. There are times when pins or wires must be used in selective cases but not indiscriminately. We have used them all but I don't think that they should be used as a routine. Bumper fractures are slow in healing. Treatment must be planned with that in mind and patients so informed. The treatment must be carried out until union results.

Clinical Notes, Suggestions and New Instruments

REVERSED COLLES FRACTURE SUCCESSFUL REDUCTION BY CLOSED METHOD

JOHN G. RAYMER, M.D., NORWICH, CONN.

Reversed Colles fracture occurs with relative infrequency. Its treatment therefore becomes a matter of importance to all who deal with fractures. Textbooks offer brief if any discussion of the subject and do not prepare the practitioner for the many

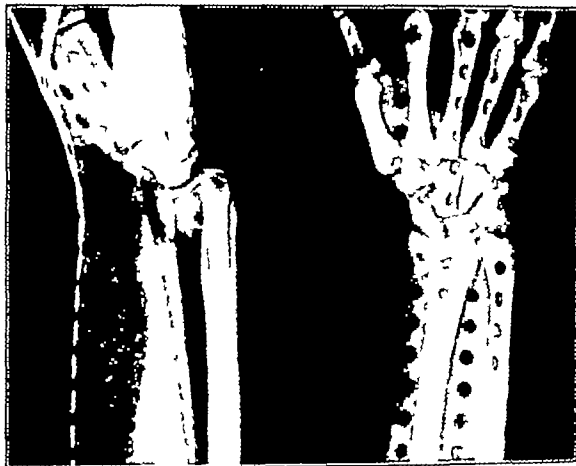


Fig 1—Before reduction May 14, 1935

difficulties which may attend the management of this type of injury. Webb and Sheinfeld¹ recently reviewed the subject and in concluding stated that "no cases of successful reduction of the described fracture by the closed method have been reported in the literature" and that "the fracture is therefore considered irreducible and operative reduction is advisable."



Fig 2—On discharge July 6, 1935

In order to help remedy the unwarranted neglect shown reversed Colles fracture in the literature, and to stimulate discussion as to its treatment, the following report of a successful closed reduction is submitted.

REPORT OF CASE

P. P., a white woman aged 38, seen May 14, 1935, within the past hour had fallen down a short flight of stairs and after being helped to arise had noticed at first only a numbness of her right wrist. On returning to work she noticed marked

¹ Webb, George, and Sheinfeld, William. Reversed Colles Fractures with Special Reference to Therapy. J. A. M. A. 104: 2324-2326 (June 29) 1935.

deformity of the wrist, which was at once reported. After immobilization of the wrist the patient was taken to the William W Backus Hospital, where roentgen examination revealed a reversed Colles fracture of the right wrist (fig 1).

Under general anesthesia the distal radial fragment was mobilized and by hyperflexion plus traction the fracture was reduced. Molded plaster splints were applied anteriorly and posteriorly with the hand in flexion, but the position was lost. Reduction was again secured, the splints being applied with the hand in a neutral position. This time the position, while improved, was unsatisfactory. A third reduction was made and the hand placed in an extended (cock-up) position and in adduction. Roentgen examination showed satisfactory position.

Ten days later the splints were temporarily removed and the skin given very light massage. At twenty days, position appearing perfect and with complete absence of pain passive motion was started, followed at twenty-four days by guarded active motion. At thirty days a light posterior wood splint was applied over the fracture, and at thirty-four days only a bandage around the wrist was required. This was worn for one week, and finally a leather strap was used for ten days.

July 6, roentgen examination showed the position satisfactory and healing progressing nicely (fig 2). Motion was excellent in all directions (estimated at 90 per cent), including supination. No pain was felt at the fracture site.

COMMENT

In this case the fracture line was situated sufficiently proximal to the joint so that effective manipulation and apposition of fragments could be secured and maintained. In determining the appropriate treatment for this type of fracture, the location of this line is an important deciding factor. The conclusion therefore is justified that certain cases of reversed Colles fracture can be reduced by the closed method and maintained throughout the necessary period of healing. It is suggested that the open reduction of such fractures be employed only when several attempts at closed reduction have failed.

40 Shetucket Street.

REVERSE COLLES FRACTURE—A PLEA FOR CLOSED REDUCTION

RALPH B. BETTMAN, M.D.

Associate Professor of Surgery, Rush Medical College

AND

WILLIAM J. TANNENBAUM, M.D.

CHICAGO

In the June 29 issue of THE JOURNAL Webb and Sheinfeld¹ stated that reverse Colles fractures are not rare, that these fractures are difficult to reduce, and that open operation is indicated. The tendency to abandon the conservative methods of closed reduction in fractures for immediate open reduction is, we think, a dangerous one as far as average practice is concerned and therefore we dislike to see an entire group branded as requiring operation. This is especially true when we try to recall our own experience with this type of fracture.

During an active service in traumatic surgery in the war and a much less active one since, it seems to us that we have seen many patients who had a Colles fracture in which the distal fragment was displaced anterior instead of dorsal to the bones of the forearm. Furthermore offhand it does not seem to us that we had much more trouble in the reduction of these fractures or that our treatment of them was much different from that used in the regular Colles fracture except that the hand was held straight or in more or less dorsal flexion depending on the case. At the time Webb and Sheinfeld's article appeared we had a patient with a reverse Colles fracture under treatment and it is this case which we report as an example of others we have seen in the past.

Miss H., aged 13 years, was thrown from a horse and in trying to break the fall stretched out her left arm. The impact came on the back of her hand just the reverse of the mechanism of the usual Colles fracture. We saw her an hour or so later and found the condition to be typical of that described

by Webb and Sheinfeld as the reverse Colles fracture (fig 1). Under a general anesthetic we reduced the fracture, controlled the reduction with a roentgenogram and placed the forearm and hand in a cast the hand being slightly dorsiflexed, the reverse of the classic Colles reduction position. The cast was immediately split to allow for swelling. A week later the top



Fig 1—This is a reversed Colles (fracture) in that the distal fragment is displaced toward the palmar rather than the dorsal surface of the wrist.

—Diagnosis of Dr. James Case

of the cast was removed to lighten it, in two weeks the arm was removed for gentle massage and limited motion and then replaced in the anterior half of the cast. The anterior half of the cast was shortened bit by bit and after four weeks there was no more splinting at all except for a leather wrist strap. Now three months later the arm is in perfect condition there is scarcely any deformity, the two wrists have to be studied together to be able to notice a difference, and the range of motion is practically full. The roentgenogram shows the excellent position of the fragment (fig 2).

We report this case to emphasize that

1. Reverse Colles fractures can be reduced and the reduction maintained without open operation.

2. We feel that an open operation is not indicated until after closed reduction has been tried.



Fig 2—Roentgenogram taken one month later. According to Dr. Case the fragments are in good position and the callus is satisfactory.

3. In the reverse Colles fracture the classic position of flexion must be discarded and a straight position or a position of dorsiflexion adopted as indicated by roentgenographic control of the position.

104 South Michigan Avenue.

¹ Webb, George and Sheinfeld, William. Reversed Colles Fracture with Special Reference to Therapy. J. A. M. A. 104: 2324 (June 29) 1915.

Special Article

POLIOMYELITIS FOLLOWING VACCINATION AGAINST THIS DISEASE

J. P. LEAKE, MD

Medical Director U. S. Public Health Service
WASHINGTON, D. C.

During the past year in the United States, several thousand individuals, mostly children, have received subcutaneous and intracutaneous injections of treated poliomyelitis virus in the hope of acquiring immunity against the natural disease. The two different forms of treatment to which the virus was subjected were intended to render it innocuous when thus used as a vaccine. Through those responsible for the production of these vaccines, through several health officers and through others word has come to the United States Public Health Service of the development, at suggestive intervals following these injections, of cases of paralytic poliomyelitis with high fatality. Though possibly subject to some correction it is believed that the following statements represent closely the facts in each case.

1 A boy, aged 5 years, had his first symptoms of poliomyelitis six days after receiving the second dose of vaccine A in the left arm, the first dose having been given in the same arm twenty-seven days before the second. Paralysis began in the left arm the day after onset and death occurred after an illness of three days.

2 A girl, aged 21 months, received the second dose of vaccine A in the right arm twelve days after the first dose and the onset of poliomyelitis occurred six days after the second dose. Paralysis began in the right arm three days later and death occurred five days after the onset.

3 A boy, aged 4 years, had his onset of poliomyelitis eight days after the first dose of vaccine A in the left buttock and one day after the second dose at the same site. Paralysis began in his right leg two days later and is at present, after three months confined to that extremity, though there is hope of ultimate nearly complete recovery.

4 A girl, aged 8 years, had her onset of poliomyelitis eight days after the first dose of vaccine A in the left arm, and one day after the second dose in the same arm. Paralysis began in the arm two days later, and death occurred after an illness of three days.

5 A boy, aged 8 years, had his onset of poliomyelitis eight days after the first and only dose of vaccine A in the left arm. Paralysis began in the right arm two days later and remained as a deltoid paralysis at last accounts.

6 A boy, aged 5 years, had his onset of poliomyelitis nine days after the first and two days after the second dose of vaccine A in the arm. Arm paralysis began two days later, and death occurred after an illness of three days.

7 A boy, aged 10 years, had his onset of poliomyelitis ten days after the first dose of vaccine A in the left arm and three days after the second dose in the same arm. Paralysis began in the right arm the next day, and death occurred after an illness of three days.

8 A girl, aged 5 years, had her onset of poliomyelitis eleven days after the first dose of vaccine A in the right arm and four days after the second dose in the left arm. Paralysis began in the left arm four days later and was still present at last accounts.

9 A boy, aged 15 months, had his onset of poliomyelitis thirteen days after a dose of vaccine B, and developed general weakness four days later, which persisted at the last report.

10 A boy, aged 5 months, had his onset of poliomyelitis fourteen days after a dose of vaccine B and paralysis was first

noticed nine days later. This paralysis persists at the last report.

11 A girl, aged 6 years, had her onset of poliomyelitis fourteen days after the first, and seven days after the second, dose of vaccine A in the arm. Paralysis began in the left arm three days later, and complete recovery was questionable at the last report.

12 A youth, aged 20 years, had his onset of poliomyelitis fourteen days after the first and only dose of vaccine B in the arm. Paralysis began in the arm two days later, and death occurred after an illness of four days. From this case poliomyelitis was transmitted to monkeys by Dr. Kessel.

Paralytic poliomyelitis was not epidemic in any of the localities at the time of the occurrence of these cases if these cases themselves are not included in the count. During the heaviest incidence of poliomyelitis in the community with the highest reported incidence, the expectation of paralytic poliomyelitis among those vaccinated within three weeks following vaccination, judging by its occurrence by age groups in the community at large, was less than one tenth of a case, yet a case occurred. At the other periods and in the other localities cited the chance of a case occurring among the vaccinated was much less, yet in each instance cases occurred. The likelihood of the whole series of cases having occurred through natural causes is extremely small. In none of the cases was exposure to infection outside its own area known to be of special significance.

It is believed that to many physicians this series of cases, following by intervals of from six to fourteen days the injection of one or the other of two different vaccines, renders undesirable the further use of poliomyelitis virus for human vaccination at present.

In every case in which the sequence is known, the level of the spinal cord first affected corresponded to the extremity in which the injection was made, paralysis beginning either in the same limb or in the contralateral limb. This is strong support to other evidence that the virus of poliomyelitis is transmitted along nerve fibers since neither blood nor lymph streams would afford direct access from one extremity to the corresponding cord level. The remarkably high fatality in this series of cases was perhaps due to the part of the cord primarily infected being close to the nuclei corresponding to the muscles of respiration. The possibility is to be considered that a strain of poliomyelitis that has been subjected to prolonged monkey passage, with rather short incubation periods, is unusually virulent to man when administered by the subcutaneous or intracutaneous route. Though in a few of these cases it is possible or even probable that there was another intercurrent illness in addition to poliomyelitis, in general the paralytic symptoms were such as would be expected in poliomyelitis naturally acquired.

In forming a judgment as to the applicability of a poliomyelitis vaccine the not inconsiderable local and general reactions following its use need to be taken into account.¹ It is also noteworthy that the appearance of neutralizing antibodies in the blood after the injection of poliomyelitis virus is very uncertain evidence of parallel immunity to the natural disease.²

Although any one of these cases may have been entirely unconnected with the vaccine, the implication of the series as a whole is clear.

¹ Gilham A. G. and Onstott R. H. Results of Field Studies with Poliomyelitis Vaccine, read before the Southern Branch American Public Health Association, St. Louis, Nov. 19, 1935. *Am. J. Pub. Health* to be published.

² See also Schultz E. W. and Gebhardt L. P. On the Problem of Immunization against Poliomyelitis. *California & West. Med.* 43:112 (Aug.) 1935.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION
OF THE FOLLOWING ARTICLE

II A CARTER Secretary

RADIOTHERAPY

(ROENTGEN RAYS, RADIUM)

ARTHUR U DESJARDINS, MD

ROCHESTER, MINN

(Concluded from page 2071)

Mode of Action—The rate of resolution of acute inflammatory lesions after irradiation corresponds to the rate at which normal leukocytes, notably the lymphocytes and polymorphonuclear cells, are known to be influenced by exposure to roentgen rays or radium. Moreover, the fact that a single, small dose usually suffices to induce resolution of acute inflammation also suggests that the main factor in the action of the rays on such lesions consists in destruction of infiltrating leukocytes. A considerable body of experimental and clinical evidence supports this view. Variation in the degree of leukocytic infiltration in different inflammatory processes may well account for differences in the effectiveness of irradiation at different stages. Destruction of leukocytes infiltrating an acute inflammatory lesion might, on superficial consideration, be regarded as necessarily deleterious. Prolonged experience, however, has failed to yield the slightest evidence of harmful effect, except when excessively large doses of rays have been used. On the whole, it seems most likely that destruction of infiltrating leukocytes liberates the antibodies and other protective substances previously elaborated within the cells and thus makes these substances more readily available for defensive purposes than when they were in the intact cells.

Chronic—Chronic inflammations of different kinds also are amenable to radiotherapy. Tuberculous adenitis and peritonitis, actinomycosis and blastomycosis may be mentioned as examples. In dealing with chronic inflammation, single small doses of radium or roentgen rays no longer suffice. The dose must be larger than in the case of acute inflammation although distinctly smaller than the maximal dose required in the treatment of tumors. Whereas in acute inflammations the dose may vary between 25 and 50 per cent of the limit of tolerance of the skin, in chronic inflammations the most effective dose varies between 50 and 80 per cent of the limit of tolerance of the skin. Still more important, however, cure or maximal benefit requires that irradiation be repeated a number of times at intervals of three or four weeks, smaller doses may be repeated at shorter intervals. Complete resolution of chronic inflammatory conditions is slow and can be obtained only by repeated treatment. This is especially true of tuberculous processes, in which the most effective treatment seems to be periodic exposure of the affected region to roentgen rays, combined with exposure of the entire body to gradually increasing doses of ultraviolet rays.

Mode of Action The effect of radiotherapy in chronic inflammations appears to depend mainly on two factors, on the one hand the degree of leukocytic infiltration, and, on the other, the proportion of connective tissue and of degenerative products such as caseous material and calcium. The relative proportion

of these two factors seems largely to account for variation in the time required to bring such lesions under control.

Miscellaneous Conditions—Hyperplasia of the Thymus Gland. Hyperplastic increase in the size of the thymus gland is not uncommon among children. This may be associated with cough, dyspnea and stridor, but the coincidence of such symptoms and thymic hyperplasia does not mean that the symptoms are the result of an increase in size of the gland. In many if not in most cases the respiratory symptoms and the enlargement of the thymus probably result from some nutritional or toxic disturbance. If the cause of the disturbance can be found and eliminated, the symptoms promptly disappear. If the etiologic factors cannot be discovered treatment with roentgen rays provides a most satisfactory means of reducing the volume of the enlarged thymus gland, and this is often accompanied by relief from respiratory symptoms. A single exposure to a moderate dose of roentgen rays may be counted on to induce rapid shrinkage of the hyperplastic gland but if subsequent regeneration and the possibility of renewed enlargement are to be prevented the region of the thymus should be irradiated two or three times at intervals of two or three weeks.

Hyperthyroidism There can be no doubt that cure or substantial improvement can be obtained by radiotherapy in a certain proportion of cases but a larger proportion of patients can be cured with greater certainty by expert medical and surgical treatment. In other words, radiotherapy for hyperthyroidism is attended by a greater measure of uncertainty than skilled medical and surgical treatment. If the symptoms are not severe and the urgency of therapeutic measures is not too great, roentgen irradiation may be tried. Such a trial involves repeated exposure of the thyroid (and thymic) regions within three or four months. Should such a trial fail to result in complete relief further radiotherapy should be given up. Regardless of the method of treatment systematic and careful study of all clinical and metabolic features should be made by a qualified physician.

Leukemia In acute leukemia exposure to roentgen rays or radium is seldom followed by perceptible improvement and experienced radiologists usually do not encourage such treatment. In the subacute form cautious treatment and in the chronic form thorough treatment yield more or less marked improvement for periods varying from months to several years. Usually the treatment must be repeated from time to time depending on the numerical behavior of the leukocytes and on the tendency of the spleen or lymph nodes to enlarge. Effective treatment can be given with roentgen rays or radium. At the outset, and when extensive areas require irradiation roentgen rays are preferable.

In myeloid leukemia the rays are directed first to the spleen, and then, if this is not sufficient to reduce the number of leukocytes approximately to the normal level the mediastinum and long bones also may be irradiated. When the spleen is large, the surface of the abdomen corresponding to that organ may be divided into a number of fields approximately 10 cm square and each field should be exposed to a moderate dose of roentgen rays. If radium is used to irradiate the enlarged spleen, a large pack is required. The effect of treatment on the leukocytes should be followed closely by daily or frequent blood counts. When the number of leukocytes diminishes rapidly, the number of fields irradiated each day should be correspondingly

reduced, otherwise, an excessive leukopenia may result. An abnormally small number of erythrocytes at the outset need not be regarded as a contraindication, under treatment the number of these cells tends to increase as the number of leukocytes diminishes. After a patient has been treated a number of times at intervals of months, the effectiveness of treatment tends to diminish, but this varies considerably from patient to patient. If the patient cooperates faithfully, the disease may often be kept under control for prolonged periods, sometimes for many years.

In lymphoid leukemia the treatment is directed first to the main groups of lymph nodes in the neck, axillae and groins, as well as to the mediastinal and retroperitoneal lymph nodes. If, by the time these several regions have been irradiated, the number of leukocytes has not diminished sufficiently, additional treatment to the shaft of the major long bones may have to be given.

The action of roentgen rays on leukemic hyperplasia of the spleen, lymph nodes and other structures, including the skin, is to destroy leukocytes (chiefly lymphocytes and polynuclear cells) or to cause such cells to pass through their life cycle so rapidly as to constitute virtual destruction. Leukemic infiltrations of the skin, with or without pruritus generally subside as the number of leukocytes decreases and as the other clinical manifestations improve. After a time which varies from patient to patient and which apparently depends on the relative acuteness or chronicity of the disease, radiotherapy may become less effective. Usually this means that the disease is approaching its terminal phase. This phase may be accompanied by a tendency to hemorrhage or by increasing weakness and death, sometimes without fresh hyperplasia of the spleen or lymphoid structures.

Hodgkin's Disease, Lymphogranulomatosis, Lymphoblastoma — (See Tumors Derived from Lymphoid Cells.)

Benign Tumors — **Giant-Cell Tumor of Bone** There is evidence that, in most cases, the giant-cell tumor of bone is a chronic inflammatory process and is therefore essentially benign. The reaction of such tumors often differs from that of malignant processes in general. After irradiation, all malignant tumors retrogress to different degrees or do not undergo any perceptible change. Two or three weeks after irradiation, in many cases, a giant-cell tumor begins to swell, and the swelling is accompanied by redness, pain and tenderness. To the patient as well as to the uninitiated physician such manifestations may give the impression that irradiation has increased the activity of the tumor, and a hasty amputation may be undertaken. If not disturbed, this swelling, redness and pain begin to subside after a week or ten days and may gradually disappear. New bone is slowly deposited in the tumor, which, in the course of time, is replaced by solid bone.

Fibromyoma Uteri In the absence of contraindications, radiotherapy is an excellent method of treatment because it avoids operation with its attendant hospitalization, disability and possible mortality, which, though small when the operation is performed by an experienced surgeon, can hardly be called negligible. Roentgen rays act primarily on the ovaries and abolish menstrual function in from three to eight weeks. This is followed by cessation of bleeding and a gradual regression of the uterine tumors, with corresponding relief from pain, discomfort and other symptoms. But one course of treatment, consisting of two or three daily exposures to roentgen rays of short wavelength,

is sufficient in all but a small proportion of cases, in which the treatment may have to be repeated once after an interval of three months. If the treatment is given within one week after a menstrual period, menstruation is not likely to recur. If given later, the patient may menstruate once or even twice more, and the menstrual bleeding may be more abundant than usual but will then cease permanently. Roentgen rays are preferable to the intra-uterine use of radium, except when the fibromyomas are definitely submucous.

Classification of Tumors from Standpoint of Radiosensitiveness

| Radiosensitive Tumors | |
|--|---|
| Group 1 | Lymphoblastoma { Lymphosarcoma Hodgkin's disease |
| | Lympho-epithelioma (Ewing) or endothelial myeloma (Kodansky) of bone |
| Group 2 | Embryonal carcinoma (seminoma of testis) (spermatogonial cells) |
| | Embryonal carcinoma of ovary (follicular epithelium) Embryonal carcinoma of kidney (Wilms tumor) |
| Group 3 | Giant cell tumor of bone |
| | Multiple myeloma of bone |
| | Basal cell epithelioma |
| | Transitional cell epithelioma |
| | Mucinous carcinoma of intestinal tract (mucous secreting epithelial cells) |
| Hemangioma | |
| Hemangio-endothelioma | |
| Moderately Radiosensitive Tumors | |
| Group 1 | Carcinoma of uterine cervix |
| | Carcinoma (not adenocarcinoma) of thyroid gland |
| Group 2 | Epithelioma of tonsil and pharynx |
| | Carcinoma of breast |
| | Epithelioma of bronchus |
| | Epithelioma of lip and eyelids |
| | Epithelioma of mouth and tongue |
| | Epithelioma (squamous cell) of skin |
| Carcinoma of rectum | |
| Chondrosarcoma of bone | |
| Radioresistant Tumors | |
| Fibromyoma (uterus) direct irradiation | |
| Fibrosarcoma | |
| Carcinoma of esophagus and stomach | |
| Adenocarcinoma anywhere with possible exception of uterus (cervix or fundus) and thyroid gland | |
| Mixed tumor of parotid gland | |
| Hypernephroma | |
| Sarcoma of bone osteogenic | |
| Melanoblastoma and nonmelanotic melanoblastoma of skin | |
| True teratoma | |
| Neurofibroma | |
| Fibroma | |
| Chondroma | |
| Lipoma | |
| Myxoma | |
| Myxosarcoma | |

The amenorrhea resulting from radiotherapy is exactly the same as that of the natural menopause, except that it comes on more rapidly. Its subsequent course is identical to the natural process, all legends to the contrary notwithstanding. The size of the tumor or of the tumefied uterus per se is not a contraindication for radiotherapy. On the contrary, excessive bleeding with anemia demanding urgent relief, the wish to avoid amenorrhea by a woman who still may have and desire children, the presence of pedunculated or calcified fibromyomas, and an incarcerated uterus require surgical operation in preference to radiotherapy. The transformation of fibromyoma into sarcoma or carcinoma by irradiation has never been established. It is probable that, in the cases reported, the uterine tumor was a sarcoma or carcinoma from the start.

Malignant Tumors — **General Considerations** The radiosensitiveness of tumors corresponds closely to the sensitiveness of the cells of which they are chiefly composed. This fundamental law enables the experienced radiologist to utilize irradiation not only to treat but sometimes to distinguish certain neoplasms from others.

Naturally, the diagnostic value of such a therapeutic test is greatest in neoplasms derived from the more sensitive varieties of cell, the information thus derived may sometimes be as valuable as the microscopic observations of the pathologist. From the standpoint of radiosensitivity, tumors may be classified as in the accompanying tabulation.

Such knowledge has made it possible to differentiate certain varieties of tumors, such as lympho-epithelioma and Ewing's endothelial myeloma of bone, from other neoplasms with which they had previously been confounded. In tumors of the mediastinum, for example, roentgen irradiation almost always permits one to establish in a short time a clear distinction between a lymphoid tumor and an aneurysm. Moreover, when the reaction of roentgen rays is correlated with the clinical features, the usefulness of the therapeutic test may be considerably extended.

The most important effect of irradiation is to destroy those cells in a tumor which are most radiosensitive. In malignant processes characterized largely or wholly by lymphoid hyperplasia, the regression of hyperplastically enlarged lymph nodes is quite rapid, in other varieties of tumor, regression may be slow and less pronounced, whereas, in tumors composed of cells that are not sensitive to irradiation, perceptible regression may not occur even after large doses. Besides the direct destruction of cells, however, certain other factors play a part in the effect of radiotherapy on malignant growths. The cells which are destroyed by irradiation are replaced by connective tissue, and this has given rise to the notion that roentgen rays "stimulate" the formation of connective tissue. If the dose of rays exceeds the tolerance of the connective tissue cells present in a tumor, a proportion of these cells degenerate, and this leads to further increase in connective tissue. The action of the rays on the blood vessels of a tumor, with thickening or obliteration of the vessels and resulting diminution in the blood supply of the growth, also plays an important part in the effect of irradiation.

The impression that exposure of a tumor to roentgen rays may cause it to grow more rapidly arises from a misconception. After a period of relative quiescence or complete arrest following one or more courses of radium or roentgen treatment, the tumor tends to recover its original rate of growth. For a time it may actually grow more rapidly than before. This, however, is exceptional and is only a transient phase of the process. In many tumors, on the contrary, subsequent growth tends to be slower than before irradiation. Moreover, many new growths do not develop at a uniform rate, without reference to irradiation. If such a tumor should have passed from a phase of relative quiescence into a phase of greater activity, and if it should recently have been exposed to roentgen rays, the inexperienced observer might draw the erroneous conclusion that the increased activity was due to the action of the rays. The extensive experience of the most competent observers indicates that exposure of a tumor to roentgen rays or radium either causes inhibition of growth or remains without effect.

Tumors Derived from Lymphoid Cells (Hodgkin's Disease, Lymphogranulomatosis, Lymphosarcoma, Lymphoblastoma)—During recent years, pathologists have tended to regard these diseases as phases of the same condition and to designate them by the collective term "lymphoblastoma." Strictly speaking the suffix "oma" indicates a tumor, and it can literally apply only

to lymphosarcoma, the fatal tendency of both conditions, however, has led many to consider them essentially neoplastic in character. Substantial evidence exists that the immediate cause of Hodgkin's disease and lymphosarcoma is long-continued infection of any kind. From a clinical point of view, and sometimes from a pathologic point of view also, the two conditions affect the lymphoid structures in much the same way, and often a purely clinical distinction cannot be made. Lymphosarcoma tends to metastasize more widely than Hodgkin's disease, but this is not often evident before death or, at least, before the late stages of the process. An important reason for considering the two conditions at the same time is that their treatment and their reaction to treatment are essentially identical.

In some cases the disease first manifests itself in the cervical lymph nodes and thence extends to the mediastinal, axillary and other nodes. In other cases the condition originates in the abdominal nodes and extends to the inguinal, mediastinal and other nodes. A few cases are encountered in which the disease primarily affects the stomach or the intestine. Bones may become involved either by pressure from adjacent hyperplastic lymph nodes or by invasion of the bone marrow. Nearly always, the nodes in which the disease first manifests itself are in anatomic relation to a region in which chronic infection has been present.

Tumors of this kind are exceptionally radiosensitive and retrogress rapidly under treatment. Many radiologists irradiate only regions in which enlarged lymph nodes are obvious. Usually it is preferable to give the patient from two to four courses of partial or general irradiation directed to the main lymphoid regions: the neck, axillae, groins, and mediastinal and retroperitoneal spaces. Irradiation of the ovaries of women less than 40 years of age should be avoided as much as possible. For general irradiation, a moderate dose of rays of medium wavelength usually yields the best results if all factors of the situation are taken into account. The condition and reaction of the blood (cellular elements) should be closely watched.

The immediate results of radiotherapy are often little short of miraculous. Patients with marked dyspnea, cough and obstructive engorgement of superficial veins may derive remarkable benefit in a few days. If treated thoroughly but carefully, the lymphadenopathy should largely or completely disappear in many cases, and meticulous periodic examination and occasional treatment as fresh hyperplasia of the lymph nodes occurs may enable the patient to remain well for months or, indeed, for several years. In a small proportion of cases lymphosarcoma reacts even more promptly than Hodgkin's disease, but in the average case the difference is hardly sufficient to constitute a distinctive feature. In lymphosarcoma, even metastatic infiltration within the skull and its associated symptoms may be made to disappear. Unfortunately, such metastasis indicates advanced disease, and improvement in the cerebral condition may soon be followed by fatal complications in some other part of the body.

Lympho-Epithelioma—Tumors of this kind usually arise around the nasopharynx, but they sometimes arise in other parts of the body also. They present a general microscopic appearance of epithelioma and are regarded as such by most pathologists, but their possible lymphoid origin and essential nature are shown by the fact that they are much more radiosensitive than

ordinary epithelial neoplasms. Growths of this kind often undergo marked and rapid regression after thorough treatment, and permanent cure has been recorded in some cases.

Tumors of the Testis—The term "teratoma," so commonly used to designate all tumors of the testis, is unfortunate because it tends to create confusion. While it may be true, as Ewing contends, that all these tumors are teratomas with one-sided development, it would seem desirable from clinical and therapeutic points of view to distinguish these varieties of testicular neoplasm from the true teratoma, which is relatively benign. The most common tumor of the testis, occurring in from 65 to 70 per cent of cases, is the embryonal carcinoma, derived from the basal or spermatogonial epithelium of the seminal tubules. It is often mistaken for sarcoma. Another, less common neoplasm of the testis is the mixed, or teratoid tumor which represents from 25 to 30 per cent of all tumors of this organ. Derived from all three embryonic layers it is composed of a rather indiscriminate mixture of embryonal tissues and, therefore, has a heterogeneous appearance. The true teratoma and a few other rare neoplasms make up the remainder of the tumors that affect the testis.

In the embryonal carcinoma or in the mixed or teratoid tumor, metastasis usually first affects the para-aortic lymph nodes in the region of the celiac axis where it may be confined for a long time. Later sometimes much later, metastatic elements may extend through the thoracic duct to the sentinel nodes in the left supraclavicular space to the mediastinum, and still later to the lungs, brain and other parts of the body. When metastasis to the retroperitoneal nodes has not occurred, orchidectomy may yield a permanent cure in a small percentage of cases, the difficulty of being certain about metastasis probably accounts for the large proportion of surgical failures. Metastasis to the para-aortic nodes occurs much earlier than is generally suspected. Even when such metastasis is not apparent, removal of the affected testis should be followed as soon as possible by thorough irradiation of the entire abdomen (from front and back and from both sides), and this procedure should be repeated once or twice at suitable intervals. Better still however, orchidectomy should be preceded by one or two thorough courses of roentgen irradiation directed to the primary tumor as well as to the abdomen, and an interval of about six weeks should be allowed to intervene between irradiation and operation. When metastasis has already occurred surgical removal of the primary growth is of no avail, but it may sometimes be advisable to relieve pain caused by the dragging weight of a bulky tumor.

In cases of embryonal carcinoma, well planned treatment with roentgen rays induces marked and rapid regression of the primary growth as well as of its metastatic deposits. The regression of mixed or teratoid tumors varies, sometimes it is rapid and pronounced, the growth sometimes practically disappearing, and sometimes it is slower and only partial. The rapidity and degree of regression of such growths apparently depend on the proportion of spermatogonial epithelium entering into their composition. The greater the proportion of such radiosensitive epithelium, the more rapid and the more complete the regression. Unfortunately few neoplasms of this kind disappear completely and permanently, but complete and sometimes permanent regression of an embryonal carcinoma is not so rare. In the latter variety a complete cure

may result from thorough treatment before metastasis has extended beyond the para-aortic nodes. But even though, in the majority of cases, more or less extensive metastasis may prevent permanent cure, adequate treatment may often lead to marked and prolonged improvement.

Tumors of the Ovary—Of the tumors that affect the ovary the colloid carcinoma is perhaps the most radio-sensitive, but none of them respond so rapidly or so favorably to roentgen rays as do epithelial tumors of the testis. Nevertheless, many patients derive sufficient benefit to make treatment worth while. Radiotherapy is not a substitute for surgery in operable cases but may be used before or after operation, or both, to prevent or delay recurrence and metastasis. When operation cannot be considered, thorough irradiation of the pelvis and abdomen may often result in substantial, temporary improvement.

Tumors of the Nose, Nasopharynx and Pharynx—Moderate irradiation with radium or roentgen rays may sometimes usefully supplement other measures or may make such measures unnecessary. If the quantity of radium available is not sufficient for effective external irradiation, roentgen treatment is preferable because it avoids the unpleasantness or discomfort of intra-oral application of radium.

Some tumors of the nose, nasopharynx or pharynx, such as lymphosarcoma, lympho-epithelioma and those of Hodgkin's disease are quite radiosensitive, whereas others, such as squamous cell epitheliomas, may offer a considerable degree of resistance to irradiation. Radium can often be implanted throughout such growths, but this should be supplemented by external irradiation with radium or roentgen rays. In some institutions the growth is first destroyed by electro-coagulation, radium needles or radon seeds are then implanted throughout the margins and base of the destroyed mass of tissue and these procedures are supplemented by external irradiation. This also applies to tumors of the tonsil. As for simple lymphoid hyperplasia of the tonsils, treatment with roentgen rays is simpler than with radium. Surgical treatment in conjunction with or exclusive of, irradiation may sometimes be advisable.

Carcinoma of the Thyroid Gland—Like adenocarcinoma of any other organ, adenocarcinoma of the thyroid gland must be classified among the radio-resistant tumors. Ordinary carcinoma of the gland, on the contrary, is more susceptible to roentgen rays, and next to embryonal carcinoma of the testis and carcinoma of the uterine cervix, is the most sensitive of all carcinomas. Why this should be so has not yet been made clear, but the fact is undeniable. Usually such a tumor is discovered by the pathologist in the course of a microscopic inspection of thyroid tissue excised by the surgeon on the clinical assumption of simple adenoma of the gland. In any event, thorough roentgen irradiation of a primarily inoperable tumor of this variety, and even of metastatic deposits in the mediastinum, skull or elsewhere, often causes the neoplastic elements to retrogress or disappear. Although such retrogression may be temporarily complete, it is almost never permanent. The tumor may disappear and the patient may be well for one or two years, or even longer, but it may generally be counted on to reappear sooner or later. Nevertheless, radiotherapy is distinctly worth while as a means of furnishing temporary and sometimes prolonged relief from symptoms.

Carcinoma of the Breast—The consensus still is that the best treatment for mammary carcinoma in the operable stage is radical amputation of the breast. From present indications it appears possible that this opinion may subsequently be modified to some extent, but the time for any general departure from present methods has not yet come. In most institutions the method in vogue is radical amputation of the breast, followed, as soon as the condition of the patient allows but generally one or two weeks later, by thorough irradiation of the affected side of the thorax in the earliest cases, or of the entire thorax in the case of large primary tumors, with or without extension to the tributary lymph nodes. The advisability of preoperative and postoperative irradiation is now being considered and tested.

For thoracic irradiation, some prefer rays of medium wavelength while others employ rays of short wavelength. The quality of rays must be governed largely by the method of irradiation. When the patient is irradiated only after operation, the treatment should be repeated once or twice at intervals of from three to six weeks, but to repeat such treatment indefinitely seems excessive and useless. If two or three thorough courses of postoperative irradiation should fail to prevent recurrence, it is not likely that indefinite repetition can be successful. Moreover, if the latter procedure is followed and carcinoma should recur in spite of it, the recurring lesions are not likely to be influenced favorably by further exposure to the rays. The results of a sound operation combined with sound postoperative irradiation appear superior to those of operation alone, but the evidence of such superiority is not so conclusive as might be desired. The reason is that few institutions or surgeons in private practice have undertaken a fair and thorough test.

If undertaken at all, preoperative irradiation should be thorough. Radium needles or radon seeds, incorporating sufficient filtration to remove all the beta rays, should be implanted throughout and around the primary growth, and this procedure should be supplemented by converging, or tangential, roentgen irradiation from without. If the primary growth is too large for effective implantation of radium or radon, several beams of roentgen rays may be made to converge on the breast. The essential point is that the largest possible dose (total dose) of rays should be concentrated on the area occupied by the tumor. The axillary space also should be thoroughly irradiated.

When metastasis to the axillary nodes, or to these and to the supraclavicular nodes, has occurred, however, the surgical indications are no longer clear. Indeed, a growing body of opinion favors abstention from surgical procedures and advocates radiotherapy. Moreover, one point seems increasingly clear, this is that, if a mammary carcinoma has once been pronounced inoperable, it should usually be thenceforth regarded as inoperable, regardless of the degree of improvement that may follow radiotherapy. Occasionally for special reasons this rule may be disregarded, but in most cases it should stand. The rule is of the greatest significance in cases of carcinoma affecting the breast during pregnancy and during the period of lactation. If under these circumstances the rule is disregarded because the primary growth has retrogressed and has become freely movable and because amputation of the breast then seems technically feasible, rapid and widespread extension of the malignant process is prone to occur.

When mammary carcinoma is definitely inoperable, radiotherapy may still accomplish much for the patient. Even when ulceration threatens or has actually occurred, thorough roentgenization can often be counted on to cause the potential or actual ulcer to heal and the primary and secondary malignant elements to recede and sometimes to disappear. Pain in the back, radiating to one or both lower extremities and indicating metastasis to the lumbar portion of the spine or to paravertebral lymph nodes in the same region (the pain being caused by pressure on branches of the lumbosacral plexus), can usually be relieved by exposure of the lower thoracic and lumbar regions to roentgen rays through parallel fields on each side of the median line, the rays being directed so as to converge on the vertebrae and tissues immediately anterior to them.

When carcinoma, originally affecting the breast, recurs in the same or in another region, well planned radiotherapy may still control the lesions for months or years and may relieve pain for prolonged periods. The same is true of metastasis to certain regions, such as the lumbar portion of the spine or the paravertebral lumbar lymph nodes, causing pain in the back radiating to one or both lower extremities.

Carcinoma of the Uterus—The favorable effect of combined radium and roentgen treatment on carcinoma of the uterine cervix is well known. It is not certain whether such excellent results depend chiefly on the exceptional radiosensitiveness of cancer in this situation or on the comparative facility with which, in early cases at least, a cancericidal dose can be delivered to every portion of the cervix. It is certain, however, that much of the favorable influence of the treatment must be credited to radium and only a minor part to roentgen rays. The purpose of external roentgenization is to supplement the intra-uterine, cervical and vaginal applications of radium and to increase the total dose of radiation reaching the cancer cells, especially outlying cells in the broad ligaments and pelvic lymphatics. The proof that such supplementary external irradiation plays a certain part in the final result is to be found in the fact that, in certain institutions in which radium is not available, roentgen irradiation yields results which, though not comparable to those of radium treatment alone, are distinctly worth while. Also, other tests have shown that the combined treatment is better than radium irradiation alone. Although a few surgeons still advocate hysterectomy for carcinoma of the cervix, the number of those who no longer advise operation in such cases is steadily increasing. The reason for this gradual shift of surgical opinion is that the results of radiotherapy and surgery are approximately equal, but the former has the advantage of avoiding the mortality of the latter.

With reference to carcinoma of the body of the uterus the situation is somewhat different. Here surgical intervention (hysterectomy) is still advocated in preference to radiotherapy whenever the malignant situation has not passed beyond the bounds of operability. Radiotherapy is usually reserved for the inoperable cases, the aim being to bring about as much temporary improvement as possible. During the last few years, however, medical opinion has shown a tendency to shift toward radiotherapy.

Carcinoma of the Bronchus—Sometimes external, converging irradiation with roentgen rays may usefully be supplemented by implanting radon seeds directly into an intrabronchial growth (through a bronchoscope), but

in most cases such a procedure is difficult. Instead, that portion of the growth which can be seen through the bronchoscope can be electrocoagulated, and the entire region can be exposed to several converging beams of roentgen rays.

Carcinoma of the Esophagus—Radium and roentgen rays can sometimes be effectively combined, but the results heretofore reported have not been striking. Highly filtered radium introduced into the affected portion of the esophagus, supplemented by a large total dose of roentgen rays from without, might lead to some improvement in results, but the natural resistance of such lesions to irradiation, the difficulty of administering adequate irradiation to every part of the growth, and the tendency to mediastinal infection will probably continue to limit the value of treatment.

Carcinoma of Gastro-Intestinal Tract—Generally speaking, carcinoma of the stomach is comparatively resistant to irradiation. A certain proportion of patients suffering from such lesions may derive moderate improvement for a time, but such improvement is seldom great and seldom lasts more than a few months. Moreover, when the general condition of the patient is bad, radiotherapy sufficient to influence distinctly the malignant process is likely to cause further deterioration and weaken the already strained power of resistance, particularly if the tumor has invaded the liver. No possible good can come from exposure to roentgen rays under such circumstances. In carcinoma of the large bowel and especially of the rectum, radiotherapy may be worth while. The symptoms may be considerably or entirely relieved for a time, but permanent cure cannot be expected. In carcinoma of the rectum or the rectosigmoid portion of the colon, radium applied directly to the growth and roentgen irradiation from without are often followed by substantial benefit, which may continue for months. In other cases irradiation may inhibit the growth of the malignant process to some extent but for only a short time. Therefore, radiotherapy should be used before or after operation in operable cases or should be reserved for inoperable cases.

Tumors of the Kidney—Most renal tumors in adults cannot be regarded as radiosensitive, but embryonal carcinomas in adults or in children are quite radiosensitive. Surgical removal alone seldom results in cure. The effect of radiotherapy on hypernephroma and primary carcinoma in the adult is usually slight and transient, but on embryonal tumors the effect of thorough irradiation is to cause rapid regression, sometimes to the point of complete clinical regression. Unfortunately, such regression is not lasting, within a relatively short time the tumor again begins to grow and a fatal outcome is the rule. Recently, the idea of thorough irradiation to the point of maximal regression, followed by surgical removal of the affected kidney and residue of the tumor, has been advanced and is now being tested.

Tumors of the Skin—Basal-cell epithelioma is quite amenable to roentgen treatment, a large percentage of such lesions can be cured permanently in this manner. Massive doses of rays of long or medium wavelength, or both combined, are preferable, but fractional doses at relatively short intervals may be nearly as effective if the total dose within a given time is sufficient. Treatment with small doses at random should never be undertaken. By massive single doses is meant from two to ten times an erythema dose at one sitting. One half of this dose may be given with unfiltered roentgen

rays generated at a potential between 80 and 100 peak kilovolts, and the other half with rays filtered through 3 or 4 mm of aluminum and generated at a potential between 130 and 140 peak kilovolts. Such a massive dose can be given with safety to an area less than about 2 cm in diameter, but should never be given to an area larger than this. If the lesion is larger, an erythema dose cannot be greatly exceeded with safety.

If operable, squamous-cell epithelioma should preferably be dealt with by thorough and wide surgical excision, followed by two or three postoperative courses of roentgen irradiation at intervals depending on the dose employed. To undertake to treat such lesions with roentgen rays alone is to risk doing grave injustice to the patient and to assume too great a responsibility. It is true that cure may be effected in this way in some cases if early and well conducted irradiation is employed, but too often a satisfactory initial result is spoiled by renewed malignant activity or metastasis. Melanoblastoma is one of the most resistant of neoplasms. When the primary lesion is small, exposure at one session to several times an erythema dose of filtered rays and to an equal quantity of unfiltered rays may cause the growth to disappear, and the patients remain well. Certainly the method is superior to ordinary surgical excision, but thorough destruction by surgical diathermy may be as effective as roentgen rays. When metastasis has occurred, however, roentgen treatment is generally useless.

Adenocarcinoma—For some reason, this variety of epithelial cell tumor, regardless of the organ or structure in which it originates, has a higher degree of resistance to roentgen rays than ordinary carcinoma or epithelioma. Some such neoplasms exhibit a certain measure of response to irradiation, but their regression is seldom pronounced or lasting. Exception perhaps should be made of adenocarcinoma of the thyroid gland and of the uterine fundus. Patients harboring such growths, therefore, may be given the benefit of the doubt to the extent of at least one thorough course of roentgen or radium treatment, but if this is not followed by substantial reduction in the size of the tumor and a corresponding improvement in general condition, repetition of the treatment is not likely to affect the issue. Moreover, to raise undue hope in the patient or relatives is to court loss of reputation.

Sarcoma—Sarcoma of the soft tissues is comparatively resistant to roentgen rays or radium and few such tumors are ever cured by these or any other methods of treatment. The effect of irradiation on the tumors depends largely on their situation and on the facility with which a large total dose of rays can be delivered to every part of the growth. When it projects from the surface of the trunk or involves an extremity, the method of multiple converging beams may cause marked or complete retrogression of the primary tumor, but the well known tendency of such neoplasms to rapid metastasis only too often neutralizes what might otherwise be an excellent result. The round-cell or spindle-cell varieties of sarcoma are relatively more susceptible to irradiation than the fibrosarcoma, and especially the myxosarcoma. Notoriously slow to metastasize, a primary fibrosarcoma can sometimes be made to undergo more or less pronounced regression, but it seldom disappears completely. The myxosarcoma, on the contrary, is almost completely insensitive to the rays. Bone tumors will be dealt with separately.

Bone Tumors—The most radiosensitive of all malignant bone tumors is the endothelial myeloma of Ewing, in which thorough and well planned roentgen or radium treatment may cause the tumor or tumors to disappear completely. The method of applying the treatment must vary according to the circumstances in each case, but it is important, after the growths seem to have disappeared, to give at least one more course of treatment in order to make the effect last longer. Careful clinical and roentgenologic scrutiny for metastasis should be made, because, if adequately treated, it also may disappear.

Chondrosarcoma is distinctly less radiosensitive than endothelial myeloma, but somewhat more so than the true osteogenic sarcoma of bone. Few chondrosarcomas or osteogenic sarcomas are ever permanently cured by any method of treatment, including surgical amputation of the affected extremity. Almost invariably metastasis to the lungs robs the radiologist as well as the surgeon of the opportunity to boast of a successful result. Nevertheless, regression of the tumor and temporary improvement in the condition of the patient may often be brought about. The earlier and the more thorough the treatment, the greater the chance of at least temporary, and possibly of permanent, success.

The tendency of bone tumors to develop in children brings up one point that must not be lost sight of. Irradiation of the rapidly growing bones or muscles of a child is prone to retard or permanently interfere with the growth of these structures. This is a minor evil in comparison with the lethal tendency of the neoplasm, but the attending physician, surgeon or radiologist should be aware of this fact and should impart his knowledge to the family beforehand in order to avoid ultimate disappointment and recrimination. The older the child the less the tendency of the rays to produce such an effect, but if children are less than 10 years of age, more particularly if they are less than 5, exposure to radiation of sufficient intensity has a marked regressive action on the tumor, but if repeated several times at intervals of from three to six or eight weeks, a deleterious effect will be produced on the subsequent growth of bones and muscles exposed to the direct action of the rays. Another point to which it may be well to call attention is that excessive irradiation, after causing regression of the tumor, may lead to abnormal repair of the bone, and this may mislead the physician into believing that the malignant process is still active when it is not.

Myeloma—In many cases myeloma is not discovered until the process is rather general and has affected many bones. This is probably because, for some time after the onset of the disease, the symptoms are not sufficiently severe to cause the patient to seek medical advice early. When the malignant process is not too widespread, roentgen irradiation may result in considerable and sometimes marked improvement, which may continue for months or even for more than one year. Substantial improvement may likewise be obtained when the disease has involved many parts of the skeleton, but in this event the degree of improvement usually is smaller and the improved condition of the patient does not last so long.

Metastasis from Bone Tumors—The majority of neoplasms primarily affecting bone metastasize to the lungs. Pulmonary metastasis from endothelioma can often be influenced to some extent by adequate irradiation, but such influence is seldom marked or prolonged. Extension of the malignant process to other

bones also may be arrested or controlled for a time but, under these circumstances, a cure is out of the question. Nevertheless, pain and disability may be sufficiently relieved to make treatment worth while. Not infrequently the metastatic tumors prove as radiosensitive as the primary growth and may disappear completely, later, metastasis to other bones and gradual physical disintegration occur.

Metastasis to the lungs from chondrosarcoma or osteogenic sarcoma seldom can be appreciably influenced by irradiation, and all therapeutic efforts usually prove unavailing.

Metastasis to Bones from Primary Tumors in Uterus, Rectum and Bladder—In the majority of cases metastatic bone lesions secondary to cancer of the uterus, rectum, bladder and other organs seldom can be controlled for more than a short time by irradiation, but pain may often be relieved and perceptible, temporary improvement in the general condition of the patient may sometimes follow thorough irradiation.

Brain Tumors—Since nerve cells naturally possess a high degree of resistance to roentgen rays, tumors of the brain also are comparatively insensitive to irradiation. Yet, probably because such neoplasms are largely made up of embryonal cells, radiotherapy may often cause the neoplasms to retrogress for months and sometimes for several years, with corresponding improvement in the condition of the patient. This is because the anatomic situation of the cerebrum and cerebellum and the conformation of the head make it possible to administer to the tumor very large doses of rays. In such cases an exceptional opportunity is offered to utilize the method of multiple converging beams. From four to eight beams of rays may be concentrated from as many different angles, often with excellent, though temporary, results. Unless a large quantity of radium is available and permits the treatment of such tumors from a distance, much as in the case of roentgen rays, the latter are to be preferred, because a larger dose of radiation can thus be delivered to the growth itself. The more cellular the neoplasm, the greater the influence of the rays, irradiation has much less effect after the tumor has become cystic. Roentgen rays of short wavelength are the most efficacious and at least three courses of treatment, each requiring from four to eight days, according to the number of fields irradiated, at intervals of six weeks, should be given. This may be usefully repeated later in the event of renewed malignant activity and recurrence of symptoms.

If a quantity of radium sufficient for thorough cross-fire of the entire tumor from a distance is available, radium treatment may be as effective as treatment with roentgen rays, and possibly more effective. But to attempt to treat an intracranial tumor with 50 mg of radium or less is not likely to yield great improvement.

Tumors of the Hypophysis—Much the same may be said of tumors of the hypophysis. In a certain proportion of such tumors repeated exposure of the hypophyseal region through multiple fields is followed by relief from headache and improvement in vision. Unfortunately, the relief thus obtained is not permanent as a rule, although it may last several months or even several years.

General Considerations—"Deep Therapy" For many years radiotherapists and physicians in general have come to speak of superficial or deep roentgen therapy. The expression "deep therapy" really came

into vogue to distinguish rays of short wavelength, generated at a potential approximating 200 peak kilovolts, from the rays of long or medium wavelength used previously, and still used extensively by many radiologists. Moreover, during the past few years the therapeutic possibilities of rays generated at voltages varying between 300,000 and 1,000,000 have been investigated, and the qualification "deep" becomes all the more confusing. At the present time, such a designation only tends to mislead, because it is so often misused by physicians without any reference to qualitative distinctions. In fact, physicians who speak or write about so-called deep therapy often cannot explain what they mean by the terms "superficial therapy" and "deep therapy," which might well be discarded.

RADIATION SICKNESS

Exposure to roentgen rays is often followed by anorexia, nausea and vomiting. Some patients may present only one of these digestive disturbances, while others may have all three in a mild, moderate or severe form. A small proportion of patients may have none of these disturbances but complain only of weakness or nervousness. The intensity of such systemic reaction depends on the extent (area) of body surface and on the part of the body exposed as well as on the ease with which the digestive equilibrium of the patient may be disturbed. Exposure of the extremities to a moderate dose of rays seldom gives rise to much reaction, but large doses, especially if administered to several fields at one time, are prone to be followed by some degree of reaction. Irradiation of the head, neck and thorax often causes a systemic reaction, the severity of which varies with the dose, duration of exposure and area of surface exposed. The part of the body most susceptible, from the standpoint of radiation sickness, is the upper half of the abdomen. This circumstance, together with the fact, demonstrated by experiments on animals that the small intestine is the most radiosensitive portion of the digestive tract, has caused the idea to be advanced that radiation sickness is due to the influence of the rays on the small intestine. Such a view is unsound because, while exposure of the small intestine undoubtedly tends to increase the systemic reaction, the reaction so commonly follows exposure of parts of the body remote from the intestine that the main cause must be sought elsewhere. Of the many hypotheses that have been offered to explain the phenomenon, the one that has the greatest number of adherents is that radiation sickness results from the circulation throughout the system of toxic products of cellular destruction in organs and tissues particularly sensitive to the action of the rays.

Numerous efforts have been made to prevent or counteract such reaction, but with no great success. The importance of thorough ventilation of the treatment rooms to remove the noxious gases generated by the electrical apparatus is great. The value of numerous drugs has been thoroughly tested, none can be depended on to prevent or diminish the intensity of the reaction. Careful preparation of the patient by evacuation of the bowel and preliminary alkalinization are valuable measures. Another measure that may help to minimize the disturbance is to have the patient fast for two or three hours before and after a treatment session. One should avoid giving too great a dose at one session or crowding a course of treatment into too short a period. In some instances unsweetened lemon juice in iced water, sipped spoonful by spoonful, may tend to allay gastric irritability, in others champagne,

if available, or ginger ale may have the same effect. In many instances, however, the reaction does not subside until several hours or days after the completion of the treatment. Even then, the anorexia may disappear slowly.

COUTARD METHOD

It is a well established principle of radiotherapy that complete regression of a tumor requires a certain dose of radium or roentgen rays. Such a dose varies with the natural radiosensitivity of the cells of which the growth is composed. Complete regression of squamous cell epitheliomas or carcinomas is known to require a total dose corresponding to about eight times the tolerance limit of the skin. If the tumor is at the surface and if the area that it occupies is small, an adequate dose is readily feasible. But if the area occupied by the growth is large, an adequate dose cannot be given through a single field without danger. When a large tumor projects above the surface, or when it is situated in a region that forms a natural projection, it is sometimes possible to concentrate on it a sufficient dose by directing toward it several beams of rays through a corresponding number of separate fields. Also, when the tumor is situated deeply within the body, it may be possible to arrange several beams so that they converge on the neoplasm. Even then, however, it is often difficult or impossible to give a total dose sufficient to cause the growth to retrogress completely, because the integrity of overlying or surrounding structures may not be unduly jeopardized.

Experiments on animals have shown that a dose of roentgen rays or radium sufficient for permanent sterilization of the testis of a rabbit, if given at one time, induces necrosis of the overlying skin. If such a dose is divided into five or more fractions and is given over a period of from five to seventeen days, sterilization of the testis is induced without severe or permanent injury to the skin. On the basis of many older experiments it was well known that the radiosensitivity of cells depends largely on their rate of metabolism in other words, on the rate of mitotic division or natural life cycle of the cells. Such considerations led to the postulate that irradiation at low intensity and in small daily increments over a period of time should be more effective and less prone to injure the intervening normal tissues.

On these grounds Coutard began, about 1920, to apply these principles to the treatment of epitheliomas of the pharynx and larynx. Rays generated at 185,000 or 190,000 volts were passed through heavy filters of zinc or copper, partly to diminish their intensity and partly to increase the homogeneity of the beam so as to diminish the tendency to reaction of the skin. With such a scheme of treatment, small doses were given daily or twice daily for from fifteen to fifty days or longer, and Coutard thus found it possible to deliver to the region occupied by the tumor total doses from five to eight times greater than had been possible by other methods, without permanent injury to the skin or mucous membranes. Moreover, the proportion of patients cured by this method is greater than had previously been possible by any other technic of irradiation. Other radiologists, notably at Radiumhemmet, Stockholm, have applied the same principle with radium, with equivalent, if not even better, results.

The Coutard method and various modifications are now being tested for many other kinds of tumor in different parts of the body. In fact, the danger is that such tests may be carried too far.

IRRADIATION AT HIGH VOLTAGES

Soon after the war, radiotherapy entered a new phase. Previous experience had shown that, in attempting to treat the more resistant neoplasms, especially when they were situated deep in the chest or abdomen, the rays available at that time were not as effective as they might be, this was thought to be due to the fact that the rays could not penetrate in sufficient quantity the portion of the body in which the tumor was situated. Therefore, a demand for more penetrating rays arose, and tube designers and manufacturers of apparatus proceeded to satisfy this demand by providing generators operating at from 200,000 to 300,000 volts. Such generators, with the new tubes that soon appeared, enabled the therapeutic radiologist to deliver to deeper parts of the body a much larger quantity of rays. Moreover, modifications in technic to take advantage of this development were rapidly devised. The result was that certain tumors which previously had not been amenable to radiotherapy now became so, at least to a certain extent.

In spite of these improvements, it became apparent that certain tumors were not greatly influenced by any technical variation and this led to a demand for still more penetrating rays, the idea being that, if rays of sufficient penetration could be obtained, even resistant tumors could be made to regress more than had been possible previously.

Besides the reasons that I have mentioned, still other reasons came into play. The high cost of radium prevented many institutions and private radiologists from using radium for external irradiation at a distance. Only a few institutions in the world have a sufficient quantity of radium to apply it in this way. During the last five years, generators capable of operating at from 500,000 to 1,000,000 volts have been designed, and tubes capable of producing rays at such voltages also have become available. Rays generated at such high voltages are more penetrating than those used heretofore and, while they do not correspond absolutely to the gamma rays of radium, their quality is such as to yield results that somewhat approximate those obtained with radium. Another advantage of roentgen treatment at high voltage over a large quantity of radium used for external irradiation at a distance is that at smaller expense a larger number of patients can be treated in the same space of time. While these developments in apparatus are desirable and advantageous, it must not be thought that they will replace all other apparatus now in use for roentgen therapy. Apparatus of this kind will probably enable the therapeutic radiologist to deal more effectively with some of the more resistant varieties of tumor and to this extent will probably yield better results. Also, it will probably tend to replace large quantities of radium for external irradiation but it would be an error for any one to think that installations operating at between 500,000 and 1,000,000 volts are going to revolutionize radiotherapy. No doubt, some institutions desiring to keep abreast of the times will go to considerable expense to install such apparatus, in spite of the fact that the character of the work of these institutions does not require such powerful apparatus. For the present, at least, it is important to recognize that radiotherapy at higher voltages is in the experimental stage, but even when it passes out of this stage it would seem sufficient if a few installations, properly distributed over the country, should be available.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.



RAYMOND HERTWIG, Secretary

1 CHERRY BLOSSOM BRAND CRYSTAL WHITE SYRUP

2 CHERRY BLOSSOM BRAND GOLDEN SYRUP

Distributors—Alpena Wholesale Grocer Company, Alpena, Mich., Grand Traverse Grocery Company, Traverse City, Mich., Sault Wholesale Grocers, Sault Ste. Marie, Mich.

Packer—Pemick & Ford, Ltd., Incorporated, Cedar Rapids, Iowa.

Description—(1) A table syrup, corn syrup sweetened with sucrose. Same as Pemick's Crystal White Syrup (THE JOURNAL, April 9, 1932, p. 1268). (2) A table syrup, corn syrup flavored with refiners' syrup. Same as Pemick's Brand Golden Syrup (THE JOURNAL, April 2, 1932, p. 1159).

1 COMMANDER BRAND GRAPEFRUIT

2 COMMANDER BRAND FLORIDA GRAPEFRUIT JUICE

(WITH ADDED SUGAR SYRUP)

3 COMMANDER BRAND FLORIDA ORANGE JUICE

(WITH ADDED SUGAR SYRUP)

Manufacturer—Dr. P. Phillips Company, Doctor Phillips, Fla.

Description—1 Canned sliced Florida grapefruit sweetened with added sucrose and retaining in large measure the vitamin C content. The same as Dr. P. Phillips Florida Fancy-Cut Grapefruit Slices (THE JOURNAL, Nov. 19, 1932, p. 1781). 2 Canned Florida grapefruit juice sweetened with added sucrose syrup and retaining in large measure the vitamin C content. The same as Dr. P. Phillips Florida Grapefruit Juice (THE JOURNAL, Jan. 7, 1933, p. 43). 3 Canned Florida orange juice sweetened with added sucrose syrup and retaining in large measure the vitamin C content. The same as Dr. P. Phillips Florida Orange Juice (THE JOURNAL, Dec. 3, 1932, p. 1948).

LEXIN

VEGETABLE LECITHIN AND ASSOCIATED PHOSPHATIDES WITH COCOA BUTTER

Distributor—American Lecithin Corporation, Atlanta, Ga., and New York.

Manufacturer—Hansa Muehle, Hamburg, Germany.

Description—Soy bean lecithin and associated phosphatides with about 25 per cent cacao fat.

Manufacture—Soy bean lecithin and associated phosphatides with soy bean oil obtained as described for Margo (THE JOURNAL, Oct. 5, 1935, p. 1119), is washed with acetone to remove the oil. The lecithin residue is admixed with cacao fat (3 to 1) and any remaining acetone is distilled off. The product is packed in barrels or cans, or molded in blocks.

Analysis (submitted by manufacturer) —

| | per cent |
|-------------------------|----------|
| Moisture | 0.6 |
| Ash | 5.4 |
| Petroleum ether extract | 65.7 |
| Acetone extract | 33.8 |
| Total nitrogen (N) | 1.0 |
| Total phosphorus (P) | 2.5 |

Calories—85 per gram, 241 per ounce.

Claims of Manufacturer—An emulsifying agent for use in foods. Contains readily assimilable phosphorus in organic form.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO, ILL.

Cable Address

Medic, Chicago

Subscription price

Seven dollars per annum in advance

Please send in promptly notice of change of address giving both old and new always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, DECEMBER 28, 1935

COLLATERAL CIRCULATION IN CORONARY OCCLUSION

The ability of the body to supply the heart with an adequate collateral circulation is less than that for any other major muscular tissue. While the heart is in direct contact with other structures, it has for obvious reasons a minimum amount of continuity with those adjacent. In a recent experimental study by Beck and Tichy,¹ the possibilities of producing a collateral circulation to the heart were reported. In these experiments an extracardiac vascular bed was prepared by utilizing the pericardium, pericardial fat or mediastinal tissues. Continuity was established by the creation of adhesions. These were produced by incision of myocardium and suture of pericardium into the wound or by removal of epicardium and endothelial lining of the pericardium. The stimulus necessary to bring about vascular continuity was a reduced or subnormal pressure in the coronary bed, which was obtained either by slow or by complete occlusion of the coronary arteries. The report was based on a study of 103 dogs in which one or more operations were carried out to produce a collateral circulation to the heart, and on sixteen dogs in which various methods were used for injection of the heart through the extracardiac anastomoses. The experiments were begun with the hope of being able to destroy or obstruct the entire arterial coronary circulation and have a new collateral circulation develop to take its place. This was not successful, though in one experiment about 85 per cent of the total cross-sectional area of both coronary arteries was occluded with survival and normal activity tolerance of the animal. In many others, large branches were occluded with survival of the animal. The experiments showed, moreover, that vascularization of the myocardium from a collateral bed was slight or absent if the coronary circulation was normal. In other words, the blood vessels grow into the myocardium only when the latter has need for more blood. Beck and Tichy believe, therefore, that these

experiments demonstrate that a collateral bed can become the major source of blood supply to the heart.

In an attempt to determine whether these experimental observations could be in any way applied to man, a study was made of ninety-four human hearts in which a major coronary artery had been occluded.² All were judged to have sustained a major trunk occlusion, either because the site was identified or because the infarct was so large, so uniform in character and so situated anatomically that, despite inability to determine the exact location of remote occlusion, it could be regarded with certainty to have occurred. Only fourteen of these died following the first occlusion. If they are truly representative, it would appear that the majority (86 per cent) survive the first coronary occlusion. Moreover, most of these (70 per cent of the entire group) had periods of cardiac competence varying greatly in duration after the primary occlusion. The significance in relation to the practicability of artificially inducing a collateral coronary circulation is obvious. Anatomically two types of collateral channels develop in the dog as a result of surgically induced pericardial adhesions and the same type of anastomoses might reasonably be expected to develop in man. The superficial anastomoses between the coronary arteries in the epicardium are increased, and the epicardial barrier between the coronary arteries and the arteries of the parietal pericardium and mediastinum is destroyed so that anastomoses between them occur. On anatomic grounds it would thus appear likely that such anastomoses would serve to protect the heart against the failure of collateral coronary circulation that usually determines death.

Moritz and Beck thus summarize the situation

On the assumption that thrombotic occlusion of a major coronary artery can be recognized clinically, it is probable that the diagnosis could have been made in life in eighty of these ninety-four patients. Only fourteen patients died as the direct result of the first major coronary occlusion. Of the eighty patients who survived the first occlusion, the question is whether or not they could have been protected against disastrous results from subsequent occlusions by the production of extra-cardiac coronary collateral circulation.

In thirty-seven of these eighty cases, concomitant disease or continued cardiac incompetence rendered the operative risk unjustifiable. The remaining forty-three patients might have been benefited by the production of the additional collateral circulation. With the exception of seven patients, who died of other causes, all died of subsequent attacks of coronary thrombosis.

Thus there was a period after the first coronary occlusion in the lives of forty-three individuals when the production of extracardiac coronary collateral circulation might have been feasible and beneficial.

While surgery of the human heart is in a relatively early stage, the studies here reported seem to offer a physiologic and anatomopathologic basis for discriminative operation in certain cases of coronary thrombosis. The actual application of these principles, however, remains for future action and analysis.

¹ Beck, C. S. and Tichy, V. L. The Production of a Collateral Circulation to the Heart. An Experimental Study. *Am. Heart J.* 10: 849 (Oct.) 1935.

² Moritz, A. R. and Beck, C. S. The Production of a Collateral Circulation to the Heart. Pathological Anatomical Study, *Am. Heart J.* 10: 874 (Oct.) 1935.

GOLD THERAPY IN ARTHRITIS

The use of gold as a remedy is not new. The value of the metal has always conferred upon it possibilities for symbolic and suggestive therapy. Recently, however, gold has been used seriously and extensively. The multitude of disorders treated by such preparations is evidenced by the numerous titles listed in the *Quarterly Cumulative Index Medicus* under "Gold Therapy." Major attention has been directed toward its use in tuberculosis of various forms, asthma, arthritis and certain skin diseases.

The precise way in which gold acts is not known. It seems improbable that, in vivo, gold has any direct action on organisms. It has been suggested that it may act by "stimulating some defense forces in the patient,"¹ most probably the cells of the reticulo-endothelial system. Such an action is similar to that of nonspecific proteins. Gold is excreted largely through the kidneys and to a lesser degree through the intestine and bronchial mucous membrane. In the experimental nephritis of rabbits given large amounts of gold, excretion takes place mainly through the convoluted tubules, the glomeruli taking little if any part. The glomeruli remain undamaged except for slight intraglomerular congestion observed in a few cases. The nephritis produced therefore seems to resemble that caused by mercury bichloride. The elimination, however, does not occur quantitatively or rapidly, and an unknown proportion of the gold is probably retained in various tissues for a considerable time.

Although scientific reports on gold therapy are infrequent in the domestic literature, several recent reports have appeared in continental and British journals, especially with reference to its use in rheumatoid arthritis. In one by Slot, Deville and others,² six cases of acute and subacute rheumatism and fourteen of rheumatoid arthritis were treated with different preparations of gold. The clinicians concluded that in acute and subacute rheumatism in children aurotherapy is of no great value and that it is contraindicated when severe carditis is present. In rheumatoid arthritis, on the other hand, the results of gold therapy seemed superior to other methods.

Forestier,³ who reported a great deal of work on the subject, discusses the actions and reactions of gold, the choice of salt and the results of treatment in some types of joint disease. He feels that gold salts in oil suspension given by the intramuscular route are the most satisfactory and that typical rheumatoid arthritis and perhaps early ankylosing spondylitis are the most promising clinical types. Several series of treatments were given successively at intervals of from six to eight weeks. The first sign of improvement, he says, was relief from pain, and the patient was able to perform

movements impossible before treatment. The second sign was reduction of swelling and its eventual disappearance. There was also improvement in the general health, appetite and weight. The laboratory tests (sedimentation rate and resorcin flocculation test) become normal gradually. He reports that he has treated more than 500 patients with various preparations and from 70 to 80 per cent have responded well. Of these, 50 per cent of recent cases and from 20 to 30 per cent of cases of more than two years' duration are reported to have been permanently cured by from two to five series and have remained cured without further treatment for from two to three years. Of course, similar results have been reported for other methods of treatment, including nonspecific proteins, vaccines and even physical therapy.

Recently Pemberton⁴ has reported the results of gold treatment of 100 cases of chronic arthritis. Three types of preparations were used, the most recent being sodium gold thiomalate. Up to 2 Gm was given intramuscularly in oily suspension in graduated doses over a period of six weeks or more. The results were somewhat clouded by the use of some other measures but were nevertheless more than suggestive. Twelve of the cases showed apparent cure, thirty-eight were much improved, thirty-eight were improved and twelve remained the same.

Hartfall and Garland⁵ reported another series of 100 cases observed and treated over a period of two years. They favored the intravenous method of administration, using gold sodium thiosulfate. Ten showed apparent cure, fifty-six showed marked improvement, five showed none and three patients died.

All reports are in agreement on the toxicity of gold compounds. Erythematous and even exfoliative dermatitis may be observed. Nephritis with albuminuria, edema and sometimes raised blood urea may occur. A tendency to bronchial irritation has been noted. Shock and collapse occurring immediately after an injection have been reported. Pyrexia has been reported more often by some observers than by others and is probably more frequent when an intravenous preparation is used. Stomatitis and diarrhea sometimes occur. Hartfall and Garland recorded toxic reactions in forty-five of their hundred cases. The most common was generalized pruritus, which occurred in thirty-six cases, erythema developed in twenty-eight of these and four went on to desquamation, in one case severe. Diarrhea developed in ten cases. Soreness of the mouth was complained of in nine cases and three went on to ulceration. In four cases vomiting occurred within a few hours of the injection and one patient had immediate nausea without vomiting. Isolated cases of hyperkeratosis of the soles, pustular dermatitis of the hands and feet, labial edema, herpes zoster, erythema nodosum, lichen

1 Davies H M. *Pulmonary Tuberculosis*. London 1933.
2 Slot Gerald, Deville P M, Hill N G, Williams Bryan and Fridjohn M H. *Treatment of Arthritis and Rheumatism with Gold*. *Lancet* 1:73 (Jan. 13) 1934.
3 Forestier Jacques. *Rheumatoid Arthritis and Its Treatment by Gold Salts*. *Lancet* 2: 646 (Sept. 22) 1934.

4 Pemberton H S. *One Hundred Cases of Chronic Arthritis Treated by Gold*. *Lancet* 1:1037 (May 4) 1935.
5 Hartfall S J and Garland H G. *Gold Treatment of Rheumatoid Arthritis*. *Lancet* 2: 8 (July 6) 1935.

planus and purpura were noted. Three of their patients died. One of these developed agranulocytosis three months after the last injection. Two died of purpura, most likely due to the injections. Hudson⁶ has reviewed the cases of gold purpura. In eleven of the twenty-two cases under consideration a previous course of aurotherapy had been given, thus suggesting sensitization. The only efficient safeguard, he believes, is systematic platelet counts. In case purpura occurs, blood transfusion should be given without delay.

Thus there is now a considerable amount of independent work indicating the therapeutic effectiveness of gold salts in rheumatoid arthritis. The best preparation, mode of administration and dosage are not a matter of general agreement. The toxicity is marked. The conservative attitude that must still be taken is indicated by the fact that the Council on Pharmacy and Chemistry has not yet accepted any therapeutic gold preparation with claims of usefulness in arthritis. It seems that aurotherapy is promising in a restricted field when some of the doubtful factors become clear and the necessary precautions against toxic reactions standardized. At the present time no one who is not thoroughly familiar with the indications and dangers should attempt its use.

Current Comment

THE NATIONAL FORMULARY VI

When Congress created the Food and Drugs Act in 1906 it included as official standards for the purpose of the act not only the United States Pharmacopeia but also the National Formulary, a book published by the American Pharmaceutical Association. The first Formulary appeared in 1888. At that time the committee stated that "there is and shall be only *one* standard, as to quality and strength, to be followed for all official preparations, viz., the United States Pharmacopeia." The National Formulary—which is, at most, intended only as a stepping stone from and to that authority—was characterized as a standard only for those preparations which are not provided for by this official work. The book may be considered, then, as an interim depository for those drugs which do not merit therapeutic recognition by the U. S. Pharmacopeia. In some ways it seems unfortunate that the life of these drugs should be continued by finding recognition in the official compendium. There are those, however, who feel that since some of these drugs are prescribed by some physicians they should be standardized. The National Formulary is also continuing the policy of being what its name implies—a formulary of certain mixtures, many of which are simply dosage forms of the Pharmacopeial drug. The National Formulary Committee is appointed by the American Pharmaceutical Association. The present committee consists of fifteen pharmacists and one physician, the membership being confined to members of the association. The

chairman of the committee, who has worked indefatigably on this venture, is Prof. E. N. Gathercoal of the University of Illinois. The Sixth Revision,¹ which is now available, is superior to previous issues in that it follows the style of the Pharmacopeia rather than being divided into three sections. Eighty of the 119 articles omitted from the Pharmacopeia have been incorporated in this volume. There are 150 other admissions and 319 deletions. The largest single group addition is the Ampules, some containing certain new and old Pharmacopeial items. The National Formulary lists certain types of tablets but, unlike its predecessor, does not prescribe as rigorous standards for the preparations. Essentially, any size tablet of the preparation described in the National Formulary now becomes official. It is interesting to note also that glandular preparations have been included in the National Formulary, but it must be admitted that there is no evidence of the value of some of these preparations given orally. Among them are ovary, corpus luteum and anterior pituitary. The sincerity of the committee that has charge of this work is recognized, but the National Formulary still seems to be a superfluous publication. There should be only one book of official standards for medicinal preparations published in the United States.

THE TREND OF SYPHILIS AND GONORRHEA IN THE UNITED STATES

The report by Usilton,¹ on the trend of syphilis and gonorrhea in the United States provides evidence of the enormity of the venereal disease problem. Annually there are apparently four per thousand individuals in the United States with a fresh syphilitic infection and eight per thousand with acute gonorrhea. An additional four per thousand seek treatment for the first time after their syphilitic infection has become late, and another four per thousand present themselves to a physician for treatment of chronic gonorrhea. Thus, more than a million persons seek medical treatment for syphilis in the United States each year, while more than 1,500,000 persons are treated annually by physicians for gonococcal infection. Eighty-four per cent of patients treated for early syphilis in five of the large clinics devoted to syphilis failed to remain under treatment until the disease was rendered noninfectious. In fact, surveys conducted by the American Social Hygiene Association reveal that twice as many persons with venereal disease seek treatment across drug-store counters as come to a qualified medical source for treatment. If two thirds of patients with fresh syphilis who seek authorized medical treatment lapse from treatment before they become noninfectious to others, if more than 500,000 persons each year do not seek treatment until one or more years after acquiring syphilis, and if two thirds of those who acquire the disease seek "drug-store treatment" or receive no treatment, nearly two million persons in the United States are either inadequately treated or fail to receive treatment for syphilis every year. Usilton also makes the significant statement that approximately 186,000 of the potential

⁶ Hudson, E. H. Purpura Haemorrhagica Caused by Gold and Arsenical Compounds. *Lancet* 2: 74 (July 13) 1935.

¹ A comprehensive review of this book will be published in a later issue.
¹ Usilton, L. J. Trend of Syphilis and Gonorrhea in the United States. Based on Treated Cases. *Ven. Dis. Inform.* 10: 147 (May) 1935.

mothers of this country have active syphilis, with the likelihood of resultant loss of the child four times more often than among nonsyphilitic mothers. These figures provide emphasis to Usilton's statement that 'syphilis as a treatment problem ranks first among the contagious diseases of man'.

Association News

ABSTRACTS OF MINUTES OF BUSINESS MEETING HELD BY COUNCIL ON MEDICAL EDUCATION AND HOSPITALS IN CHICAGO, DECEMBER 8 AND 9

1 The meeting was called to order at 10 a. m. Those present included Drs Ray Lyman Wilbur (chairman) Merritte W Ireland Frederic A Washburn, J H Musser, Fred Moore Reginald Fitz, William D Cutter, Herman G Weiskotten, Carl M Peterson, Oswald N Andersen and Mr Homer F Sanger.

2 It was resolved that the minutes of the business meeting of Sept. 15, 1935, be approved.

3 It was voted to reconsider the resolution passed in September to the effect that after July 1, 1938, the Council would no longer list two year schools and it was further voted that such schools be considered individually.

4 It was voted that the nineteen sophomore students at present enrolled in the University of Mississippi School of Medicine may be accepted in approved schools without prejudice to the standing of the latter.

5 It was voted that the American Board of Dermatology and Syphilology be approved.

6 It was voted that the American Board of Radiology be approved.

7 It was voted that the list of pathologists as submitted be approved.

8. It was voted to approve the lists of hospitals and other institutions recommended by the staff.

WILLIAM D CUTTER M D, Secretary

RADIO BROADCASTS

The American Medical Association broadcasts over WEAf, the Red network instead of the Blue as formerly, and certain additional stations of the National Broadcasting Company at 5 p. m. eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time) each Tuesday presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health. The program is recognizable by a musical salutation through which the voice of the announcer offers a toast 'Ladies and gentlemen, your health!' The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

Red Network—The stations on the Red network of the National Broadcasting Company are WEAf, WEEI WTIC WJAR, WTAG, WCSH, WFI-WLIT WFBR WRC WGY, WBN WCAE WTAM, WWJ WSAI, WMAQ-WCFL KSD, WOC-WHO, WOW and WDAF.

Pacific Network—The stations on the Pacific network are KGO KFI, KGW, KOMO and KHQ.

The next three programs are as follows:

December 31 No broadcast
January 7 Infantile Paralysis Morris Fishbein M D
January 14 Diphtheria W W Bauer M D

This program is broadcast occasionally on the short waves through KDKA Pittsburgh over station W8YK, 11,870 and 12,210 kilocycles.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

University News—Dr John H Musser, professor of medicine Tulane University of Louisiana School of Medicine New Orleans gave a lecture at the University of Alabama School of Medicine recently, his address was entitled "The Life and Work of Sir William Osler, with Some Personal Reminiscences." The occasion was the observance by the Gorgas Medical Society of the university of the birthday of Gen. William Crawford Gorgas.

ARKANSAS

Society News—Dr George E Knappenberger Kansas City, Mo. discussed "Gastro-Intestinal Disorders" before the Benton County Medical Society, November 14.—Speakers before the Sebastian County Medical Society, November 12, were Drs Miles E Foster and Arthur F Hoge, Fort Smith, on "Thyroid Surgery" and "Surgery in Diabetes".—Among others Dr C W Rasco DeWitt presented a "Review of Recent Literature Regarding Undulant Fever" before the Arkansas County Medical Society in Stuttgart, November 12.

CALIFORNIA

Lectures by Dr Houssay—Dr Bernardo A Houssay, professor of physiology and director of the physiologic institute in Buenos Aires, Argentina lectured at Stanford University, December 7, and at the medical school December 9, on "The Hypophysis and Resistance to Infection, Intoxication and Cancer." Lectures were also presented before the University of California School of Medicine and the California Academy of Medicine, December 14.

Society News—Dr Curle Latimer Callander San Francisco, discussed "A New Amputation" before the San Diego County Medical Society, December 10.—At a meeting of the Alameda County Medical Association, December 16 speakers were August Vollmer on "The Problem of Crime as Related to Medicine," Paul L Kirk, Ph D Berkeley "Application of Scientific Principles in the Investigation of Crime," and Dr Hubert N Rowell Berkeley, "Medicopsychological Aspects of Crime."

Auxiliary Sponsors Health Meetings—The women's auxiliary of the Alameda County Medical Association sponsored a health institute at the Oakland Civic Auditorium November 4-5 'to present to the public the fundamental facts of modern scientific medicine for the purpose of building sound public opinion and knowledge relative to the questions of public and private health. Local medical organizations and civic agencies cooperated. Exhibits were included depicting important phases of personal and community health.

Survey of the Blind—In a survey in California, 3,512 blind persons responded to questionnaires issued to 6,960 blind persons who were recorded in the census. Of the group studied, 121 per cent were under 20 years of age while 54.4 per cent were more than 60. Only eighty-eight of the 3,512 persons surveyed reported that they make even a bare living, while about 95 per cent of the blind in California have no earned income at all and so are wholly dependent economically, either on relatives and friends or on society. The study was sponsored by the bureau of rehabilitation of the state department of education and carried out in cooperation with the state emergency relief administration and the state council for the blind. Its purpose was to ascertain the number of blind persons in the state who are self supporting, the number who are of employable age and in what occupation they have been successful and the number needing aid for economic or social adjustment.

COLORADO

Personal—Dr Robert W Gordon has been appointed deputy manager of health and charity of the health department of Denver, succeeding Dr Bertram B Jaffa.

Society News—The annual midwinter graduate clinics of the Colorado State Medical Society will be held in Denver, January 23-24.—Dr Ralph A Fenton Portland, Ore, discussed "Facts and Fallacies Regarding Accessory Sinuses" before the Colorado Oto Laryngological Society, November 16.

GEORGIA

New Society of Pathologists—The Georgia Association of Pathologists was organized recently with seventeen charter members. Atlanta will be the headquarters of the new society, and officers are Drs Everett L Bishop, president, Roy R Kracke, vice president, and Thomas F Sellers, secretary. Meetings will be held monthly.

Society News—Speakers before the Georgia Pediatric Society in Atlanta, December 12, included Dr Isaac A Abt, Chicago, on "Progress of Infant Feeding" and "A Child's Heart in Avitaminosis", Charles E Bills, Ph D, Evansville, Ind, "Medicinal Fish Oils" and "Multiple Nature of Vitamin D", Dr John A Kolmer, Philadelphia, "Infection, Immunity and Vaccination in Anterior Poliomyelitis," and Dr John L Morse, Boston, "The Thymus Delusions" and "Diagnosis and Prognosis in Pediatrics".—Dr William F Reavis read a paper entitled "Cancer in the Lower Urogenital Tract" before the Ware County Medical Society, Waycross, November 6.—An official bulletin for the Georgia Medical Society made its appearance with the October issue. The society was founded in 1804 and since 1908 has been the official medical society of Chatham County. Dr Michael J Egan is president, Dr Cornelius F Holton president-elect, Dr Harry M Kandel vice president, and Dr Otto W Schwalb secretary. All are from Savannah.

INDIANA

Portrait Presented to University—A portrait of the physician immortalized by James Whitcomb Riley in his poem "The Doctor" has been presented to the Indiana University Medical Center, Indianapolis, and hung in the reading room of the medical library, according to the state medical journal. Dr William B Fletcher, subject of the painting by Theodore C Steele, served as a scout during the Civil War. Captured near Big Spring, Va, he succeeded in destroying his notes and maps by lighting his pipe with them while seated near a camp fire, but he was condemned to be shot. After he made two unsuccessful attempts to escape, his identity as a condemned prisoner was lost and by mistake he was sent to Libby prison and was later paroled. Dr Fletcher served more than forty years as a teacher in the old Indiana Medical College and the College of Physicians and Surgeons in Indianapolis. He died in 1907.

IOWA

Typhoid Outbreak—Twenty-four cases of typhoid with one death in Polk County during the week ended November 30 were attributed to a contaminated water supply, according to the state health department. The outbreak involved with one exception persons residing, working or visiting at the county farm or attending an adjacent school. The investigation revealed the water supply to be the only factor common to the farm and the school.

Society News—A symposium on rare fevers was presented before the Decatur County Medical Society, Decatur, November 12, by Drs John C Parsons, Creston, Ernest E Shaw, Indianola, and Herbert E Stroy, Osceola.—Dr Elwood P Russell, Iowa City, discussed "Fractures of the Hip, Thigh and Knee" before the Louisa County Medical Society, November 14.—At a meeting of the Scott County Medical Society in Davenport, December 3, Dr Charles Hugh Neilson, St Louis, discussed "Effect of Weather on Human Conduct and Disease".—At a meeting of the Woodbury County Medical Society in Sioux City, November 21, Dr Edgar V Allen, Rochester, Minn, spoke on "Peripheral Vascular Disease".—A symposium on inflammatory lesions of the bowel was presented before the Northwest Iowa Medical Society in Sheldon, November 5, by Drs Harry M Weber and Philip W Brown, Rochester, Minn.

KANSAS

Changes in Health Officers—Dr James B Ungles, Satanta, has been appointed health officer of Haskell County, succeeding the late Dr Loring V Miner. Dr William J Scott, Ottawa, was recently placed in charge of the Franklin County health unit.

Society News—The Wyandotte County Medical Society was addressed, November 29, by Drs La Verne B Spake, Kansas City, on "Indications for Surgery of the Mastoid Process" and Oscar W Davidson, Kansas City, "Visceroarenal Reflexes".—Speakers before the Rush-Ness Medical Association recently in La Crosse were Drs John A Dillon, Larned, on psychosis, Albert C Armitage, Kinsley, the state medical society, and Otto A L Hennerich, Hays, otitis media.—At the annual meeting of the Kansas Hospital Association recently at Emporia, Rev J E Lander, Wichita, was chosen president.

LOUISIANA

Personal—Dr Paul T Thibodaux, secretary of the Lafourche Levee Board and coroner of the Ascension Parish for many years, has been appointed health officer of Donaldsonville, he was also postmaster of Donaldsonville for three terms, resigning this position several months ago, it was stated.

Chaillé Memorial Oration—The tenth Stanford E Chaillé Memorial Oration was delivered at the memorial meeting of the Orleans Parish Medical Society December 7. Dr Joseph A Danna gave the lecture entitled "Dr Chaillé, Dean, Teacher and Friend." Other speakers at this meeting were Drs William H Slaughter on "Present Status of Fever Therapy," and Roscoe R Spencer, "An Explanation of the U S Public Health Survey."

MARYLAND

A Year in Baltimore Without a Diphtheria Death—Not one death was reported from diphtheria in Baltimore during the year and sixteen day period ended October 13, according to the health department. Four deaths occurred in children brought into Baltimore from county homes for treatment at Sydenham Hospital, but these are classified as "nonresident" deaths. The death of a little girl occurred October 13.

Changes in Faculty at University of Maryland—Dr James Dawson Reeder, clinical professor of diseases of the colon and rectum, University of Maryland School of Medicine, Baltimore, has been promoted to the rank of professor. The promotion of Dr John Mason Hundley Jr from associate in gynecology to professor of clinical gynecology is also announced. New appointments include that of Magnus Greger sen, Ph D, as professor of physiology.

Personal—Dr John A Skladowsky was promoted, October 23, to be full time medical health officer in the Baltimore health department and was assigned to the Western Health District, he has been connected with the department since 1920.—Dr Harry Garland Timbres has been appointed assistant in biostatistics at Johns Hopkins University School of Hygiene and Public Health, Baltimore.—The work of the late Dr Joseph C Bloodgood at St Agnes Hospital, Baltimore, will be continued under the direction of Drs George A Stewart and Leopold Clarence Cohn. They will also continue his clinic at 3301 North Charles Street. These physicians had long been associated with Dr Bloodgood.

MASSACHUSETTS

Changes in Medical Examiners—Dr John L O'Toole, Haverhill, was appointed in November medical examiner of the fourth Essex district. Dr John P Creed Haverhill, was named associate medical examiner of the district, and Dr Charles R Abbott, Clinton, associate medical examiner of the fourth Worcester district.

Society News—Dr Burgess L Gordon, Philadelphia, discussed "The Mechanism and Effects of Abdominal Compression in the Treatment of Pulmonary Tuberculosis" before the Harvard Medical Society, Boston, November 26.—Speakers before the Norfolk District Medical Society in Norwood, November 26, included Dr Valmore A Pelletier, on "Metastasis in Cancer of the Breast."

MICHIGAN

Personal—Dr Kenneth W Dick, Carsonville, has been appointed medical adviser in the Michigan Home and Training School at Lapeer.—Dr Harold W Jacox has resigned as assistant professor of roentgenology at the University of Michigan Medical School, Ann Arbor, to become director of the department of radiation therapy for the Western Pennsylvania Hospital at Pittsburgh.

Society News—Dr Archibald L Hoyne, Chicago, addressed the Detroit Pediatric Society, December 4, on "Treatment of Meningococcal Infections".—Dr Clark D Brooks, Detroit, discussed "Malignancy of the Gastro-Intestinal Tract, Diagnosis and Treatment" before the Jackson Medical Society in Jackson, November 19.—A symposium on management of the more common skin diseases was presented before the medical section of the Wayne County Medical Society, December 9, the program was arranged by the Detroit Dermatological Society.

State Survey of Goiter—The state medical society and the state department of health are cooperating in a survey now being conducted in the state to determine whether the depressed income of the average family has brought about an increase of goiter cases. Questionnaires are being given to school children in which they are asked whether the use of iodized salt prevails in their families and whether it ever was used. The children

are questioned about their own diet and given a superficial examination for goiter. Samples sold by all salt manufacturers in Michigan have been collected to be tested in the state agricultural laboratory to determine whether packages sold as iodized salt contain the proper amount of sodium iodide. The results of the survey will be tabulated by the state health department in Lansing, and the conclusions drawn by the state medical society will be presented to the state emergency relief commission.

MINNESOTA

Society News—Dr Irving S. Cutter, dean, Northwestern University Medical School, Chicago, discussed "The Physician and the Public" before the St. Louis County Medical Society in Duluth, December 12. Speakers before the Medical Society of Blue Earth in November included Dr. Charles N. Hensel, St. Paul, on internal medicine; Dr. Neil Hamilton Fairley, London, gave a Mayo Foundation lecture in Rochester, November 25, on "Tropical Diseases as They Affect the Practice of Medicine in the Temperate Zone." Dr. Leo G. Rieger, Minneapolis, discussed "Development of the Use of Opaque Media in Roentgen Diagnosis" before the Rice County Medical Society at Faribault recently. At a meeting of the Upper Mississippi Medical Society in Wadena, recently, Dr. Charles B. Wright, Minneapolis, read a paper entitled "Abdominal Symptoms of Heart Disease," and Dr. Theodore H. Sweetser, Minneapolis, spoke on diagnosis and treatment of hydronephrosis. Dr. Henry E. Binger, St. Paul, was recently elected president of the Minnesota Academy of Ophthalmology and Oto-Laryngology. Vice presidents are Drs. George E. McGary and Anderson C. Hilding, Duluth, and the secretary is Dr. Walter E. Camp, Minneapolis. Speakers before the Minnesota Academy of Medicine in St. Paul, December 11, were Drs. Hendrie W. Grant, St. Paul, on "Visual Field Contractions after Head Injury," and Herbert Z. Giffin, Rochester, "Hemorrhagic Purpura."

MISSISSIPPI

Physical Examinations of Health Workers—Every health worker in the state had had a physical examination by his family physician, December 15. In addition each worker had had a dental examination, including x-ray and all corrections, typhoid and smallpox vaccination, Schick test and toxoid if positive, and roentgenogram of the chest.

MISSOURI

Society News—Dr. Carliss Malone Stroud discussed vitamins before the St. Louis Medical Society, December 10, and Dr. Cyril M. MacBryde, "Functional Changes in Liver Heart and Muscles and Loss of Glucose Tolerance Resulting from Dinitrophenol." At a meeting of the society, December 3, Dr. Ellis Fischel discussed "Cancer of the Rectum" and Dr. Millard F. Arbuckle, "Cancer of the Larynx."

Cancer Program—The cancer committee of the state medical society sponsored a meeting with the Pettis County Medical Society as host at Sedalia, November 12-14. A clinic was conducted at the Bothwell Hospital in the morning and a public meeting was held in the afternoon. Dr. Ferdinand C. Helwig, Kansas City, discussed "Causes of Cancer," Dr. Ernest Kip Robinson, Kansas City, "Prevention of Cancer of the Mouth," and Dr. David S. Dann, Kansas City, "Cancer Control." In the evening, Dr. Helwig spoke on "Reaction of Tumors to Radiation," Dr. Robinson, "Treatment of Metastatic Glands in the Neck," and Dr. Dann, "Management of Cancer of the Lip."

NEBRASKA

Society News—Dr. Arthur T. Henrici, Minneapolis, was guest speaker at the meeting of the Omaha-Douglas County Medical Society, December 10, on "Fungi in Disease." Drs. Claude T. Uren and William H. Stokes, Omaha, addressed the Platte County Medical Society, Columbus, November 14, on "Acute Infection of the Middle Ear and Mastoid" and "Treatment of Some of the More Common External Diseases of the Eye," respectively.

NEW JERSEY

"Washington Plan" Adopted—The Essex County Medical Society has established a medical-dental service bureau in the pattern of the "Washington Plan" for distribution of medical service to low income groups in Washington, D. C. It was expected that the bureau which is incorporated as a nonprofit organization, would be in operation by December 15.

Society News—Dr. Alfred F. Hocker, New York, addressed the Monmouth County Medical Society, Asbury Park, recently, on "Tumors of the Head and Neck," and Dr. Frank C. Parker, Norristown, Pa., presented a motion picture of ophthalmic operations. Dr. Paul R. Correll, Easton, Pa., addressed the Warren County Medical Society, Belvidere, recently, on "Traumatic Ruptures of the Liver and Spleen and Ruptures of Gastric and Duodenal Ulcers." Dr. Murray H. Bass, New York, addressed the Hudson County Medical Society, Jersey City, November 6, on "Unusual Forms of Rheumatic Infection in Children."

Health at Camden—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million for the week ended December 14 indicate that the highest mortality rate (20.5) appears for Camden and the rate for the group of cities as a whole was 12.1. The rate for Camden for the corresponding week of last year was 15.3 and for the group of cities, 11.7. The annual rate for the eighty-six cities for the fifty weeks of 1935 was 11.3 and the same rate appeared for the corresponding period of 1934. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that a city is a hospital center for large areas outside the city limits or that it has a large Negro population may tend to increase the death rate.

NEW YORK

The Will Rogers Tuberculosis Hospital—The name of the National Variety Artists' Lodge, a tuberculosis hospital at Saranac Lake for members of the theatrical professions, has been renamed the Will Rogers Memorial Hospital. The directors of the National Variety Artists' Association turned over the deed to the hospital to the Will Rogers Memorial Fund at a meeting November 21.

Society News—Dr. David L. Engelsher, Bronx, addressed the Westchester Village Medical Society, November 26, on "Allergy and the General Practitioner." Dr. Abraham Kaplan, New York, addressed the Dutchess-Putnam Counties Medical Society, Poughkeepsie, November 13, on "Diagnosis of Operable Intracranial Lesions." Dr. Bret Ratner, New York, addressed the society, December 11, on "The Allergy Problem in Childhood." Dr. Murray B. Gordon, Brooklyn, addressed the Rockaway County Medical Society, November 21, on "Endocrinology in Children."

New York City

Hospital News—A new research laboratory has been completed at St. Clare's Hospital in connection with the Tumor Institute recently established at the hospital. The laboratory is entirely separate from the laboratory for pathology. The department of hydrotherapy at the Hospital for Joint Diseases has been reorganized under the direction of Drs. Jerome Weiss attending physical therapist, and Hans Behrend, formerly of the hydrotherapeutic institute of the University of Berlin.

Scholarships at Post-Graduate School—Scholarships for qualified graduates in medicine who wish to do graduate study are available at New York Post-Graduate Medical School under the Oliver-Rea endowment. Under the terms of the agreement, applicants from Allegheny County, Pa., other circumstances being equal, will be given preference. Application should be made to the director of the school, 303 East Twentieth Street.

Society News—Speakers before the Medical Society of the County of New York, December 16, were Drs. Bernard S. Oppenheimer, on "The Era of Chronic Diseases in Medicine," James C. White, Boston, "Neurosurgery in Cardiovascular Diseases," and Richard Kovacs, "Thermal Therapy in Chronic Disease." Dr. Beverly C. Smith addressed the New York Surgical Society, December 11, on "Peripheral Nerve Block in Arterial Disease of the Lower Extremity." Dr. Nathaniel G. Alcock, Iowa City, addressed the New York Society of the American Urological Association, December 13, on "Operations on Transurethral Resections of the Prostate." Drs. James S. McLester, Birmingham, Ala., and James Tate Mason, Seattle, President and President-Elect respectively of the American Medical Association, addressed the Bronx County Medical Society at a special meeting November 25, on the activities of the Association and Dr. Frederic E. Sondern, president of the Medical Society of the State of New York, spoke on the state society's work. The International Spanish Speaking Association of Physicians, Dentists and Pharmacists, at the first meeting of the fall, November 22, held a symposium on the gallbladder with the following speakers: Drs. Henry L. Bockus and William Wayne Babcock, Philadelphia, Walter G. Crump, New York, Jose Arce, Buenos Aires, Argentin-

tina, and Eugenio Cienfuegos, Santiago, Chile. Dr Jacob M Gershberg, president of the society, gave an account of a recent European trip, where he addressed various medical societies on 'Metchnikoff's Theory of Longevity and the Colon'—Drs Lay Martin, Baltimore, and Harlow Brooks addressed the National Society for the Advancement of Gastro-Enterology December 18, on "Clinical Interpretation of Jaundice" and "Abdominal Symptoms and Signs of Thoracic Disease," respectively

OKLAHOMA

Penitentiary Quarantined—The Oklahoma state penitentiary at McAlester was placed under quarantine by the state health commissioner, December 21, when a case of cerebrospinal meningitis was diagnosed in a convict. Parts of four counties were reported to be under quarantine, December 18 when three deaths were announced in addition to one previously attributed definitely to meningitis and nine others believed the result of the disease (THE JOURNAL December 21, p 2079). Canadian, Cleveland, Kiowa and Tillman are the counties affected.

PENNSYLVANIA

Personal—Dr William Moore Guilford Lebanon, celebrated his one hundred and third birthday, November 26—Dr Lorne T MacDougall, Tunkhannock, has been appointed medical director of Wyoming County, succeeding Dr Frank J Austin, Laceyville

Philadelphia

Colleagues Honor Dr Coates—Members of the staffs of the University of Pennsylvania, Graduate, Presbyterian and Abington Memorial hospitals gave a testimonial dinner, November 16, in honor of Dr George M Coates, professor of otolaryngology, University of Pennsylvania School of Medicine, and professor of otorhinology in the Graduate School of Medicine of the university. A feature of the dinner was the presentation to Dr Coates of a portrait of himself to be hung in the school of medicine. Dr Benjamin H Shuster made the presentation

Pittsburgh

Society News—Speakers at a meeting of the Allegheny County Medical Society December 17, were Drs Eben W Fiske on 'Therapy of Rest and Motion', John W Fredette, 'Treatment of Hand Infections', Wilton H Robinson, 'Injuries of the Shoulder Girdle, with Particular Reference to the Prevention of Deformity', and Rutherford T Johnstone 'Interpretation of the Electrocardiogram for the General Practitioner'

RHODE ISLAND

Society News—Speakers at a meeting of the Providence Medical Association, December 2 were Drs Kalei K Gregory, on "Some Clinical Aspects of the 1935 Epidemic of Anterior Poliomyelitis", George M Retan Syracuse, N Y, "Treatment of Poliomyelitis by Forced Perivascular Drainage" and Maurice Brodie New York, "Present Problems of Poliomyelitis Diagnosis, Treatment and Prevention"

VIRGINIA

Society News—William T Sanger LL D, president, Medical College of Virginia, Richmond, was guest speaker before the Southwestern Virginia Medical Society in Roanoke, recently, on "Trends in Medical Education"—Drs Frank S Johns and Emmette T Gatewood, Richmond, addressed the Mid-Tidewater Medical Society at a meeting at Millers Tavern in October on "Cancer of the Colon" and "Foreign Bodies in the Trachea," respectively—Dr Martillus H Todd, Norfolk, addressed the Northampton County Medical Society, Eastville, recently, on emergency surgery—The Culpeper County Medical Society was organized recently at a meeting in Culpeper, with Dr David W Kelly Jr, Culpeper, as president, John E Parks Jr, Brandy, vice president, and Otway K. Burnette, Culpeper, secretary—Dr Charles R Austrian, Baltimore, addressed the Virginia Peninsula Academy of Medicine, November 18, on "Differential Diagnosis of Pulmonary Tuberculosis"—The quarterly session of the Southside Virginia Medical Association was held in Petersburg, December 10, with the following speakers: Drs Wyndham B Blanton, Richmond, "Medical Economics", William M Bickers, Richmond, "Ectopic Pregnancy", Herbert C Jones Petersburg, "Intravenous Pyelography", Leta J White and George H Reese, Petersburg, "Congenital Pyloric Stenosis", Henry M Snead, William B McIlwaine III Petersburg, and Thomas F Wheelton, Richmond, "Unusual Cases of Paralysis"—Dr W Ambrose McGee, Richmond opened the discussion

GENERAL

News of Epidemics—Three cases of epidemic meningitis were reported in Lawrence County, Ark., December 5. Two cases were discovered in Washington, D C in November—An outbreak of twenty-three cases of diphtheria was reported from Fort Wayne, Ind., December 4—A Civilian Conservation Corps camp at Red House, N Y, was quarantined for several days early in December when a case of scarlet fever was discovered. Schools were closed in Waukesha, Wis., to combat an outbreak of scarlet fever during November—An epidemic of 497 cases of mumps was reported in Fargo, N D, in November—Thirty-four cases of typhoid in the vicinity of Saylorville, Iowa, were attributed to contaminated water on the Polk County farm, December 4

Changes in Status of Licensure—The New Mexico Board of Medical Examiners recently reported the following actions:

Dr John L Kirby, Clovis license revoked because of his conviction on a narcotic charge

Dr James Monroe Wattam Carlsbad license revoked because of alcoholism

Dr George Frear Johnston formerly of Clayton license revoked on the ground that he is an impostor using the license of a physician of the same name who died several years ago

The Massachusetts Department of Registration recently reported the following action:

Dr John F Cummings Brockton license revoked November 15 for conviction in court on a charge of abortion

The Arizona State Board of Medical Examiners reports the following:

Dr Claude E. Duvall Tucson license revoked December 3 for violation of the Harrison Narcotic Act

Medical Section of Science Association.—At the mid winter meeting of the American Association for the Advancement of Science in St Louis, December 30-January 3, Section N (Medical Sciences) will have a program each morning. Two sessions, those of Thursday and Friday, will be devoted to symposiums on the sex hormones. Among speakers will be Dr George W Corner, Rochester, N Y, Edward A Doisy, PhD, St Louis, G F Marrian Toronto, Dr Carleton J Marinus, Detroit, Dr Willard M Allen, Rochester, N Y, Dr Howard F Kane Washington, D C., and Charles W Turner, PhD, Columbia, Mo. Dr Stanhope Bayne-Jones New Haven, Conn, vice president for the section, will present his official address, January 1, in the afternoon on 'Bacterial Poisons and Their Antidotes'. The preceding afternoon Dr Bernardo A Houssay, Buenos Aires Argentina, will speak on "The Pituitary Gland and the Metabolism of the Body."

Orthopedic Surgeons to Meet.—The fourth annual convention of the American Academy of Orthopedic Surgeons will be held in St Louis, January 13-16, with headquarters at the Hotel Jefferson. The program includes two symposiums. Drs. Richard H Jaffe, Chicago, Robert I Harris and Arthur C Singleton, Toronto, and Henry W Mejerding, Rochester, Minn., will present a symposium on bone tumors, the other on "Fractures About the Elbow," will be presented by Drs William Darrach, Clay Ray Murray and Philip D Wilson, New York. H Earle Conwell, Fairfield, Ala., James S Speed Memphis, Tenn., and Alfred R Shands Jr, Durham, N C. Other speakers announced include:

Dr Donald E King San Francisco The Question of Healing and Regeneration of the Internal Semilunar Meniscus

Dr Edward L Compere Chicago Indications for and Against the Leg Lengthening Operation

Dr Alexander Gibson Winnipeg Manit A Method of Spinal Fusion

Dr Mather Cleveland New York Lateral Curvature of the Spine

Following Thoracoplasty in Children

Dr Arthur Bruce Gill Philadelphia An Evaluation of Present Day Methods of Dealing with Congenital Dislocation of the Hip

Dr William B Carrell Dallas Texas Use of Fascia in Unstable Knees

Dr John Albert Key St Louis Metabolic Factors in the Diagnosis and Treatment of Hypertrophic Arthritis

Dr Joseph Kite Decatur Ga Treatment of Congenital Clubfoot

Dr Frank D Dickson, Kansas City, Mo., is president of the academy, Dr Melvin S Henderson, Rochester, Minn., president-elect, and Dr Philip Lewin, Chicago, secretary

Deaths in Other Countries

Charles Richet, professor of physiology, University of Paris, winner of the Nobel Prize in Medicine in 1913 died December 3, aged 85—**Griffith Evans**, Bangor, Wales, December 3, aged 85—**Griffith Evans**, Bangor, Wales, pioneer veterinary surgeon, who discovered Trypanosoma Evansi to be the cause of surra, a disease of horses and cattle, died December 7, aged 100

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov 30 1935

The Birth Control Controversy

At present there is a controversy on the subject of birth control. On the whole the medical profession is in favor of birth control under certain circumstances, while it is opposed by certain ecclesiastics, on religious or moral grounds and is entirely condemned by the Roman church. At the Hunterian Society a debate was opened by the bishop of St Albans who entirely opposed birth control by artificial means. He had a strong intuitive sense that the whole thing was wrong and degrading, and in all esthetic and moral judgments the intuitive sense was not to be disregarded. Birth control was a deliberate frustration of the biologic ends of nature. Self control he exalted as the thing which differentiated man from the animal.

Dr C P Blacker, secretary of the Eugenics Society, said that the central question was whether it was possible for the married to regulate an appropriate number of births by the method of abstinence. He had been impressed lately by a number of books from Catholic sources advocating the so called safe period. It was clear that Catholic physicians and priests were finding difficulties with their patients and penitents in this regard.

Sir Walter Langdon Brown, emeritus professor of physics in the University of Cambridge, said that the world was overshadowed by war, the aggressor being a country trying to find room for its teeming population and yet in the criminal code of the same country birth control was ranked side by side with banditry. Birth control was directed to life and health, so that a woman would be able to space her family at the proper intervals and give each member a chance of being properly brought up. He believed that celibacy was possible to many and that marriage was the crown of human happiness but that married celibacy was the worst thing possible. He preferred birth control as an alternative to those things which in the old days were regarded as of divine ordinance—war, pestilence and famine.

In the general discussion a young physician said that if physicians did not believe in birth control because it was an interference with nature, logically they ought not to try to prevent or postpone death, for this also was an interference with nature.

Road Accidents and Lighting

To what extent motor accidents are due to poor road lighting is not easily ascertained but statistics suggesting that it is the cause of many injuries were given in an address by Mr E C Lemov, vice president of the Association of Public Lighting Engineers, at the Public Works, Roads and Transport Congress, held in London. The density of traffic on the roads, he said, was not only steadily increasing but steadily increasing during the hours of darkness. Heavy goods traffic was being carried to an ever greater extent on the roads at night, and this with the enormous development of omnibus service, has contributed to make us 'an eighteen hour nation.' Statistics showed that the accident hazard at night was several times greater than by day. He estimated that if the main roads were efficiently lighted, making the use of motor headlights unnecessary, accidents would be reduced by 10 per cent and the increased cost would be counterbalanced by the reduced cost of what the community paid for accidents through insurance companies alone. More than 46 per cent of accidents occurred during the winter months, although traffic was then less heavy than in the summer. In the winter 52 per cent of accidents occurred during the dark hours and in summer more than 20 per cent, when there

was least traffic. In a whole year one third of the accidents happened during the dark hours. During the two hours of the session of the congress on the average two persons would be killed and sixty-two injured. If the session had been between the hours of 5 and 7 in the evening, in the dark when traffic would be less, the figures would have been 43 killed and 132 injured. These figures could easily be reduced by better public lighting.

In the discussion that followed it was stated that experience at Lewisham (South London) showed that better lighting led to greater speed of motorists and that it was a question how far improved lighting tended toward safety. A county surveyor said that the present system of lighting was detrimental to good driving because lights placed up in the air, particularly on a gradient, had a dazzling effect on drivers. It might be possible to floodlight the highways in such a way that the light itself would not be visible.

Discovery of a New Blue Dye

The discovery of a new blue dye possessing all the qualities demanded of a pigment is announced by Imperial Chemical Industries Ltd. It is named Monastral Fast Blue BS and is the first discovery of a blue pigment in more than a hundred years. The two blues at present most used are ultramarine, discovered as long ago as 1704 and prussian blue, discovered in 1826. Until now blue has been the most difficult color in the spectrum, and no blue has given complete satisfaction. There are seven criteria by which a pigment is judged, and even the most efficient blues fail in at least two of these. Thus ultramarine, among other faults, is destroyed by dilute acids and prussian blue by alkalis. Monastral blue fulfils all the qualifications demanded of a pigment. These are fastness to light, heat, acids and alkalis, chemical inertia, high tinctorial value and brilliance of shade. Efficient pigments representing all the colors of the spectrum have been discovered. It is thought that the new pigment will be of particular value in the making of printing ink and particularly for three-color printing. Being chemically inert it may be used in oil painting without risk of detrimental effects. Possibly it may be useful in histology.

International Congress of Physical Medicine

The sixth International Congress of Physical Medicine will be held in London, May 12-16, 1936. This will be the first occasion on which the congress has met in Great Britain. The following will be the principal officers: president, Lord Horder, chairman of executive committee, Sir Robert Stanton Woods, chairman of general committee, Sir Henry Gauvain, honorary secretary, Dr Albert Eidenow, honorary assistant secretary, Dr Alexander Cawadias. Those who wish to attend the congress are requested to communicate with the honorary secretary, Dr Albert Eidenow, 4 Upper Wimpole Street, London, W. 1. The fee for membership is \$10.

A Device for the Protection of Radium Operators

The resumption of the use of a 4-Gm bomb of radium at the Westminster Hospital, reported in a previous letter, has raised the question of the safety of the operators who will be near this powerful source of radiation, and precautions are being taken. While the bomb will be continuously used for the whole twenty-four hours of the day, no operator will work longer than eight hours. During this time he has to spend an average of two minutes each hour in adjusting the bomb to the patient. It is the cumulative effect of these small exposures over a period of months or years that causes concern. In addition to the usual precautions of periodic blood examinations, rest and vacations, and screening of the radium, a new telltale has been devised by the physicist of the hospital. When going on duty the operator will take from a cabinet a small tube of elektron metal and at the same time operate a clocking-in apparatus which indicates the time he starts work. He places this telltale

in his pocket. When he comes off duty he replaces it in the cabinet and at the same time clocks out. The telltale contains a thin rod of insulated elektron charged to about 400 volts. The radiation which the operator encounters in the course of his work causes leakage of the discharge, and this is a measure of the dose of radiation which he receives. Thus a daily record is kept of his exposures. If this is found to be too great, immediate steps can be taken.

Red Cross Airplane for Abyssinia

In response to a request from Lady Barton, wife of the British minister to Abyssinia, an airplane for Red Cross work is about to be sent by the Woman's Advisory Council of the League of Nations. How much it is needed is shown by Lady Barton's statement that while the Ethiopian Women's Work Association (which she helped to form) is supplementing the Red Cross in every possible way, it will take the Unit for the North five weeks to get to the front from Addis Ababa. An experienced airman has offered to fly the airplane without payment from England and will take a pilot, who will remain in the employment of the Ethiopian Red Cross Society.

PARIS

(From Our Regular Correspondent)

Nov. 15, 1935

The French Orthopedic Congress

The seventeenth annual meeting of the French Orthopedic Society was held October 4. M. Meyer of Strasbourg presented a paper on "Mycotic Infections of Bones and Joints." A good clinical classification of these infections is as follows: the Aspergilloses, the Blastomycoses, the Actinomycoses or Oosporoses, the Sporotrichoses and the Hemisporoses. The history of the clinical discovery of each of these five varieties of mycotic infections was discussed. The portal of entry is most commonly at some point in the alimentary tract, rarely by way of the respiratory organs or as the result of injury. The infection involves the bony structures by invasion either from an adjacent focus in the soft tissues or by the hematogenous route. When the bone infection appears to be primary, a search should always be made for an atrium elsewhere that has been overlooked and probably healed at the time the bone focus appears. A primary mycotic throat infection is a possible atrium. The bone lesions due to the different forms of mycotic infection do not differ in any respect from those due to the ordinary pyogenic organisms. Aside from the yellow granules seen in actinomycosis there is nothing that enables one on gross examination to distinguish one form of mycotic infection from another. Meyer believes that the most characteristic feature is the tendency for the various mycoses to give rise to a localized infection with rarefaction of bone and a well marked "shell" of osteosclerosis. Certain forms give rise to tumor-like formations. Microscopically, each type of infection gives rise to characteristic pictures as a rule, but there are often such protean changes that the diagnosis of a particular mycosis cannot be made until a typical histologic picture and the organism are found in the sections of tissue.

Clinically there are no pathognomonic symptoms. The predilection for involvement of the spine, metatarsal and metacarpal bones and phalanges makes a differentiation from tuberculosis difficult. Localization in the bones of the forearm, tibia and skull resembles syphilitic infection. A mycotic periostitis without suppuration simulates a syphilitic periostitis and, when there is pus formation, a suppurative pyogenic periostitis. In some cases there is acute bone involvement with such high fever, chills and severe pain that it is difficult to distinguish a mycotic from an acute pyogenic osteomyelitis. The same is true of the more chronic cases. There is a fulminating form the patient dying with symptoms of an acute septicemia.

When the bone is invaded from an adjacent focus, it is seen on roentgen examination to be eroded without any periosteal reaction. In the hematogenous types, roentgen examination reveals one of three changes: a sclerosing osteitis with periosteal thickening, an osteomyelitis with necrosis or an intraosseous gumma in the form of a central abscess surrounded by an osteosclerotic shell.

A differential diagnosis on examination of the films is not difficult from tuberculosis or the polycystic forms of hereditary syphilis or chronic bone abscess. Although there is nothing pathognomonic about the roentgenographic appearance of mycotic bone involvement, one should always be on the lookout for such an infection.

In general, unless the pus from the sinus leading to a bone or joint focus is examined for mycotic infection there is nothing to distinguish such a type of infection from that due to ordinary pyogenic organisms. Early infiltration and a peculiar purplish discoloration of the overlying skin and the presence of multiple fistulas should lead one to look for a mycosis. To detect the latter in the laboratory requires a good deal of experience. If no fistulas exist, an effort should be made after making a small skin incision to obtain some of the secretion with the aid of a pipet. When fistulas exist, the mycotic agents of infection often disappear because of the presence of secondary invaders. The pus should be examined in smears, by hanging drop, by inoculation on culture mediums and into animals.

Mycotic infection of the vertebrae simulates closely that due to tubercle bacilli. The diagnosis is often made only at necropsy. On roentgen examination the only distinctive features of a mycotic infection are the superficial erosion of the bodies of the vertebrae, intervertebral disks and the transverse and articular processes, the last three being seldom involved in tuberculosis. As to joint involvement, this most commonly affects the knee either primarily or as a part of a generalized infection. The inflammatory tumor-like forms of mycotic infection termed mycetomas are rare in Europe but have been observed in America and in Africa. "Madura foot" is the most familiar example of a mycetoma.

In treatment, potassium iodide is to be preferred to all other drugs. One begins with 2 Gm. a day and increases the dose gradually until from 6 to 8 Gm. is given in twenty-four hours over a prolonged period, with intervals of from eight to ten days. Intravenous injection of aqueous solution of iodine has also been employed. Potassium iodide is especially efficacious in infections due to *Actinomyces* and *Sporothrix*. Local treatment must never be overlooked. This includes dilute solution of sodium hypochlorite, methylthionine chloride, aqueous solution of iodine, ultraviolet rays and roentgen treatment. In all bone cases, thorough eradication of the foci by operative measures should be carried out and supplemented by general treatment.

In the discussion, Allenbach reported nine personal cases observed during a period of five years. In all, the bone localization was the first clinical evidence of infection. The diagnosis could be made only as the result of the roentgen examination.

Lombard of Algiers had seen only four cases in twenty-five years. He was inclined to doubt the etiologic role of the various forms of mycoses and believed they were often only of a secondary character.

VOLKMANN'S CONTRACTURE

Massart of Paris read a paper on Volkmann's contracture. He maintained that such an ischemic contracture followed supracondylar fracture of the humerus more frequently than fracture of one or both bones of the forearm. It was formerly believed that interference with the circulation as the result of too tight a dressing was the chief factor in the etiology. Frequently such a cause is not to be found. At present the principal part is played by a extensive hemorrhagic infiltration of the involved muscles, which interferes with the return circula-

tion. This has been proved by the rapid relief of incipient symptoms of a Volkmann contracture in a case reported by Moulouguet and Senegaux, following incision of the aponeurosis. Intramuscular hemorrhages without fractures have been observed in hemophilic patients which gave rise to typical Volkmann contracture symptoms. The circulatory disturbances observed at the onset of this clinical entity, such as modification of the radial pulse and difference in the oscillometric curves of the two extremities, also verify this hypothesis. The sub-aponeurotic intramuscular serosanguinolent effusion is due to a blocked circulation and resembles the hemorrhagic infarcts observed in the lungs. The muscular changes are really circumscribed aseptic necroses of ischemic origin rather than a retractile myositis.

As to treatment, surgical measures should be applied as early as possible. They include incision of the aponeurosis and at the same time reduction of the fracture and inspection of the nerve trunks, peribrachial sympathectomy, in early cases only, and ligation of the brachial artery if the latter has been injured or is thrombosed. The early period having passed, extension methods give perhaps the best results. Other not generally accepted methods are resection of the radius and ulna, and disinsertion of the flexors and pronators from their attachments to the humerus, radius and ulna.

Lombard of Algiers reported a case in which sympathectomy of the brachial artery had been followed by complete disappearance of the Volkmann contracture symptoms in a boy of 12. The child could use his hand well, but the muscular force of the forearm was still below normal and atrophy persisted.

Froehlich of Nancy maintained that a plaster or splint dressing too tightly applied still must be considered as the principal cause of Volkmann's contracture in cases of fractures of the forearm and lower end of the humerus. He had reexamined seventeen patients and found this to be true of fifteen. The only surgical treatment was a resection of the radius and ulna.

Tavernier believed that the prognosis of the more advanced cases was not very promising. In late cases, resection of the wrist is indicated rather than that of the bones of the forearm.

Billet of Lille reported a case of immediate but only transitory (five days) improvement following a peribrachial sympathectomy. In a typical case without fracture occurring in a hemophilic patient the Volkmann contracture had disappeared spontaneously. It is advisable in general in cases of fracture of the elbow and forearm, to wait several days before attempting a reduction.

Meeting of the Therapeutic Union

A large number of foreign and French members of the Therapeutic Union met at Paris October 9. The president is Prof. M. Loeper of Paris. The first paper was on the "Quinine Salts in Cardiac Disease" by Professor Pelzi of Milan, who has found that quinidine is the only drug which can establish a normal rhythm in complete arrhythmia due to auricular fibrillation. Quinine is preferable to quinidine in the treatment of extrasystole and in paroxysmal tachycardia. In the former, quinine ought to be given orally but in paroxysmal tachycardia neither quinine or quinidine is efficacious if given orally. Quinine is especially indicated in cardiac conditions in nervous individuals without organic lesions in whom the vegetative nervous system functions so badly that there is a resultant disturbance of the cardiac rhythm. These are the individuals to whom the cardiologist has applied the terms "unstable with palpitation, irritable or hyperkemic hearts" like those seen following the World War. Professor Clerc and also Professor Pende have demonstrated the sedative action of quinine on the vagus in paralyzing the bulbar center and its action as a regulator. It acts also on the sympathetic nervous system hence its great value in neuropathic conditions of the heart.

Pende of Genoa, Bürgi of Brussels, Decourt of Paris and Delherm of Paris took part in a symposium on viscerospasm. Pende stated that a large number of conditions might give rise to viscerospasm. He mentioned hyperalkalosis, hypocalcemia, hyperphosphatemia, hyperpotassemia, parasympathetic predominance, predominance of parasympathicotonic hormones (acetylcholine, insulin, thymic and splenic hormones, solution of pituitary) or insufficiency of the sympathicotonic hormones (epinephrine, parathyroid extract).

The treatment of all viscerospasm symptoms should be to raise the calcium ion content of the blood, to diminish the alkaline phosphates of the blood and alkalosis in general, especially if one is able to demonstrate a diminished hydrogen ion concentration and an increase in the alkali reserve. The diet should include, as a base, foods with little potassium (oatmeal, milk, meats, fish, eggs, fats and cheese, all of which contain much calcium). As drugs, hydrochloride or phosphoric acid and ammonium, potassium or calcium chloride can be ordered. Among the endocrine products, epinephrine or parathyroid extract is to be preferred. Care must be used in attempting to correct the neurovegetative atonicity with such drugs as atropine or belladonna, which have a direct action on the neurovegetative system.

Bürgi read a paper on the spasmogenic substances and their antagonists. Pilocarpine, acetylcholine, physostigmine and the choline group can, through the agency of the parasympathetic system, give rise to spasms in the nonstriated muscle fibers of the stomach, intestine, uterus and bronchi. The choline derivatives dilate the blood vessels. Especially acetylcholine and its derivatives combat intestinal atony and blood vessel spasm. Lead has a spasmogenic action on the intestine, and barium chloride excites its muscle fibers. Epinephrine and ephedrine derivatives increase the tonus of the sympathetic nervous system and diminish intestinal spasm, but they contract the arteries of the uterus. Atropine and papaverine paralyze the nonstriated muscle fibers. Morphine is spasmogenic for the stomach but paralyzes intestinal peristalsis. The medical treatment of viscerospasm was discussed by Decourt. Every case requires special study before medication is begun. The available drugs can be placed in three groups: (1) those which are physiologic, such as calcium, magnesium, acids and the hormones, (2) the antispasmodic alkaloids, and (3) those acting reflexly or on the psychic centers. A local irritation in the viscus itself acts on the sensory nerve endings and by means of a reflex arc of variable length stimulates the motor element of the visceral spasm. One should always attempt to determine the underlying cause (sensory) of such a reflex arc. At times the spasm seems out of all proportion to the sensory cause, thus indicating an abnormal reactivity of the nervous system, as in asthma and spasmodic colitis. One is forced in some cases to ascribe the spasm to a veritable "diathesis" for which a sort of desensitization is necessary.

Ectopic Spleen with Torsion of Pedicle

At the July 10 meeting of the Société de chirurgie, Desplas reported the case of a woman aged 23, with a negative previous history, who had sudden severe colicky abdominal pain accompanied by metrorrhagia. Bimanual vaginal examination revealed an oval tender, mobile mass in the culdesac of Douglas to the left of the median line. A diagnosis of twisted pedicle of an ovarian cyst was made and a laparotomy was performed. This revealed that the mass was a large spleen presenting a threefold torsion of its long pedicle. On removal, section of the spleen disclosed little evidence of interference with its blood supply. Just before this attack the patient had passed through an apparently normal pregnancy, but a slow engagement of the head had been noted during the first stage of labor. The torsion of the splenic pedicle began

six days before the operation. In spite of this prolonged anemia, no very marked changes were to be found in the parenchyma. In the discussion, a similar case was cited in which Pean had operated in 1867. Gregoire reported a case similar to the case of Desplas. Faure also added a case in a man, the spleen being found in the rectovesical pouch. In his case there was no torsion of the pedicle. Mondor stated that he had been able to find reports of six cases like that of Desplas. It was easy to make such a mistake in diagnosis, especially when the ectopic spleen was an accessory one.

BERLIN

(From Our Regular Correspondent)

Oct. 28, 1935

The Discovery of Syphilis

A short time ago, Haberling, professor of the history of medicine in Dusseldorf, discussed the question of the discovery of syphilis. In the last decade of the fifteenth century, which is replete with significant historical events as is scarcely another decade in the world's history, syphilis as a distinct disease entity first attracted attention. Astrologic interpretations having called attention to a sexual plague that would spring up in this decade, all Germany, through the blasphemy edict that was promulgated at Worms Aug. 7, 1495, became acquainted with the fact that a previously unknown disease called "die bosen Blattern," or virulent smallpox, had been sent down to earth as a punishment from heaven. In reality, as Haberling demonstrated, the disease was not new at that time but had been known for many years among the so-called wundärzte, by whom it was treated with mercury. Haberling also pointed out that in spite of the comprehensive research of Sudhoff, the fable of the American origin of syphilis still hobbles up even in studies apparently undertaken seriously. In Haberling's opinion this fable is connected with the then growing trade in guaiacum wood from which huge profits were realized. To strengthen the public faith in the efficacy of this wood, the absolutely groundless tales of the transmission of syphilis by the natives of Haiti to the sailors of Columbus were invented, a full generation after the discovery of America. Likewise the account of a devastating epidemic of syphilis in the vicinity of Naples and in German regions was a pure fabrication. Haberling pointed out also that, according to the researches of Sticker, along with the term "lepra vera," again and again one finds in the writings of the physicians of the middle ages the expression "lepra spuria" which, in contradistinction to lepra vera did not require isolation and was curable. This lepra spuria to which, in course of time, many other names were assigned, was doubtless syphilis, which, simultaneously with leprosy, was brought in from the Orient by persons returning from the crusades.

Sterile Marriages

In view of the attitude of the present German government in promoting an increase of the population, the question of sterile marriages is fraught with interest. Professor Eymmer, ordinarius in gynecology at the University of Munich, who discussed this subject before the Munich Medical Society, stressed most emphatically that any attempt to discover the cause in a given case presupposes a careful examination of both partners even though the wife should present pronounced abnormalities.

Causes of marital sterility traceable to the wife may be based on anomalies of any of the many portions of the genital canal. In addition, there are general, and even psychic, causes of sterility. Of less importance are inflammations of the vulva, tumor formations of the labia majora and the labia minora, and a rigid hymen. Vaginism as a psychic reflex requires mental treatment. There is no doubt that retroflexion of the

uterus may cause sterility. Considerable importance attaches to the observation that after long continued use of inserts and anticonceptional lavages, and also after induced abortion, sterility often intervenes. Nonpatency of the fallopian tube is an important factor from a purely numerical point of view. In bilateral closure of the tubes the prospects of successful treatment are very poor. Roentgen stimulative treatment is absolutely rejected by reason of the undesired effects often observed and because of possible injury to the germinal plasma. Sterility associated with disturbances of other endosecretory glands is always traceable to ovarian dysfunction accompanying these glandular disturbances. Of especial importance in this connection are the hypophyseal disorders. It is the opinion of Professor Eymmer that occasionally the causes of sterility lie in the general mode of living or in the misuse of medicines and luxury articles (tobacco).

Reduction in Industrial Accidents

According to investigations instituted by Oberregierungsrat Wicke, a general reduction in the number of accidents to German workmen is observed. According to the figures published by the industrial unions, conditions over the period 1929-1934 were as shown in the adjacent table. This obser-

Industrial Accidents in Germany 1929-1934

| Year | Number of Registered Full Time Workmen | Total Number of Workmen Compensated the First Time for Accident | Number of Compensated Accidents per Thousand Full Time Workmen | Number of Fatal Accidents | |
|------|--|---|--|---------------------------|--------------------------------|
| | | | | Totals | Per Thousand Full Time Workmen |
| 1929 | 10,770,361 | 66,404 | 6.17 | 4,913 | 0.46 |
| 1930 | 9,984,123 | 61,965 | 6.21 | 4,476 | 0.45 |
| 1931 | 8,394,347 | 47,369 | 5.64 | 3,221 | 0.38 |
| 1932 | 7,153,270 | 27,672 | 3.87 | 2,311 | 0.32 |
| 1933 | 7,738,697 | 24,139 | 3.12 | 2,402 | 0.31 |
| 1934 | 9,413,493 | 24,394 | 2.59 | 2,317 | 0.25 |

vation is the more surprising when one considers how many among those workmen recently put to work have, through enforced idleness, become disaccustomed to work. Wicke holds that this reduction in the number of accidents is ascribable particularly to the indefatigable accident prevention campaign that has been waged in recent years. In the building trades it has been established that, in 1932, 7.87 per thousand full time workmen suffered their first compensated accident and that 0.55 of these accidents (per thousand workmen) proved fatal. In 1933 the corresponding figures were 5.19 and 0.43, in 1934 4.80 and 0.45. In 1932 in underground operations 15.48 per thousand full-time workmen suffered their first compensated accident and 0.92 of these accidents (per thousand workmen) proved fatal. The corresponding figures for 1934 were 5.75 and 0.66. During the first seven months of 1935 there was a still further decrease in the number of accidents.

Seventy-Fifth Anniversary of the Founding of the Berlin Medical Society

On October 31 the Berliner Medizinische Gesellschaft will celebrate its seventy-fifth anniversary. The society at its founding was an amalgamation of two societies, the Gesellschaft für wissenschaftliche Medizin and the Verein Berliner Aerzte. Its first president was the surgeon Langenbeck, who was succeeded by Graefe, Virchow, von Bergmann and many others whose names are well known. Since 1915 the society, in affiliation with the Deutsche Gesellschaft für Chirurgie, has had a new building of its own—the Langenbeck-Virchow Haus. For many years the Berliner Medizinische Gesellschaft exerted an important influence over medicine in general, which was far beyond its local significance. In recent years, because of the disturbing political events, the attendance has fallen off considerably.

BUDAPEST

(From Our Regular Correspondent)

Nov 1, 1935

The International Dermatologic Congress at Budapest

The work of Prof Louis Nékam and the Hungarian organization committee stimulated great interest in the ninth International Dermatologic Congress, held in Budapest September 13-21. Of more than a thousand members assembled here, about eight hundred were foreigners. Official representatives were present from twenty-seven countries. Fifty-seven universities and more than sixty scientific societies and institutions sent delegates. The European universities two universities of Argentina, three universities of the United States, and universities of Egypt, Japan and China sent official representatives.

The opening of the congress took place in the magnificent cupola hall of the parliament building in the presence of a huge audience including representatives of the Hungarian government. The opening address was made by Professor Nékam. Professor Zieler of Würzburg greeted the congress on behalf of all nations. After the opening speeches the board of the Budapest Pázmány Peter University of Sciences awarded to Prof Jean Darier of Paris, president of the International Dermatologic League, an honorary diploma. M. Horthy regent of Hungary, received the members of the congress at 5 o'clock tea in the royal castle, while in the evening the government received the members in the gala hall of the ministry of internal affairs.

The scientific work began next day. The international permanent committee of eleven met under the presidency of Professor Darier and resolved to reduce the membership fee of the International Dermatologic League to 25 Swiss centimes annually. The permanent committee has been supplemented by new members: Lesczinsky of Lemberg, Arzt of Vienna, Zieler of Würzburg and Harold N. Cole of Cleveland. The committee reported that the Spanish government had sent an invitation to hold the next congress in Madrid, which the congress unanimously accepted.

Under the presidency of Rille of Leipzig the terminology committee resolved to preserve the old classic etiologic denominations and if this is not feasible, the pathogenesis should be reflected in the terms used.

The classification committee under the presidency of Howard Fox of New York set as an aim a grouping of diseases on an etiologic and pathologic basis. The committee agreed to observe three points of view in the matter of classification: clinical symptoms, tissue anomalies and etiology.

Under the presidency of Gougerot of Paris the reform of teaching was discussed. It was agreed that dermatology should be given at the universities four hours a week while specialty training should require three years of special study, with at least one of the years spent in a university clinic. The exchange of assistants and special dermatologic graduate courses for qualified dermatologists were suggested.

Under the presidency of Graham Little of London a committee discussed questions of practice. It objected to further socialization of medicine. The committee considered the compulsory notification of venereal diseases and professional secrecy, which, it decided, should be defended unless its breach is required by the law.

A committee under the presidency of Tomassi of Palermo resolved that a new institution, the international exchange center should be established. For five years the seat of this will be the dermatologic clinic of Budapest. The purpose of this exchange center is to supply institutes and also private physicians with scientific and analytical material the acquisition of which is difficult. There will be exchange of microscopic preparations, bacterial cultures, vaccines, photographs and reprints. The center will forward leaflets on scientific subjects to its members.

The idea was received with enthusiastic approval. The scientific subjects discussed concerned venereal diseases, skin tuberculosis, diseases conveyed to men from animals, medical examination before marriage, sex education and antivenereal institutes. Also therapeutic methods and preventive measures were discussed, and the compulsory examination of grammar school children, suggested by Professor Neuber of Debreczin, was approved.

At the conference on skin tuberculosis, under the presidency of Lomholt of Hague, it was resolved to collect statistics on lupus patients and to establish lupus homes, and to study the social conditions of lupus patients and methods by which poor patients can be adequately treated and placed in institutes where they can carry on some occupation. It was deemed desirable that an international lupus home should be organized. To carry out this plan a special committee was appointed.

The president of the conference dealing with industrial skin diseases was Oppenheim of Vienna. The conference dealt with the compilation of a list of poisons, clinical instruction on industrial diseases, and the problems of insurance and indemnity.

The conference on comparative dermatology, cooperated with veterinary surgeons under the presidency of Marel of Budapest, discussing diseases of animal origin—erysipeloid, bird tuberculosis, foot and mouth disease, anthrax, malleus, brucellosis, tularemia, and fungous diseases of animal origin. Gottron of Berlin read a paper on the bacteriology and epidemiology of erysipeloid. Balogh exhibited histologic slides of eight cases of glanders observed by him.

The scientific papers were presented in four spacious halls of the Redout. Professor Darier outlined the fifty years of the development of dermatology, through the morphologic etiologic and biologic development stages. Sabouraud of Paris summarized the development of mycology. Riecke of Göttingen discussed the relation of dermatology to the general medical sciences. In the symposium on the functions of the skin, the speaker dwelt on the skin as a defensive organ. Darier, Civatte and Tzank of Paris stated that in case of external influences the skin reacts either defensively or passively: it takes up the entering substance and assimilates it (immunity) or defends itself with an inflammation (intolerance). Pasini of Milan discussed the temperature of the skin, abnormal dermographism and the influence of hemoglobin and porphyrin on skin processes. Milian of Paris discussed the dermatoses produced in connection with the defensive action of the skin. Hegler of Hamburg explained the connection between the skin and the internal organs in infectious diseases. Lesczinsky of Lemberg interpreted the connection between the skin and the sexual organs. Desaux of Paris called attention to the connection between the skin and the gastro-intestinal system. Brack of Basle emphasized the role of the vegetative system in the origin of itching.

In the symposium on allergy, Stühmer of Freiburg dealt with allergy in syphilitic cases. W. Jadassohn of Zurich made known the mechanism of allergic testing. Geber of Budapest described a method of desensitization. Mouriquand Gate of Lyons discussed the importance of metabolic disturbances in the causation of skin diseases. Spillmann of Nancy explained the role of the endocrine glands in the origin of skin diseases.

In the symposium on skin diseases produced by external causes, Sir Graham Little sketched the English conditions, reading statistics on chemical and other substances causing skin disorders. Brill of Rostock called attention to the importance of climate, race and geographic position.

In the symposium on filtrable viruses variola, varicella, tuberculosis, herpes and papilloma were discussed. Balogh of Budapest reported the results of extensive investigations of cases of varicella and found pathologic changes in the spinal ganglions, which he regards as histologic group reactions. Lavre-Gate of Lyons stated that it is probable that the bacillus of tuberculosis possesses also an ultravirus form. Baló of Budapest discussed the etiology of senile warts and papillomas, which he believes

are caused by filtrable viruses Urbach of Vienna gave an account of his experiments on pemphigus, which he believes is caused by a filtrable virus Several members of the congress took a different view

In the symposium on the pathology of tuberculosis, Lange of Berlin pointed out that the theories with regard to the developmental cycles and filtrable forms of the tubercle bacillus have not been sufficiently confirmed. Gougerot of Paris read a paper on the local action of the tubercle bacillus, the tuberculi, the local defenses of the skin and the role of antibodies formed in the skin

In the symposium on syphilis, Mulzer of Hamburg read a paper on the nonspecific treatment of syphilis Cole of Cleveland and his fellow dermatologists reported experiences gained in five American clinics An examination of 6,253 cases of late syphilis was made to ascertain how far antisyphilitic treatment is apt to check the evolution of cardiovascular and central nervous system manifestations Pinard of Paris reviewed the literature on malaria and fever therapy The same topic was the subject of a paper by Arzt of Vienna. Hilgermann read a treatise on the treatment of syphilis with vaccine prepared from inactivated spirochetes The results as yet are not encouraging Zieler of Würzburg summarized the criteria that determine the cure of syphilis

Many papers were read on miscellaneous subjects Von Berde of Szegedin stated that rat pellagra is not identical with human pellagra and that the latter is not caused by the lack of vitamin B but is a genuine infectious disease, which occurs only in association with some nutritional and digestive disturbance Nicolau of Bucharest spoke on inguinal lymphogranulomatosis Reiss of Shanghai read a paper on the tubercloid form of lepra as observed in China Pearce of New York made known his experiences with experimental syphilis The number of papers presented in this group exceeded 400 of which fifty-six were read by Hungarians

An interesting part of the scientific meetings was the demonstration of slides of microscopic preparations Jame of Paris projected a film illustrating the treatment of gonorrhea in the French army Györkovacs of the French Congo presented a film on tropical skin diseases and the public health institutions of the Congo region Schereschewsky of Paris demonstrated the morphology and motion of *Spirochaeta pallida* in experimental and human syphilis, together with its response to chemotherapy

The scientific work was supplemented by a scientific exhibition The historical section comprised the valuable library of the Budapest dermatologic clinic, including a great number of incunabula, codexes and collected edicts Faludy's precious collection of medical plaquettes had many admirers, likewise the ancient atlases of the Parisian St Louis Hospital, a collection of the photographs of prominent dermatologists, and old medical prescriptions The Hungarian National Museum lent many objects, among them a collection of faience pots used in pharmacists' shops in the sixteenth, seventeenth and eighteenth centuries Another section comprised the wax models of parasites causing skin diseases, moulages, several hundred histologic figures, insects, plants, wood substances causing skin disorders, cultures of bacteria pathogenic to the skin, and charts displaying the frequency of various skin diseases Much interest was shown in the exhibition of fungi, compiled by Ballagi, the first to collect almost all varieties of fungi causing skin diseases Cultures were exhibited from all parts of the globe, and keeping them alive was the duty of the Budapest dermatologic clinic. The transinoculated stocks stood at the disposal of all members of the congress In fact, this was the first function of the central exchange On the last day, 140 patients were exhibited

During the congress a gala performance was given at the Royal Opera members were entertained at an evening party in the Alpine village at a Budapest park, and a banquet was given at the Hotel Gellert

Marriages

HOWARD Q L LITTLE, Gibsonville, N C., to Miss Elizabeth Jordan of Smithfield at Kernersville, in September

WILLIAM HUSTON TANKSLEY JR., Nashville, Tenn., to Miss Billie Barringer of Sumter, S C., October 2

FRANK KIMZEY JUSTICE, Clayton, Ga., to Miss Katherine S Miller of Murphy, N C., October 19

SAMUEL WEISSROSS, Pocatello, Idaho, to Miss Evelyn Vera Maver of Los Angeles, December 8

WILLIAM H KRAUSE, Windsor Vt., to Miss Madeline Kel liher in Amenia, N Y, October 10

HAROLD T LARSEN, Fort Dodge, Iowa, to Miss Katherine Kumpf of Los Angeles, October 7

LOUIS SCHNEIDER, New York, to Miss Lilian Blass of Mount Vernon, N Y, November 28

MARTIN PATMOS, Kalamazoo, Mich., to Miss Alice Eleanor Brown of Detroit, June 7

HAROLD E O'NEAL, Tipton, Iowa, to Miss Elsie Maddox of Sedalia, Mo., October 13

HOWARD G BEATTY, Creston, Iowa, to Miss Helen Maneely of Afton, October 17

Deaths

William Perry Northrup, New York, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1878, an Affiliate Fellow of the American Medical Association, instructor of Greek, Knox College, Galesburg, Ill., 1872-1876, adjunct professor of pediatrics, 1893-1896, professor, 1896-1919, and since 1919 emeritus professor of pediatrics, University and Bellevue Hospital Medical College a founder and past president of the American Pediatric Society, for many years on the staff of the Presbyterian Hospital, New York Foundling Hospital, Willard Parker Hospital and the hospitals of the New York Health Department, the Babies' Hospital, Newark, N J, and the State Orthopedic Hospital, West Haverstraw, N Y, also played an important part in Dr O'Dwyer's development of the treatment of diphtheria by intubation, American editor of "Ashley and Wright's Diseases of Children" in 1900, and "Nothnagel's Encyclopedia of Practical Medicine," American edition, volume 4, in 1902, aged 84, died, November 20

Charles Percy Noble, Radnor, Pa., University of Maryland School of Medicine, Baltimore, 1884, at one time clinical professor of gynecology, Woman's Medical College of Pennsylvania, Philadelphia, at various times on the staffs of the Chester County Hospital, West Chester, Kensington Hospital for Women, Stetson Hospital, Philadelphia Lying-in Charity Hospital and the Woman's Hospital, Philadelphia, co-editor with Howard A Kelly and one of the authors of the "Kelly Noble Gynecology and Abdominal Surgery" in two volumes, corresponding member of Die Gynäkologische Gesellschaft in München, aged 72, died, November 21

Hugo Albert Kiefer of Los Angeles University of Pennsylvania Department of Medicine, Philadelphia, 1897, formerly adjunct professor and assistant professor in ophthalmology, University of California Los Angeles Medical Department, member of the American Academy of Ophthalmology and Otolaryngology and the Pacific Coast Oto-Ophthalmological Society, fellow of the American College of Surgeons, on the visiting staff of the Hollywood Clara Barton Memorial Hospital, aged 65, died, October 26, in Cedars of Lebanon Hospital

Thomas Herbert Bell, Winnipeg, Manit., Canada, Trinity Medical College, Toronto, Ont., 1896, M R C S., England, and L R C P., London, 1897, professor of ophthalmology, University of Manitoba Faculty of Medicine, fellow of the American College of Surgeons, aged 63, on the staff of the Winnipeg General Hospital, where he died, November 28, of cerebral embolism and thrombosis of the right leg

Douglas Bissell of New York, University of Maryland School of Medicine, Baltimore, 1888 member of the American Gynecological Society, one of the founders and fellow of the American College of Surgeons, past president of the New York Obstetrical Society, surgeon to the Woman's Hospital, 1910-1929, aged 71, died, December 3, of cerebral hemorrhage

Joseph Albert McGuire, Norton Va., University of Virginia Department of Medicine, Charlottesville, 1900 member of the Medical Society of Virginia, past president of the Wise

County Medical Society, member of the state board of health, formerly medical director of the Norton Hospital, aged 59, died October 25, of cerebral hemorrhage.

William Burdick Wells ♂ Riverside, Calif., College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901, formerly health officer of Riverside City and Riverside County and secretary of the Health Officers' Section of the League of California Municipalities, aged 60, died, November 1

Richard Root Rupert, South Bend, Ind., College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1912, member of the American Association of Anatomists, ship surgeon to the steamship *American Trader* aged 53, died, October 16, of cerebral hemorrhage, while in England

Warren Lynnford Duffield ♂ Brooklyn, Long Island College Hospital, Brooklyn, 1898 fellow of the American College of Surgeons, senior surgeon to St John's Hospital consulting surgeon to the Methodist Episcopal Church Home, Brooklyn, and the Southside Hospital, Bayshore, aged 60, died, November 21

Emmett Patrick Whalen, Indiana, Pa. St Louis University School of Medicine, 1932, member of the Medical Society of the State of Pennsylvania aged 28, on the staff of the Indiana Hospital, where he died, November 8, of peritonitis, following a perforated gastric ulcer

Daniel Thompson Boger, Monroe, N. C., North Carolina Medical College, Davidson, 1906 member of the Medical Society of the State of North Carolina president of the Union County Medical Society, aged 67, died, December 2, in a hospital at Charlotte

Samuel Mitchell Wagaman, Hagerstown Md., University of Pennsylvania Department of Medicine, Philadelphia 1901 formerly county health officer, at one time on the staff of the Washington County Hospital, aged 62 died, November 8, of heart disease.

Ida Mary F. Alexander, Lansing Mich. University of Minnesota Medical School, Minneapolis 1908, lecturer for the state health department on child and maternal hygiene, aged 58 was found dead in her automobile near Lake City, October 23

James Joseph King ♂ New York, University of Louisville (Ky.) Medical Department, 1907 member of the American Academy of Ophthalmology and Oto-Laryngology, formerly on the staff of the French Hospital, aged 53 died, November 29

William Franklin Keller ♂ Sioux Falls S. D., University of Nashville (Tenn.) Medical Department, 1897, served during the World War for twenty years president of the city health department, state prison physician, aged 71, died in October

Norvel William Jarvis, Festus, Mo. St. Louis University School of Medicine, 1904 member of the Missouri State Medical Association, past president of the Jefferson County Medical Society, aged 55, died, October 23, of cerebral hemorrhage

Charles Felice Tommasi, Newark, N. J. Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy 1899, member of the Medical Society of New Jersey aged 67 died October 29, of coronary thrombosis and bilateral pyonephrosis

Ogilvia Curtis Ricksecker ♂ Wilmot Ohio, Ohio Medical University, Columbus 1897, also a druggist past president of the Stark County Medical Society formerly county health officer, aged 60 died, October 22, of cerebral hemorrhage

Harry Albert Bennett, Battle Creek, Mich. Eclectic Medical College, Cincinnati, 1915, on the staff of the American Legion Hospital aged 52 died, October 26 in the Leila Memorial Hospital of teratoma of the testicle

Oscar Edwin McHenry, Blue Creek Ohio Medical College of Ohio Cincinnati 1903 member of the Ohio State Medical Association, for many years member of the board of education aged 68 died, October 26

Archibald Carlton Weaver, Santa Monica, Calif. Western Reserve University Medical Department Cleveland, 1911, member of the California Medical Association formerly police surgeon aged 49 died, October 23

George B. Gesner ♂ Marshall Mich. Trinity Medical College Toronto Ont. Canada, 1899 for many years member of the board of education on the staff of the Oaklawn Hospital aged 64, died October 27

Joseph Leslie Pyle, Chester W. Va. Keokuk (Iowa) Medical College, 1896 formerly mayor of Chester at one time president of the Public Health Council, aged 68 died suddenly, October 23 of heart disease

Henry Finlay Hyndman ♂ Wichita, Kan., University of Kansas School of Medicine Kansas City 1910 past president

of the Sedgwick County Medical Society, aged 49, died, October 31, of diabetes mellitus

Paul Williams Sweet ♂ Centralia, Wash. Jefferson Medical College of Philadelphia, 1908, medical director of St Luke's Hospital and Sweet Clinic, aged 56, died, October 22, of cerebral hemorrhage.

Cortes Holiday Wheeler, Portland, Ore., Medical College of Ohio, Cincinnati, 1875, member of the Oregon State Medical Society formerly health officer of Portland, aged 86, died, October 31

Horace Clinton Whisler, Smithfield, W. Va., University of the South Medical Department Sewanee, Tenn. 1898, aged 76 died, October 14, in a hospital at Laurel, Md., of heart disease

John Gordon McGuire, Chicago, Chicago College of Medicine and Surgery, 1911, also a minister, aged 62, died, November 30, in the Cook County Hospital, of cerebral hemorrhage

Edward F. Beall, San Marcos, Texas, University of Louisiana Medical Department, New Orleans, 1883, member of the State Medical Association of Texas, aged 71, died, October 6

William Abraham Berendsohn, Brooklyn, Long Island College Hospital, Brooklyn, 1889, member of the Medical Society of the State of New York aged 67, died, October 7

Thomas A. Cahill, Chicago, Chicago College of Medicine and Surgery, Medical Department of Valparaiso University, 1904 aged 56 died, September 8, of carcinoma of the lung

Samuel Melvin Harpe, Calhoun, Ga., University of Georgia Medical Department, Augusta, 1884, member of the Medical Association of Georgia, aged 72, died, October 27

William Alexander Thomson Robertson, Ponca City, Okla. McGill University Faculty of Medicine, Montreal, Que., Canada 1896, aged 66, died, October 26

James Thomas Moon, Miami Okla., Eclectic Medical College, Cincinnati, 1922, member of the Oklahoma State Medical Association, aged 49, died, October 20

John Edler Knipfel, Barkerville, B. C., Canada, University of Toronto Faculty of Medicine, 1905, aged 59, died, September 30, in Wells, of acute myocarditis

John C. Swan, Marietta, Ohio, Jefferson Medical College of Philadelphia, 1876, aged 81, died, October 20, in the Marietta Memorial Hospital, of pneumonia

Donald James Strohm, Audubon, N. J., University of Pennsylvania School of Medicine, Philadelphia, 1931, aged 30, died December 3, of encephalitis

Harrison Morgan Brown ♂ Pittsburgh, Western Pennsylvania Medical College, Pittsburgh, 1904, aged 61, died, October 25, of cerebral hemorrhage

Charles Henry Glidden, Fort Pierce, Fla., Hahnemann Medical College of Philadelphia, 1876, aged 82, died, November 21, of cardiorenal disease

Orange H. Thomas, Fremont, Ohio, Medical College of Ohio, Cincinnati, 1882, for many years county health officer, aged 76 died October 19

Charles Edward Wingfield Jr., Athens, Ga. Meharry Medical College Nashville, Tenn. 1929, aged 31, died, October 28, in a local hospital

Robert Clarke Boyle, Vancouver, B. C., Canada, Manitoba Medical College, Winnipeg 1892, aged 66, died, November 18 of angina pectoris

David Douglas Steiner, Quincy, Ill., College of Physicians and Surgeons, Keokuk, Iowa, 1886, aged 75, died, September 27, of cerebral hemorrhage

Orizabor Burnett Fritch, Detroit, Michigan College of Medicine and Surgery, Detroit, 1904, aged 60, died, October 27, of heart disease

Crawford Le Roi Thompson, Pittsburgh, Western Pennsylvania Medical College, Pittsburgh, 1896, aged 60, died, October 14

John MacRae, Los Angeles, University of Pennsylvania Department of Medicine, Philadelphia, 1884, aged 73, died, October 15

Jefferson D. Magee, Abilene, Texas Louisville (Ky.) Medical College, 1886, aged 74, died October 11, of lobar pneumonia

Jennie Baker, Chicago College of Medicine and Surgery, Chicago, 1908, aged 72, died, September 28 of cerebral hemorrhage

Augustus Baton Kehrner, Philadelphia, Hahnemann Medical College of Philadelphia, 1880, aged 79 died, October 25

James Beard, San Francisco California Medical College, San Francisco, 1899, aged 77, died, October 1

Bureau of Investigation

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE The abstracts that follow are given in the briefest possible form (1) the name of the product, (2) the name of the manufacturer, shipper or consigner,* (3) the composition, (4) the type of nostrum (5) the reason for the charge of misbranding and (6) the date of issuance of the Notice of Judgment—which may be considerably later than the date of the seizure of the product]

Warm Springs Crystal Compound—Warm Springs Crystal Sales Co. Warm Springs Ga. Composition Essentially Glauber's salt. For stomach disorders. Fraudulent therapeutic claims.—[N J 22613 February 1935]

Hayward's Preparation—Hayward Remedy Co. Inc. New York. Composition Essentially an iodide with alcohol and water. For asthma, hay fever and bronchial catarrh. Fraudulent therapeutic claims.—[N J 22621 February 1935]

Leonard's Mexico Barbed Wire Liniment—Mrs. Harry Leonard Hutchinson Kan. Composition Essentially kerosene, linseed oil and tar oil. For lung troubles, diphtheria, bronchitis, tonsillitis, etc. Fraudulent therapeutic claims.—[N J 22633 February 1935]

Pneumoseptin—Virginia Carolina Medical Co. Roanoke Va. Composition Essentially camphor, wintergreen, eucalyptol and lard. For congestion, inflammation, etc. Fraudulent therapeutic claims.—[N J 22634 February 1935]

Husbands' Calcined Magnesia—Husbands' Magnesia Co. Inc. Philadelphia. Composition Essentially magnesium oxide. For indigestion, dyspepsia, rheumatism, etc. Fraudulent therapeutic claims.—[N J 22636 February 1935]

Germol—Paris Chemical Co. Huntingdon Tenn. Composition A dilute solution of hydrochloric acid in water, colored red. For stomach, liver and kidney troubles, etc. Fraudulent therapeutic claims.—[N J 22637 February 1935]

Georgia Crystal Compound—Warm Springs Crystal Co. Warm Springs Ga. Composition Essentially Glauber's salt. For sour stomach, heartburn, hyperacidity, etc. Fraudulent therapeutic claims.—[N J 22638 February 1935]

Truth Brand White Pine Cough Syrup—Blackstone Mfg. Co. Newark N. J. Composition Essentially chloroform, tar, sugar and water with a small amount of inorganic salts. Fraudulent therapeutic claims.—[N J 22641 February 1935]

Echlone—Strong Cobb & Co. Cleveland. Composition Essentially plant drug extracts, alcohol, sugar and water. For chronic eczema, ulcers, boils, etc. Fraudulent therapeutic claims.—[N J 22642 February 1935]

Cysto Sedative—Strong Cobb & Co. Cleveland. Composition Essentially plant drug extracts, alcohol, sugar and water. For genito-urinary diseases. Fraudulent therapeutic claims.—[N J 22642 February 1935]

Kuhn's Ep Sum Pill—H. Dale Kuhn Laboratory, Shelby Ohio. Composition In each pill aloin, phenolphthalein (about ½ grain) and epsom salt (about 3 grains). For regulating bowels for headaches, neuralgia, etc. Fraudulent therapeutic claims.—[N J 22646 February 1935]

Epsaline Tablets—Cold Seal Products Co. Columbus Ohio. Composition In each tablet aloin, phenolphthalein (about ½ grain) and epsom salt (7½ grains). Alleged tasteless and concentrated substitute for epsom salt. False therapeutic claims.—[N J 22648 February 1935]

Katrolpine Antiseptic Nasal Jelly—Phoenix Drug Co. Newark N. J. Composition Chiefly benzocaine (3 per cent) and essential oils including menthol and camphor incorporated in fat. For hay fever, catarrh, sinus infections, etc. Fraudulent therapeutic claims.—[N J 22648 February 1935]

Parker's Treatment for Indigestion and Constipation—Parker Medicine Co. Cincinnati. Composition Essentially baking soda (42 per cent), starch and ginger, peppermint flavored. The Liver Tablets which were part of the treatment contained plant drug extracts including aloin and nuxvomica. Fraudulent therapeutic claims.—[N J 22653 February 1935]

Female Re Lax Lozenges—H. Will Elders, St. Joseph Mo. Composition Plant drug extracts including a laxative, ginger and belladonna, podophyllin and a strychnine compound coated with sugar and calcium carbonate and colored red. For laxative and tonic purposes. Fraudulent therapeutic claims.—[N J 22655 February 1935]

Sterillone—H. Will Elders, St. Joseph Mo. Composition Essentially plant drug extracts including hydrastis and a laxative with ferrous sulphate and arsenic trioxide. For sterility, etc. Fraudulent therapeutic claims.—[N J 22655 February 1935]

Servu Vaporizing Rub—Service Laboratories, St. Louis. Composition Essentially volatile oils such as wintergreen, camphor, menthol and eucalyptus with turpentine incorporated in petroleum and fat. For coughs, rheumatism, stiff neck, etc. Fraudulent therapeutic claims.—[N J 22661 February 1935]

Po Da Cro Bak Ake Kidney and Bladder Pills—Podacro Co. Inc. Morristown Tenn. Composition Juniper oil and methylene blue, coated with calcium carbonate. Fraudulent therapeutic claims.—[N J 22667 February 1935]

Buno Hair Medicine—Buno Co. Inc. Philadelphia. Composition Resorcin, brucine, perfume oils including bay with alcohol, water, a small amount of a fatty oil and yellow coloring. For dandruff, falling hair, eczema, etc. Fraudulent therapeutic claims.—[N J 22664 February 1935]

X E Ma—X E Ma Co. Milwaukee. Composition Essentially mercuric chloride, glycerin and water, colored red. For skin disorders including eczema, psoriasis, itch, dandruff, etc. Fraudulent therapeutic claims.—[N J 22666 February 1935]

Pioneer Crystals—Pioneer Crystal Co. Mineral Wells Texas. Composition Essentially dehydrated Glauber's salt (99.1 per cent) and a small amount of common salt. For Bright's disease, high blood pressure, arthritis, neuritis, etc. Fraudulent therapeutic claims.—[N J 22668 February 1935]

Dieto—Kent Drug Co. Brooklyn. Composition Partly dehydrated epsom salt, potassium sulphate and common salt. For reducing weight, maintaining youth and preventing various diseases induced by overweight. Fraudulent therapeutic claims.—[N J 22669 February 1935]

Clifton's Brazillian Oil—Clifton Drug Co. Girard Ill. Composition Essentially nitrobenzene and extract of red pepper dissolved in gasoline. For toothache, rheumatism, deafness, swollen glands and limbs, etc. Fraudulent therapeutic claims.—[N J 22670 February 1935]

Clifton's Brazillian Herb Tablets—Clifton Drug Co. Girard Ill. Composition Essentially ground plant drugs such as aloin, cascara sagrada, uva ursi, damiana and a pungent drug. For stomach, kidney and joint disorders, etc. Fraudulent therapeutic claims.—[N J 22670 February 1935]

Bon Vino Health Restorer—Bon Vino Products Inc. Buffalo. Composition Essentially plant drug extracts including a laxative with alcohol (about 20 per cent by volume) and water, mint flavored. Misbranded because not made in Poland as represented and because alcohol content was incorrectly declared misbranded further because of fraudulent therapeutic claims as a tonic, etc.—[N J 22674 February 1935]

Sanmetto—Od. Peacock, Sultan Co. St. Louis. Composition Plant drug extracts, alcohol and water. For genito-urinary disorders. Fraudulent therapeutic claims.—[N J 22955 April 1935]

R M B Powders—R M B Laboratories Inc. Seattle. Composition Essentially bismuth subnitrate and sugar. For stomach disorders including ulcers. Fraudulent therapeutic claims.—[N J 22957 April 1935]

Dismuke's Famous Mineral Crystals—Famous Mineral Water Co., Mineral Wells Texas. Composition Essentially Glauber's salt with small amounts of chlorides and magnesium compounds such as epsom salt. For stomach trouble, rheumatism, auto-intoxication, etc. Fraudulent therapeutic claims.—[N J 22956 April 1935]

Peerless Crystals—Peerless Mineral Water & Crystal Co. Mineral Wells Texas. Composition Essentially Glauber's salt with small amounts of common salt and epsom salt. For rheumatism, gout, stomach, kidney and bowel troubles, etc. Fraudulent therapeutic claims.—[N J 22958 April 1935]

Nuxferrone—John L. O'Bannon, Marissa Ill. Composition Essentially compounds of iron, manganese, calcium and potassium hypophosphites, quinine, peptone, extracts of plant drugs including nuxvomica and a laxative with alcohol, water and aromatics. For debility, anemia, etc. Fraudulent therapeutic claims.—[N J 22959 April 1935]

Re Cu Ma—Robinson Drug Co. Blytheville Ark. Composition Epsom salt, potassium iodide, plant drug extracts including licorice, aloin and podophyllin with glycerin, alcohol (8.6 per cent by volume) and water, flavored with anise and sweetened with saccharin. System purifier and tonic. Fraudulent therapeutic claims.—[N J 22980 April 1935]

Puratone—John L. O'Bannon, Milan Tenn. Composition Essentially plant drug extracts including licorice and a laxative such as cascara sagrada with alcohol (7.9 per cent by volume), glycerin and water. For stomach, liver, kidney, bowel and blood disorders. Fraudulent therapeutic claims.—[N J 22961 April 1935]

Kal—Makera of Kal, Los Angeles. Composition Essentially powdered rice, cocoa and dicalcium phosphate. For mineral deficiencies in diet. Fraudulent therapeutic claims.—[N J 22963 April 1935]

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address but these will be omitted on request.

ARTERIAL TENSION AND CARDIAC RESERVE

To the Editor.—What reliable and dependable authoritative part does blood pressure take in cardiac insufficiency? When the pulse pressure exceeds the diastolic pressure unless in aortic regurgitation is it not evident that the cardiac reserve is low and that myocardial safety is at stake? Is it not proper to warn such a patient of his weakness and advise against taxing his heart muscle by any strain—even a physician's duty to urge complete rest until the patient's physical condition improves? Is not myocardial weakness the stepping stone to cardiac failure and often overlooked until conditions become so bad that prolonged rest—even heroic measures—must be resorted to in order that normality may be regained? Are not dyspnea on slight exertion sleeping with the head elevated or even the stage of orthopnea edema of the extremities and hypertension with or without valvular murmur or pain all evidences of deficient cardiac reserve or a weak heart? There are many tests for myocardial deficiency listed in the literature but my experience has been that the Barach rule and Strassburger's rule both obtained by blood pressure readings prove valuable adjuncts in diagnosis the former to give the systolic diastolic rate index and the latter showing the efficiency of the heart as a pump or the blood pressure coefficient. The latter is shown in the example cited at the beginning of this letter wherein I refer to the high pulse pressure exceeding the diastolic pressure which would give over 50 per cent which normally should be between 20 and 40 per cent. Below 20 or over 40 per cent is considered myocardial inefficiency. As some may not be familiar with the Strassburger rule allow me to say that it is obtained by dividing the pulse pressure with two ciphers added by the systolic pressure and the result gives a percentage which should be within the limits mentioned (from 20 to 40 per cent). Posture and exercise tests also are coordinating proofs of heart efficiency all of which taken with the general history aided of course by the cardiogram when available confirms the fact of normal or weak heart muscle. May I ask your valuable experience as to the foregoing being reliable in drawing conclusions about the condition of the heart muscle?

M D District of Columbia

ANSWER.—The arterial tension is often a valuable guide to the status of the cardiac reserve. After all, it is primarily the cardiac force that maintains the arterial tension. Briefly, it may be said that the diastolic pressure is equivalent to the peripheral resistance to the circulation and that the systolic tension represents the cardiac force overcoming this resistance and propelling the blood. Therefore ignoring for the time being such factors as pulse volume and circulatory velocity one may consider the pulse pressure as an indirect index to the useful propulsive force of the heart. The arterial tension alone however does not tell the whole story and the pulse rate is of the greatest significance in evaluating the cardiac reserve as well as the results of physical examination.

The relationship of the pulse pressure to the diastolic pressure is not a fixed one and it is altered by a number of factors. For example as the diastolic tension rises in hypertensive arterial disease the pulse pressure increases more rapidly, with a competent heart. Maintenance of the diastolic pressure is certainly dependent on competence of the aortic valves in aortic regurgitation the pulse pressure is often extreme. Thyrotoxicosis, by increasing the cardiac output without much, if any, change in the peripheral resistance often results in a greatly increased pulse pressure. In these instances the diastolic tension is usually normal or slightly elevated whereas in the former example of aortic regurgitation it is almost invariably much reduced. In thyrotoxic tachycardia the rise in pulse pressure is proportionate to the elevation of the basal metabolic rate and increased cardiac volume output. In acute myocardial failure it is usual that the systolic tension and pulse pressure are reduced, and such reduction is of ominous prognostic import. The pulse pressure may be considered a rough measure of the stroke volume, which is ordinarily reduced in cardiac exhaustion. However, myocardial inadequacy may be associated with dilatation of the ventricle of such a degree that relative aortic regurgitation results with a consequent great increase in the pulse pressure. This increase is associated with a reduced diastolic tension. This exception to the general rule that with reduced myocardial strength the pulse pressure falls occurs most frequently in cases in which silent and asymptomatic calcification of the aortic valves has occurred, as described by Henry A. Christian (*Aortic Stenosis with Calcification of the Cusps* THE JOURNAL, July 18 1931 p 158) and by H M Margolis F O Ziellessen and A R Barnes (*Am Heart J* 6 349 [Feb] 1931).

The complaints and symptoms mentioned in the query are certainly evidences of reduced cardiac reserve and warrant the induction of rest. This is particularly the case if the pulse is

rapid. Hypertension is mentioned as one of the evidences of cardiac disease. This is really putting the cart before the horse cardiac disease is a consequence of hypertensive arterial disease and not vice versa. To evaluate fully the significance of the hypertension in such an instance, it is important to know not only the present levels but what the blood pressure was before the appearance of signs of myocardial inadequacy. The cardiac changes in hypertensive disease are divisible into three phases (1) the sthenic stage, in which the heart is amply compensated, the pulse is slow and the pulse pressure is increased proportionately more than the diastolic tension, with a good response to exertion, (2) the asthenic stage, which appears insidiously in an almost imperceptible transition from the sthenic phases and which is characterized by an increasingly rapid pulse a diminishing pulse pressure due to a fall in the systolic levels and the induction of dyspnea by lesser degrees of effort and (3) frank myocardial decompensation with its attendant fall in the systolic tension and the other well known signs of failure.

The two rules mentioned in the query are most useful as far as rules go. Clinical interpretation and correlation of all the facts available is essential. Rules and specific test procedures are not infrequently fallacious and misleading. MacKenzie emphasized years ago that the best criteria of the patient's cardiac reserve and cardiac efficiency were the data derived from careful study of a detailed history. Rather than rely on some one or two test procedures or formulas it is wiser to evaluate the situation from as many sources of information as possible. Perhaps the most significant single observation is the ease with which dyspnea is induced by effort as compensation and reserve strength diminish dyspnea appears with less and less exertion. The degree of dyspnea per se is less important than the extent of effort required to induce it. This aspect of the situation is best illuminated by careful inquiry into the history the patient can thus report the effect of changes in weather (such as a cold wind), the effects of digestion, and other occurrences on his circulatory efficiency.

One must not ignore the fact that all evidences of circulatory embarrassment are considerably aggravated by coincident anemia. In fact most of the phenomena associated with reduction of the cardiac reserve can be brought about by profound anemia even relatively minor depression of the oxygen carrying capacity of the blood enhances the intensity of symptoms. In the present instance, examination of the blood and of the renal functional reserve and determination of the basal metabolic rate are indicated before final conclusions regarding the extent of purely cardiac damage are warranted.

USE OF WHOOPING COUGH VACCINE

To the Editor.—In the October issue of *Parents Magazine* page 80 Dr Emelyn Lincoln Coolidge in an article entitled *Safety via Vaccines and Serums* states that the Sauer vaccine for protection from whooping cough must not be used for at least four months after any other vaccine or serum has been given. Is this correct? Why? Please omit name.

M D New York

ANSWER.—Because whooping cough is more prevalent than diphtheria smallpox or scarlet fever and is serious only during the first few years of life it is advisable to immunize early. As the earliest age at which infants can develop immunity from the injection of the authorized vaccine has not yet been determined, it is best to give the injections during the second half year of life—preferably at about 7 or 8 months. Because a period of several months must elapse before the resulting immunity is complete other immunization or vaccinations should not be attempted within that time.

It is rarely if ever necessary to crowd the various immunization procedures. A recent three year summary of results with a total of 8 cc of the authorized vaccine for immunization shows that about 90 per cent of the children less than 3 years of age at the time of injection were protected when exposed to the disease from four months to three years after injection. Because failures occurred somewhat more often in children over 3 years of age at the time of injection, a total of 10 cc is now recommended for all children beyond that age. If another immunization has already been performed, sufficient time for immunity to develop from it should elapse before the pertussis vaccine is given.

A practical immunization schedule used by some physicians for several years, is to vaccinate first against whooping cough at 7 to 8 months then a single diphtheria toxoid alum precipitated injection against diphtheria at 11 to 12 months, when the Schick test reading is made from four to six months later and found negative the smallpox vaccination or scarlet fever immunization may be performed. By this plan all four immunizations can be completed relatively early in life without one conflicting with the other.

ROUTINE VISUAL TESTS IN SCHOOLS

To the Editor—During the routine examination of the eyes in school examinations what standard or test should be followed in rural schools? What percentage of defect should be present to demand correction immediately or soon? It doesn't seem practical to go through a complicated and detailed ophthalmologic examination in rural communities. Various eye charts for vision test are confusing some having distances and percentages on the same chart. What would you suggest as a brief reliable test for rural use? Omit name, please

M D, New York

ANSWER.—The only satisfactory routine measurement of visual acuity in school examinations is by means of the standard Snellen chart. For this, a testing distance of 20 feet is essential. Illumination must be adequate, at least 7 to 10 foot candles and preferably artificial illumination. Probably the most satisfactory chart is the Snellen chart, published by the American Medical Association containing notations of visual acuity and percentages of visual efficiency.

It is difficult to state empirically exactly what decrease in visual acuity necessitates further examination. That depends on the age of the child and the character and extent of the error of refraction that is present. When the error is small, visual acuity of 20/30 or even 20/40 may not necessitate correction. But if the error of refraction is great, particularly in a case of high hyperopia, even 20/25 requires further investigation. For routine purposes, one may say that visual acuity of 20/30 or worse in either eye should be the basis for refraction under mydriasis.

RELATIONSHIP BETWEEN LEUKEMIA AND CARCINOMA

To the Editor—Are the lymphocytes seen about carcinomatous infiltrations an irritative or an inadequate defense mechanism? Has blood taken from a patient or animal with lymphatic leukemia ever been transfused into a normal person or animal to determine what effect it might have? In other words could it possibly be transmissible in this manner? Likewise has blood from a patient with lymphatic leukemia ever been used in a patient suffering from carcinoma? It has seemed to me logical to assume on a theoretical basis that, if the lymphatic infiltration so frequently seen about carcinomatous tissue is an inadequate defense, an added number of lymphocytes a good source of which would be from a patient suffering from lymphatic leukemia might be of value. I understand that many of the cells (lymphocytes) when found in large numbers are immature and for this reason may not possess the antitoxic properties.

M D, Michigan

ANSWER.—It is assumed, at least by some that the accumulation of lymphocytes by carcinomatous infiltration may have defensive effects. In animals notably fowls and mice, various forms of leukemia are readily transmissible by injection of blood or cells. So far as known there is no recorded instance of the injection of blood from a patient with lymphatic leukemia into a patient suffering from carcinoma. Naturally, one would hesitate to make such an injection because of the possibility of thereby transferring leukemia.

UTERINE FIBROIDS NOT RELATED TO THICKENING OF SKULL

To the Editor—A married woman has a thickening of the inner table of the skull associated with uterine fibroids. So far her mentality is normal but she has some headaches and dysfunction of the right arm and both legs. May I ask for a frank discussion of the treatment you would advocate and the prognosis?

M D, Illinois

ANSWER.—The uterine fibroids are not responsible for the thickening of the skull, the headaches, or disturbed function of the right arm. Pressure, or venous engorgement associated with fibroids, might produce disturbances of the lower extremities, although it is uncommon in the absence of a complicating malignant condition or pelvic infection.

TONIC EFFECTS OF EMETINE

To the Editor—I have been using emetine in standard 6 cc ampules for the relief of stomach ulcer or duodenal ulcer. Recently one patient complained of weakness of the limbs resulting from this medication. As this is the first complaint I wondered what you might know about the toxic effect of emetine.

M D, New Mexico

ANSWER.—Muscular weakness is a prominent symptom of emetine poisoning. Such weakness may be due to direct action of the emetine on the muscles, to depression of the heart muscle, to collapse from excessive loss of fluid to neuritis, or to combinations of these. Excessively rapid intravenous injection may result in direct depression or paralyzes of the heart with no other symptoms than sudden weakness, fainting and even fatal collapse. In more slowly developing cases the vomiting and purging contribute to the collapse by inducing dehydration. It is a peculiarity of poisoning by emetine

that, even following a single dose, severe symptoms and even death may be delayed a long time. It may occur as long as a week later. When peripheral neuritis sets in it may prove fatal, especially in children and weak persons, in spite of interruption of the treatment at the onset of the neuritis.

BLEEDING AFTER INCISION OF VULVA IN PREGNANCY

To the Editor—I was recently called to see an 18 year old primipara within a few weeks of term. There was a tender and painful swelling of the left labium majus slightly fluctuating and rather edematous. I made an incision low down, about 1 cm broad and nearly 2 cm deep. There was a discharge of pus with a good deal of blood which had ceased by the time I left. An hour later she began to bleed in spurts and was taken to a hospital. The bleeding was checked and a day or so later another incision was made. The discharge has stopped by this time. What did I do that was wrong?

M D, California

ANSWER.—The painful swelling was probably a Bartholin gland abscess. The vulva is often highly vascular in the advanced months of pregnancy and a transverse incision might cause free bleeding. The usual practice is to incise longitudinally, not transversely, thereupon spreading the wound with forceps to insure good drainage.

GLOMUS TUMORS

To the Editor—In THE JOURNAL September 7, Dean Lewis reported a series of glomus tumors that had come under his observation. In view of the fact that I am unable to find a definition of the glomus in any medical dictionary I have will you please define the word and specifically locate it? Dr. Lewis mentions removal of these tumors. Will you kindly outline the technic, stressing necessary points of danger or trouble in their removal?

M D, Florida

ANSWER.—Glomus is derived from the Latin meaning ball and usually refers to a plexus of vessels. The word glomerulus used in the histology of the kidney is a diminutive of glomus and refers to a coil of blood vessels. Luschka in 1860 applied the term glomus coccyeum to a small organ situated near the tip of the coccyx. In applying the term glomus to the arterial angioneuromas, the resemblance of these tumors histologically to the glomus coccyeum of Luschka is emphasized.

Webster's dictionary gives the definition and use of glomus. These tumors can be removed under local anesthesia without any difficulty, and no danger or trouble should be experienced in their removal.

CONSTITUENTS OF THE NEURON

To the Editor—I should like to know the chemical constitution of the fluid contained within the cell body of the neuron.

R F. SUEETS, M D, Carthage, Ill.

ANSWER.—The "cell body" of the neuron consists of the semi fluid sticky gel called protoplasm. This is fundamentally the same in all cells. Since nerve cells have not been separated from other elements of nervous tissue for chemical study, it is not known specifically how their protoplasm differs from that of other cells. There are evidences that they are exceptionally rich in nucleoproteins. For a consideration of the great number of substances that have been separated from dead protoplasm, a textbook of physiologic chemistry must be consulted. The characteristic activities of any type of cell are the results of the cooperation of the various "organs" within the cell. These differ from one another both physically and chemically.

VEHICLE FOR PRESCRIBING BROMIDES

To the Editor—I have been trying in vain to prescribe bromides in U. S. P. and N. F. vehicles that would be as pleasant as the proprietary preparations put out by various pharmaceutical houses. I shall appreciate it if you will inform me of a vehicle that will compare favorably.

WILLIAM STEINBERG, M D, Philadelphia

ANSWER.—A comparative study of vehicles has shown that the syrup of glycyrrhiza is one of the best disguising vehicles for bromides. Its colloidal nature suppresses the salty taste to a considerable degree. The immediately perceived sweetness of the sucrose and the lingering sweetness of the glycyrrhizin add further disguising value. Flavoring the syrup with anise or an anise bouquet is advisable. This may be done by using anise water as the solvent for the bromide, since the syrup is too concentrated to dissolve a full dose of this salt. The following prescription may serve as an example.

| | |
|----------------------|--|
| R Sodium bromide | 30.0 Gm. |
| Anise water | 30.0 cc. |
| Syrup of Glycyrrhiza | to make 120.0 cc. |
| Mix and Label | Teaspoonful in glassful of milk after meals and at bedtime |

GLYCOSURIA

To the Editor—In Queries and Minor Notes in THE JOURNAL, October 12 page 1210 the following statement appears Glycosuria excreting 20 mg per hundred cubic centimeters of urine should cause rejection for employment or at least comprehensive study In Quantitative Clinical Chemistry by Peters and Van Slyke 1932, page 131 the excretion of dextrose in normal urine is said to occur in concentrations of from 0.02 to 0.10 per cent What method for dextrose determination was considered in presenting your figure?

E S WILLIAMS MD Richmond Va

ANSWER—The statement should read "Glycosuria exceeding 200 mg (or 0.2 per cent) per hundred cubic centimeters of urine should cause rejection for employment or at least, comprehensive study" The statement that 20 mg per hundred cubic centimeters of urine should so disqualify an applicant is incorrect, owing to clerical or stenographic error The method of dextrose determination employed is the trinitrophenol method of Benedict.

ISOTONIC SALT SOLUTIONS BY HYPODERMOCLYSIS

To the Editor—I am interested in learning about the effect of giving physiologic solution of sodium chloride and 5 per cent salt solution by hypodermoclysis I have been unable to find any literature pertaining to this Should 5 per cent sodium chloride ever be given subcutaneously? What factors other than injection too rapid flow and too warm solution might account for a slough of the soft tissues if physiologic solution of sodium chloride should be administered?

JOSEPH O HAWKINS MD San Rafael, Calif

ANSWER—Only isotonic solutions should be used for subcutaneous injection A solution containing 5 per cent of sodium chloride is too concentrated It produces inflammatory reaction and may even cause a slough In addition to excessive heat of solution, excessive distention of tissues and infection either carried in from without or brought to the tissues through the circulation, extremely poor circulatory activity in the part injected may favor production of a slough

BLOOD GROUPS IN TWINS

To the Editor—One of male twins was murdered The twin sister attempted to throw guilt on a third party by means of a cloth on which she put some of her own blood The age of the twins was about 40 Is there enough similarity in blood typing at that age to make it appear that the blood may have come from the murdered twin brother?

MD Pennsylvania

ANSWER—In monovular (or identical) twins the blood groups are invariably the same The twins described are of different sexes and are therefore biovular Biovular twins resemble each other neither more nor less than ordinary siblings Hence they may or may not have the same blood group though they are more likely to have identical groups than two unrelated individuals The age makes no difference since the blood group properties are demonstrable at birth and remain unchanged throughout life

TELEGONY

To the Editor—A dog breeder informs me that, if a thoroughbred bitch is raped by a mongrel the bitch is ruined as far as further breeding of thoroughbred pups is concerned Pups following this even though the bitch is covered by a thoroughbred will show characteristics of the mongrel If this is true, would the same apply to human beings? That is if a Negro raped a white woman who gave birth to a mulatto, and later she marries a white man would their children be liable to have Negro characteristics? Please explain

MD Idaho

ANSWER—There is no scientific evidence for and considerable evidence against telegony, which is defined as an influence of a previous sire on offspring of a later sire

ROENTGEN TREATMENT OF SINUSITIS

To the Editor—Has roentgen treatment of frontal sinus disease been successful? How many treatments are given and for what length exposure are they employed? Are there any contraindications to the treatment? At what stage is treatment most efficacious? What is the efficacy of autogenous vaccine treatment in frontal sinus disease? Please omit name

MD Ohio

ANSWER—Although some writers have reported favorably on roentgen treatment in sinusitis its use has not been generally accepted Details regarding roentgen treatment in chronic cases are given in the following articles

Butler F E. and Woolley I M. Roentgen Therapy in Chronic Sinusitis *Bent J Surg* 40: 379 (July) 1932
Butler F E. and Woolley I M. Roentgen Therapy in Chronic Sinusitis A Further Report *Radiology* 23: 328 (Nov) 1934

GONORRHEAL ARTHRITIS AND INFECTED PROSTATE

To the Editor—Kindly inform me as to whether or not the existence of gonorrheal arthritis implies necessarily an infected prostate.

M.D., California.

ANSWER—Gonorrheal arthritis occurs not infrequently as a complication of acute gonorrheal urethritis without any demonstrable prostatic involvement Occasionally gonorrheal arthritis may be diagnosed conclusively by demonstrating the organisms in fluid aspirated from the joint, although careful examination does not reveal any local genital, urethral or prostatic infection Gonorrheal arthritis is much more common secondary to gonorrhea in the male than in the female, but it may follow simple vulvovaginitis or ophthalmia neonatorum

EFFECT OF SYPHILIS ON HEALING OF FRACTURES

To the Editor—I would appreciate information concerning the role of syphilis in the healing of fractures Is it the modern belief that secondary or tertiary syphilis retards the healing or union of fractures? I have to appear in court next week so would appreciate an early reply Please omit name

MD, Pennsylvania

ANSWER—The modern belief is that syphilis does not retard the uniting of fractures Nonunion is seen most frequently in fractures of the neck of the femur, in the humerus and in the tibia The records of the larger clinics show few cases of coexisting syphilis

Council on Medical Education and Hospitals

ADDITIONAL HOSPITALS APPROVED

The Council on Medical Education and Hospitals of the American Medical Association has given its approval to the following hospitals since the publication of the last previous list in THE JOURNAL, July 6

Hospitals Approved for Intern Training

Wesson Memorial Hospital Springfield, Mass
St Joseph Mercy Hospital Pontiac, Mich
St Agnes Hospital White Plains, N Y
Evangelical Lutheran Hospital, Cleveland
Good Samaritan Hospital Dayton, Ohio
St Joseph's Hospital Lancaster Pa

Hospitals Reinstated to Approved Internship List

St Mary's Hospital San Francisco
St Elizabeth Hospital, Chicago
St Anthony's Hospital Rockford Ill
St Luke's Methodist Hospital Cedar Rapids, Iowa
Flushing Hospital and Dispensary Flushing N Y
St Mary's Hospital Cincinnati
Mount Carmel Hospital, Columbus Ohio
St Luke's Hospital, Milwaukee

Hospitals Approved for Residencies in Specialties

California Babies Hospital Los Angeles Pediatrics
San Diego County General Hospital San Diego Calif Medicine
ophthalmology-otology and surgery
Peoria Municipal Tuberculosis Sanitarium Peoria Ill Tuberculosis
James Lawrence Kernan Hospital Baltimore, Orthopedics
St Mary's Hospital Kansas City Mo Surgery
Mary Hitchcock Memorial Hospital Hanover N H Pathology
United States Marine Hospital Fort Stanton N M Tuberculosis
Beth Israel Hospital New York City Radiology
Longview State Hospital Cincinnati Psychiatry
St Vincent's Hospital Portland Ore Pathology
Abington Memorial Hospital Abington Pa Medicine pathology and surgery
Germantown Dispensary and Hospital Philadelphia Medicine and surgery
Skin and Cancer Hospital Philadelphia Dermatology

Hospitals Approved for Additional Residencies

Children's Hospital Los Angeles Pathology
San Francisco Hospital San Francisco Orthopedics thoracic surgery, tuberculosis and urology
Stanford University Hospitals, San Francisco Physical therapy
University of California Hospital San Francisco Neurosurgery and urology
Research and Educational Hospital Chicago Ophthalmology and radiology
University of Chicago Clinics Chicago Anesthesia neurology and psychiatry
Evanston Hospital Evanston Ill Surgery
Methodist Episcopal Hospital Indianapolis Radiology
St Mary's Group of Hospitals St Louis Ophthalmology and otology
Jewish Hospital Brooklyn Pathology
Millard Fillmore Hospital Buffalo Pathology
Metropolitan Hospital New York City Pathology
New York Post-Graduate Medical School and Hospital New York City Dermatology
Jewish Hospital Cincinnati Radiology
Memphis General Hospital Memphis Tenn Pediatrics

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country, March 14. Oral examination for Group A and B applicants will be held in Kansas City Mo. May 11-12. Applications for written examination should be filed with the secretary before Jan. 15. Sec. Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada, March 28. Applications must be filed not later than February 28. Oral clinical and pathological examination of all candidates will be held in Kansas City Mo. May 11-12. Applications must be received not later than April 1. Sec. Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY Kansas City Mo. May 11 and New York Oct. All applications and case reports must be filed sixty days before date of examination. Asst. Sec. Dr. Thomas D. Allen, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St. Louis Jan. 11. Sec. Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY Kansas City, Mo. May 9. Sec. Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS Kansas City, Mo. May 9. Sec. Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY New York Dec. 30. Sec. Dr. Walter Freeman, 1726 Eye St. N. W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY Kansas City, Mo. May 8-10. Sec. Dr. B. R. Kirklin, Mayo Clinic, Rochester, Minn.

CALIFORNIA Reciprocity, San Francisco Jan. 15. Sec. Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO Denver Jan. 7. Sec. Dr. Harvey W. Snyder, 422 State Office Bldg., Denver.

CONNECTICUT Basic Science, New Haven Feb. 8. Prerequisite to license examination. Address: State Board of Healing Arts, 1895 Yale Station, New Haven.

DISTRICT OF COLUMBIA Washington Jan. 13-14. Sec. Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

HAWAII Honolulu Jan. 13-16. Sec. Dr. James A. Morgan, 48 Young Bldg., Honolulu.

ILLINOIS Chicago Jan. 28-30. Superintendent of Registration Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

MINNESOTA Basic Science, Minneapolis Jan. 7-8. Sec. Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. Medical, Minneapolis Jan. 21-23. Sec. Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II, Feb. 12-14; May 6-8; June 22-24 and Sept. 14-16. Part III tentatively scheduled as follows: Chicago Jan. 7-9 and New York Jan. 13-15. Ex. Sec. Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEBRASKA Basic Science, Omaha Jan. 14-15. Dir. Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA Reciprocity, Carson City Feb. 3. Sec. Dr. Edward E. Hamer, Carson City.

NEW YORK Albany Buffalo New York and Syracuse Jan. 27-30. Chief Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH DAKOTA Grand Forks Jan. 7-10. Sec. Dr. G. M. Williams, 44 S. 3d St., Grand Forks.

OREGON Portland Jan. 7-9. Sec. Dr. Joseph F. Wood, 509 Selling Bldg., Portland.

RHODE ISLAND Providence Jan. 23. Dir. Department of Public Health, Dr. Edward A. McLaughlin, 319 State Office Bldg., Providence.

SOUTH DAKOTA Pierre Jan. 21-22. Dir. Division of Medical Licensure, Dr. Park B. Jenkins, Pierre.

VERMONT Burlington Feb. 12. Sec. Board of Medical Registration, Dr. W. Scott Nay, Underhill.

WASHINGTON Basic Science, Seattle Jan. 9-10. Medical, Seattle Jan. 13-15. Dir. Department of Licensure, Mr. Harry C. Huse, Olympia.

WISCONSIN Madison Jan. 14-16. Sec. Dr. Robert E. Flynn, 410 Main St., La Crosse.

Oregon June Examination

Dr. Joseph F. Wood, secretary, Oregon State Board of Medical Examiners, reports the written examination held in Portland, June 18-20, 1935. The examination covered 11 subjects. An average of 75 per cent was required to pass. Thirty-eight candidates were examined, all of whom passed. The following schools were represented:

| School | PASSED | Year Grad. | Per Cent |
|--|--------|------------|----------|
| College of Medical Evangelists | | (1935) | 92 |
| Northwestern University Medical School | | (1935) | 87.2* |
| Creighton University School of Medicine | | (1934) | 88.5 |
| University of Nebraska College of Medicine | | (1933) | 86.9 |
| University of Oregon Medical School | | (1934) | 84.2 |
| 84.8 85.1 85.2 85.4 85.8 86.8 87.2 87.8 88.4 | | | |
| (1935) 84.6† 84.7† 85.3† 85.6 85.9 86.2† 86.3 87 | | | |
| 87.2 87.3† 87.5† 87.5† 87.5 87.7 87.8 88.5† 88.6 | | | |
| 88.8 89.2 89.4† 89.7 | | | |
| University of Wisconsin Medical School | | (1934) | 86.1 |
| University of Toronto Faculty of Medicine | | (1934) | 89.8 |

Five physicians were licensed by reciprocity and 1 physician was licensed by endorsement from June 19 through July 30. The following schools were represented:

| School | LICENSED BY RECIPROCITY | Year Grad. | Reciprocity with |
|--|-------------------------|------------|------------------|
| State University of Iowa College of Medicine | | (1933) | Iowa |
| University of Kansas School of Medicine | | (1930) | Kansas |

University of Minnesota Medical School
University of Oregon Medical School

(1928) Minnesota
(1933 2) California

School LICENSED BY ENDORSEMENT
University of Oregon Medical School

Year Endorsement
Grad. of
(1934) N. B. M. Ex.

* This applicant has received an M.B. degree and will receive his M.D. degree on completion of internship. License has not been issued.

† License has not been issued.

Georgia October Examination

Mr. R. C. Coleman, joint-secretary, State Examining Board, reports the written examination held by the State Board of Medical Examiners in Atlanta, Oct. 8-9, 1935. The examination covered 10 subjects and included 100 questions. An average of 80 per cent was required to pass. One candidate was examined and passed. The following school was represented:

| School | PASSED | Year Grad. | Per Cent |
|---|--------|------------|----------|
| Columbia Univ. College of Physicians and Surgeons | | (1933) | 8.4 |

Ten physicians were licensed by reciprocity from August 17 through November 9. The following schools were represented:

| School | LICENSED BY RECIPROCITY | Year Grad. | Reciprocity with |
|--|-------------------------|------------|------------------|
| University of Arkansas School of Medicine | | (1935) | Arkansas |
| Emory University School of Medicine | | (1931) | Michigan |
| Tulane University of Louisiana School of Medicine | | (1926) | Louisiana |
| University of Maryland School of Medicine and College of Physicians and Surgeons | | (1920) | Maryland |
| University of Michigan Medical School | | (1933) | Michigan |
| Medical College of the State of South Carolina | | (1930) | S. Carolina |
| Meharry Medical College | | (1934 3) | Tennessee |
| University of Virginia Department of Medicine | | (1934) | Virginia |

Book Notices

Doctors and Juries The Essentials of Medical Jurisprudence. By Humphreys Springston. Fabrikold. Price \$2. Pp. 150. Philadelphia: P. Blakiston's Son & Co. Inc. 1935.

The title of this volume is a misnomer. The book contains little information concerning juries and does not cover the essentials of medical jurisprudence. But its language is simple and its style easy; it is divided into numerous short chapters, it is printed in easily legible type, is bound in a flexible cover, is almost small enough to go into the coat pocket, and may well serve to aid a physician to pass away a few idle moments while waiting for something to turn up. Even so the reader, unless he is already versed in legal medicine, must be on his guard lest he be misled. A lawyer or a physician seriously in need of aid will hardly find it in this volume because the author has given no citations to support his statements.

The author's comments on the attire to be worn on the witness stand are novel, but they are practical and, corresponding as they do so closely with comment on the same subject by an English author (Kerr, D. A. J. *Forensic Medicine*, A New Text-Book for Students and a Guide for the Practitioner, New York, Macmillan Company, 1935, p. 29) seem to be of sufficient interest to justify setting them out at length (pp. 94-95).

Clothes may not make the man but they sometimes undo him. Most men—that is most jurors—resent duds and tailors' dummies but they also dislike ostentatious raggedness. Showiness of apparel whether of either extreme is likely to militate against its wearer. At the same time there is a universal approval of being well dressed as opposed to seeming either over-dressed or too slovenly. Ideal courtroom clothes are usually dark of conservative weave and cut and without ornamentation by way of accessories of haberdashery. Plain ties, plain shirts, inconspicuous appointments and appointments are least likely to arouse antagonism and the general rule is that all articles of dress should be such that they have to be looked at twice before being seen or noted. In some communities spats, wing collars, stick pins, wrist watches, gloves, canes, stiff hats and lodge or fraternal emblems create no distrust and are unnoticed in others they are as red flags to a bull, especially in regard to lodge buttons, emblems, rings and watch charms for with the many divisions of race, religion and affiliations existing in most towns it is unwise to display affiliation with any particular group and risk antagonizing an opposing group.

The author seems to be an earnest advocate of a policy advocated at times by physicians, under which a physician is not to testify against a fellow physician in support of a claim based on malpractice, even though the facts of the case are within

his own professional knowledge and he knows that the claim is just. The author contends (p 136) that

It is far better that a negligent and careless physician escape liability for damages than that a whole community or locality should suffer because strict justice in such case is enforced. Confidence of patients in physicians is invaluable and when this confidence is sapped by the publicity attendant upon malpractice suits and at the same time the physicians in that district are made timorous thereby the effect upon the public at large can be nothing but evil.

In support of his contention the author points out that indemnity companies have in some instances withdrawn from localities in which physicians have testified against fellow physicians and he alleges (pp 134-135) that, because of such withdrawal, the doctors tend to become overly cautious their nerve is sapped and their judgment warped by fear, and the result is that the general public fails to receive the medical care and attention in that sort of locality that it receives in other localities where such unfortunate conditions do not exist.

Unfortunately the author does not state the facts on which he bases this allegation or the lines of demarcation that he draws between a physician's being normally cautious and "overly" cautious, or between a physician's "nerve" being normal and his "nerve" being "sapped" and his judgment being sound or being "warped by fear." In the absence of such basic information a critic might suggest that the relative freedom from personal liability that a physician experiences when he carries malpractice indemnity insurance leads to carelessness, undue boldness and unsound judgment on his part and that the withdrawal of such insurance is not a detriment to either patient or physician but restores normal standards of care, courage and judgment.

A physician who has been regularly summoned as a witness in a malpractice suit cannot refuse to testify to facts within his own knowledge—unless by so doing he will incriminate himself—or to opinions based on those facts. But even if the rule were otherwise, physicians it is believed, should hardly engage in a conspiracy to deprive patients who are in fact injured by the malpractice of their physicians, of the medical testimony necessary to support their claims and to obtain justice. Such a policy hardly appeals to one's sense of fair play, and if enforced it would tend to deprive physicians of a proper sense of responsibility and drive juries to appraise damages on the basis of the evidence of irregular practitioners and of laymen.

The protection of the public, the author seems to believe, does not depend on the existence of financial liability on the part of the physician for the consequences of his own carelessness, ignorance, unskilfulness and bad judgment but on the revocation of the licenses of physicians found deficient in professional care, knowledge, skill or judgment. Dishonorable and incompetent physicians should be deprived of their licenses of course, but it is notoriously difficult to obtain evidence sufficient to accomplish that end, and but few patients would be likely to institute proceedings looking toward the revocation of their physicians' licenses, even though the law permitted them to do so, so long as such patients could obtain no personal advantage by such action. This book is hardly one to be commended as a guide to medical students, physicians or lawyers.

Hormone des Ovariums und des Hypophysenvorderlappens. Untersuchungen zur Biologie und Klinik der weiblichen Genitalfunktion. Von Dr. Bernhard Zondek, Professor an der Hebräischen Universität Jerusalem. Mit einem Anhang: Hormonale Schwangerschaftsreaktion. Hormone des Hypophysenhinterlappens. Second edition. Paper. Price 58 marks. Pp 638 with 177 illustrations. Vienna: Julius Springer 1935.

The second edition of this work which first appeared in 1931 and has already become a classic has been enlarged by the addition of fifteen chapters. It includes extensive discussions not only of experimental work but of technical methods and clinical applications, representing a synthesis of knowledge in one of the most fascinating fields of medical research in which the author has played a significant part. Important information not available elsewhere and much that would be accessible only by diligent search of the literature appears in this volume. The typography is excellent and the many illustrations, a number of which are in color are almost without exception well chosen, well executed and reproduced with unusual clarity. Extensive appendixes on pregnancy tests and on the chromatophorotropic hormone of the pars intermedia of the hypophysis are included.

Professor Zondek proposes in this edition a new nomenclature for the gonadotropic principles, taking into account differences in the effects of products from various sources not established at the time the original terms were suggested. Thus the gonadotropic principle of pregnancy urine remains "prolan," and the follicle stimulating and luteinizing factors, prolan A and B respectively, but the "synergistic" pituitary factor of Evans becomes "synprolan" and the gonadotropic complex of the pituitary (prolan plus synprolan) is designated "prosylin." This somewhat complicated terminology may be confusing to those not intimately acquainted with the work in this field, however until chemically pure fractions are available the nomenclature will inevitably remain in a state of flux.

One minor flaw in an otherwise excellent book is the lack of uniformity in the bibliographic references, necessitating in many cases more searching than should be necessary.

The author who is both a noted investigator and a practicing gynecologist is co-discoverer with Aschheim, of phenomena which they utilized as the almost infallible pregnancy test that bears their name. Their discoveries also led to the isolation from the urine of pregnant women of pure estrogenic compounds by Doisy, Butenandt, Marrian and others. The author and Aschheim share honors with Smith and Engle in this country for the discovery of the role of the hypophysis in the control of the genital system. These and numerous other important contributions provide an unusually sound and critical background for the material in this book, which will be an indispensable acquisition to the reference library both of investigators and of clinicians.

Dermatology and Syphilology for Nurses including Social Hygiene. By John H. Stokes M.D. Duhring Professor of Dermatology and Syphilology, the School of Medicine University of Pennsylvania. Second edition. Cloth. Price \$2.75. Pp 308 with illustrations. Philadelphia & London: W. B. Saunders Company 1935.

This is a thoroughgoing revision of the well known textbook for nurses. General consideration of skin diseases, including all the common ones and some of the less common, comprises the first ninety-seven pages. Seventy-one pages are devoted to treatment of skin diseases, with detailed instructions in nursing care. Thirteen pages are devoted to gonorrhea for the purpose of emphasizing the differences between gonorrhea and syphilis. The next ninety-two pages consider syphilis and its treatment, with minute details for the nurse who assists in the treatment. The last forty-two pages are devoted to social hygiene, social service follow up, and the normal ideals of sex life. A three-page appendix gives pertinent bibliographic references, and a glossary occupies thirteen pages, giving accurate easily understood definitions of the terms used throughout the book. A complete index is appended. One could scarcely hope in a small book for a more excellent exposition of dermatology and syphilology for nurses.

Lehrbuch der Gastroskopie. Von Dr. med. Norbert Henning, Privatdozent an der Universität Leipzig. Boards. Price 7.20 marks. Pp 88 with 45 illustrations. Leipzig: Johann Ambrosius Barth 1935.

According to Henning, a new textbook on gastroscopy became indispensable after the rapid spread of gastroscopy resulting from the invention of the flexible gastroscope. This instrument is now used in almost every large German hospital. The technical parts of former books on the subject had become obsolete. The work is based on several thousand gastroscopies, it is written only for gastroscopists. In spite of its brevity, one feels in each sentence the authority of an expert. Morawitz, director of the Medical University Clinic of Leipzig and now editor of the *Archiv für Verdauungs-Krankheiten* has written the preface in which he says: "A certain reserve toward gastroscopy seemed to be comprehensible as long as there were only rigid instruments, but since gastroscopy has become safe today this hesitation is not justifiable any longer."

If it is known that in my hospital several thousands of gastroscopies have been carried out during the past eight years, frequently with valuable diagnostic results, it will be understood why I will not do without gastroscopy any longer. It probably will become a procedure which the gastro-enterologist must master just as the urologist must know cystoscopy." After remarks on the anatomy and physiology of the stomach and after a discussion of the development of the flexible gastro-

scope, Henning describes the modern instruments. He begins with the old rigid instrument of Schindler because he believes that the experienced examiner will often prefer it and because it allows photography by the use of Henning's gastrophotographic camera. The wisdom of discussing rigid instruments is questionable, since they have become obsolete following the invention of the flexible gastroscope. "Blind" gastrophotography is considered of no value. The flexible gastroscope is described in detail. The contraindications and especially the indications are discussed. Henning believes that soon treatment of stomach diseases without exact morphologic diagnosis by roentgen examination and especially by gastroscopy will be stigmatized as a serious mistake if not malpractice. The preparation of the patient and the introduction of the instrument are well described. Henning's opinion that the orientation in the stomach is easy will not be shared by expert teachers in gastroscopy. It is certainly significant that the description of gastroscopic pictures of gastritis takes twelve pages but of ulcer and tumor pictures only three pages. The importance of gastroscopy in the diagnosis of chronic gastritis is emphasized and reference is made to the author's more extensive monograph on the subject. The importance of gastroscopy in cases of ulcer and carcinoma is also pointed out. The comparison of gastroscopic observations with those of the x-ray relief method is of the greatest value. It is regrettable that only a few colored pictures are included in this most commendable book. Henning thinks that the variety of observations is too great to be shown in colored pictures. The beginner will miss nevertheless the multitude of pictures as shown in the old obsolete book of Schindler and in the new work of Moutier. The seven pictures of the three different types of gastritis, however, are excellent. This book should be read carefully by every gastroscopist.

Elementary Zoology for Medical Students. By L. A. Borradaile Sc.D. Fellow and Tutor of Selwyn College Cambridge. Third edition. Cloth. Price \$3.50. Pp. 420 with 285 illustrations. New York & London: Oxford University Press, 1935.

This edition contains additional material on the protozoa and on embryology. The book as a whole contains an account of invertebrates and vertebrates adapted to the needs of the pre-medical or medical student interested in acquiring a basic background in zoology. Aside from embryology and evolution, the principles of biology are touched on only in the accounts of the animals selected as representative types. The illustrations are numerous and carefully selected to augment the text. The work as a whole is a compact and condensed account of a few type animals selected because of their medical or evolutionary significance.

Sex Behavior in Marriage. By Charles A. Clinton M.D. Cloth. Price \$2. Pp. 150 with 8 illustrations. New York: Pioneer Publications, Inc. 1935.

Here is another contribution to the innumerable books now available in this field. It is a brief, simple statement, not nearly so technical or even as well written as many of the other books now available. However, it will no doubt find a certain number of purchasers, as have all the other volumes now available in this field.

The Determination of Iodine in Biological Substances. By C. O. Harvey. Medical Research Council Special Report Series No. 201. Paper. Price 1s. Pp. 43 with 3 illustrations. London: His Majesty's Stationery Office, 1935.

The significance of biologic iodine is widely appreciated. Consequently numerous analytic methods have been developed for its quantitative detection. Since it is usually minute in amount, these have long given varying results in the hands of different investigators. A standard method, so that data may be carefully compared, is certainly desirable. In this monograph the British Medical Research Council, after extensive investigations, presents its choice of an adequate micro-method. This is based on Hurlley's modification of the von Fellenberg procedure. The principles of this fundamental procedure, which has also been extensively developed in certain American laboratories, consist of (1) basic ashing in nickel crucibles, (2) alcoholic extraction of the iodide, and (3) titrimetric or colorimetric determination of the iodine. The author has thoroughly subjected the details of these principles to critical

chemical analysis. As a result he presents a standardized von Fellenberg technic. This is still tedious and hardly yet adapted to the clinical laboratory. Nevertheless, it has yielded gratifying comparative results in the hands of competent analysts. It represents a more accurate research instrument for the investigation of iodine metabolism.

Medicolegal

Malpractice Liability of Physicians for Anesthetizing a Minor Without Consent of Parents.—The plaintiff, 20 years of age, injured his ankle. He was taken to the defendant, a physician, for treatment, neither parent accompanying him. Without obtaining the consent of either parent, but with the minor's consent, the defendant anesthetized him with ether and proceeded to "set the ankle" and apply a cast. The plaintiff and his father subsequently sued the defendant in the city court of New York, Bronx County, to recover damages for alleged malpractice and for an assault predicated on the theory that the defendant anesthetized the plaintiff without obtaining the consent of his parents.

Where there is an emergency which endangers the life or health of a patient, or where suffering may be alleviated, said the court, it is a physician's duty to do that which the occasion demands within the usual and customary practice among physicians in the same locality. To hold that a physician must wait until he has obtained the consent of a minor's parents, who may not be available, before administering an anesthetic or before giving to an injured minor the benefit of his skill and learning to alleviate pain and suffering, might result in the loss of many lives and in much pain and suffering that might otherwise be prevented. Under the circumstances in the present case, the court thought that it would be altogether too harsh a rule to hold the defendant liable because he did not obtain the consent of the father to the administration of the anesthetic. Since the defendant was confronted with an emergency, and since he obtained the consent of his patient, the consent of the father was not necessary. The court could find no evidence of malpractice and consequently dismissed the complaint.—*Sullivan v. Montgomery* (N. Y.), 279 N. Y. S. 575.

Malpractice Death During Administration of Ethylene and Ether Anesthesia.—The physician defendant administered an anesthetic, consisting of a mixture of ethylene, ether, carbon dioxide and oxygen, while another physician removed the patient's appendix and drained her gallbladder. The operating physician in order to facilitate the closing of the incision requested a deeper anesthesia. As the oxygen supply was becoming rapidly depleted, a full tank of oxygen had to be installed, which required about five minutes, during which time the physician-defendant continued to administer the anesthetic. At about the time he began to administer the fresh supply of oxygen, the patient ceased to breathe and died. The plaintiffs, the husband and daughter of the deceased patient, sued the physician defendant. From a judgment in favor of the plaintiffs the physician appealed to the district court of appeal, second district, division 1, California.

The plaintiffs contended that the patient's death was caused by suffocation due to the physician-defendant's negligence in failing to administer a sufficient supply of oxygen in the anesthetic mixture. The physician-defendant contended that death resulted from heart failure and surgical shock unrelated to the anesthesia. The medical experts agreed that the symptoms of an overdose of ethylene gas are cyanosis appearing before death, labored, rapid and shallow breathing, and a drop in blood pressure following cessation of respiration, but that a drop in blood pressure prior to cessation of respiration would indicate a death caused by heart failure. The evidence showed that the symptoms preceding the patient's death were cyanosis following cessation of respiration, normal breathing up until cessation of respiration, and a drop in the systolic blood pressure five minutes preceding death from 135 to 105. The plaintiffs' only expert witness, an osteopath, in answer to a hypothetical question which assumed a normal blood pressure

during the anesthesia and omitted the last blood pressure reading, and which did not assume normal respiration up until cessation of respiration, testified that in his opinion death resulted from asphyxiation. The district court of appeals held that the hypothetical question was palpably deficient in that it omitted to state the last blood pressure reading and contained false hypotheses in assuming normal blood pressure during the anesthesia and in assuming normal respiration up until its cessation. The opinions of expert witnesses, said the court, based on hypothetical questions, are admissible if they are honest opinions predicated on facts established by the evidence. They are inadmissible if based on essential facts which are not given in evidence on facts which are directly contrary to the evidence, or on statements omitting important facts. A hypothetical question need not include all the facts testified to and it may assume facts most favorable to the theory of the party propounding it. There may be an allowable variation between the facts assumed and the actual facts proved, but the material facts assumed must be substantially true. Where the material facts on which the opinion is based are untrue the opinion itself becomes false, misleading and incompetent. The court held that the opinion of the plaintiffs' expert witness as to the cause of death was worthless, because it was based on false hypotheses and its admission was reversible error because it prejudiced the physician-defendant's case.

Accordingly, the judgment of the trial court was reversed.—*Forbis v. Holzman (Calif.)*, 45 P (2d) 215

Corporate Practice of Dentistry Illegal in Illinois—The Dr Allison, Dentist, Inc., the plaintiff in this action, entered into a contract with the defendant dentist wherein the latter agreed, according to the record, "that he would not practice operative dentistry for a period of three years at any place within two miles of the corporate location. Shortly thereafter the dentist opened a dental office directly across the street from the corporate dental parlors and the corporation sought to enjoin the violation of the agreement. The trial court, in denying the injunction, held that the plaintiff corporation was illegally practicing dentistry, that the corporation's only damage would arise out of competition in a line of business which it could not lawfully follow, and that therefore the petition of the corporation for an injunction did not appeal to the conscience of a court of equity. The corporation appealed to the Supreme Court of Illinois, contending that section 18a of the dental practice act which prohibits corporations from practicing dentistry, was unconstitutional.

The Supreme Court, however, considered it to be unnecessary to pass on the constitutional question. The gist of the corporation's complaint, and its claim to equitable relief, was based on damages alleged to be feared through the defendant's competition in practicing dentistry. The practice of a profession said the court, is everywhere held to be subject to licensing and regulation under the police power and not subject to commercialization or exploitation. To practice a profession requires something more than the financial ability to hire competent persons to do the actual work. It can be done only by a duly qualified human being and something more than mere knowledge or skill is essential to qualify. The qualifications include personal characteristics, such as honesty, guided by an upright conscience and a sense of loyalty to clients or patients even to the extent of sacrificing pecuniary profit if necessary. These requirements are spoken of generically as that good moral character which is a prerequisite to the licensing of any professional man. No corporation can qualify. It can have neither honesty nor conscience and its loyalty must in the very nature of its being be yielded to its managing officers, its directors and its stockholders. Its employees must owe their first allegiance to their corporate employer and cannot give the patient anything better than a secondary or divided loyalty.

The corporation in its complaint, stated that the dentist had acquired secrets and confidential information in regard to the patrons of the corporation. It might be well inquired said the court in whom are these personal secrets imposed when a corporation attempts to practice? Can it be in the president alone or is he under the corporate duty of disclosing them to his directors? And are the directors under

the further corporate duty of disclosing them to stockholders? This very allegation of the corporation clearly demonstrates, the court said the inappropriateness of any corporate attempt to practice one of the learned professions involving personal and confidential relations, and most clearly demonstrates that such practice is not and cannot be open to commercial exploitation. The corporate charter of the corporation, the court said did not and could not authorize it to practice dentistry, and the trial court quite properly dismissed the complaint.—*Dr Allison Dentist Inc v Allison (Ill.)* 196 N E 790

Malpractice Sponge Left in Patient—The appellant, a physician, performed an appendectomy on the appellee, June 19, 1931. During the course of the operation the physician discovered that the patient had gallstones, and a second incision several inches above the first was made and the gallstones were removed. The second incision healed quickly and normally. The lower wound continued to discharge pus and did not heal. About six months later, the physician removed from the appendectomy wound a gauze sponge. Thereafter the wound healed in about two weeks. The patient sued the physician and obtained judgment for \$9,896, from which the physician appealed to the Supreme Court of Oklahoma.

The physician argued that if he adopted and used the recognized and customary method of keeping track of sponges, he could not be considered negligent even if a sponge was left in the patient's body. While there is substantial authority, said the court to the effect that the leaving of a sponge in the body of a patient constitutes negligence per se the better rule is that a physician, like other persons is bound to exercise ordinary care to avoid injuring any one with whom he comes in contact. The fact that a physician adopts and uses the recognized and customary method of keeping count of sponges will not afford a complete shield from liability, if in fact a sponge is left in the patient's body. The real test is whether the physician, and the nurses acting under his authority, exercise ordinary care in keeping track of the sponges and seeing to it that they are all removed before the incision is closed. The fact that in the present case one of the nurses who was assigned the task of keeping count of the sponges might have made a miscount would not alter the situation. The physician admitted that the nurses were employed and directed by him and he would therefore be liable for their acts of negligence in connection with the operation.

The physician further contended that an instruction given by the trial court imposed on the jury the duty to segregate the injuries suffered by the patient due to the negligence of the physician in leaving a sponge in her body from her injuries due to the operation itself, and that there was no evidence to support such segregation. It was admitted, said the Supreme Court, that the incision made for the removal of the gallstones, where no sponge was involved healed promptly and completely, and that the other wound drained pus and caused the patient pain and suffering continuously until the sponge was removed. Under these circumstances the court said it would be unreasonable to say that there was no evidence of extra suffering on account of the sponge.

After reviewing all the evidence, it was the opinion of the Supreme Court that the question of the physician's negligence was properly submitted to the jury. There was, however no evidence either lay or expert, to support the plaintiff's allegation that her injuries were permanent. Up to the time the appendectomy wound healed there was objective evidence of suffering a part of which at least, could be attributed to the presence of the sponge. After the wound healed, her sufferings were largely subjective and both the continuance of such sufferings and their connection with the sponge would be matters to be established by expert testimony. There was no such testimony offered and whatever suffering the patient may have endured after the wound healed could not be charged to the fact that a sponge had been left in the body, except as a pure surmise. In the opinion of the court, it clearly appeared from the size of the verdict that the jury must have taken into consideration probable future suffering. There being no competent evidence to support a finding of future suffering, the verdict was excessive. The court ordered, therefore, that if the patient consented to a reduction of the verdict to \$5,000

the judgment of the trial court, as thus modified, would be affirmed. Otherwise the judgment would be reversed and the cause remanded for a new trial.

The patient's husband filed a separate suit against the physician to recover damages for expenses and loss of services of his wife due to the alleged negligence of the physician. The trial court gave judgment for the husband in the amount of \$734, and this judgment was affirmed by the Supreme Court of Oklahoma—*Aderhold v Stewart (Okla.)*, 46 P (2d) 340, *Aderhold v Stewart (Okla.)*, 46 P (2d) 346.

Workmen's Compensation Acts Physician as an Employee or Independent Contractor—The Goodman Medical Association, composed largely of the employees of the Goodman Lumber Company, was organized for the primary purpose of furnishing medical and hospital services to its members. Dr. Jacob Gomber entered into a written contract with the association to perform such services as a physician and surgeon as were required to be furnished by the Goodman Lumber Company and another company under the workmen's compensation act of Wisconsin, to testify in any case arising out of industrial accidents to be superintendent of a hospital maintained by the association, and generally to render medical care to members of the Goodman Medical Association. On Aug. 2, 1932, he was requested by the Goodman Lumber Company and the association to testify before the industrial commission. On the way to the hearing, he injured two fingers of his right hand when his automobile door closed on them. Infection set in, necessitating first an amputation of the middle finger and later on the amputation of his arm. He sought compensation under the workmen's compensation act, and from a judgment of the circuit court confirming the order of the commission denying compensation, he appealed to the Supreme Court of Wisconsin. Pending the appeal, he died and his administrator was substituted as plaintiff.

It is obvious, said the Supreme Court, that the examiner, the commission and the circuit court regarded the contract between the association and Dr. Gomber as requiring the latter to render only professional services. It has been generally held that the relation between a hospital and a physician employed by it is not that of master and servant. Physicians and surgeons employed by hospitals to minister to the sick and the infirm continue to be professional men who practice their profession according to their best judgment and discretion. While so practicing they are in no sense of the word subject to the orders or control of their hospital employers or bound in treating the sick to follow their directions. In a note in 19 A. L. R. 1183 it is stated:

The decisions of which the rationale is that physicians and surgeons are not the servants of their employers are referable to the conception that they are professional men who are engaged on the understanding that they are to exercise their profession to the best of their abilities according to their own discretion but in exercising it they are in no way under his (their) orders or bound to obey his (their) directions. This theory as to the nature of their position necessarily implies that they are independent contractors—a designation which has sometimes been specifically applied to them.

In this case, however, Dr. Gomber was employed to perform many duties that were not professional in character. He served as superintendent of the hospital. While so acting, his status was that of a servant. *Schloendorff v Society of New York Hospital*, 211 N. Y. 125, 105 N. E. 92, 52 L. R. A. (N. S.) 505, Ann. Cas. 1915C, 581. He also managed the hospital pharmacy and in that capacity bought and sold drugs for the association. He was required to attend hearings of the industrial commission in which employees of either the Goodman Lumber Company or another company were interested. His attendance on such hearings was clearly under the control of the association. The association had the authority to direct him where and when to go. The workmen's compensation act of Wisconsin defines employee to include " (4) Every person in the service of another under any contract of hire, express or implied. " This language, in the opinion of the court, was sufficiently broad to bring the facts of the present case within it and to impel the conclusion that Dr. Gomber's status at the time he was injured was that of an employee.

The judgment of the circuit court was reversed, with directions to reverse the order of the industrial commission and to return the record to the commission for further proceedings.—*Gomber v Industrial Commission (Wis.)*, 261 N. W. 409.

Accident Insurance Sunstroke an Accidental Injury, Delayed Demand for Autopsy—The insurance company promised to pay certain benefits under a policy insuring "against the effects resulting directly and exclusively of all other causes, from bodily injuries sustained solely through external, violent and accidental means." The insured, during the usual course of his employment, suffered a sunstroke and died. The company, contending that the death was not accidental, denied liability. The beneficiary obtained judgment in the trial court, and the company appealed to the Supreme Court of Oklahoma.

The Supreme Court, in denying the company's contention that a sunstroke does not constitute an accidental injury, said it was not inclined to depart from the holding in the case of *Continental Cas. Co. v. Clark*, 70 Okla. 187, 173 P. 453, wherein it was said:

That accidental means is used to denote accidental cause and in case of sunstroke, if the same was suffered while the insured was engaged in his usual avocation or going about his affairs in an ordinary manner as any other person might have been under like or similar circumstances and did not intentionally and voluntarily subject himself to an intense heat calculated to produce sunstroke with the knowledge that it would probably occur then the sunstroke was suffered from accidental means or accidental cause within the meaning of the policy.

The insurance policy in the present case contained a provision entitling the insurer to an autopsy in case of death where such procedure was not forbidden by law. The insurance company contended that it was denied the right to make the autopsy. The insured died on July 27, and notice of the death was received by the company August 2. The body was buried in Mississippi July 30. Nothing was said by the company with respect to an autopsy until September 10, when demand was first made. Coupled with this demand was a further request for permission to remove any specimen or specimens for chemical, microscopic, pathologic, laboratory or other examination. The request was refused as not being in accord with the terms of the policy and for the further reason that the request was not made within a reasonable time. No claim was made that an autopsy would have disclosed that the insured died of or from any cause other than sunstroke. There was, therefore, no showing whatever that the company was prejudiced by the refusal of the request for an autopsy. In fact, the beneficiary never did refuse an autopsy within the terms of the policy, because no request limited to such terms was ever made. No explanation was offered for the delay of some five or six weeks in requesting an autopsy. The court held that there was no merit in this contention by the company.

Finding no substantial error in the record, the judgment of the trial court for the beneficiary was affirmed.—*Provident Life & Accident Ins. Co. v. Green (Okla.)* 46 P (2d) 372.

Society Proceedings

COMING MEETINGS

Annual Congress on Medical Education, Medical Licensure and Hospitals Chicago Feb. 17-18 Dr. W. D. Cutter 535 North Dearborn Street Chicago Secretary

Eastern Section American Laryngological, Rhinological and Otolaryngological Society, Newark N. J. Jan. 3 Dr. Henry B. Orton 24 Commerce St., Newark N. J. Chairman

Middle Section American Laryngological, Rhinological and Otolaryngological Society Milwaukee Jan. 11 Dr. William E. Grove 324 East Wisconsin Avenue Milwaukee Chairman

Midwestern Section American Laryngological, Rhinological and Otolaryngological Society St. Louis Jan. 15 Dr. Harry W. Lyman Carleton Building St. Louis Chairman

Society of Surgeons of New Jersey Jersey City Jan. 15 Dr. Walter B. Mount 21 Plymouth St. Montclair Secretary

Southern Section American Laryngological, Rhinological and Otolaryngological Society Jackson Miss. Jan. 18 Dr. Robin Harris Lamar Building Jackson Miss. Chairman

Western Section American Laryngological, Rhinological and Otolaryngological Society Del Monte Calif. Feb. 12 Dr. Carroll Smith Paulsen Building Spokane Wash. Chairman

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

10 849 994 (Oct.) 1935

The Production of Collateral Circulation to the Heart. I. Experimental Study. C. S. Beck and V. L. Tichy, Cleveland—p. 849.
Id. II. Pathologic Anatomic Study. A. R. Moritz and C. S. Beck, Cleveland—p. 874.

*Precordial Lead of Electrocardiogram (Lead IV) as Aid in Recognition of Active Carditis in Rheumatic Fever. R. L. Levy and H. G. Bruenn, New York—p. 881.

Form of Electrocardiogram in Experimental Myocardial Infarction. II. Early Effects Produced by Ligation of Anterior Descending Branch of Left Coronary Artery. F. D. Johnston, I. G. W. Hill and F. N. Wilson, Ann Arbor, Mich.—p. 889.

Id. III. Later Effects Produced by Ligation of Anterior Descending Branch of Left Coronary Artery. F. N. Wilson, I. G. W. Hill and F. D. Johnston, Ann Arbor, Mich.—p. 903.

Cerebral Blood Flow in Man as Influenced by Adrenalin, Caffeine, Amyl Nitrite and Histamine. F. A. Gibbs, E. L. Gibbs and W. G. Lennox, Boston—p. 916.

The Precordial Electrocardiogram. I. Potential Variations of the Precordium and of Extremities in Normal Subjects. C. E. Kossmann, New York and F. D. Johnston, Ann Arbor, Mich.—p. 925.

Electrocardiographic Abnormalities Characteristic of Certain Cases of Arterial Hypertension. H. E. Rykert and J. Hepburn, Toronto—p. 942.

Mortality Rates of Organic Diseases of the Heart by Geographic Areas in the United States. C. C. Dauer, New Orleans—p. 955.

Modification of Wiggers' Dean Method of Recording Heart Sounds Using Audio Amplification. H. A. Sacks, H. Marquis and B. Blumenthal, Chicago—p. 965.

Lead 4 in Carditis in Rheumatic Fever.—Levy and Bruenn state that if successive electrocardiograms are taken in rheumatic fever, lead 4 may furnish evidence of active carditis when changes indicating active myocardial involvement are not observed in the standard three leads. Frequently gross variations in the contour of lead 4 indicate the significance of minor alterations in the three standard leads which might otherwise be regarded as of doubtful importance. This statement applies particularly to slight changes in the T wave in lead 3. On occasion, changes denoting rheumatic lesions in the cardiac muscle are present in the first three leads when no change is apparent in lead 4. In ambulatory patients with rheumatic heart disease, a single electrocardiogram may reveal evidence of myocardial damage only in lead 4. On the basis of a single record however it is not possible to establish the presence of rheumatic activity in the heart. Changes in the electrocardiogram characteristic of myocardial involvement were found in five patients whose hearts at necropsy showed lesions of active rheumatism. In two patients in whom active rheumatic carditis was suspected during life but was not found at necropsy, the electrocardiograms were normal. In rheumatic fever the use of lead 4 is of clinical value as an aid in the recognition of active myocardial involvement and in following its course.

Electrocardiographic Changes in Arterial Hypertension.—Rykert and Hepburn point out that in the course of an investigation into the serial electrocardiographic changes following acute coronary occlusion one of them found cases showing abnormalities of the ventricular complexes (QRST) of an unusual type. In certain respects the abnormalities observed in the records of these cases simulated and in other respects differed from the typical electrocardiographic changes found in myocardial infarction. Without exception these atypical records showed an identical type of electrocardiographic abnormality. A diagnosis of coronary thrombosis had been made largely on this electrocardiographic abnormality. The clinical histories while in some cases suggestive in practically all gave only inconclusive support to that diagnosis. Of 143 patients in the series, 124 had arterial hypertension at the time

the electrocardiographic records were obtained. The patient who had a systolic blood pressure of 160 mm of mercury or higher was considered to have arterial hypertension. Eighty-three had a systolic pressure of 200 mm of mercury or more, and in forty-one cases the systolic pressure varied between 160 and 200 mm of mercury. The diastolic pressure readings were correspondingly high. In the other nineteen cases the systolic pressure was found to be less than 160 mm of mercury. A diagnosis of myocardial disease was made in all cases. Of the 143 patients 126 had chronic degenerative heart disease. The size of the heart was determined accurately in eighty-three cases by means of orthodiagrams and in the remainder by percussion. Moderate to marked cardiac enlargement was present in seventy-three and enlargement of slight degree was present in the other ten. Objective evidence of cardiac insufficiency, i. e., rales at the base of the lung, enlargement of the liver and dependent edema was found in eighty-two cases and was more often of moderate than of marked degree. In the remainder congestive failure occurred with a normal heart rhythm. A diagnosis of endocardial disease was made in twenty-nine of the 143 cases. It was found in eleven of the nineteen cases in which the systolic blood pressure was less than 160 mm of mercury and in only eighteen of 124 cases in which hypertension was present. Aortic valve disease, either alone or combined with mitral lesions, occurred in twenty-seven of the twenty-nine patients who were found to have endocardial disease, and two had mitral stenosis.

American Journal of Ophthalmology, St. Louis

18: 903 1002 (Oct.) 1935

Uveal Sarcoma Malignant Melanoma. Statistical Study of Ninety Four Cases. T. L. Terry and Juanita P. Johns, Boston—p. 903.

Measurement (Roentgenometry) of Anteroposterior Diameter of Eyeball in Situ Correlated with Micrometer Measurement Following Enucleation. D. Katz and A. C. Ledoux, Chicago—p. 914.

Congenital and Acquired Deficiencies of Fusion. A. Bielschowsky, Breslau, Germany—p. 925.

Ocular Complications in Neuroblastoma. P. J. Ienfelder, Iowa City—p. 938.

Strabismus in Children Corrected by Refraction Alone. G. P. Cuthbert, Chicago—p. 944.

Bacillus Pyocyaneus Infection of the Eye. Report of Two Cases. W. W. Lanou, Iowa City—p. 950.

Trachoma as an Endemic Disease in Egypt. F. Massoud, Cairo, Egypt—p. 952.

Archives of Neurology and Psychiatry, Chicago

34 931 1132 (Nov.) 1935

Electrical Stimulation of Points in Forebrain and Midbrain Resultant Alterations in Blood Pressure. H. Kabat, H. W. Magoun and S. W. Ranson, Chicago—p. 931.

Volume of Blood in Normal Subjects and in Patients with Schizophrenia. J. M. Looney and H. Freeman, Worcester, Mass.—p. 956.

Tumors of Corpus Callosum. Pathologic and Clinical Study. II. C. Morris, Chicago and A. W. Adson, Rochester, Minn.—p. 965.

Effect of Extract of Adrenal Cortex on Experimental Neurosis in Sheep. H. S. Liddell, O. D. Anderson, E. Kotyuka and F. A. Hartman, Ithaca, N. Y.—p. 973.

*Possible Relation of Lead Intoxication to Multiple Sclerosis. B. Boshes, Chicago—p. 994.

Relationship of Unconsciousness to Cerebral Blood Flow and to Anoxemia. W. G. Lennox, F. A. Gibbs and E. L. Gibbs, Boston—p. 1001.

Can the Problem of Neuroses Be Formulated More Concisely? O. S. English, Philadelphia—p. 1014.

Experimental Convulsions Induced by Administration of Thujone. Pharmacologic Study of Influence of Autonomic Nervous System on These Convulsions. H. M. Keith and G. W. Stavsky, Montreal—p. 1022.

Visceral and Referred Pain. L. J. Pollock and I. Davis, Chicago—p. 1041.

Removal of Left Cerebral Hemisphere. Report of Case. R. Zollinger, Boston—p. 1055.

Lead Intoxication and Multiple Sclerosis.—Boshes analyzed specimens of cerebrospinal fluid from twenty-eight patients for lead by the Fairhall hexanitrite method. In one of sixteen cases of multiple sclerosis the fluid showed a positive result. The patient had been given sodium iodide, and the urine also showed lead. Of twelve other cases of various conditions in which one case of lead intoxication were abundant crystals found in the cerebrospinal fluid. In this case there was 0.2 mg. of lead per liter of urine. Taking all three studies into consideration there is no adequate proof for and ample evidence against the theory that lead is an etiologic agent in cases of multiple sclerosis.

Removal of Left Cerebral Hemisphere—Zollinger removed the left cerebral hemisphere because of extensive infiltration by a tumor in a right-handed woman. During the seventeen days that she survived, an elementary vocabulary was retained, which was partially increased by training in speech. It was difficult to evaluate the mental capacity of the patient. She was more calm after operation but was less willing to perform coordinated movements. She did experience emotional reactions, but they were not marked. The functions of the cranial nerves were well preserved except for slight weakness of the right side of the face and absence of the corneal reflex on the left. The spastic paralysis on the right side was replaced by flaccid paralysis. The presence of acute pain with motion of the joints or compression of the deep muscles demonstrated the existence of a center of sensation below the cortex. Studies of the vasomotor responses of the extremities by determinations of skin temperature did not show measurable alterations in peripheral temperature regulation on either the ipsilateral or the contralateral side.

Archives of Ophthalmology, Chicago

14: 699-878 (Nov.) 1935

- Results of Cervical Sympathectomy in Pigmentary Degeneration of the Retina F B Walsh and Louise L Sloan Baltimore—p 699
The Reattached Retina Physiologic Ophthalmoscopic and Microscopic Observations and Comparisons E B Spaeth Philadelphia—p 715
*Survey of Cases of Sympathetic Ophthalmia Occurring in New York State H H Joy Syracuse N Y—p 733
Albrecht von Graefe Founder of Modern Ophthalmology His Life and Works C A Perera New York—p 742
The Problem of the Crystalline Lens B L Gordon Atlantic City N J—p 774
Structure of the Vitreous J S Friedenwald and R D Stuehler, Baltimore—p 789
Two Different Fundus Pictures in Metastatic Choroidal Carcinoma Clinicopathologic Study J W Smolero and S A Agatston, New York—p 809

Sympathetic Ophthalmia in New York State—Joy points out that sympathetic ophthalmia occurs less frequently than its diagnosis, since uveitis due to other causes, especially that due to tuberculosis, may give a similar clinical picture. A routine microscopic examination of the enucleated exciting eye is indicated if only for its statistical value. In 151 cases in which the clinical features of sympathetic ophthalmia were present, 126 exciting eyes were enucleated, forty-eight of which were examined microscopically in all but seven the diagnosis was confirmed. The forty-one cases in which the diagnosis was established showed a higher percentage of final visual defects than did the cases in which no microscopic examination was made. Pathologic examination would eliminate the question of correct diagnosis. Analysis of the forty-one confirmed cases indicates that: 1 The frequency of sympathetic ophthalmia is not decreasing. 2 Nonpenetrating trauma may not be a rare exciting cause. 3 Sympathetic ophthalmia due to cataract extraction is unusually violent and the prognosis grave. 4 The interval between injury to the exciting eye and the onset of sympathetic inflammation may vary from nine days to twenty-four years or possibly to forty-eight years. 5 Sympathetic ophthalmia may be feared for at least two months after enucleation of the exciting eye. 6 Removal of the exciting eye before the onset of sympathetic inflammation does not favorably influence the ultimate outcome if the enucleation is delayed twenty-six days or more after the injury. 7 Sympathetic ophthalmia in children is unusually severe and the outcome unfavorable. 8 Removal of the exciting eye favorably influences the ultimate outcome in the sympathizing eye.

Canadian Public Health Journal, Toronto

26: 469-522 (Oct.) 1935

- Diphtheria Toxoid Comparison of One Dose of Alum Precipitated with Three Doses of Unmodified Toxoid D T Fraser and K C Halpern Toronto—p 469
Serial Titrations of Diphtheria Antitoxin Following Toxoid D T Fraser and K C Halpern Toronto—p 476
Communicable Disease as Administered by the Department of Pensions and National Health C P Brown Ottawa—p 482
The Present Antituberculosis Program in Ontario D W Crombie London Ont—p 486
Provincial Program for Control of Tuberculosis W J Dobbie, Weston Ont—p 494

Colorado Medicine, Denver

32 865-952 (Nov.) 1935

- Specific Treatment of Various Streptococcal Infections with Human Convalescent Serum H L Baum Denver—p 876
Immune Blood and Serum in Prophylaxis and Active Treatment of Measles and Scarlet Fever R H Verploeg Denver—p 881
Use of Serum in Treatment of Erysipelas O S Philpott Denver—p 883
Theory of Convalescent Serum Therapy Frances McConnell Denver—p 884
Medical Russia N Mume Denver—p 890
Ectopic Pregnancy M Weiner Denver—p 894
*Stream Pollution B V Howe Denver—p 897
Proposed Device Which Is Capable of Continuously Indicating Approximate Percentage of Carbon Dioxide in Stream of Flowing Gases Circulation of Irritant Dust of Soda Lime Within Modern Gas Machine W B Draper and B B Longwell, Denver—p 899

Stream Pollution—Howe speaks of a triple threat in stream pollution: it is a direct menace to health by rendering water supplies dangerous and unfit to drink, it threatens many recreation spots on the shores of lakes and streams by making bathing dangerous, and streams may become periodically so offensive that property values in the vicinity are depreciated. Natural cleansing processes are effective to only a limited extent. Typhoid dysentery and infectious diarrhea are filth diseases transmitted through human excreta. Water contaminated by sewage carries the bacteria of these diseases. Edibles that have been irrigated with this contaminated water are a means by which these diseases may be transmitted. The importance of cleaning up streams cannot be overestimated. Dwellers near streams have the fundamental right to receive the water coming to them in its natural purity, and their obligation is to pass it on to their neighbors unimpaired in quality.

Journal of Nervous and Mental Disease, New York

82: 373-496 (Oct.) 1935

- Trophic Lesions in Multiple Sclerosis C M Byrnes Baltimore—p 373
Group Therapy and the Psychiatric Clinic L C Marsh Tucson Ariz.—p 381
Visual Fields Defects as Deciding Diagnostic Factor in Lesions of Temporal Lobe Simulating Cerebellar Involvement A Gordon, Philadelphia—p 394
Personality Studies in Thirty Migraine Patients Preliminary Report Olga Knopf New York—p 400
Amyotrophic Lateral Sclerosis Syndrome and Trauma S E Jelliffe New York—p 415

Journal of Thoracic Surgery, St. Louis

5 1112 (Oct.) 1935

- Some Dramatic Thoracic Operations J Alexander Ann Arbor, Mich.—p 1
Recurrence of Bronchiectasis Following Mass Ligation of Hilus of Lobe Report of Case with Comment on Certain Technical Points Pertaining to Lobectomy H L Beye Iowa City—p 18
Pedicled Muscle Flap in Closure of Persistent Bronchopleural Fistula with Description of Preservation and Employment of Intercostal Muscle Bundles by Process of Ribboning (for Avoidance of Abdominal Hernia) in Obliteration of Large Chronic Empyema Cavities O H Wangersten Minneapolis—p 27
*Pneumonectomy for Malignant and Suppurative Disease of Lung Report of Eight Cases R H Overholt, Boston—p 54
Evaluation of Interpleural Adhesions by Oblique Roentgenography with Reference to Intrapleural Pneumolysis in Pulmonary Tuberculosis C Haight and C B Pearce Ann Arbor Mich—p 83
Pneumothorax by Open Operation F Torek New York—p 90
Bronchoscopy in Diagnosis of Asthma Complicating Pulmonary Tuberculosis D H Ballon, Montreal—p 103

Pneumonectomy for Malignant Disease of Lung—Within the last eighteen months, Overholt operated on thirteen patients for carcinoma of the lung. Metastatic involvement was found on exploration in seven patients, and pneumonectomy was carried out in six patients with three recoveries. Two additional successful pneumonectomies have been performed on patients with suppurative disease of the lung, giving a total of five successful operations. In the patients with suggestive symptoms or a suspected primary malignant condition of the lung he employs chest roentgenograms, bronchoscopy, a search for metastasis including roentgenograms of the long bones, skull and spine, evaluation of the operative risk, preliminary pneumothorax and intrapleural thoracoscopy to determine, if possible, the presence or absence of pleural or mediastinal metastasis. It has been his policy (1) to explore all cases of proved carcinoma of the lung if an extension beyond the lung cannot be

demonstrated by the foregoing methods, provided the general condition is fair, and (2) to explore in the face of a negative bronchoscopic report if the history and roentgenograms suggest a peripheral neoplasm

Kansas Medical Society Journal, Topeka

38 441-484 (Nov.) 1935

- Differential Diagnosis of Coronary Artery Disease A C Erastene Cleveland—p 441
Surgical Treatment of Obstructing Lesions of Biliary Tract W Walters Rochester Minn—p 446
Embolism of Extremities R A McIlhenny R C McIlhenny Conway Springs and K E Voldeng Wellington—p 450
Mental Injury W M Brewer Hays—p 457

Military Surgeon, Washington, D C

77 239 294 (Nov.) 1935

- Gunshot Wounds of Liver J W Davis—p 239
Traumatic Rupture of Renal Pedicle with Many Complications Report of Case with Recovery J A Bethea and W L Peterson—p 253
Relation of Insects to Disease Notes W A Riley—p 256
*Hematemesis Diagnostic Significance and Treatment L L Gardner—p 267
Diverticula of Appendix Case Each of True and False Varieties L B Kline—p 275
Cerebral Malaria While Receiving Atabrine Case Report H E Fraser—p 279
Mushroom Poisoning T L Gore and E J Tracy—p 281

Diagnostic Significance and Treatment of Hematemesis—Gardner groups the causes of hematemesis under the three headings of intrinsic gastroduodenal or jejunal lesions, varices and infrequent causes, and he states that 90 per cent of all cases of hematemesis are due to intragastric lesions. Moderate hemorrhage late in the course of chronic dyspepsia suggests gastric ulcer. Severe hemorrhage early in the course of chronic dyspepsia suggests duodenal ulcer. Slight hemorrhage in the course of chronic dyspepsia in a patient in the cancer age suggests carcinoma of the stomach. Profuse or fatal hemorrhage without any history of indigestion or illness suggests cirrhosis of the liver. Profuse hemorrhage with obvious splenic enlargement suggests splenic anemia. If the hemorrhage is not due to any of the conditions enumerated, less frequent and more obscure causes must be sought. The treatment of hematemesis, particularly that from peptic ulcers, is medical. Transfusions should be employed as indicated.

Missouri State Medical Assn. Journal, St. Louis

32 425 460 (Nov.) 1935

- Tumors of Head of Pancreas Value of Cholecystenterostomy W T Coughlin and J M McCaughan, St. Louis—p 425
Diagnosis and Management of Cancer of Stomach C J Hunt Kansas City—p 431
Adrenal Hypercortical and Hypermedullary Syndromes A A Werner St. Louis—p 434
Pulmonary Tuberculosis Associated with Valvular Heart Lesions W W Buckingham and J S Hoffman Kansas City—p 438
Pneumothorax Treatment of Lobar Pneumonia J J Hammond and R L Smith, St. Louis—p 441
Genito-Urinary Infections A L Osborn Kansas City—p 444
Urologic Findings in General Practice A Van Ravenswaay Boonville—p 448
Pregnancies After Nephrectomy for Tuberculosis E Lissack Concordia—p 450

Pulmonary Tuberculosis and Valvular Heart Lesions—Buckingham and Hoffman state that recent observations have shown that the view of Rokitsansky that tuberculosis of the lung and heart disease do not occur together is untenable and that association of phthisis with primary heart disease is probably more common than is usually suspected. Lawason Brown in 7,115 necropsies on tuberculous patients found 0.9 per cent of valvular heart disease. Norris in 8,154 necropsies found 3.5 per cent. Anders reports six cases of mitral disease with pulmonary tuberculosis, and Bronfin and Simon on the clinical examination of 2,100 tuberculous patients found approximately 6 per cent with valvular lesions chiefly mitral insufficiency and stenosis, with varying degrees of cardiac symptoms. However the views of Rokitsansky are held by many competent observers. Five cases of pulmonary tuberculosis are presented three of rheumatic heart disease with mitral involvement and two with congenital heart disease which occurred in a series of 522 cases of adult pulmonary tuberculosis treated at the Kansas City Tuberculosis Hospital during the last two years.

New England Journal of Medicine, Boston

213 841 892 (Oct 31) 1935

- New Method of Calculating Discharge Rates in Mental Diseases with Especial Consideration of Age Factor N A Dayton Boston—p 841
Hemoptysis in Trichiniasis L J Goldwater, I Steinberg New York H Most London England and J E Connery New York—p 849
Uncinariasis and Appendicitis M K King Savannah Ga—p 851
Cataracts and Diminutophenol D G Cogan and Frances C Cogan, Boston—p 854
Electrosurgical Appendectomy L R Whitaker Boston—p 856
Primary Abscess of Omentum R W French Fall River Mass—p 857
Role of Peripheral Circulatory Failure in Clinical Medicine D W Atchley New York—p 861
Economic and Social Aspects of Socialized Medicine I Galdston, New York—p 868
Memories of a Great Physician Dr Frederick C. Shattuck of Boston J B Hawes 2d Boston—p 873

New Orleans Medical and Surgical Journal

SB 265 334 (Nov.) 1935

- The Universal Challenge Ewing Fox Howard Oration G S Bryan Amory Miss—p 265
Popular Beliefs and Superstitions About Eyes C A Bahn New Orleans—p 270
*Inoculation and Sanitation in Control of Typhoid Fever D V Galloway Meridian Miss—p 278
Value of Blood Coagulation G E Adkins Jackson Miss—p 287
So-Called Agranulocytic Angina with Especial Consideration of Causal Agents W H Harris and H J Schattenberg New Orleans—p 288
Right Side of Heart in Pulmonary Diseases L Hart Meridian Miss—p 293
Lipiodol and Some of Its Uses in Surgery O J Bienvenu Opelousas La—p 295
Bacteriology of and Experimental Work in Focal Infections G F Fasting New Orleans—p 298

Control of Typhoid—Galloway points out that typhoid vaccine given in adequate dosage to groups of people at an effective rate of 25,000 cc per hundred thousand persons annually or more will influence the typhoid case rate and, if given to more than 90 per cent of the population will control it. Sanitation alone will greatly reduce typhoid and in conjunction with other aids will control it. The carrier is the source of infection in an increasing proportion of the total cases as control measures become effective, case to case infection is relatively easy to prevent. Mass typhoid immunization should be abandoned and selective immunization used as soon as a stable low case rate is attained. Selective immunization is aimed to protect those known to be in especial danger from cases or carriers or from environmental factors. Complete epidemiologic study of cases is difficult while the case rate is high, but records of such a study may be prepared as soon as the case rate is reduced by vaccination or other factors. Final reliance for typhoid control in an area should rest on intensive case and carrier work and sanitation, meaning sanitation in its broadest aspects of ensuring good personal hygiene. Lauderdale County has apparently reached a low stable incidence of typhoid and is ready to reduce mass immunization in favor of selective immunization, sanitation and intensive case and carrier control. Mississippi is probably ready to reduce mass immunization gradually as a policy in counties with full time service, as a low stable typhoid case rate has been attained. However, this can be done only if intensive epidemiologic study and control of cases and carriers is instituted and maintained and a high degree of sanitation is reached.

Ohio State Medical Journal, Columbus

31: 817 904 (Nov 1) 1935

- Appraisal of Organized Medicine in Ohio Annual Address of the Retiring President J A Caldwell Cincinnati—p 833
Organized Medicine and the Individual Physician Inaugural Address of the Incoming President R R Hendershott Tiffin—p 837
Treatment of Diabetes in Children M Deitchman Youngstown—p 844
Some Effects of Upright Position of Humans on Pregnancy Parturition and Puerperium A Rogers Columbus—p 847
*New Treatment for Chronic Ulcers of Leg and Foot C H Verovitz Cleveland—p 850

Treatment for Chronic Ulcers of Leg—It occurred to Verovitz that breaking up of the fibrotic ring or sclerosed tissue surrounding ulcers (lifting the ulcer from its bed) and injecting a fresh supply of nourishing material, as blood, are needed for the healing of these ulcers. This he accomplishes by injecting patient's whole blood in the margin near the ulcer. In giving the injections, the ulcer and the edges surrounding the area are

cleansed with alcohol. A 2 per cent solution of iodine is painted over the area where the injection is given. A 10 cc Luer syringe, with a 23 or 24 gage needle from 1 to 1½ inches in length, is employed. About 10 cc of blood is taken from any of the veins at the bend of the elbow and is immediately injected in the ulcer. The injection is started one-fourth inch from the edge of the ulcer. The needle is inserted until it passes the resistant fibrotic area. The blood is slowly injected while the needle is gradually withdrawn. Sometimes one injection is given at a sitting, or multiple injections up to four have been given from one-fourth to one-half inch apart, depending on the size of the ulcer. In the first treatment the injections are started near the edges, and in the next treatment one-fourth inch nearer the center of the ulcer and so on. In some cases the entire circumference was injected. In the beginning this procedure is frequently painful, and it is advisable to anesthetize the ulcer with a 2 per cent solution of procaine hydrochloride near the edges. Considerable force will be found necessary in order to penetrate through the sclerosed area. In the beginning of the treatment little bleeding is noticed from the needle puncture, but when new blood vessels and granulations begin to form bleeding becomes free. The treatment is repeated once a week until the ulcers show signs of healing, and then the injections are discontinued. The number of injections varies with the size and chronicity of the ulcer and with the extent of fibrosis in the surrounding area. Every two days the ulcer is cleansed with alcohol and dried and 2 per cent mercuriochrome is applied the latter having some astringent properties. The ointment giving the best results is enough 10 per cent gentian violet applied on gauze to cover the ulcer. The clinical course of the healing of the ulcer appears as follows. The edges soften, bleeding from the needle puncture is free, and pink and healthy granulations appear at the base and edges. A seam of epithelium grows from the periphery toward the center of the ulcerated area. Sections taken from the healing ulcer show the base clean and free from necrotic material the infiltration diminished and rete pegs spreading over the edge. Normal vessels with a single row of endothelial lining appear instead of the thrombosed infiltrated capillaries.

Surgery, Gynecology and Obstetrics, Chicago

61: 585-712 (Nov.) 1935

- Experimental Production of Cholesterosis of Gallbladder with Observations on Cholesterol Absorptive Properties of Gallbladder Wall. I. M. Rousselot and L. Bauman. New York—p. 585.
- The Intervertebral Disk. Embryology, Anatomy, Physiology and Pathology. R. J. Joplin. Boston—p. 591.
- Gastrojejunal Ulcer and Gastrojejunal Colic Fistula. F. H. Lahey and N. W. Swinton. Boston—p. 599.
- Treatment of Acute Fetal Hemorrhage by Injection of Artificial Blood Substitutes. Comparative Study of Artificial Blood Substitutes. A. W. J. H. Hoitink. Utrecht, Holland—p. 613.
- Hypertonic Wet Dressing. Experimental Study. T. W. Taylor. Indianapolis—p. 623.
- Colostomy of Transverse Colon. T. Clenn. New York—p. 629.
- Kraurosis Vulvae (Leukoplakia) and Scleroderma Circumscripta. Comparative Histologic Study. L. W. Ketron and F. A. Ellis. Baltimore—p. 635.
- Transduodenal Resection of Ampulla of Vater for Carcinoma of Distal End of the Common Duct with Restoration of Continuity of Common and Pancreatic Ducts with Duodenum. V. C. Hunt and J. W. Budd. Los Angeles—p. 651.
- Complete Excision and Reconstruction of Both Achilles Tendons for Giant Cell Xanthoma. F. Young and C. T. Harris. Rochester, N. Y.—p. 662.
- Acute Inflammation of Pancreas. Cause of Epigastric Pain in Gallbladder Disease and of Recurrent Pain After Cholecystectomy. R. Elman. St. Louis—p. 670.
- Treatment of Senile Vaginitis with Ovarian Follicular Hormone. M. E. Davis. Chicago—p. 680.
- Ferric Chloride Coagulation in Treatment of Burns with Résumé of Tannic Acid Treatment. G. L. Coan. Wyandotte, Mich.—p. 687.
- Massive Resection of Small Intestine. Analysis of Two Hundred and Fifty Seven Collected Cases. H. E. Haymond. Midwest, Wyo.—p. 693.

Treatment of Hemorrhage by Injection of Blood Substitutes.—Hoitink compared several artificial blood substitutes to determine their action in acute dangerous hemorrhages. For that purpose fatal hemorrhages that were biologically equivalent were produced in dogs to discover whether the dog's life could be saved by the injection of blood substitutes into the blood stream. In addition a study was made of the influence of the infusion fluids on the blood, and of the hemorrhage and sub-

sequent infusion of substitutes on the urine and sodium chloride excretion. It was found that none of the infusion liquids gave better results than the sodium chloride solution. The injection into a vein of a 0.9 per cent solution of sodium chloride after an acute dangerous hemorrhage is preferable to the use of other artificial substitutes and to blood transfusion.

The Hypertonic Wet Dressing.—Taylor shows that the amount of fluid that can be withdrawn by a hypertonic solution from 1 square inch of wound surface is from 12 to 15 cc an hour. This amount varies between these figures regardless of the hypertonicity or nature of the solution. In general the more concentrated solutions gave the higher figure, but to all practical purposes they were identical. This at least held true for solutions with a hypertonicity between 3 and 23 (2.5 and 20 per cent sodium chloride). The values given are maximal for the animals used. They represent figures for new wounds with vascular muscle bases. In older wounds that had started to granulate, with surfaces partly covered by fibrin, the values varied to a considerable extent in different animals and were found to be lower. The fluid withdrawn by a hypertonic solution is water and not serum similar to that seen in burns. It contains only the amount of protein material that would normally diffuse from the wound. There is no increment of this caused by the hypertonic solutions. The value of this withdrawal seems to the author to be debatable for after the initial dehydration of the surface tissues, the continued outpouring comes from the blood vessels themselves and is dependent on the vascularity of the area. In the light of the author's experiments on wet dressings, an effective hypertonic solution reaches only the superficial tissue. That the deeper tissues containing the active infection cannot possibly be reached by the solution is evident. The chief benefit derived from this type of dressing is its poulticing action. This keeps the skin soft and pliable. It prevents crusting and allows drainage. Above all, it soon becomes warmed by the body and this markedly increases the flow of capillary blood, thus improving the defense mechanism against infection. Bearing out this contention is the fact that isotonic saline and even hypotonic solutions (1:5,000 mercury bichloride) have been seen to give the same beneficial effects noted in hypertonic solutions.

Kraurosis Vulvae and Circumscribed Scleroderma.—Ketron and Ellis state that kraurosis vulvae (leukoplakia of the vulva) shows in a considerable percentage of cases peculiar degenerative changes in the connective tissue identical in appearance with those characteristic of white spot scleroderma. They believe that some cases at least which are diagnosed leukoplakia are examples of white spot scleroderma of the vulva. Here the characteristic degenerated collagenous bundles may be entirely replaced by secondary inflammatory and sclerotic tissue owing to various local irritants. It is possible also that the vulvar tissue is peculiarly susceptible to degenerative processes in the connective tissue and that, in some cases, these changes may be only incidental to various inflammatory processes in this location. Leukoplakia of the vulva (clinically whitish patches) may be produced either by degenerative processes in the connective tissue, maceration of a hyperkeratotic epidermis, or a combination of the two. Leukoplakia of the vulva (histologically acanthosis and hyperkeratosis) probably is frequently superimposed on various pathologic processes of the vulva whether primarily of a degenerative or an inflammatory nature.

Treatment of Vaginitis with Estrogenic Substance.—Davis observed that the use of an estrogenic substance, amniotin (Squibb), in the treatment of senile vaginitis rapidly restores the normal adult epithelium seen during active sex life. The simple restoration of the epithelium leads to a healing of the ulcerated areas, a disappearance of the inflammatory symptoms, a cessation of the adhesive manifestation and a complete disappearance of all symptoms. No undesirable effects have been noted, nor can they occur during the postmenopausal period. Although the vaginal mucosa reverts to the normal senile type, the symptoms do not recur. Interesting biopsy specimens showing all the changes initiated by the estrogenic substance in the vaginal mucosa are presented. The treatment is simple, inexpensive and entirely feasible. The biopsy method of study can be used as an aid in all endocrine studies in the human female.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Anaesthesia, Manchester

13 140 (Oct.) 1935

Second Embley Memorial Lecture Delivered at Melbourne University
Z. Mennell—p. 3

*Paraldehyde Idiosyncrasy Report of Case G. Brown—p. 25
Anesthesia Its Present and Future W. S. Sykes—p. 28

Idiosyncrasy to Paraldehyde—Brown reports a case of paraldehyde idiosyncrasy in which prolonged deep unconsciousness took place after a dose of only 4 drachms (16 Gm.) There was complete loss of reflexes, even that of the eyes to light and the corneal reflex, very little depression of blood pressure, rapid respiration, rise of temperature, diminished air entry at bases and probably paraldehyde idiosyncrasy combined with some collapse of the bases of the lungs.

British Journal of Radiology, London

S 669 732 (Nov.) 1935

Leukocytic Variations in Radium Workers (Part I) D. R. Goodfellow—p. 669

Distribution of Radiation in Deep X-Ray Therapy H. M. Parker and Joan Honeyburne—p. 684

Rare Cause of Intracranial Calcification Tuberos Sclerosis C. Macdonald—p. 697

Measurement in Röntgens of Distribution in Water of Intensity of Radiation from a 3 Gm. and a 4.9 Gm. Radium Unit L. G. Grimmett and J. Read—p. 702

Two Unusual Aneurysms P. Kerley—p. 714

Effect of High Frequency Field on Experimental Rat Tumors with Especial Reference to So Called Specific Effect H. J. Taylor—p. 718

Further Note on Speedier Production of Finished Radiograph A. E. Barclay—p. 722

Edinburgh Medical Journal

42 569 632 (Nov.) 1935

Histologic Study of Normal Mammary in Relation to Tumor Growth II. Mature Gland in Pregnancy and Lactation E. K. Dawson—p. 569

*Pneumonia and Other Common Respiratory Conditions in the New Born Clinical Study W. S. Craig—p. 599

Pneumonia in Infants—Craig correlates the clinical and pathologic results of 146 necropsies on new-born infants presenting some of the common respiratory conditions. In many infants the lungs are healthy and well expanded, simple atelectasis is a frequent observation, bronchitis occasionally occurs alone, and consolidation is common and may result from pneumonia or/and hemorrhage. Inflammation and hemorrhage are frequently found in atelectatic tissue. Respiratory conditions are particularly prone to occur in premature infants and children born severely asphyxiated, they are frequently associated with cerebral hemorrhage. A "ratchet" or "cogwheel" element in the breathing is sometimes heard over atelectatic tissue and when present is diagnostic of the condition. Bronchitis is much less common than pneumonia, the physical signs may be extremely localized, but they do not differ from those present at other age periods. Recovery occurs in mild cases, which usually have a febrile course. Pulmonary consolidation can be diagnosed during life in a large number of cases but it is not possible to determine whether it is the result of pneumonia or intrapulmonary hemorrhage. Crepitations of a peculiarly fine crackling nature can be heard over the affected tissues in the majority of cases of pneumonia or intrapulmonary hemorrhage; they are diagnostic of consolidation and are not found in other respiratory conditions of the new-born. Periodic attacks of cyanosis are constant in cases of pulmonary consolidation; administration of oxygen results in an appreciable improvement in color. Attacks of cyanosis occurring in other neonatal conditions (intracranial hemorrhage, urinary infection, septicemia, atelectasis) are not influenced to the same extent by oxygen administration. The prognosis in cases of pulmonary consolidation is grave, the majority die within a few days of diagnosis. Three cases are described in which clinical examination led to a diagnosis of pneumonia and eventual recovery. They differed from fatal cases in that they all showed continued high fever.

Indian Medical Gazette, Calcutta

70 541 600 (Oct.) 1935

Ringworm of the Scalp in India N. C. Dev and P. A. Mapstone—p. 541

Some Observations on Dermal Leishmaniasis R. O. A. Smith and K. C. Holder—p. 544

Nerve and Cord Degeneration Referable to Vitamin A Deficiency L. Nicholls—p. 550

Lumbar Sympathectomy in Treatment of Circulatory Diseases M. M. Cruickshank—p. 553

Some Unusual Acute Abdominal Conditions P. N. Ray—p. 554
Hill Malaria C. Strickland—p. 559

Journal of Mental Science, London

81 489 754 (July) 1935

Resemblance of Twins with Regard to Perseveration Ella Pratt Yule—p. 489

Fate of One Hundred and Fifty Psychiatric Outpatients I. Skottowe and Madeline R. Lockwood—p. 502

*Investigation into After History of Ninety Patients Discharged from Mental Hospital Against Advice. L. Minski—p. 509

Experimental Studies on Connection of Schizophrenia and Tuberculosis A. Beck, W. Ogden and M. Whelen—p. 514

Agglutinations of Bacillus Coli by Serum of Psychotics Especially of Schizophrenics A. Beck, W. Ogden and M. Whelen—p. 524

Serum Calcium and Sodium in Some Psychotic Disorders A. H. Tingey and S. W. Hardwick—p. 528

Studies on Influence of Emotions on Functions of Organs (Including Observations in Normals and Neurotics) E. Wittkower—p. 533

Patients Discharged from Mental Hospital Against Advice—Minski states that of ninety patients who left the Maudsley Hospital and went home against advice seventeen cannot be traced, twenty-five are in mental hospitals, twenty-four have recovered, sixteen are at home no better, seven committed suicide and one died at home. Obviously the standards of behavior determine the relatives in taking patients home and for this reason the largest number taken home while still ill were suffering from depressive states in which behavior likely to lead to conflict with the environment is not marked. It seems necessary to urge relatives of patients suffering from severe depressive states to send them to suitable hospitals. Most of the patients suffering from depressive states who remain at home, although ill, are of the involutional type, and only two who might reasonably be expected to recover remain ill in difficult home situations. The relatives seem to take a more serious view of states with excitement, only four manic patients and three with toxic confusional states were taken home while excited, no unrecovered schizophrenic patients remain at home.

Lancet, London

2 927 986 (Oct. 26) 1935

Some Epochs in Medical Research H. Dale—p. 927

*Agranulocytosis Meningitic Symptoms with Changes in Cerebrospinal Fluid in Case of Relapsing Type K. Goadby and C. Worster Drought with report on cerebrospinal fluid by W. E. C. Dickson—p. 933

Appendicitis in the Aged H. Taylor—p. 937

Surgery in Treatment of Primary Skin Carcinoma H. T. Simmons—p. 938

Agranulocytosis with Meningitic Symptoms—Goadby and Worster-Drought discuss the occurrence of meningitic symptoms in a case of agranulocytosis in which the cerebrospinal fluid was examined. Opportunity was afforded also for chemical and histologic examination of the blood during the prodromal period of a relapse. The diagnosis of agranulocytosis was made during an illness that started in April 1934 with vomiting, pyrexia and ulceration of the gums. After a few weeks the more acute symptoms yielded to injections of penicillin but there were subsequent relapses in May, June, September and December 1934 and a severe one toward the end of February 1935. It was during this last attack that definite meningitic symptoms—drowsiness, rigidity of the neck and Kernig's sign—were first observed. Each of the previous relapses had been ushered in with pyrexia, languor and prostration, but no physical signs indicating involvement of the nervous system were detected. During each relapse the granulocytes fell to a very low level, the spleen was palpable and abnormal signs—dulness and crepitations—appeared at the base of the left lung. At no time during the entire course was Bacillus fusiformis or Vincent's spirochete detected in films from the ulcers of gums, throat or tongue.

Presse Médicale, Paris

43 1649 1664 (Oct. 23) 1935

- *Weltmann's Serum Coagulation in Clinic. G. Carrière, P. Martin and A. Dufosse—p. 1649
 Study of Pigmentation in Alopecia Areata. F. Woringer and R. Thee.—p. 1652
 *Scleroderma with Sclerodactylia Treated by Cervical Sympathectomy. D. Pléteff and T. Plotkin—p. 1653

Weltmann's Serum Coagulation—For eight months Carrière and his co-workers studied the serum coagulation reaction of Weltmann in various diseases. The principle of the method is to place constant quantities of blood serum in the presence of increasingly strong solutions of calcium (or barium) chloride, running from 0.1 to 1 per thousand. The reaction is read after the tubes have been removed from the warm water bath. They may be clear or show a simple opalescence or a flocculation. The result, which measures the heat coagulation of serum in the presence of calcium ions of growing concentration, allows the determination of the so-called band of coagulation. This band may be increased or diminished. Its increase is in general associated with a fibrous process and its decrease with an inflammatory one. According to the authors' experience, the band is increased in tuberculosis when the process is fibrotic and is diminished when it is exudative or pneumonic. In chronic rheumatism the reaction is helpful in diagnosis and prognosis for the same reasons. In hepatic disorders, especially cirrhosis, the increase in the band appears constant. The band appears decreased in the majority of cancer cases. Finally in exudates and transudates the band is decreased as in inflammatory conditions. The authors feel that this reaction offers additional help to that provided by other laboratory tests.

Scleroderma Treated by Sympathectomy—Pléteff and Plotkin report a case of scleroderma with sclerodactylia which responded well to cervical sympathectomy. They believe that the sympathectomy acts on the function of the parathyroids and diminishes calcemia. Periarterial sympathectomy of the arteries of the arm in cases of scleroderma associated with involvement of the upper extremities and sclerodactylia gives no result and it is necessary to attack the stellate ganglion directly.

43 1689 1704 (Oct. 30) 1935

- *Cancer of Colon. Atypical Onset. M. Chiray and Georges Rosanoff—p. 1689
 Facilities and Difficulties of Diagnosis of Duodenal Ulcer. R. A. Gutmann and G. Voulpiotis—p. 1691

Cancer of Colon. Atypical Onset—Chiray and Georges-Rosanoff discuss the various types of atypical onset of cancer of the colon. It is sometimes manifested by a prolonged febrile state without any localizing symptoms. This form is not well known. Sometimes it sets in with intestinal symptoms without the characteristics of cancer. This may resemble appendicitis, intestinal tuberculosis, simple colitis, or diverticulitis. Sometimes the onset may take on the aspects of an extra-intestinal disorder, such as gallbladder disease, hepatitis, simple dyspepsia, urinary manifestations and, in women, genital conditions. The practical conclusion that can be drawn from this discussion is that one should not hesitate to make repeated roentgen examinations, since colonic cancer cannot be eliminated on the strength of one negative examination.

Pediatrics, Naples

43 1201 1296 (Nov. 1) 1935

- Infantile Hypotonia. G. Suranyi—p. 1201
 Anatomopathologic and Clinical Considerations of One Hundred Necropsies on Premature Children. F. Pontieri—p. 1212
 Treatment of Favism. A. Chieffi—p. 1220
 *Intolerance to Milk and Its Treatment with Injections of Milk. A. Beverini—p. 1227
 Laryngeal Tuberculosis. Two Cases. G. Murano—p. 1254
 Possibility of Cure of Tuberculous Meningitis. L. Sertoli—p. 1267

Treatment of Intolerance to Milk—In discussing the pathogenesis of sensitivity to milk, Beverini states that digestive disturbances occurring in infants are a manifestation of anaphylaxis. He advocates subcutaneous injections of milk. The milk injections are specific breast milk vaccines against breast milk only and cow's milk against cow's milk only. The symptomatology of the condition consists in vomiting after

feedings, obstinate constipation, fatty stools, eczema and impetigo. When cow's milk is injected the temperature rises for several hours, sometimes for as many as ten hours. This does not occur when breast milk is administered. An injection of breast milk produces a slight erythematous reaction that disappears in the course of one or two days, whereas that of cow's milk produces a marked erythematous reaction. The author reports on two infants, aged 16 and 8 days, respectively. The children were treated with progressive doses of breast milk heated to 110° C. for twenty minutes. Preliminary doses of 1 cc. and 2 cc. of milk were injected subcutaneously one hour apart and were followed by a dose of 5 cc. injected subcutaneously into the flank. After the third injection, from 5 to 10 cc. of milk was injected every other day. The treatment was well tolerated. After four months of milk injections, the first child showed great improvement, but an acute intercurrent gastro-enteritis set in suddenly with a fatal result. The other child presented deficient assimilation of food and abnormal amounts of fat in the feces. Dyspepsia aggravated the intolerance to milk. Under treatment the general condition improved. The child became more lively, had more color and gained weight. The feces lost their dyspeptic character, indicating that the assimilation of fats had improved.

Riforma Medica, Naples

51 1501 1540 (Oct. 5) 1935

- *New Sign for Diagnosis of Pleural Effusion. L. D'Amato—p. 1503
 Autohemotherapy in Arterial Hypertension. G. Pizzillo—p. 1505
 Takata Test in Diseases of Extrahepatic Biliary Tract. G. Manzoni—p. 1508

New Sign for Diagnosis of Pleural Effusion—D'Amato states that, in patients with pleural effusion, there is an area of dullness on the segment of the vertebral column near the posterior costomediastinal sinus of the pleura. The sign that he describes for the diagnosis of pleural effusion consists in the displacement of the dullness from the vertebral segment to the cardiac area, when the patient changes from the sitting position to the lateral decubitus and lies on the side opposite that in which the pleural effusion is located. The displacement of the vertebral dullness is due to the passage of the pleural fluid from the posterior to the anterior costomediastinal sinus of the pleura during the change of position of the patient. The dullness of the cardiac area increases on both sides. Its increase on the side on which the patient lies is due to the gravitational displacement of the heart and on the opposite side to the new location of the pleural fluid in the anterior costomediastinal sinus of the pleura.

Prensa Medica Argentina, Buenos Aires

22 2003 2050 (Oct. 16) 1935

- *Diagnostic and Prognostic Test for Diseases of the Subhepatic Crossway. M. Zinny—p. 2003
 Heart and Anasarca in Mixedema. A. O. Raffo and A. Ruiz Moreno—p. 2009
 Constitutional Type Observed in Middle West of Argentina. J. M. Nagera—p. 2014
 Fibroma of Uterus. Two Hundred and Ten Cases with Operations. E. B. Ries and R. M. Bueno—p. 2020

A Test for Liver Function—Zinny reports a test for functions of the liver and of the biliary tracts. The results of which indicate whether an operation, especially cholecystectomy, should be performed on patients suffering from diseases of the liver or the biliary tract. It determines the amount of azorubin in the duodenal secretion, which is collected by means of duodenal tubage during the first hour of elimination of the dye that follows the intravenous injection of 4 cc. of a 1 per cent solution of azorubin. The determination is made by identifying the color of the duodenal secretion in a tube with that of a mixture of a 1 per cent solution of azorubin and ammonium picrate (of the color of the C bile) in the control tubes that form the colorimetric scale, previously prepared with twenty tubes, numbered from 1 to 20, each containing increasing quantities of from 0.05 to 1 cc. of the 1 per cent solution of azorubin and decreasing quantities of from 4.95 to 4 cc. of the solution of ammonium picrate. The colorimetric scale corresponds to concentrations of from 0.001 to 0.02 Gm. of azorubin in the duodenal secretion. If the liver and the biliary tract are normal,

the dye appears in the duodenal secretion within fifteen and thirty minutes after the injection. Its elimination lasts about three hours. The normal hourly elimination ranges between 0.01 and 0.018 Gm of the dye, 0.01 Gm being considered the lower normal limit. An elimination of 0.008 Gm indicates incipient impairment of the liver but does not contraindicate operation, 0.006 Gm makes operation inadvisable for the time being but may improve with treatment, and the operation can be performed when the results of the test, repeated at intervals of five or eight days are better. An elimination of 0.005 Gm indicates grave liver or biliary insufficiency that prevents operation, except in cases of emergency. Even in such cases it is dangerous in spite of the intensified preoperative and postoperative care of the patient. An elimination lower than 0.003 Gm an hour indicates too serious an involvement of the liver and biliary tract to operate. The author states that the test is harmless, has no contraindications, is of a simple technic and may be repeated whenever necessary.

Deutsches Archiv für klinische Medizin, Berlin

178 89 216 (Oct. 6) 1935 Partial Index

*Hemolytic Hypersplenism Acquired Hemolytic Icterus L. Heilmeyer —p. 89

Indican Tolerance as Functional Test of Renal Function P. Schillerbach —p. 103

Experimental Nycturia A. Jores —p. 109

Pathologic Physiology and Clinical Aspects of Atrioventricular Dissociation I. Oettinger —p. 117

Hemolytic Hypersplenism—Heilmeyer separates from the group of disorders collectively designated as acquired hemolytic icterus a definitely defined disease entity, namely, hemolytic hypersplenism. The symptoms of this disorder are severe hemolytic anemia with considerable increase in the blood exchange (reticulocytosis of from 100 to 400 per thousand and urobilin elimination in feces of from 700 to 3,000 mg.) absence of hepatic changes, absence of bilirubinuria, reduction of osmotic resistance, microspherocytosis, splenic tumor, sudden onset of the disorder and lack of symptoms of congenital hemolytic icterus in the anamnesis, absence of constitutional hemolytic signs, absence of similar disturbances among the relatives, and cure of the hemolytic anemia with complete disappearance of the reduction in the resistance and of the microspherocytosis following splenectomy. From the complete reversion of the biologic and morphologic changes in the erythrocytes after splenectomy the author concludes that this acquired disorder is not a disease of the bone marrow or of the erythrocytes but rather of the spleen. This is borne out also by a comparison of the measurements of the erythrocytes in the splenic artery and in the splenic vein. It reveals that in passing through the spleen the erythrocytes become thicker and simultaneously their spherical diameter becomes reduced (microspherocytosis). Although there are as yet only isolated cases with this aspect, they nevertheless throw some light on the process of splenic hemolysis in this disorder. The author suggests an investigation of this problem in cases of congenital hemolytic icterus. In discussing the etiology of hemolytic hypersplenism, he calls attention to the significance of severe infections. It is possible that severe disturbances in the endocrine correlations may likewise play a part in the etiology, for the author cites a case of hemolytic anemia with splenic tumor which developed after a severe thyroid and hypophyseal disturbance.

Klinische Wochenschrift, Berlin

14: 1593 1632 (Nov. 9) 1935 Partial Index

Occurrence of Iminazol Bodies in Gastric Juice F. Oefelein —p. 1599
Especially Intense Action of Estrogenic Substance in Vaginal Instillation. M. Berger —p. 1601

Lactic Acid Elimination in Urine in Premature and Full Term Nourlings H. Seckel and W. Sommer —p. 1602

Formation of Biliary Calculi A. von Kuthy —p. 1605

Calcium Resorption and Calcium Retention in Various Diets E. Hesse and Charlotte Parrdt —p. 1607

Histamine in Treatment of Allergic Conditions (Bronchial Asthma, Urticaria) A. D. Smith —p. 1612

Action of Estrogenic Substance Applied in Vagina—Berger says that in studies on the resorption capacity of the skin of rats for estrogenic substance it was decided to determine the efficacy of estrogenic substance in case of direct application

to the vaginal mucous membrane. It was found that this instillation required much smaller quantities for elicitation of estrus than did subcutaneous administration. The experiments were made on adult, castrated rats. The author states that 0.05 cc. of fluid can readily be instilled into the vagina of the rat by means of a thin urethral catheter and an especially calibrated record syringe. An ampule containing 100 mouse units of estrogenic substance was diluted in the required manner and 0.05 cc of fluid was instilled five times in the course of thirty-six hours. By dilution of the extract and by repeated injections it was possible to avoid the sources of error that are involved in the use of extremely small doses. It was found that in vaginal application, 0.5 mouse unit was sufficient to elicit estrus in rats, whereas in the case of subcutaneous administration more than 6 mouse units was required. In the estrus that was produced by instillation, noncornified epithelia were often found among the cast-off, non-nucleated horny lamellae. In this respect this type of estrus differs from that produced by the subcutaneous administration of estrogenic substance.

Histamine in Treatment of Allergic Conditions—Dzsinich calls attention to the great similarity between histamine shock and anaphylactic shock and points out that on the basis of this observation it was assumed that histamine plays a part in allergic conditions. The investigations that were made in connection with this hypothesis corroborated the assumption of the important role of histamine in the allergic reaction, namely, of the histamine that is liberated by the cells in the sensitized organism. It is assumed that in asthma histamine is liberated by the vascular cells of the bronchi, in urticaria by those of the skin, in hay fever by those of the nasal mucous membrane and in migraine and epilepsy by the vascular cells of the brain. The histamine and histamine-like substances thus liberated supposedly elicit endogenously the local and general symptoms of these disorders. If this stand is taken it seems justified to assume that allergic persons can be desensitized against this endogenously produced histamine by the exogenous introduction of small doses of histamine. The author decided to try this therapy in fifteen cases of bronchial asthma and in three cases of urticaria. In severe cases he began with 0.00001 mg. of histamine, in the milder ones with 0.0001 mg. The first injection was given intracutaneously and when it caused no noticeable reaction the same dose was given subcutaneously on the following day. Later, the injections were given at intervals of two days. In a few cases the daily treatment was tried but was found inadvisable. The doses were gradually increased but the author advises against their being increased beyond 0.01 mg. A table shows that this maximum dose is reached in severe cases after the twelfth and in milder cases after the ninth injection. Quite frequently, ten or twelve injections resulted in complete disappearance of the symptoms, but in other cases up to thirty injections were required. Summarizing his results the author says that with a suitable technic and an individualized dosage histamine treatment may produce permanent and satisfactory results in bronchial asthma as well as in urticaria. Although he had some failures in his rather small material, he nevertheless considers the method worthy of further trial.

Medizinische Klinik, Berlin

31 1453 1484 (Nov. 8) 1935 Partial Index

Danger of Infection from Children with Masked Elimination of Tubercle Bacilli G. Zederbauer —p. 1458

*New Symptom for Differentiation of Diaphragmatic Hernia from Diaphragmatic Relaxation W. Bohme —p. 1460

Tuberculosis in Persons of Advanced Age A. Albrecht —p. 1461

Anaphylactic Spring Edema of Lung D. Engel —p. 1466

Pathologic Anatomic Aspects of Artificial Respiration in Death from Drowning D. Schenke —p. 1466

Differentiation of Diaphragmatic Hernia from Diaphragmatic Relaxation—Bohme points out that on the basis of a roentgenoscopy it is frequently difficult to determine whether the arched shadow in the right thoracic space represents the liver that has passed through a diaphragmatic cleft, or whether the liver together with the diaphragm has become elevated because of a relaxed diaphragm. In the left side of the thorax the same doubt may apply with regard to the stomach. More-

over, the paradox motility that is usually cited in support of the diagnosis of diaphragmatic paralysis is observable also in case of traumatic diaphragmatic hernia, when large portions of the abdominal viscera have ascended into the thorax. After pointing out that the isolated electrical irritation of the phrenic nerve as well as kymographic tests are of no value in the differentiation, the author stresses the importance of this differentiation, stating that, although relaxation of the diaphragm resulting from phrenic paralysis is frequently irreparable, diaphragmatic tears are amenable to surgical repair. It is therefore desirable to know of a reliable symptom that permits definite differentiation. The author calls attention to an esophageal-diaphragmatic phenomenon suitable for this purpose. He shows that the *contraction phenomenon* elicited by the contracting diaphragm on the esophagus at the esophageal hiatus is helpful in testing the function of the diaphragm and in determining the localization of the diaphragm in otherwise obscure topographic conditions. This constriction appears also when the abdominal muscular pressure is exerted. It frequently is lacking or considerably reduced in case of paralysis of one side of the diaphragm. If there is a suspicion of a tear in the diaphragm and of displacement of abdominal organs into the thorax, and if in this case a constriction of the esophagus at the hiatus develops in response to a unilateral electrical irritation of the phrenic nerve, it denotes diaphragmatic hernia and contradicts diaphragmatic relaxation.

Munchener medizinische Wochenschrift, Munich

82 1749 1784 (Nov. 1) 1935 Partial Index

Comparative Therapy of Whooping Cough A. Knorr—p. 1750

Spontaneous Pneumothorax E. Schott—p. 1751

Refractory Case of Kala Azar (Internal Leishmaniasis) J. P. Naab—p. 1756

*Cure of Syphilis with Spirochetal Vaccine Hilgermann—p. 1760

Experiences in Treatment of Suppurating Anginas with Bismuth Preparation Stüch—p. 1761

Cure of Syphilis with Spirochetal Vaccine—Hilgermann states that he has demonstrated that the efficacy of chemotherapy is not the result of its sterilizing effect but rather of an immunizing action. To be sure, the chemotherapeutic effect is based on the parasitotropic action of chemical substances, not in the sense of a sterilization but rather in the sense of a killing of some of the pathogenic organisms, the liberated toxins of which present an adequate specific stimulus for the elicitation of an active immunization. The chemical substance neutralizes the endotoxins of the pathogenic organism, and the neutralized toxins stimulate the formation of defense substances. The chemotherapeutic agent arsphenamine fulfils its parasitotropic action completely if a sufficient amount of protective substances are present in the organism. This was proved by several investigators in cases in which chemical substances could not be administered at first. After a preliminary immunization, a few doses of arsphenamine were sufficient to make all reactions negative. The author cites one investigator who, on the basis of observations in 225 cases, reaches the conclusion that in patients who have undergone preliminary treatment with spirochetal vaccine the manifestations of early syphilis are made to disappear by chemotherapeutic substances with unequaled rapidity. If the cure of early syphilis requires the presence of considerable quantities of protective substances, this is even more important in chronic infections. The administration of spirochetal vaccines makes it possible to compensate for the deficiency of protective substances in the organism. After this immunization the organism alone is able to counteract the infection or the chemotherapeutic substances are more effective. The author shows that the vaccine therapy of syphilis has become practical since he succeeded in the mass culture and in the production of avirulent cultures of *Spirochaeta pallida*. He maintains that this immunization either alone or in combination with chemotherapy will produce a cure of the syphilitic infection and the prevention of the late sequels of syphilis, the latter aim not being satisfactorily achieved with chemotherapy alone. He shows that the spirochetal vaccine can be used also as a test substance in order to detect inactive foci in latent cases and points out that the negative Wassermann reaction is not sufficient proof of a complete cure and that in the future the negativity

of that reaction together with the lack of manifestations following vaccination with spirochetal vaccine will be required as a proof of complete cure.

Wiener klinische Wochenschrift, Vienna

48: 1343 1374 (Nov. 1) 1935 Partial Index

Serum Protein Bodies in Hepatic Diseases H. Kaunitz—p. 1349

Physiologic Fetal Forced Position and Its Significance for Development of Congenital Deformities F. Bauer—p. 1352

*Determination of Age on Roentgenograms of Aorta of Living Persons and By Means of Geometrical Method of Measurement After Death S. Kreuzfuchs—p. 1355

*Abderhalden's Incretory Reaction in Hyperthyroidism M. Schacherl—p. 1356

Occupational Skin Diseases M. Oppenheim—p. 1359

Determination of Age by Roentgenography of Aorta.—Kreuzfuchs maintains that the increase in the diameter of the aorta from birth to the age of 70 conforms to a certain law. For the period between the ages of 20 and 70, he was able to determine with his aortico esophageal distance method that the diameter of the so called arch of the aorta is 20 mm at the age of 20 and thereafter increases each decade by 2 mm. At the age of 70 it equals 30 mm. Measurements on 200 persons revealed that this method gives correct results in 90 per cent of the cases. The author points out that his method as well as several others, although they can be employed on the living patient, are not suitable for postmortem examinations. For this reason he devised a method that permits a mathematically exact measurement of the aorta. He explains his formula on a diagram and gives an example of the computation. He shows that it is not only more simple but also more exact than his other method and that it can be used by anatomists and in legal medicine.

Abderhalden's Incretory Reaction in Hyperthyroidism—After pointing out that Abderhalden's incretory reaction has been entirely rejected by some and has been accepted by others only with considerable reservations, Schacherl relates the observations he made with this test in patients with hyperthyroidism. He concedes that different examiners frequently obtain different results and that the Abderhalden test involves sources of error. Nevertheless, he thinks that the errors can be reduced to a minimum and that the results of the test will eventually be more valuable than the determination of the basal metabolism, emphasizing that the latter has been overestimated. He points out that the physical aspects of patients with endocrine disturbances are important, since they often give indications of the type of the disturbances. In view of the fact that the Abderhalden incretory reaction indicates the existence of a disorder in the examined gland but does not reveal whether the disturbance is a hyperfunction or a hypofunction, it seems desirable to determine the type of the disorder by clinical observation. The physical aspects of incretory disturbances are especially noticeable in female patients, so that the outcome of Abderhalden's incretory test can frequently be estimated in advance. Nevertheless, the reaction complements the clinical observations considerably. The results of the reaction are recorded in a table. From these results it is evident that the disturbances which are considered of a hyperthyroid nature, are really polyglandular, with a predominance of the symptoms known as hyperthyroidism. The involvement of the various endocrine organs differs in the individual cases. Especially great is the involvement of the thymus, the gonads and the anterior hypophysis. Moreover, the clinical picture indicates an involvement of the mammary glands. In discussing the therapeutic significance of the Abderhalden incretory reaction the author shows that, in cases in which neither the thyroid nor the thymus was decomposed in the reaction, thyroid should be administered only when gonadal and anterior hypophyseal hormones are likewise required. Without this combination, the administration of thyroid should be dispensed with and only thymus should be given. However, the simultaneous administration of thyroid and thymus is never indicated. In the conclusion the author points out that Abderhalden's opinion, namely, that the decomposed organ should be compensated by its hormone, would have proved erroneous in the cases here investigated, and he stresses that the clinical use of the reaction is possible without the exact knowledge of the chemical processes that are involved.

Zentralblatt für Chirurgie, Leipzig

62: 2657-2704 (Nov. 9) 1935 Partial Index

- *Cardiodysia A New Operation for Treatment of Cardiospasm G Lotheissen—p. 2658
Do Late Disorders Develop After Use of Petz's Suturing Apparatus in Gastric Resections? O Schürch—p. 2660
Conservatism in Case of Retarded Callus Formation with Pseudarthrosis A Lorenz—p. 2662
Cervical Echinococcus with Rare Localization M Matyás—p. 2667

Operation for Treatment of Cardiospasm—According to Lotheissen, most cases of so-called cardiospasm yield to non-surgical dilation, for among about 120 cases he found only two in which more radical interventions became necessary. In one of these cases he did the cardioplasty according to von Hacker and obtained good results. The second patient, a woman aged 52 had a dilatation of the esophagus and a severe cicatricial stenosis (probably the result of ulcerations). It was decided that the stenosis had to be excluded and that a new connection with the stomach had to be formed. After mentioning the shortcomings of the methods usually employed in such cases the author describes a new technic that he employed. The abdominal cavity was opened in the midline. Following division of the peritoneum at the diaphragm, the esophagus could be readily detached and drawn down for about 8 cm. It was then again attached to the diaphragmatic cleft with button sutures. After that it was turned so that the posterior wall could be seen. A fold of the fundus portion of the stomach was lifted and attached to the dilated portion of the esophagus, above the stenosed part, by means of two rows of button sutures. Then the esophagus was again turned back so that the anterior wall was exposed, and an elastic Doyen clamp was put on it directly anterior to the diaphragm. The ectasia had been well irrigated but in order to make sure that there could be no escape of contents the surroundings were well covered with compresses. Then the entire constricted portion (4 cm. in length) was incised down to the lumen and the mucous membrane was immediately attached all around to the external wall by means of button sutures—that is, a sort of cardiotomy was made but intentionally also through the mucous membrane. Then followed the intussusception of the constricted portion into the stomach and the attachment of an anterior fold, which on both sides was joined to the posterior fold with a double suture, to the dilated esophagus. By this the cut portion was completely buried. In order not to impair the sutures and yet to insure proper nutrition of the greatly weakened and emaciated patient, a gastric fistula was made. The author points out that since the disorder is always designated as cardiospasm even if the stenosis is at the diaphragm, his operation can be designated as cardiodysia (intussusception of the cardia). He thinks that cardiodysia is advisable especially for cicatricial stenoses. The covering with folds greatly reduces the danger of infection. Considerable dilatation of the esophagus is of course a prerequisite for this intervention.

Klinicheskaya Meditsina, Moscow

13 1103-1256 (Aug.) 1935 Partial Index

- Diotropism and Resistance in Syphilis K M Ishvsky—p. 1125
Variability of Microbes and Its Significance in Infectious Diseases I S Bomshteyn—p. 1137
*Acute Appendicitis in the Aged F S Korganov and A P Krapivina—p. 1142
Syphilitic Epilepsy E M Vizen—p. 1176
Diathermy Therapy of Genuine Epilepsy V V Isaev—p. 1186

Acute Appendicitis in the Aged—Korganov and Krapivina state that between 1928 and 1933, 1670 cases of acute appendicitis were treated at the Hospital Semashko in Moscow. Of these, 1638 or 98.1 per cent comprised patients ranging in age between 10 and 50 while thirty-two or 1.9 per cent were past 50. The authors summarize their study of the thirty-two cases as follows: 1 The peculiarities of the clinical course of acute appendicitis in old people conditioned by the weak reaction of the organism. Persons with generalized arteriosclerosis react poorly or not at all to local inflammatory manifestations. Systemic reaction as expressed by temperature and pulse may be absent until the development of peritonitis. 2 The atypical picture of acute appendicitis of the aged is responsible for errors in diagnosis, late recognition and a high incidence of complications. 3 Operation should be performed in

all cases of acute appendicitis in the aged as soon as the diagnosis is established. Expectant treatment is permissible in the case of abscess. 4 Because of alterations in the cardiovascular and respiratory systems of the aged, the use of general narcosis should be reduced to a minimum. 5 The authors advise the removal of the appendix except when the presence of an abscess complicates the procedure. 6 The incision is to be closed without drainage except in the cases in which the focus of infection cannot be removed or in the presence of parenchymatous oozing from the bed of the removed appendix. 7 The postoperative treatment calls for especial attention to the status of the cardiovascular, the respiratory and the intestinal tracts. 8 Mortality in the cases in which operation was performed in the early stage is not high (about 0.5 per cent), in the late and the complicated cases it reaches from 30 to 50 per cent.

13 1257-1420 (Sept.) 1935 Partial Index

- *Analysis of Cardiovascular Disease on Constitutional Basis M V Chernorutskiy and F M Ganskay—p. 1307
Grave Disturbances of Myocardial Blood Supply Occasioned by Functional Disorders of Coronary Circulation D M Grotel—p. 1314
Symptoms of Myocardial Abscess A A Gerke—p. 1332
Diagnosis and Symptoms of Sclerosis of Pulmonary Artery L M Georgievskaya and N V Potte—p. 1342
*Skin Reaction to Streptococcus Toxins in Rheumatic Disease A V Kaminskaya and I T Teplov—p. 1363

Cardiovascular Disease—Chernorutskiy and Ganskay analyzed 935 cases of cardiovascular disease with special attention to distribution according to constitutional types. There were 501 male and 434 female patients. Distribution according to age was as follows: up to the age of 20 years 5.2 per cent, between 20 and 30 years 24.2 per cent, between 31 and 40 years 20.2 per cent, from 41 to 50 years 20.8 per cent, and over 51 years 29.6 per cent. Rheumatic lesions such as endocarditis and valvular disease gave the highest incidence in their series, 46.7 per cent. The next in frequency was the arteriosclerotic type with an incidence of 34.85 per cent, while syphilitic disease of the vascular system gave an incidence of 9.8 per cent. These relationships varied with the age, sex and constitutional type. The rheumatic form was more frequent in the young, the female and the asthenic type, while the arteriosclerotic and syphilitic forms predominated in the adult, the male and the hypersthenic constitution. Distribution of pathologic types in the hypersthenic patients was as follows: arteriosclerotic in 61.5 per cent, syphilitic aortitis in 11.5 per cent, rheumatic in 23 per cent and miscellaneous in 4 per cent. The normasthenic type gave an incidence of rheumatic lesion in 48.25 per cent, arteriosclerotic in 31.25 per cent, syphilitic in 10.5 per cent and miscellaneous in 10 per cent. The asthenic group showed the greatest tendency to rheumatic heart disease, 74.1 per cent and the least tendency to arteriosclerotic 14.3 per cent. Syphilitic aortitis occurred in 3.6 per cent, miscellaneous in 8 per cent. It is evident from these figures that the hypersthenic patients are four times as prone to the arteriosclerotic and three times to the syphilitic type as the asthenic patients while the incidence of the rheumatic forms is only one-third that occurring in the asthenic type.

Skin Reaction to Streptococcus Toxins in Rheumatic Disease—Kaminskaya and Teplov report 62 per cent of positive reactions to intradermal injections of Dick's streptococcus toxin in cases of acute rheumatic infection with joint involvement. The response in nonrheumatic or nonallergic diseases was positive in 20 per cent. There were four positive reactions in a group of twelve cases of a pure cardiac form of rheumatism without joint involvement. The reaction was negative in all of ten cases of endocarditis septica lenta. The positive reaction to Dick's toxin in acute rheumatic disease may persist as such for three or four months. Salicylate therapy leads to earlier disappearance or to diminution of the intensity of the reaction. Simultaneous injection of the streptococcal endotoxin (nucleo-protein) in the positive cases gave a positive reaction in 46 per cent, while injection of the exotoxin component of Dick's toxin gave a positive reaction in 16 per cent only. The authors conclude that skin reaction to Dick's toxin because of its inconstancy cannot serve as an index of rheumatic infection. A certain amount of scientific and practical interest attaches to it however, because it is observed more frequently in rheumatic than in nonrheumatic diseases and because it displays a certain dependence on the course of the disease.

Hospitaltidende, Copenhagen

78 1001 1028 (Sept 24) 1935

*Otto's Disease and Other Forms of Protrusion of Acetabulum (Primary Juvenile Osteo-Asthenic Protrusion and Secondary Protrusions) K Overgaard—p 1001

Two Cases of Rupture of Uterus (One with Patient Moribund on Admission the Other with Recovery) J Henriksen—p 1025

Protrusion of Acetabulum—Overgaard says that the changes in the joints in Otto's disease agree with those in ordinary arthritis deformans except that in protrusion there is a forward arching of the acetabulum with a deep seat of the head of the femur and in arthritis deformans a flattening or a "wan-dering" of the joint surface laterally and upward. The deformity usually appears bilaterally, although the development of the two sides may differ somewhat. In the unilateral cases the contralateral acetabulum is generally deeper than normal. To the tabulation from the literature of the thirty-five cases that surely or most probably belong to this group are added nine personal cases, bringing the total up to forty-four or, with the addition of the six possible cases from the literature and one personal possible case, to fifty-one. Of these, thirty-one (or thirty-four) were in women and thirteen (or seventeen) in men. In men the disorder usually appears in the fourth decade of life, in women, in the fifth or sixth decade. The etiology is uncertain in all cases. The disturbance appears as a rule without demonstrable connection with other pathologic conditions. The possibility that a congenital skeletal variation plays a part in the development cannot be rejected, but the disorder cannot be regarded as merely an anatomic variation, since it occurs only in exceptional cases in younger persons. In three cases from the literature and in one personal case the disease appeared in young women, in three about the time of puberty. Because of signs of weakness in the bones, possibly due to endocrine disturbances or late rachitis and absence of arthritic changes, these cases are thought to be of other nature than Otto's disease, later development of an arthritis deformans might give rise to a picture resembling Otto's disease. This osteo asthenic juvenile protrusion occurring predominately or exclusively in young women presents an obstacle in delivery. In the differential diagnosis between a primary osteo-arthritic protrusion (Otto's disease) and a secondary protrusion due to traumatic injury, double protrusion, possibly unilateral protrusion but with a deep acetabulum on the other side marked arthritic processes with considerable sclerosis and appearance at a more advanced age point to Otto's disease. Certain trauma, more irregular protrusion and unilateral appearance with the other acetabulum natural, not particularly deep point to secondary traumatic protrusion. In infectious secondary protrusion the history and the clinical observations most often differ strongly from the picture in Otto's disease.

78 1029 1056 (Oct 1) 1935

Investigations on Elimination of Vitamin C A Culdager and J E Poulsen—p 1029

*Some Cases of Lead Poisoning C Lind—p 1043

Ambulant Treatment of Adipositas C C Stochholm Borresen and E Worsaae—p 1049

Lead Poisoning—Lind reports two cases of acute intoxication after intake of fourteen teaspoonfuls of lead oxide during the course of six weeks and of one teaspoonful respectively, and four cases of occupational lead poisoning after exposure to the effect of lead for six months, four months and five months, respectively. He says that the first two cases, in each of which the characteristic changes in the red blood picture were marked, illustrate the difference in tolerance of lead, the patient who had taken only one teaspoonful being more gravely affected. In one of the five cases with lead colic there was colic-like pain, in the other four the abdominal pain was constant. The lead line appeared in five, the sixth patient was toothless. The author emphasizes that anemia in occupational lead poisoning is a constant and early symptom. A slight increase in the number of reticulocytes and the appearance of basophil punctate erythrocytes in abnormal number go hand in hand in lead poisoning, being regeneration symptoms. The number of reticulocytes and basophil punctate erythrocytes is on the whole proportional to the degree of anemia. The effects of the blood poisoning have not been overcome until the anemia disappears,

the reticulocytes return to normal and the basophil punctate erythrocytes disappear or decrease, resumption of dangerous occupations with lead should not be permissible until this time. Examination of the white blood picture showed no characteristic changes. Lind says that his sixth case of anemia, without signs of active blood regeneration, is one of the rare exceptions to the rule.

78 1057 1068 (Oct 8) 1935

*Hyperazotemia in Massive Intra Intestinal Hemorrhage. T Christiansen—p 1057

*Hyperazotemia in Acute Gastric Hemorrhage J Clausen—p 1062.

Hyperazotemia in Massive Intra-Intestinal Hemorrhage—Christiansen says that hyperazotemia occurs in grave cases of intra-intestinal hemorrhage and is a more or less marked symptom in almost all massive hemorrhages, whether due to cancer, ulcer, esophageal varices or the like. It may develop without vomiting or frequent intestinal evacuations. It may appear even if the sodium chloride elimination in the urine continues and may disappear spontaneously without salt water infusions, and it can recur repeatedly. The anemia as such is not the causal factor, because azotemia is not found in anemias in general. In intra-intestinal hemorrhages the hyperazotemia may aid in the prognosis, slight or transient rise in the blood urea indicating a good prognosis and high blood urea values, possibly with progressive rise, being an unfavorable prognostic sign, especially if the condition is complicated with symptoms of lowered turgor and achlorhydria. In such cases an attempt should be made to reduce the blood urea to normal values by the administration of physiologic solution of sodium chloride.

Hyperazotemia in Acute Gastric Hemorrhage—Clausen states that after massive gastric hemorrhages hyperazotemia appears in the course of from six to twenty-four hours and on cessation of the bleeding disappears in a few days. His studies indicate that the main cause of hyperazotemia lies in increased urea production by the organism (resorption of blood) in combination with an impaired renal function due to the effect on the general condition, no impairment of the renal function on an organic basis can be established. That a toxic effect on the organism may contribute to increased production of urea cannot be excluded. Bacterial decomposition of the blood in the intestinal canal seems not to play a noteworthy part. Increase in the urea is believed not to depend on demineralization of the organism. Three cases are cited.

78 1069 1096 (Oct 15) 1935

*Investigations on Azotemia After Hematemesis and Melena G Alsted.—p 1069

Viscerocutaneous and Cutovisceral Reflexes in Abdomen H I Bing and E S Tobiassen—p 1076

Investigations on Fingerprint as Constitutional Mark in Mental Diseases Ctd N B Møller—p 1085

Azotemia After Hematemesis and Melena—Alsted reports eighteen cases in which treatment was carried out from March to June 1935, an abundant diet (Meulengracht) was used in fifteen and an ulcer diet in three. In fifteen cases the bleeding was caused by gastric or duodenal ulcers and in one by an esophageal varix, and in two esophageal varices were suspected. The blood urea values were abnormally high in nine cases more than 50 mg per hundred cubic centimeters and in five between 40 and 50 mg. In fifteen cases an average increase of urea in the blood to 52 mg per hundred cubic centimeters was found the day after confirmation of the hemorrhage. This azotemia diminished noticeably during the following days was then maintained for three or four weeks, and finally fell to the average normal value of 28 mg per hundred cubic centimeters (the McKays). No relation was seen between the azotemia and the degree of anemia, and the azotemia seemed to be independent of the different methods of treatment. The author is inclined to believe that even in the milder forms of hematemesis and melena some relation exists between the renal function and the degree of azotemia. The fall in blood pressure during every hemorrhage from ulcer causes impairment of the renal function for a shorter or longer time and is thus a contributing cause for the azotemia. Other conditions also, particularly dehydration, are believed to play a part in the genesis of the azotemia.

